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Global Value Chains of Multinational Enterprises

OLEXANDR ROGACH¹

Abstract: The article is devoted to the analysis of global value chains in multinational enterprises. Various types of international production fragmentation in multinational enterprises and specifics of vertical and horizontal build up of networking between entities engaged in supply and production chains are shown. The essential meaning of the production fragmentation process and specifics of offshoring and outsourcing in multinational enterprises are highlighted.

Keywords: Multinational enterprises • Fragmentation • Global value chains • International production • Vertical integration

1 Introduction

The latest two decades are marked by radical change in international production of multinational enterprises (MNEs). This change pertains to organization of value creation and forms for its control (Buckley, 2008). It covers production, institutional and organizational structure of MNE organizing their production in the form of global value chains (GVCs). The process of value creation is splitting into the increasingly narrow functional phases or segments of international production of commodities and services. This change in the global operation of MNE is referred to as *fragmentation of international production* in economic literature (Grossman, Rossi-Hansberg, 2008). This ‘clipping’ of international production in MNE occurred first in electronics, IT industry, electrical industry, and car making. Later on, the fragmentation spread to other manufacturing and service sectors: chemical and pharmaceutical industries, mechanical engineering, business and financial services. Today, hundreds of thousands of companies across the world are engaged in GVCs. Some of the countries could already feel significant effects from fragmentation of international production. They were able to gain additional advantages and expand their export capacities. Other countries have just started the rapid connection to MNE production networks. The others still face considerable problems related with their engagement in this process.

2 Literature Review

Although the earliest publications on these problems came out in the 1990s (Kierzkowski, 1990), further useful theoretical analyses of global value added chains were provided by Antràs, Garicano, Rossi-Hansberg (Antràs, 2006; 2008). Grossman and Rossi-Hansberg offered the ‘trade in task’ concept to describe fragmenting of production functions and constructed a model of fragmented production, with each country taking on one function in production and sales of a commodity (Grossman, Rossi-Hansberg, 2012). Some of the researchers also studied theoretical background of offshore trade between countries with different factor endowment (Egger, 2003; Kohler, 2004). Another important issue concerning distribution of advantages from fragmentation, especially between industrially developed and developing countries (Baldwin, 2006; Baldwin, Robert-Nicoud, 2007).

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Microeconomic approach to studying GVCs involved analyses of patterns for commodity exchange between GVCs participants, the architecture of relations between chief flagman companies and subcontractors (Sturgeon, 2010; Altomonte and others, 2011). It was shown that vertical integration determined network flows of commodities in GVCs (Abonyi, 2007). These flows have various trajectories, the so called upstream and downstream ones, and various impacts on value creation (DeBacker, Miroudot, 2012).

Issues of methodology for studying GVCs, calculating the value added created domestically and abroad gained special importance (Gereffi, 2013). It is believed that the higher is the measure of value added created abroad, the higher is the degree of the county's engagement in GVCs of MNE (Braga, 2013).

3 Essential Results

Fragmentation of international production triggers radical change in labour division at corporate and national level. This segmentation of production process has resulted in *global value added chains* (GVCs) of MNE. *GVCs refer to production processes involved in value creation, which are organized and controlled by MNE and entail international division of tasks and work.* Fragmentation of international production causes deep structural change in the contemporary global trade. The increasing numbers of countries and firms start specializing in selected phases, tasks or functions involved in value creation within GVCs, thus shaping their new specialization in the global economy.

Two types of architecture for process of international production fragmentation can be distinguished by the organizational model of MNEs. Vertically integrated MNEs tend to fragment production of finished goods through by-phase processing of raw materials, semi-finished or intermediate products. Examples of such vertically integrated value added chains can be found in oil refinery, electronics and electrical engineering where MNEs organize international production system through successive technological operations (Bang, 2013).

Horizontally integrated MNEs and international firms with widely diversified production lines tend to build another model for fragmentation architecture. These sophisticated network systems have looser links to product processing technologies, with the considerably higher role of participants' specialization in functions involved in value creation or their competencies and unique assets. In another case, fragmentation of international production constitutes a more complex pattern of relations between networking enterprises, the so called 'multi-cell organization' or 'differentiated network'. They involve exchange of components or services, which differs from supplies within vertically integrated production lines.

Although the fragmentation process is organized and controlled by MNEs, its participants, apart from MNE affiliations, are subcontractor partners and market agents. Also, non-equity participants of the fragmented process of value creation can build their own subsystems for international production, meaning that they can also transform into MNE. This results in building up the multi-tier architecture of production links engaging hundreds of thousands of small or medium companies and suppliers. For example, fragmented production systems at leading car making MNEs include 3 to 4 tiers of part suppliers, each covering great numbers of enterprises.

GVCs of flagman MNEs can often cooperate and work together to fulfill selected functions or tasks. This is clearly manifested in the so called 'strategic alliances'. Quite often, a strategic alliance is set up by two leading MNEs to address strategically important issues, such as R&D, standardization or innovation. It entails building up very extensive and sophisticated networks of production, R&D and distribution entities exchanging information, competencies, services or products.

Various terms and concepts are used in economic literature to characterize organizational, technological and spatial aspects of the complex international architecture for MNEs production system: supply chains, outsourcing, off-shoring, global value chains, production sharing, vertical integration, and fragmented production. Although these terms refer to global production networks, they put emphasis on

essential features of value creation process, labour division and networking of international production participants.

The concept of fragmented production provides for the most comprehensive characteristic of the meaning of change in international production in MNEs: it covers organization, technology and spatial dispersion of the production process. As mentioned earlier, fragmentation of international production means physical split of the value creation process into phases or segments. These fragments of production process are spatially dispersed and located wherever the optimal combination of production factors occurs. Sometimes the term ‘production sharing’ constitutes its synonym, because it also emphasizes that value (product) creation process is split into phases. Therefore, authors sometimes use it to characterize technological change in contemporary MNEs.

Contrary to the above mentioned terms, the concepts of outsourcing and off-shoring characterize ultimately different systems of international production. The key analytical criterion for this characteristic is whether value added is created by enterprises controlled through shareholding or by subcontractors who are MNE partners. Therefore, these categories show external (relative to the corporate network of MNEs’ affiliations) mechanisms for value creation process originating from non-shareholding forms of relations between MNEs. In most part of international production systems in MNEs, external subcontractor partners have great significance as suppliers of parts, components or services. Sometimes their numbers exceed the ones of controlled participants of fragmented production. The term ‘off-shoring’ emphasizes that external sources of value added cover enterprises located abroad.

The concepts of GVCs and supply chains are nearly equal by interpretation. In economic literature, they are often used as synonyms to illustrate the form for organization of value creation in production system of many MNEs. They characterize the organizational structure of production at contemporary MNEs, where each phase of the chain uses the value created at its previous phase and increase it to the extent depending on factor endowment of a country.

A large part of GVCs and supply chains is built by vertical integration of production and technological process. Therefore, the term ‘vertical integration’ shows technological character of fragmentation and directions of networking flows within GVCs. It should be noted that the term ‘vertical integration’ is narrower than the concept GVCs or fragmentation of production. Only part of fragmented international production systems and, respectively, GVCs is built by vertical integration. The other part, which is rapidly growing, consists of networking fragmented systems not linked to vertical integration.

Therefore, the term ‘fragmentation of production’ shows the essential meaning of change in international production systems of MNEs. It is used in the current theoretical literature devoted to foreign direct investment and MNEs. The term ‘global value chains’ is the most widespread in business literature, including UNCTAD studies. It characterizes three main aspects of current MNEs operation: (i) global character of production activities involved in value creation; (ii) spatial fragmentation of value creation into segments and tasks; (iii) chain link of production process, from product development to product sales and after-sale service.

The concepts of international production in MNEs and GVCs are, therefore, interlinked, although not equal. Sometimes they are used as synonyms, but they characterize the contemporary process of production internationalization from different perspectives. The concept of international production in MNEs refers to the whole production system in a flagman corporation. It underlines the character and scales of cross-firm relations linking clusters of firms in larger global economic groups. The notion of *chain* reflects the vertical sequence of events resulting in supply, consumption and technical services of products. Here the emphasis is made on product approach. GVCs are very mobile and dynamic. Their reconfiguration and relocation of selected production fragments to other countries occurs along with the changing comparative advantages of countries.

Large diversified MNEs can have international production systems that cover several value added chains. While some of them can feature large-scale fragmentation of production processes, another can

have far smaller one. By analogy, while some of the chains within international production systems can have large spatial dispersion (can be of the global scale), another can have far lesser one, covering a region or even neighbouring countries.

Sometimes GVCs can have comprehensive character and cover selected fragments of various international production systems. For example, when several flagship MNEs set up a strategic alliance their GVCs will overlap and have common participants. This can occur in manufacturing of related products or various classes of the same products. For example, a global producer of a certain type of parts can have its own international production system and gain the status of a flagship MNE in this niche. However, its GVC can be a supplier of parts to international production systems of other MNEs manufacturing various brands of finished products. But because the MNE supplying parts have no impact on the overall management of GVCs in manufacturing MNEs, it does not coordinate the whole value creation process. In this case, the MNE supplying parts constitutes a segment in a larger GVC, as it supplies components for manufacturing finished goods (Gereffi, 2011).

The largest global manufacturer of electronic components, MNE Foxconn, is the principal subcontractor of MNE Apple. The major part of Apple output, such as iPhone and iPad, is assembled in Foxconn factories. At the same time, GVCs of Foxconn integrate with international production systems of other leading MNEs. Foxconn is the principal subcontractor for manufacturing cameras for Canon, game consoles for Sony, cell phones for Motorola, motherboards for Intel and components for other MNEs (see Figure below).

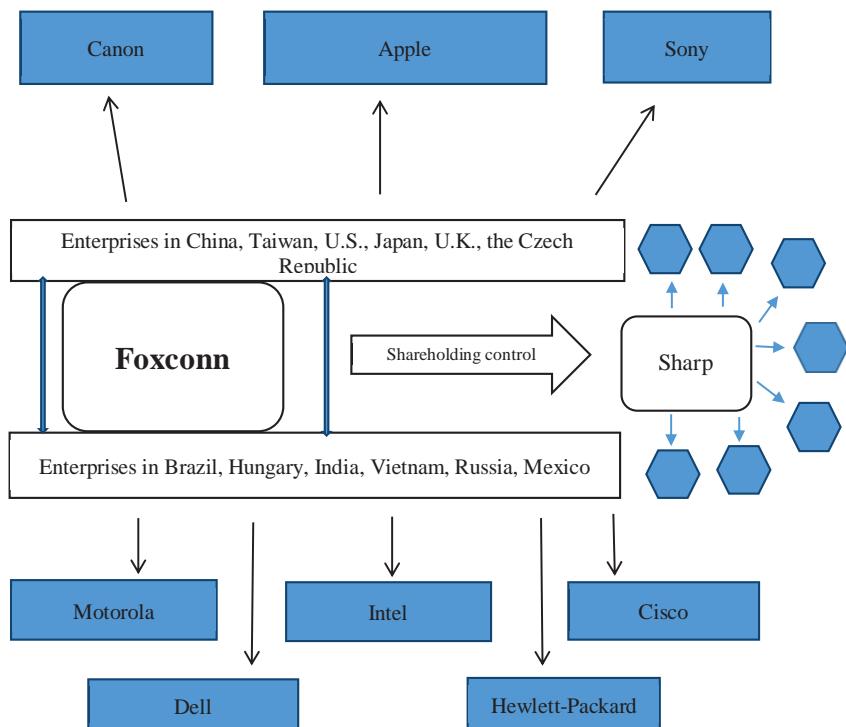


Figure 1. International Production System of MNE Foxconn

Three types of flagman MNEs are distinguished by operation strategy and organization of global production networks. The first type is brand leaders (such as IBM, Compaq or Dell), externalizing rapidly their international production systems through including autonomous supplies. These MNEs build GVCs to reduce costs and differentiate products. They organize and control the whole process of value creation, coordinate business of numerous subcontractors and require high productivity and quality from them. The second type is contracted producers (such as Foxconn, Solelectron or Flextronics). They are global leaders in manufacturing parts and components and they build their own international production systems and global chains of supply for servicing MNEs that are brand leaders.

International production of MNEs is, therefore, fragmented in organizational and technical form of GVCs. Fragmented international production systems have sophisticated institutional structures. Various entities engaged in GVCs can be distinguished by various classification criteria. By stock ownership, GVCs include participants controlled by shareholders, subcontractors and autonomous market agents. By value creation function, GVCs include producers of intermediary or finished products and services, and firms with key supplementary functions of sales, logistics or client services. This institutional structure of GVCs puts strong emphasis on management, control and coordination of all the segments. This control is exercised by flagman MNEs that are brand leaders acting as main organizers and initiators of GVCs.

4 Conclusions

Advantages of participation in network production of MNEs for host countries' economies are essentially conditional on types of GVCs. Their heterogeneity results from not only MNEs strategy, but from the subject of production process. A country participating in global networks of mass-scale manufacturing of consumer goods (household electronics, apparel or footwear) has an opportunity to increase employment and social standards or to build export capacities. However, this type of fragmented production fails to offer significant advantages in innovation.

Extracting sectors of the economy also generate far lower value added, especially when domestic firms specialize on primary phases of processing oil and other mineral resources. Practices of many countries engaged in agricultural chains of value added give evidence of far lower advantages gained by producers of primary agricultural products compared with phases of manufacturing, retail trade and marketing. Therefore, economic policies in a major part of countries dependent on primary commodities seek for stimulating additional processing of products in order to create higher value added.

Industrially developed countries are actively engaged in high tech product chains requiring massive innovation, participation of research centres or laboratories, and high performing R&D.

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The Evaluation of Value at Risk (VAR) Model in case of Commercial Bank

KHUDAYAR HASANLI⁵

Abstract: The main purpose of research paper was a founding of Value at Risk (VAR) of Commercial Bank on evaluating market risk. Parametric method, Historical Simulation method, and Monte-Carlo Simulation method are investigated for VAR evaluation. Parametric (Variance-Covariance) was an optimal method for evaluating VAR based on existence database in case of Azerbaijan banking system. VAR has been calculated with a gap of deposits and credit loans for "X" Commercial Bank in Azerbaijan (for commercial reasons the name of the bank is confidential) based on 95% and 99% confidence level and one-month holding period. Average Credit rate of a bank is taking into account as a risk factor. Firstly, the exchange rate was taken (USD / Manat) as a risk factor, but based on Jarque-Bera and Chi-Square (χ^2) test argued that exchange rate had not a normal distribution. Same statistic test applied to average credit rate and credit rate had a normal distribution. Rule of Sturgess was used in the identification of interval of groups on applying of Chi Square test. The frequency of parent population (E_i) was found for group interval with existing Frequency of observation (O_i). In this paper being a normal distribution of risk factor is calculated standard deviation in annual basis and then this standard deviation of risk factor convert to daily basis. Z score (99%), the standard deviation of the risk factor on monthly basis, holding period and credit and deposit gap are taken variables on evaluating of VAR. Applying Variance-Covariance method VAR has found and the result shows that, Value at Risk or maximum loss of bank will be 11,246,927.1948 AZN (14341911.7506 USD) in the holding period (next month – April 2014). Additional to this, the share of maximum loss on a total asset is 3%, on credit loan portfolio is 10.88%.

Keywords: Parametric (Variance-Covariance) • Value at Risk (VAR) • Chi Square χ^2 Statistic test • Jarque-Bera statistic test, Normal distribution • Market risk • Z-score • Standard error • Holding period

JEL Classification: G32, O24, C36

1 Introduction

Firms started to calculate their whole risks in the one approach in 1970 – 1980. The application of VAR has been extended from its initial use in securities houses to commercial banks and corporates and from market risk to credit risk, following its introduction in October 1994 when JP Morgan launched Risk Metrics (Yieldcurve.com, 2003). VAR has been called the "new science of risk management". There are two approaches for VAR calculation.

1. Parametric (Variance-Covariance) method,
2. Historical Simulation method,
3. Monte-Carlo Simulation method.

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JP Morgan improved and applied VAR model, but initial term being improved VAR did not apply only based on Portfolio as well used to historical profit and deficit variances and some firms used to Mote Carlo Simulation method of calculation VAR. Value at risk as a statistical technique is used by risk managers in order to measure and control the level of risk which the firm, enterprise, and bank an undertakes. Being free declaring of JP Morgan inside of Manuel preparing "The Technical Document" VAR can answer to with x% probability and in "x" days holding period maximum how much will lose? (Dr. K.E.Bölgün, 2009, p. 422). For investors, the risk is about the odds of losing money, and VAR is based on that common-sense fact. By assuming investors care about the odds of a really big loss, VAR answers the question, "What is my worst-case scenario?" or "How much could I lose in a really bad month?" Value at Risk is measured in three variables: the amount of potential loss, the probability of that amount of loss, and the time frame. Expected loss of banks are nor risk, the risk is an unexpected loss (H.Candan, 2009) which VAR in order to measure it.

In recent years value at risk (VAR) has become a very popular measure of market risk. It is widely used by financial institutions, fund managers, and nonfinancial corporations to control the market risk in a portfolio of financial instruments.

A key task for risk managers has therefore been the development of accurate and robust procedures for calculating a one-day VAR. The variance of the probability distribution, and hence the percentile of the distribution corresponding to VAR, can be calculated in a straightforward way from the variance-covariance matrix for the market variables.

In circumstances where the linear assumption is inappropriate, the change in the portfolio value is often approximated as a quadratic function of percentage (White, Journal of Risk, Fall 1998 October) changes in the market variables. This allows the first few moments of the probability distribution of the change in the portfolio value to be calculated analytically so that the required percentile of the distribution can be estimated (An alternative approach to handling non-linearity is to use Monte Carlo simulation. On each simulation trial, daily changes in the market variables are sampled from their multivariate distribution and the portfolio is revalued. This enables a complete probability distribution for the daily change in the portfolio value to be determined. (White, Journal of Risk, Fall 1998 October)

VAR is estimated based on Parametric Approach (Variance-Covariance) in this paper. Parametric VAR is more fit to Azerbaijan Banking system according to statistic data set gap. Historical Simulation and Monte-Carlo Simulation method of VAR estimation required more time series.

2 Theoretical and methodological approach to Value at Risk

In this study for Probability based measure being Value at Risk is calculated based on real statistic data of "X" Bank (Bank name is confidential). There are 3 main approaches for evaluating on Value at Risk and these approaches have under the heading. The main approach and it's under heading for VAR evaluating is consisting of following.

1. Parametric (Variance-Covariance) Method
 - Simple (delta normal) method
 - Exponential Weighted Moving Average (EWMA) method
2. Historical Simulation Method
 - Simple (equal to the weighted) Historical Simulation Method
 - Hybrid (Exponential weighted) Historical Simulation method
 - Hybrid method basis of Taking volatility account
3. Monte-Carlo Simulation Method

Historical simulation method requires more statistic time series, because this method investigates VAR of Bank with historical behavior of variables. Noted at above Historical simulation method evaluate various estimation. Simple historical evaluation procedure consists of following.

$$1-\alpha = () - \alpha \quad (1)$$

$1-\alpha$: being made probability of confidence degree;

RMD_{1-a}: $100 \times (1 - \alpha) \%$ evaluating with confidence degree VAR;

$\mu(R)$: Average of changing of market factors (or profit/loss);

R_a : Loss of below from $\alpha\%$ of observed loss, in another word appropriate confidence degree loss
(Central Bank of Azerbaijan Economic Journal, 2014)

Hybrid Historical Simulation Model (Exponential Weighted)

1. *Measuring r(t) – from t-1 to t time with changing of the market variable.*

2. If there are K number (quantity) variable, each for r(t), r(t-1),...,r(t-K+1) According to $\frac{1-\lambda}{1-\lambda^K} [\frac{1-\lambda}{1-\lambda^K}]$, ..., $[\frac{1-\lambda}{1-\lambda^K}] \lambda^{K-1}$ applying weight

Where $\frac{1-\lambda}{1-\lambda^K}$ Sum of weighting must be one;

3. Ranking from A to Z of variable;

4. For measuring $\alpha\%$ level VAR starting from the smallest variance VAR is a small change from the beginning to find the changes in the weights $(1-\alpha)\%$ before to collect. Cumulative $(1-\alpha)\%$ change in the amount of the VAR is standing in front of the weight sets.

Hybrid Historical Simulation Model (Taking Volatility Account)

This method is put forwarded by Hull and White (1998). Method while keeping advantages of Simple Hybrid Method eliminate leaps in results of VAR. In this case changing of volatility is used for weighting process. Volatility is estimated by the GARCH or EWMA model. Using method is consistent as following stages. (White, Journal of Risk, Fall 1998 October): Volatility evaluate with GARCH or EWMA model.
(Central Bank of Azerbaijan Economic Journal, 2014)

✓ r_t - Changing for parameters basis of historical observation;

✓ σ_t – daily changing of the parameter for Volatility is calculated (4) equations:

✓ Changing in according to with historical observation is corrected based on Volatility (estimated volatility remained stable in the last period), and taking into account the change in the calculation of the parameters is done in the following way

$$x = r_t * \sigma_T / \sigma_t \quad (2)$$

✓ where, σ_T – Volatility calculation for the last period;

✓ σ_t – Volatility calculation for each period;

✓ x – interest changing taking volatility account;

✓ Fulfill 3 and 4 steps of Historical Simulation (Exponential Weighted)

Monte-Carlo Simulation Method

Simulation studies are usually used to investigate the properties and behavior of various statistics of interest. The technique is often used in econometrics when the properties of a particular estimation method are not known. (Brooks, 2008) Valuation of Monte Carlo simulation is followed.

Geometric Brownian Motion (GBM) model is calculated as follow:

$$\Delta S_t = S_{t-1} (\mu \Delta t + \sigma \varepsilon \sqrt{\Delta t}) \quad (3)$$

S_t – Portfolio value;

$\Delta t = (T-t)/n$

$\varepsilon = \mu=0$ and $\sigma=1$ Standard Normal Random Variable (distribution). In this process average is $E(\Delta S/S) = \mu \Delta t$, and variance is $V(\Delta S/S) = \sigma^2 2 \Delta t$

Exponential Weighted Moving Average (EWMA) method

This method is calculated based on EWMA model. Volatility (Variance) with Exponential Weighted Moving Average is evaluated as the following equation.

$$\sigma_t^2 = \lambda \sigma_{t-1}^2 + (1 - \lambda) r_t^2 \quad (4)$$

σ_t^2 – Standard deviation in t time;

λ - “Decay” factor ($0 < \lambda < 1$);

r^2_t – changing according to parameter in “t” time.

Parametric (Variance-Covariance) method

Firstly, Parametric VAR requires selecting risk factors. Usually, in measuring of market risk is taken exchange rate and interest rate as a risk factor (including credit loan rate).

This method is calculated as following equation:

$$VAR = Z * \sigma * \sqrt{t} * V \quad (5)$$

Z – Z-value in confidence level

σ – Variance of risk factor Risk (volatility)

\sqrt{t} – Time factor (holding period) (“Geometric Brownian Motion” theory)

V – Value of Portfolio

While having more than one risk factor it can be calculated such as weighting proses as follow.

$$\sigma^2 = [\omega_1, \omega_2, \dots, \omega_n] * \begin{bmatrix} \sigma_{11}, \sigma_{12}, \dots, \sigma_{1n} \\ \sigma_{21}, \sigma_{22}, \dots, \sigma_{2n} \\ \dots \dots \dots \dots \dots \\ \sigma_{n1}, \sigma_{n2}, \dots, \sigma_{nn} \end{bmatrix} * \begin{bmatrix} \omega_1 \\ \omega_2 \\ \vdots \\ \omega_n \end{bmatrix} \quad (6)$$

Where,

$$\sigma_{ii} = \sigma_i^2$$

$$\sigma_{ij} = \rho_{ij} \sigma_i \sigma_j$$

σ in VAR equation is risk factors variance, which is, calculated equation 7.

$$\sigma = \sqrt{\frac{\sum_{i=1}^{12} (x_i - \bar{x})^2}{n-1}} \quad (7)$$

Usually, the standard deviation of the risk factor is evaluated in an annual basis, and it requires converting to monthly and daily basis. It is showed in equation 8 converting process.

$$\begin{aligned} \sigma_{daily} &= \sigma_{annual} * \frac{1}{\sqrt{252}} \\ \sigma_{monthly} &= \sigma_{annual} * \frac{1}{\sqrt{12}} \\ \sigma_{quarterly} &= \sigma_{annual} * \frac{1}{\sqrt{4}} \end{aligned} \quad (8)$$

Value at Risk for “X” Bank is calculated based on parametric method. Why Parametric method? What are the reasons?

- Time Series is required less more than Historical simulation (“X” bank has statistic data series),
- One of the most applying methods in the world
- The calculation is processed using Mathematical Statistics methodologies and etc.

First of all, risk factor or factors have to be choosing for VAR calculation. There are two risk factors such as exchange rate and credit loan rate in Azerbaijan banking system. Interest rate and other factors have not transmission mechanism in Azerbaijan banking system of economy. Because stock exchange and other financial markets are not developed compare with international level.

3 Statistic test of Exchange rate and Credit loans rate as risk factors

There are just two risk factors are exchange rate and average credit rate (“X” bank rate) in the case of this condition that, need to test according to with a normal distribution with the parametric method. Usually, normal distribution test is processed by “Jargue-Bera” statistics and “Chi-Square χ^2 ” (Fit test) distribution in Calculation VAR. (Hasanli, 2014) (Kohler, 2002)

$$JB = n \left[\frac{S^2}{6} + \frac{(K-3)^2}{24} \right]$$

Where, JB - Jargue-Bera, S - Skewness, K – Kurtosis

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

Where, χ^2 - Chi square, O- observed frequency, E- frequency of parent population (expected).

Initially, exchange rate and credit loan average rate are chosen as risk factors and tested in E-views program pocket with Jargue-Bera statistic (Picture 1 and 2). The exchange rate has not normal distribution while seeing normality statistic test. Normal distribution condition Kurtosis statistics must be 3 and Skewness statistics must be 0. In the table view Kurtosis close to 3 and Skewness statistics close to 0. (Dr. K.E.Bölgün, 2009) (Hasanli, 2014) (Kohler, 2002). Approaching Chi Square (Hasanli, 2014) is more deeply test for normal distribution fulfilling.

Chi-Square was introduced a century ago by Karl Pearson (1857-1936). Chi-Square statistics is sum of all the ratios that can be constructed by taking the difference between each cell's observed and expected frequency in a contingency table, squaring the difference, and then dividing this squared deviation by the expected frequency (Formula 10) (Kohler, 2002)

4 Value at risk calculation and interpretation

After data set collecting, the first step of the Fit test is introduced H_0 hypothesis, then computing. (Hasanli, 2014) Let's introduce Hypothesis.

H_0 : Probabilities of elements of each k interval determined via observation characterize the existing probabilities in the population.

H_a : Probabilities of elements of each k interval determined via observation do not characterize the existing probabilities in the population.

Accept or reject elements of Hypothesis.

a) P-value approach:

If $p \leq \alpha$, H_0 reject,

b) Critical Value Approach:

If $\chi^2 \geq \chi^2_\alpha$, H_0 reject.

c) Otherwise, H_0 accept

After hypothesis, the testing process is lasted step by step. Procedures are seen in the next stage.

Initial computing steps:

- Selecting Risk factor(s) and applying filter – put in a column from A to Z of time series.

- Calculation mean of the series

$$- \quad \bar{x} = \frac{\sum_{i=1}^n x_i}{N}$$

$$\sigma = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}}$$

- To find standard error of the series -

- Identification of series, number, and width of groups

$$B = Z - A$$

B – Frequency of group, Z – maximum value of series, A – minimum value of series

$$R = \frac{Z - A}{k}$$

R - The width of series

$$k = 1 + 3.322 * \log(n) = 6.28 - \text{Sturcress' rule}$$

k – Number of groups

The result is found and then hypothesis rejects or accept.

- $\chi^2 = 1.626 < \chi^2_\alpha = 15.086$

In this case, hypothesis accepts and it means credit loan average rate has the normal distribution. This datum can apply for computing VAR model, in other word variance of credit loan average rate can indicate having the normal distribution.

Table 1

Table of with identify the interval of groups finding the standard deviation

| No | Interval of groups X_{i-1}, X_i | Frequency (O_i) | Mean of Interval $\frac{X_{i-1} + X_i}{2}$ | Weighted mean | Variance | Standard error $\left(\frac{X_{i-1} - \bar{X}_i}{2} - \mu\right)^2$ |
|---------------------------|-----------------------------------|-------------------|--|---------------|-------------|---|
| 1 | $-\infty$ | 19.26 | 0.00 | | | |
| 2 | 19.26 | 19.8141719 | 2.00 | 19.53940821 | 39.07881642 | -1.47144094 |
| 3 | 19.8141719 | 20.36369929 | 5.00 | 20.08893560 | 100.444678 | -0.92191356 |
| 4 | 20.36369929 | 20.91322667 | 9.00 | 20.63846298 | 185.7461668 | -0.37238617 |
| 5 | 20.91322667 | 21.46275406 | 14.00 | 21.18799037 | 296.6318651 | 0.17714121 |
| 6 | 21.46275406 | 22.01228144 | 6.00 | 21.73751775 | 130.4251065 | 0.72666859 |
| 7 | 22.01228144 | 22.718708031 | 3.00 | 22.36549474 | 67.09648421 | 1.35464558 |
| 8 | 22.71870801 | $+\infty$ | 0.00 | | | |
| 9 | | | $\sum O_i = 39.00$ | | | $\sum \left(\frac{X_{i-1} - \bar{X}_i}{2} - \mu \right)^2 = 5.548225431$ |
| 10 | \bar{X} | | | | | $\sigma = 0.832783393$ |
| Variance | | | | | | $\sum O_i = 5.54822531/8 = 5.54822531/8$ |
| Standard error (σ) | | | | | | $\sqrt{\sum O_i} = \sqrt{5.54822531/8} = 0.832783393$ |

Table 2

Finding of Chi Square value

| No | Interval of groups | Frequency of observation (O_i) | Z-score | 99% confidence interval (p_i) | Frequency of parent population $(E_i = 39 * p_i)$ | Frequency of parent population $(E_i = 39 * p_i)$ | Standard error $\frac{(O_i - E_i)^2}{E_i}$ |
|----|--------------------|----------------------------------|---------|---------------------------------|---|---|---|
| 1 | $-\infty$ | 19.26 | 0 | -2.283473897 | 0.01044 | 0.40716 | |
| 2 | 19.26 | 19.8141719 | 2.00 | -1.58637233 | 0.04326 | 1.68714 | |
| 3 | 19.8141719 | 20.36369929 | 5.00 | -0.889270762 | 0.12771 | 4.98069 | 7.07499 |
| 4 | 20.36369929 | 20.91322667 | 9.00 | -0.192169195 | 0.23542 | 9.18138 | 0.003583198 |
| 5 | 20.91322667 | 21.46275406 | 14.00 | 0.504932373 | 0.27814 | 10.84746 | 0.916206047 |
| 6 | 21.46275406 | 22.01228144 | 6.00 | 1.202033940 | 0.19189 | 7.48371 | |
| 7 | 22.01228144 | 22.718708031 | 3.00 | 2.098169594 | 0.09571 | 3.73269 | 11.89617 |
| 8 | 22.718708031 | $+\infty$ | 0.00 | | 0.01743 | 0.67977 | |
| 9 | | | | $\sum O_i = 1.0$ | | | $\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i} = 1.626$ |

It can be easily seen from VAR equation that firstly, has to compute the standard error of risk factor (σ) and Portfolio gap (V). Z score must choose from the table value and "t" calculates with depending on holding period. Last one-year monthly basis data of normally distributed risk factor is selected and calculation standard error as follow.

$$\sigma_{annual} = \sqrt{\sum_{i=1}^n \frac{(X_i - \bar{X})^2}{n-1}} = \sqrt{\frac{13.2815307}{12-1}} = 1.098822953$$

The annual standard error of risk factor has found as above and holding period is taken one month (21 days working day) in this paper. So, it needs to convert standard error from Annual to Daily basis. Standard error of risk factor is converted following equation (Abbasov, 2013)

$$\sigma_{daily} = \sigma_{annual} * \sqrt{\frac{1}{252}} = 1.098822953 * 0.06921 = 0.076059799$$

The after identification variables of equation – Z score, standard error, holding period and net portfolio, Value at Risk model can be estimated. VAR equation and its value of variables are showed as follow:

$$VAR = Z * \sigma * \sqrt{t} * V$$

Where,

Z – Score (99% confidence interval) – 2.575

Standard error σ (daily) – 0.076059799

Holding period \sqrt{t} - $\sqrt{21}$ - 4.582575695

Net Portfolio V – 12531176 AZN (1 USD = 0.7842 AZN)

VAR estimation:

$$\text{VAR (99\%)} = 2.575 * 0.076059799 * 4.582575695 * 12531176 = 11,246,927.1948 \text{ AZN}$$

(14341911.7506 USD)

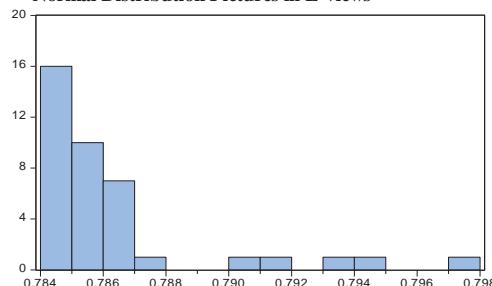
5 Conclusion

Value at Risk (VAR) calculates the maximum loss expected (or worst) on Portfolio (in our case), over a given time period and given a specified degree of confidence. In this case, VAR result declares us "X" Bank's maximum loss will be **11,246,927.1948 AZN (14341911.7506 USD)** in the next one month (April 2014). Additional to this, VAR results can give us other comments such as ratio on Asset. So VAR is the ratio of the total asset is 3% and shared of Credit loan portfolio is **10.88%**. "X" bank has 10.88% maximum loss for the next month (April 2014) of Credit Portfolio. In order to give additional information: VAR/Aggregate Capital * 100 = 18%, VAR.

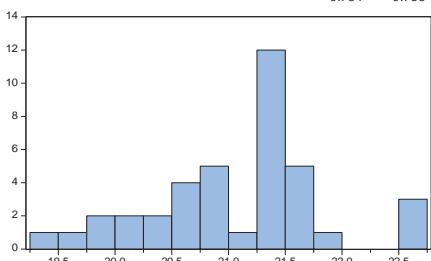
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Normal Distribution Pictures in E-views



1. Picture. AZN=USD exchange rate (Estimated in E-views)



Series: INTERES_RATE_CR
Sample 2011M01 2014M03
Observations 39

| | |
|-------------|-----------|
| Mean | 21.06436 |
| Median | 21.29000 |
| Maximum | 22.72000 |
| Minimum | 19.26000 |
| Std. Dev. | 0.788546 |
| Skewness | -0.080949 |
| Kurtosis | 3.102384 |
| Jarque-Bera | 0.059627 |
| Probability | 0.970626 |

- 2.Picture. Average credit interest rate (Estimated in E-views)

Insurtech as a Modern Driver of Insurance Market Internationalization

DMYTRO RASSHYVALOV⁶

Abstract: The global insurance market place provides coverage from a variety of risks starting from traditional property-casualty and liability exposure through life and personal lines to newest cyber and nanotech risks. In the wake of acute global financial crisis, low interest rate and slowing growth in the emerging markets the insurers are struggling to grow. The new challenge for insurers is the new type of tech competition. The carriers able to harness innovation-centric market strategies coupled with international market approach provide themselves with the competitive edge to weather the ongoing economic headwinds. In modern era of financial and digital engineering the technologically advanced insurers are more competitive in terms of tuning to customers requirements and thus preventing disruption of their insurance chain value. There are three main ways to progress in the field of insurance internationalization. The first is based on undertakings set up in different forms (partnerships, acquisitions, etc.) by the established insurers and insurtechs from different countries. The second is related to insurtech transformation of the deeply internationalised markets (London). The third is attributed to the boosting appetite of astute venture investors (in particular, from China and Asia-Pacific) motivated to invest into overseas insurtechs.

Keywords: Fintech • Insurtech start-ups • Global insurance • Internationalization of insurance

JEL Classification: G22, F39, F69

1 Introduction

In global terms, the insurance industry is constantly growing realm of financial services where strong cash flow and investment resources are accumulated and redistributed. Suffice it to say that over the past thirty years, the global insurance penetration ratio (gross insurance premiums in global GDP) has not been less than 5.6% and total premiums of the world market is now almost 5 trl.dollars (Sigma, Swiss Re database, 2017).

However, the insurance industry in the leading countries is experiencing terribly difficult times. On the one hand, the global economic challenges of the last decade have led to stable low interest rates undermining investment in insurers' business and, as a result, motivating investors to buy tools of insurance issuers. On the other hand, insurance markets, which are the most conservative in the field of financial services, have found themselves facing the threat of insurance value chain disruption. This threat is primarily associated with changing preferences and requirements of the insured on sales channels of insurance products in the digital age. More and more clients are choosing the insurer based on innovated of policies sales channels and their subsequent maintenance. About 80 percent of traditional European insurers (European insurance incumbents) feel devastating effects of competition from new technologically

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advanced insurance startups according to modern surveys (Pierre Audoin Consultants, 2017). Hence, the traditional client-centric strategy insurers is not able to maintain the value chain security and to protect it from destruction by competitors. Alternatively, innovation technology-centric strategies which are based on the use of new digital technologies at all stages in insurance product life cycle have appeared.

InsurTech refers to a group of new terms connected to the FinTech industry and we can say is a derivative of the realm. As you know, FinTech companies are startups in banking and in the last ten years that have significantly changed the business landscape in this field creating serious competition for traditional 'non-digital' operators. They operate with significantly lower costs than traditional banks. They are free from the burden of documenting bank transactions and also devoid of the cost of branch networks and bulky IT systems. By developing innovative products and digitally delivering them to customers instantly, they have mastered the business areas where the traditional actors of the bank sector used to dominate.

A similar pattern has begun to develop in insurance as well. Insurers, albeit with some time lag, have understood that transition to digital technology is not just a question of launching new channels for selling insurance products but also a new paradigm for further development whether "to be or not to be" in the insurance market. So Insurtechs are technologically advanced companies entering the insurance market, using their technological advantage, and providing coverage of the customer base that is more oriented on the digital environment. It is noteworthy that in some countries, understanding exceptional importance of conversion technology advantages into competitive market ones has forced insurance regulators to change institutions and reduce regulatory barriers in advance. For example, in Australia, Singapore and UK insurance companies are recommended to test their innovative Insurtech business plans for specific customer segments without any need for full compliance with regulations applicable to existing operators of traditional insurance market.

The digital pattern of transformation of the financial service market today is technologically based on APIs' (Application Programming Interfaces) application. However, experts point out the limited number of available specialized insurance interfaces. For example, one of the world's largest API databases Programmable Web contains fewer than 30 active APIs for insurance that is not enough compared to other sectors: banking has more than 150, transport – more than 400. (Mulesoft, Whitepaper, 2017).

The strategic perspective in this area will be determined by blockchain technology. According to experts, by 2022, one innovative business built on blockchain technology will be worth at least \$10 billion. By 2025, the business value added by blockchain will grow over \$ 176 billion and then will exceed \$ 3.1 trillion by 2030. (Furlonger, Valdes (2017).

2 Literature Review

Analysts from financial market institutions, specialised IT consulting companies, and global insurance broking house and insurance carriers have been recently focused on the issues of Fintech and its derivative Insurtech. The published research papers are mostly dedicated to the initial data collecting and empirical studies related to the first undertakings set up for the last five years by venture investors and their market practice. In writing this article we relied on the papers of Anish Raj, Prasad Joshi Juergen Weiss, David Furlonger, Jeff Haner, Hugh Terry, Rick Huckstep, Sylvain Bouyon, Oliver Wyman, Tanguy Catlin, Oliwia Berdak, Martin Arnold and others. The academic writers are yet to closely take on this field of research. To fill up this gap by this paper we challenged to examine whether Insurtech is able to boost the internationalization of insurance practices and vice versa.

3 Basic Results of the Research

— Insurech companies offer insurance services and new business models in the field of finance risks, including insurance. Gained InsurTech market formation practice shows that according to the type of services the following make up the field:

— manless contract management service mode, providing digital methods of insurance contract management, from marketing and sale of insurance products to handling claims. Actually Insurtech begins from this direct Internet client-insurer contact (or rather Gadget database). This manless contract management reflects the process titled disintermediation by insurance experts and broadly once again demonstrates the advent of the Internet of Things;

— insurance services with the use of so-called Usage-based insurance (UBI), which involves the use of digital technologies to optimize coverage and its prices because of the risk selection and its level accordingly. For example, motor risk insurance based on vehicle telematics integrates monitoring, mobile communication, and information processing systems allowing online monitoring of compliance with the insurance contract by the insured. So telematics-based UBI is not only gradually transformed into an alternative to traditional model of motor risk insurance, but also changes the asymmetry of information in favour of the insurer and decreases moral hazard in conditions of the Internet of Things;

— *marketing policy of the digital age* Insurance markets, as financial markets, are becoming more efficient. This means that the innovative insurance product only briefly remains the newest and can be reproduced by competitors extremely quickly. The insurance product life cycle is declining, prompting insurers to constantly bring to the market new insurance products and even types targeted at online sale. The Internet makes selling easier and cheaper, and excludes intermediaries from sale channels, at least from the insurance retail sector.

— *peer-to-peer-insurance* Mediation services for formation of pools of the insured according to similarity of their risk profiles are based on the well-known Peer2peer principle of Contemporary Financial Technology. Insurtech companies within their portfolios form a group of the insured with a similar interest and insurance contracts and negotiate on behalf of the insurer. Provided a formed group of insurers achieves certain aggregate insured loss they partly return their payments. Experts believe that with the further embodiment of Insurtech blockchain technology creating such pools will get global nature and by 2025 10% of global gross domestic product will be stored on blockchain technology (World Economic Forum, 2015).

According to Gartner Inc. research, about two thirds of the world's leading insurers have already invested in insurtechs. By 2018, 80% of world insurers (life and non-life carriers) are expected to create partnerships with them through platformification strategy and use of the mentioned APIs to maintain their competitive position (Gartner Inc., 2016).

Researchers determine insurtechs as technology companies according to three criteria:

1. fledgling tech start-ups;

2. introducing traditional digital innovation in business processes or creating new business interface user-oriented models and, thus, transforming insurance value chain;

3. using flexible financing forms, including, but not limited to, attracting venture capital.

Experts believe that traditional insurers have six main options to respond to the challenges from insurtechs and use the opportunities offered by digital technology:

1. Creating partnerships (e.g., AXA cooperates with the BlaBlaCar to service cars).

2. Mergers to acquire insurtechs' intellectual assets and resources related to insurance activities.

3. Acquisition of IT technology from software developers and suppliers.

4. Become a majority or minority shareholder directly or through venture capital investors (like Allianz entered Simplesurance).

5. Create one's own insurtech for competition and exchange of ideas with other participants of this market niche.

6. Insure insurtech operations or assets.

According to PricewaterhouseCoopers, more than half (52%) of insurers regard their sector as one of the most vulnerable in the financial sector (after retail banking) in terms of risk of breaking the insurance service value chain because of interference of competitors armed with digital technology into this chain (PwC, 2017).

The most vulnerable link of this chain (especially for insurers with portfolio mainly oriented on retail clients) is *Distribution* which terminates at *Sales* and section of *Policy Administration* terminating at *Renewal* (see Figure 1). In fact, insurtech companies create a new type of insurance value chain without or with significantly reduced acquisition cost (without the need for insurance agents) and, most importantly, simplified risk selection and underwriting. Imperfection of this value chain is evident. Interestingly, in the retail market segment where marketing has traditionally relied on the agency network, these gaps in the value chain are made up by digital insurance brokers. In particular, a new generation of this type of insurance intermediaries has appeared in a number of countries:

GetSafe in Germany; Esurance, FinanceFox, and Knip in Switzerland; Brolly and Worry + Peace in the UK; and PolicyGenius in the US providing services not only to sign but also to support Insurtech contracts.

In our opinion, insurance digitalization, among other things, is a consequence and, at the same time, a prerequisite for strengthening the process of its internationalization.

Insurance internationalization against the background of technological transformation happens through coupling of hefty capitalised capacities of established carriers and insurtechs from different countries. The latter as part of insurance aggregation platforms are specialised on sales and digital marketing, leaving the risk balance to market incumbents. According to the survey, about 90 percent of traditional insurers (legacy insurers) are planning to implement these strategies, considering them critical to survive and provide new sources of income. Thus, in the UK, partnerships of old established highly capitalised and tech-savvy new market players provide up to 70 percent of new growth of insurance premiums. It is not surprising that over 2012 -2016 the amount of global investment into new insurance aggregation platforms increased a hundred times on the global insurance market! (BI Intelligens, 2017).

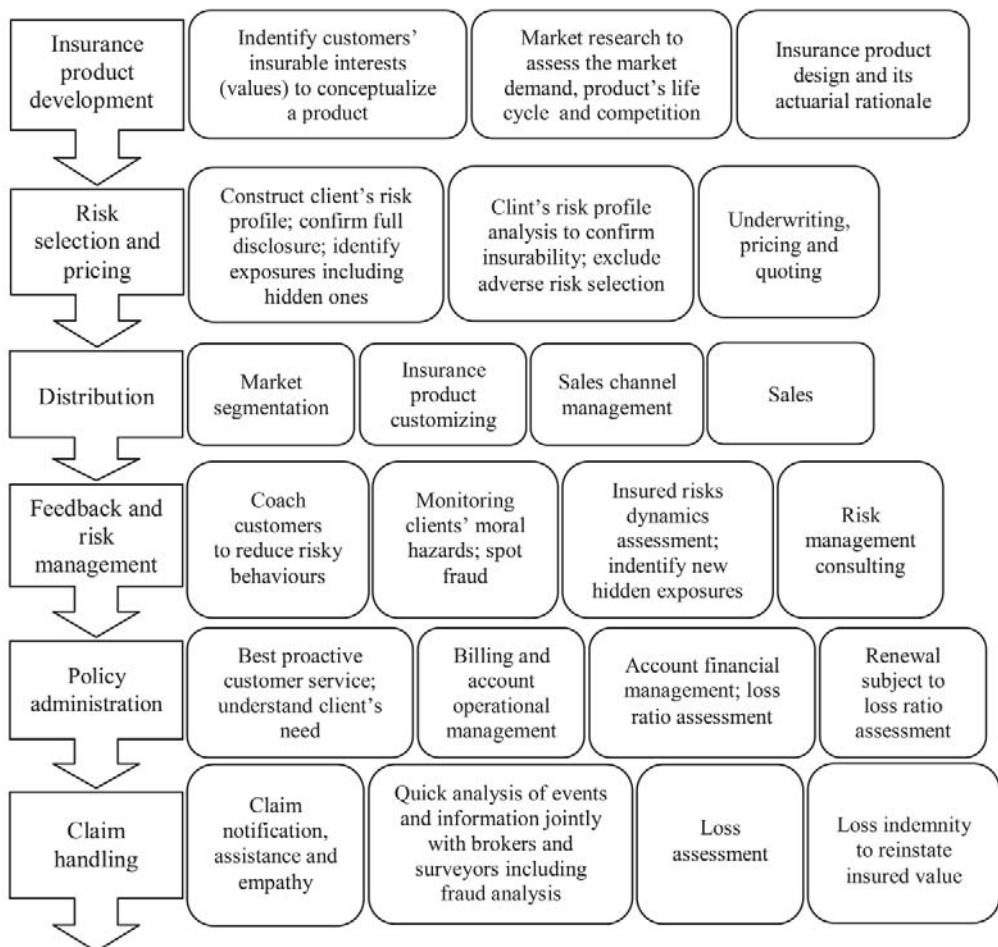
In our opinion, the main feature of the insurtech internationalization is international competition among transborder Insurtech insurance providers, as traditional insurers regardless of residence are unbeatable. Multinational insurers building their insurtech model should consider the institutional features of national markets and cultural traditions of different countries.

For example, countries with Protestant traditions (Germany, Southern Europe), where insurance markets are very sensitive to prices, obviously promote effective insurtech operators with flexible and diversified underwriting approaches. However, the principles of strict customer privacy and security of their personal data make the transparency principles of insurtech business models less attractive. According to market research, in some countries of the region the use of digital technology will grow and become a dominant channel for research and purchasing insurance products in the near future; while in other countries, such as Germany, customers are less ready to purchase digital insurance.

On the contrary, on insurance markets in Latin America with traditions of public openness insurtech business model can effectively work for creating segmented client databases, fraud prevention and pricing. Market insurance sales practices of South-East Asia (emerging markets in particular) are rapidly moving from paper processes to direct mobile technology. Currently, the technology level is not necessarily advanced Insurtech, but consumers on these markets will certainly be ready to accept digital innovation. (Bain & Company, Inc., 2015).

Figure 1

Insurance Value Chain Pertaining to Established Carriers



Source: Author's version is based on: (Forrester Research, 2016)

Pilot insurtech business models on Chinese insurance market show very interesting experience. Zhongan company draws particular attention in this regard.

Analysts say that Insurtech Zhongan is primarily a technology company which, among others, is engaged in insurance, unlike traditional insurers who see digital technology as simply a sales channel. Since 2014 Zhongan has sold 5.8 billion policies to 460 mln clients via the Internet. The total company assets have increased more than 500 percent to 8 billion yuan (\$1,175 billion) during this period. Currently, supported by Chinese Alibaba venture investment company, Tencent online group and financial conglomerate Ping An, Zhongan is preparing initial public offering on international markets. (Weinland, 2016). In general, Chinese investment in the field of FinTech, including regional, is a powerful factor of internationalization in the financial sector. Thus the total volume of Chinese investment in FinTech in Asia in 2016 rose to \$8.6 billion. More than half of the total (\$4.5 billion) were on Ant Financial's deal. China, along with the United States, is currently one of the two largest global FinTech markets. Together these

two countries account for 90% of investment in this area in the world. The interest of investors continues to rise in some special FinTech areas, including blockchain technology and insurtech (Arnold, 2017).

Figure 2

InsurTech Transactions by Target Country, 2012– Q1 2017 (%)

| | |
|----------------|----|
| USA | 67 |
| United Kingdom | 5 |
| Germany | 5 |
| India | 4 |
| China | 3 |
| France | 2 |
| Others | 14 |

Transactions totally: 541

Source: CB Insights, WTW (2017)

In global terms, the insurtech sector is most exposed to internationalization through cross-border transactions like investments, mergers and acquisitions. In this respect, the undisputed leader is the US market whose share accounted for two thirds of international agreements in the last five years. (See Figure 2).

Strategies of traditional insurers and insurtech start-ups are complementary and, in our opinion, international transactions should be regarded as manifestation of international specialization of labour. While traditional insurers supply risk selection, underwriting, claim handling and such a valuable asset as reputation and insurtechs are able to communicate with the new generation of consumers in the language of the Internet of Things. Indeed, if we look at eloquent examples (see Figure 3), today no one is surprised by international interaction of the world market giants like Hathaway, Lloyd's, Catlin, Allianz and Munich Re insurance with unknown to the public stratus with common names like Lemonade, Policygenius or Oscar. But such aggregated international insurance platforms have hundreds of millions of dollars of capitalization and generate terribly high yield.

A powerful driver of insurance internationalization based on digital modernization is London insurance market. Traditionally, London market operates as a global insurance market place. London market is more than £60 bn in gross written premium paid, more than £140 bn in claims in the last five years, and is the largest global hub for commercial and speciality risk employing circa 50 000 people. London market needs reform for Insurtech. This ambitious goal was formulated by London Market Group in Strategy Target Operating Model (TOM).

The strategy involves creating Placing Platform Limited (PPL). LLP is the first step in TOM implementation. The program suggests a uniform market platform accessible to all insurers for electronic risk placing, which will electronically provide participants with instant reliable information. Creating a platform complements traditional risk assessment methods (face-to-face negotiations) with digital placement tools or combines both. The platform allows brokers and insurers to quote, negotiate and conclude contracts in the digital form. Risks can be evaluated and placed both in the traditional and electronic form removing the paper from the insurance process. PPL creates a single electronic version of the contract, allowing brokers and underwriters to do business regardless of their location.

Some insurance companies have already begun to explore the possibility of applying the blockchain concept (London Market Group, 2017).

4 Conclusions

Digital technologies are coming to the insurance industry later than to other Fintech areas. In particular, this is due to traditional institutional conservatism and closeness of this field when traditional insurers are not ready for fast digital transformation. Appearance of insurtech start-ups make it possible to accelerate these processes, thus providing for competitive market conditions and threat of destruction of the insurance value chain, which was formed in pre-digital days.

Currently, few insurtech companies have become full-fledged insurers with sufficient capitalization and complete business cycle. This encourages traditional insurers to seek for different models of partnership with startups, including international ones.

Globally, there are three main ways for insurance internationalisation to progress in this field. First is based on undertakings set up in different forms (partnerships, acquisition etc.) by the established insurers and insurtechs from different countries. Second is related to insurtech transformation of the deeply internationalised markets (London). Third is attributed to the boosting appetite of astute venture investors (in particular, from China and Asia-Pacific) motivated to invest overseas. Insurance internationalization against the background of technological transformation ensues from alliance of highly capitalized traditional insurers and insurtechs from different countries in the so-called aggregate insurance platforms.

In our opinion, transborder insurance cooperation can be regarded as a manifestation of the international division of labour.

Insurtechs Internationalized by Capital and Operations

Figure 3

| | Insurtech | Funding | Residence, set up year | Activity |
|---|---------------------|----------------|-----------------------------------|--|
| 1 | Cuava | £ 500 000 | UK, 2012 | Cuvva breaks down insurance cover of cars into smaller chunks. Its products allows policyholders to insure themselves on a friend's vehicle for as short a period as an hour via an app. Cuvva uses data provided by the UK's Driver and Vehicle Licensing Authority to help verify policy requests, a process that takes about 10 seconds, it says. |
| 2 | Cyence | \$40 000 000 | US,2014 | CyberInsurance. Cyence is developing a system that can model the risks in financial and economic terms. Customers: Brit Insurance, AM Best and Marsh. Raised \$40m from investors in one of the largest insurtech fundraisings of 2016. |
| 3 | Lemonade | \$13 000 000 | US,2014 | Licensed as a peer-to-peer insurer. Signed international partnerships with the likes of Berkshire Hathaway, Lloyd's and XL Catlin. |
| 4 | Oscar | \$750000 000 | US,2012 | One of the most developed insurtech start-ups. Focused on health insurance. Offers phone lines to its doctors and systems that help healthcare professionals manage members' care. Fundraising 2016 valued the company at \$3bn. Annual revenue is \$200m. International shareholders are Fidelity Investments, Google Capital, General Catalyst. |
| 5 | Policygenius | \$21 000 000 | US,2014 | Offers a range of products including life, health and pet policies. International shareholders are Revolution Ventures, Karlin Ventures, Susa Ventures, Transamerica Ventures, Axa Strategic Ventures. |

| | Insurtech | Funding | Residence, set up year | Activity |
|----|----------------------|----------------|-------------------------------|---|
| 6 | Safeshare | £ 200 000 | UK, 2015 | One of the few companies to have launched a blockchain-based product. It describes its market as “insurance for the sharing economy”. Teamed up with Vrumi – a website that allows people to rent out their spare rooms – to launch property insurance. The policies are underwritten at Lloyd’s. |
| 7 | Simplesurance | €20 000 000 | Germany, 2012 | International shareholders are Rheingau Founders, Assurant, Route 66 and Allianz SE. Is not a risk-bearing insurer itself. Acts as a broker, passing on the risk to traditional players such as Allianz and Assurant. |
| 8 | SPIXII | £ 50 000 | UK, 2016 | Is developing chatbot – software that allows insurers, brokers and price comparison sites to talk to customers via programmes such as Facebook Messenger and Skype. Germany’s Allianz put SPIXII into a five-month accelerator programme at one of its bases in France. |
| 9 | Synerscope | €5 000 000 | Netherlands, 2011 | International shareholders are Mangrove Capital Partners, 5 Park Lane and TikititooSynerscope; is one of a clutch of companies focused on helping insurers make better use of their data. That information can be used not only to reduce claims but also to prevent accidents. |
| 10 | Trov | \$46 000 000 | US, 2012 | International shareholders are OAK HC/FT, Anthemis Group, Guidewire and Suncorp. It sells item-by-item insurance policies for personal possessions, via an app. In Australia, where it was launched, Suncorp is the underwriter. In the UK Trov’s imminent launch is Axa, while in the US, Munich Re provides the underwriting. |

Source: the author's compilation is based on Oliver Ralph (Financial Times, October 3, 2016)

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Comparative Analysis of Tax Reforms in East European Countries Associated with EU

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Abstract: With the signing of the Agreement on Association and Deep and Comprehensive Free Trade Area with the European Union, Ukraine, Georgia and Moldova have entered upon a new evolutionary path of European integration leading to new economic benefits, challenges and threats. One of the areas of economic integration is tax convergence and harmonization, which is still exciting quite a bit of controversy in the United Europe due to the reluctance of the EU-28 member states to lose their economic independence in the process of filling the budget and, in general, one of the main levers that has been helping them to influence the economy of each individual country. This agenda sets a task to East European countries associated with EU to speedy up the process of most quick adaptation of tax laws and tax rules and regulations to the EU requirements and standards, and to update the scientific and practical investigation into the question of modernization of tax systems in East European countries and their deep transformation in the European area.

Keywords: European Union Association Agreement • European integration • Tax reforms • Transformations of tax systems • Economic activity • Tax rates

JEL Classification: E62, H21, H22, H26

1 Introduction

After a deep crisis, consistent reconstruction of economies of East European countries, as well as of the EU on the whole, is subject to influence of external and internal negative factors, among them: the risk of losing sales markets, imperfection of economic basis for sustainable growth, instability of financial system in general. Many researchers are perfectly right to point out that inconsistencies in public and market interrelations have recently often lead to establishing illogical and sometimes unpredictable ties characterizing the movement of money capital. Practice has shown that governmental financial anti-crisis institutes work more efficient if their machinery is adjusted at achieving the economy equilibrium [1]. It should be noted that bank institutions concentrate and allocate investments in the economic system, creating in this way mediated chains of connections between investors and the public sector. In the result, provided that tax rules are loyal enough towards investors and there is a general potential of stabilizing influence, credit rating of the country rises significantly. This is related to the fact that possibilities of predicting and covering investment risks for supporting safe financial parameters of capital investments depend to a great extent on direct or indirect participation of budget expenditure items in specific projects.

The practice of numerous tax reforms in Moldova and Ukraine has shown that so far these countries have not learned to use effectively the fiscal tools of anti-crisis measures and to distribute effectively the tax burden among taxpayers. Instability of the legal framework and its multiplicity and contradictions, lack of culture of compulsory tax payments by citizens, excessive tax burden placed on the vulnerable segments of the population and existence of unjustified preferences distort tax competition in East European countries (except maybe Georgia) and have a negative impact on fiscal capacity of the state.

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2 Literature Review

Theoretical and methodological basis of research into integration processes in the area of EU taxation, as well as fundamentals of tax systems reforming East European countries for deepening of European integration, have been subjected to a scrutiny in the works of the following foreign scientists: H. Appel, E. Balatskiy, S. Blankart M. Bleyer, L. Burakova, J. Buchanan, R. Weber, O. Williamson, E. Grigalashvili, David Demekas, F. Engler, D. Zodrov, F. Cameron, T. Kerikmay, C. Knosen, V. Kniazev, P. Leblank, D. North, K. Ogata, B. Oates, W. Panskov, A. Pohorletskyy, E. Revyakin, J. Stiglitz, E. Stewart M. Shkreb, F. Schneider.

Among Ukrainian researchers, a significant contribution to the study of tax policy within the framework of European association on integration and reformation of the tax system of Ukraine towards full harmonization with EU rules and regulations has been made by A. Amosha, V. Valihura, Z. Varnaliy, O. Vasilik, V. Vishnevsky, V. Heyets, L. Demydenko, T. Yefymenko, T. Koschuk, A. Krysovaty, I. Lunina, I. Liutyi, V. Melnyk, P. Melnyk, V. Nusinov, V. Oparin, R. Rymarska, M. Romaniuk, A. Sokolovska, I. Taranov, V. Fedosov, N. Khoroshaiiev, V. Shevchuk, S. Yurii.

3 Basic Results of the Research

As far back as in 2004, a dramatic decline in tax paying, twice as swift as in any other region of the world, was registered in East European countries. As expected, due to the fall of the overall index of the time necessary for meeting one's tax obligations and issues related to tax management, Belarus and Ukraine witnessed the effect of one of the most significant falling in the number of payments – 115 and 119 correspondingly. Thus, each of these economies constitutes slightly less than a quarter of the general number of tax payments reduction in the East European region on the whole. Other countries of the EU “Eastern Partnership” programme – Armenia and Georgia – had also quite significant reductions of 40 and 41 payment correspondingly. Use of online document submitting and enhancement of payment systems were the driving force behind many of these changes, along with a decrease in the frequency of payments (e.g., change from monthly to quarter payments). Taxes on labour income make the most of the tax payment burden in Moldova, even though this economic system started using an accepted online system of submitting accounting documents. In Georgia and Ukraine, online submitting of accounts works for both tax on labour income and social security payments, but these systems have not become common use. However, for income tax, VAT and other taxes the online form filling and paying are held to be the best method [2].

Since 2008, Georgia has implemented was one of the most important tax changes – merger of the income and social taxes [3]. The social tax made 33% in 2004, and from 2005 it was reduced to 20%. After their merger in 2008, the total value made not 32%, but 26.6%, because it was calculated basing on different taxable bases. And the rate was immediately reduced first to 26% and then to 25%, and after the war in Abkhazia and South Ossetia in November 2008 – to 20%. Moreover, first the law suggested further reducing of this figure to 15% as early as in 2012, but the amended Tax Code dated 2010 postponed the date: in 2013 it was to be 18% and only in 2014 – 15%. Today, due to the fiscal necessity of filling the budget and realization of social programmes planned by it, the income tax rate remains at 20%.

Merger of social and income taxes together with subsequent reduction of the tax rate rendered restoring of extra-budgetary funds practically impossible. Now, pension in Georgia is a kind of welfare payment, and there is no Pension Fund – the state budget is universal. Instead of Pension Fund, there were introduced better schemes of accumulation –both individual and collective. A series of changes was introduced to the law on securities, various tax incentives were suggested [4].

Since 2016, Parliament of Ukraine also amended the Tax Code. Unification of the single contribution for obligatory state social insurance was performed, which had been a heavy burden on the shoulders of

employers and favoured shadow economy. Regardless of the form of production risk, the single contribution makes 22%.

One must not omit the fact of a fairly high percentage of non-taxed (shadow) economy in Ukraine. As evidenced by the Ministry of economic development and trade of Ukraine, about 40% of Ukraine's GDP lie within the zone of shadow schemes application. Therefore, since the process of "de-shadowing" is usually quite unhurried, it is highly likely that a large part of personal incomes in the state will rest in the shadow for a long while [5].

In its turn, Republic of Moldova has quite a peculiar system of obligatory state-wide payments. In 2004, they introduced an obligatory medical insurance along a single social security tax. The innovation was aimed at creating favourable conditions for public access to better medical services. During the 12 years of application of this system, the fund size has grown nearly 4.2 times (from MDL 0.97 billion in 2004 to MDL 5.2 billion in 2015). The contribution for compulsory health insurance, calculated as a certain percent of personal income and some other payments, makes 9% in total (4.5% for each category of payer) [6].

When compared with post-socialistic EU states, Ukraine has to develop tax policies while not only being significantly behind the EU-15 in terms of economic development, but also suffering from certain institutional restrictions. The fact is that the Baltic States, Poland and other new members of the united Europe have relatively easily passed the initial first phase of fostering market economies and quite quickly reached the stage of ascending dynamics of economic development; they launched tax mechanisms that allowed creating of an effective financial basis for functioning of the state [7]. However, in Ukraine during the transition to a market economy one could observe a decline in GDP (quite dramatic up to 1996) and ever increasing distortion of social-economic system. This high tax rates were destimulating the legal entrepreneurship causing deficit of fiscal resources in frequent cases of non-effective use of accumulated budget funds [8; 9; 10].

A striking comparison provides present-day Georgia, which rates 10 in the «Doing Business» ranking, which evaluates easiness of doing business. It has risen by 100 positions since 2004. The revenue side of the budget has doubled in relation to GDP – from 16% to 28% in 2015, and the total number of private concerns that pay taxes regularly has increased from 35% to 78-85% [11]. By its own example Georgia has demonstrated the classic case of Laffer curve in action: reducing of economically illogic taxes raises public revenues, because the business gets out of the shadow.

A forward-looking tax reform initiated by Mykhail Saakashvili's team did not start from sharp reducing of tax rates but laid emphasize on building systems of motivation of state tax officers. If seen economically, three stages can be discerned to constitute the whole process:

- 2005-2006: reduction of the number of taxes from 22 to 7, expansion of tax base (abolition of tax credits, securing impossibility of tax evasion by introducing pervasive control);
- 2007-2009: merger of social contribution with individual income tax and rate reduction from 32% to 25%, and in 2009 to 20%. Besides, in 2008 the corporate tax rate was reduced 20% to 15%, and tax on dividend and interest was reduced from 15% to 5%;
- 2010-2011: the stage of radical reduction of tax rates. It was introduction of depreciation of capital investment in the volume of 100% with a right to declare possible losses within 5 years [12].

In contrast to Georgia, the world economic crisis has much eclipsed the development prospects of Moldova. Moldova's economic partners, foreseeing a dramatic economic downturn, have significantly reduced the amount of capital investment in the economy in Moldova, that is why until recently the growth of investments had been frustrated. Exports and remittance flows have suffered seriously from the regional recession, and it had a direct impact on the national economy. The global crisis has also rendered the financial policy problematic, having contributed to reducing the fiscal effective strength of income taxation with a simultaneous rising of requirements for spending on social protection. All these factors emphasize

the necessity of a consistent macroeconomic policy and strategic approach to determination of short-term and medium-term developmental priorities [13].

In 2014-2015, in connection with aggravation of problems with filling Ukraine's budget, tax burden on passive and high incomes of physical persons was raised. But further rise of the national maximum income tax rate is unlikely to be of any use before the level of economic development of the state has risen and/or certain success of measures on de-shadowing personal incomes has been achieved.

The tax reform, which came into force in Ukraine since January 1, 2016, suggests catering for tax liberalization, which first and foremost should partake of voluntary payment of tax liabilities and minimum interference of regulatory tax agencies into financial and economic activities of businesses [14].

The tax reforms in Ukraine have actually in no way influenced the income tax. Perhaps, the only change for taxpayers in this segment is bringing back of quarter reporting, but it concerns only those payers whose incomes will exceed USD 20 million. Today, the tax rate on corporate income makes 18%. Compared with EU states, the income tax in Ukraine has much higher fiscal effective force and has amounted to 4% of GDP in recent years (in the EU-28 states – 2.5% of GDP) [15].

For the tax on personal income, the base rate is set at 18%. In addition, the system of reporting for personal income tax payers was facilitated. It is no longer necessary to fill in the annual declaration for physical persons who have paid taxes to two or more tax agents. Under conditions of acute deficit of financial assets and a pressing necessity to fill the budget, the state still reveals the tendency to tax passive incomes (dividends, interest, investment income, royalties), where the basic rate of 18% is applied.

It is important that the simplified system of taxation of groups 1 and 2 has not been changed. The innovation concerns exclusively group 3 of taxpayers, which are taxed by a simplified system. For VAT payers the single tax rate has risen from 2% to 3%, and for those who do not pay VAT – from 4% to 5% (under indispensable condition that the year income does not exceed UAH 5 million, earlier this threshold was UAH 20 million). The reform also gives a possibility for small businesses to use a “softer” system without registration, but under condition of submitting an annual report and paying up to 10% of the difference between revenues and expenses to the Treasury.

The innovations to the Tax Code of Ukraine have meant certain changes for transport tax, which was viewed by the government more as a luxury tax. Thus, the transport tax will be paid by owners of passenger cars not older than 5 years from the date of issue and the value of which exceeds 750 minimum living wages.

The most radical changes were introduced to indirect taxation. From now on, operations on supplying grain and industrial crops conducted by corn traders will be taxed with VAT in general order without concessions. However, the final provisions of the Tax Code of Ukraine set up a transitional period that distinguishes between producers of grain and industrial crops on one hand and livestock farmers on the other hand in terms of share of VAT distribution and payment. VAT is going to be paid the following way: when trading with grain and technical cultures, the taxpayer will pay 85% to the budget and keep 15% of the revenue; for operations in cattle breeding the correlation is 20% to the budget vs. 80% to keep; for other operations in agriculture – 50% to 50% [16].

When lowering the single social contribution rate to 22%, the government of Ukraine was fully conscious of disbalancing state incomes and expenses that would mean violating the principle of budget consolidation. The much risen excise duties were meant to compensate for the loss. The excise rates were increased by half or even two times: for beer – from UAH 1.24 to UAH 2.48, for vermouths –from UAH 3.58 to UAH 7.16, for Champaign – from UAH 5.20 to UAH 10.40, for 1 litre of 100% alcohol – from UAH 70.53 to UAH 105.80. The particular excise duty on tobacco products was changed significantly: it rose from UAH 227.33 to UAH 318.26 for cigarettes with filter (for 1,000 pieces). The list of excise tax payers was extended: enlisted were fuel retailers [16].

The main goal of the current tax transformations in Georgia is, above all, further simplification of business. In particular, the new rules will be profitable for small and micro-sized businesses and will favour

creation of new jobs. In addition, the government would like to increase confidence in Georgian tax system and bring it into full conformity with European standards in order to deepen European integration.

Taxpayers who believe their rights have been violated may file a complaint to an ombudsman. After consideration he delivers a decision whether or not the rights of taxpayers have been violated. In case of positive conclusion he transmits it to an authority and gives recommendations as to how to resolve the situation.

The simplification planned for this year will be postponed. So, the income tax was 20% in 2006 and 2007, and from 2008 it was reduced to 15% (the position it takes today). The dividend tax fell from 5% in 2011 to 0% in 2014. Taxes for non-residents were also reduced. In 2014 dividend taxation and taxation of non-residents dropped to 0%.

Besides, the tax legislation of Georgia includes an expanded specification that defines the cases when the services of non-residents have their sources in Georgia. These are services in estate property, movable property, as well as management, financial and insurance services. Income tax at the source of payment was also set at 15%.

One of the main objectives of modern Georgia on its way towards European integration is simplifying the taxation system for small and micro-sized businesses. Registered micro-sized businesses with annual turnover no more than GEL 30,000 (not including equipment and hired labour costing up to GEL 45,000) are completely exempt of tax payment [17]. There are no formal requirements to micro-sized companies.

Registered small businesses with annual turnover of up to GEL 100,000 (equipment costing up to GEL 150,000) pay value added tax of 5%, which excludes all other taxes. The rate may be reduced, under certain conditions, to 3%.

Small businesses need to log in purchases and sales and to have a cash journal. They do not pay salary taxes if salary expenses count up less than 25% of the sales turnover. Ministry of Finance may publish the list that defines the types of operations not belonging to small business.

In the context of adjusting tax legislation and policies in Moldova to EU standards and norms, it is important to note that legislation adjustment is a medium-term process that involves reconciliation of policies, right harmonization/transposition of corresponding laws, updating of such laws where it is appropriate, creation and provision of resources (by means of new organizations or otherwise) to the necessary institutional structures and a tendency to a veracious objective review of their implementation and law enforcement [18].

Analysis of recent tax changes in taxation policy of Moldova shows that most of them are connected with tax administrations and increase of excise taxes. By the end of 2016, they plan to keep the progressive system of citizen income tax and at the same time to increase the total amount of income, which is subject to taxation, of annual personal releases with consideration to inflation forecast for this period (up to 4.3%). This measure is aimed at supporting natural persons with low income and gradual shift of tax burden on the population with medium and higher level of income. This year, the tax rate of 7% will be applied to personal income in the amount of MDL 29,052 instead of MDL 27,852. For incomes above MDL 29,052 the rate will be 18%. The annual personal release will make MDL 9924 against MDL 9516 in 2015.

The National Confederation of Patronage and “Teampool” business people club maintain that “it is more correct to calculate for natural persons, namely to calculate personal release, in relation to the minimum living wage determined by the government with consideration to indexation for suggested inflation”.

Obligatory state social and medical insurance contributions for 2015-2017 are supposed to make 29%.

Other innovations: the bill suggests cancellation of tax credits for legal entities and natural persons on interest on deposits for a term of more than three years and corporate securities in the form of bonds issued for more than three years. Instead, though, the Ministry of Finance of Moldova offers additional tax concessions in exemption of state securities income tax for an unsettled period [19].

In 2016 the owner of cars in Moldova have incurred additional expenses. Excise duties on fuel, costs for car customs clearing and road toll have been increased again.

Increase in road toll by 50% means payment of MDL 960 to MDL 10,000 a year for car owners, depending on engine power. According to the Ministry of Finance of Moldova, this increase will allow to increase incomings used for road renovation to MDL 231.9 million.

Excise duties on fuel imports in 2016 have risen approximately by 9% per ton of fuel, that is, for a ton of petrol by more than MDL 300, and for diesel fuel by a hundred plus. Importers say that in the future it will lead to petrol cost rising by 30 ban, and diesel fuel cost – by 15 ban. In 2016, the increase of excise taxes on imported oil products is planned to raise the budget incomings by MDL 168.2 million.

In 2015, the system of excise duties on filtered cigarettes and cigarettes without filter was revised. Excise tax on tobacco products was set at MDL 80 – + 32% compared to MDL 75 in 2014 and + 24% in 2013. In 2016 the excise tax on 1000 cigarettes was MDL 100 – + 33%, and in 2017 it is to make MDL 120 – + 34%. Excise tax on cigarettes is going to be increased from MDL 50 to MDL 80 per 1 thousand of cigarettes.

The deepening and expansion of European economic integration, coming with development of tax harmonization, affects taxation policy and taxation load in EU countries. It is revealed through both measures aimed at convergence of taxation mechanisms in the United Europe and decisions that favour rise in effectiveness (competitive performance) of national taxation systems for promoting investments. Sometimes it makes the changes in taxation in different areas of integration even more deep.

4 Conclusions

Modern tax policy of East European countries in the context of the Agreement on Association with the EU is to be actualized with due regard to the following determinants:

1. Considering differences in taxation in the EU states, there seems to be no need in radical changes in taxation of East European countries with the suggested aim of its “unification greatest possible”;
2. Tax policy of East European countries should pay regard to peculiarities of tax harmonization (first of all, demands set by the Agreement on association in relation to adjusting of national tax legislation to a series of EU guidelines on VAT and specific excise duties) and current trends in tax transformations in EU states;
3. Peculiarities of economic and institutional environment in Ukraine, Moldova and Georgia compel them to a search of certain “know-how” in tax reformation, whereas it is important to take advantage of the experience in taxation changes in the EU countries (primarily post-socialist integration participants) under similar economic and fiscal conditions.

In general, the peculiar feature of taxation in East European countries associated with EU is a very moderate level of tax burden, which is well below the average of the EU-28. That means that the foremost function of taxes is fiscal and not regulatory. Against this background the tax system of Georgia seems to be the most progressive and liberal, as evidenced by the very structure of tax incomings. Most recent tax reforms in Ukraine are still difficult to assess, but shift of the tax strategy towards profitable taxation and release of pressure on salary fund lays the groundwork for fostering pro-European taxation culture. The principal problem of Republic of Moldova in this light is high taxation conservatism and low competence of tax administration.

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Innovative Financial Technologies as a Global Challenge for the Traditional Economic System

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Abstract: The value of the financial sector in the modern business environment is constantly growing because of the increased globalization process and the accelerated rate of development of financial innovation. A relatively new financial technologies industry have recently attracted more and more attention from regulators, investors, IT companies, researchers, as the latest innovations in the sector of finance have a wide range of influence going beyond the banking, insurance or investment companies. One way or another, finance penetrates to all segments of the economic system and, consequently, changes in the financial system could cause a powerful impetus to the further transformation of the business environment.

Controversial signs in the financial environment development of the financial technologies industry call active discussions, as the phenomenon of innovation is logically not only a tool of creating significant benefits but also a source of various threats. The study of existing financial innovation and analysis of the potential consequences of financial technologies revolution become especially relevant.

Keywords: Financial technologies (fintech) • Venture investment • Start-ups • Payment systems • P2p-platforms

JEL Classification: G15, G23, G28, O16, O31

1 Literature Review

The question of innovative financial processes is associated with the names of such foreign scientists as J. Schumpeter, P. Drucker, K. Davis, B. Graham, F. Mishkin, M. Yunus, R. Zinhales, R. Merton, H. Minsky and other researchers. Their works form the basis for the study of financial processes in general, and as the term of fintech is relatively new, the scientific system of understanding the phenomenon of modern financial technologies has not been created yet. However, some understanding of the industry of new financial technologies in the scientific literature already exists. For example, the role and nature of electronic currency was investigated both by domestic scientists (S.V. Naumenkova, S.V. Mishchenko) and by foreign scientists (A. Gallova, E.A. Kuznetsova, O. Sachkovska, V.I. Tarasov, etc.). Such economists as I. Vasylchuk, O. Belova, M. Kotkina, J. Petrushenko, O. Dudkin, A. Shevchenko, K. Ackermann have written about the potential of crowd funding in financing of investment projects. Particular attention to the research of financial technologies sector is paid by large international rating agencies, audit companies and associations who specialize in the field of finance, such as PWC, Innovate Finance, Venture Scanner and others. Thus, the problem of financial technologies is currently the subject of research of many scientists. Due to the scale of the topic many aspects remain insufficiently covered. These include the impact of fintech field on different areas of the economy and international relations, as well as the regulatory issues which are unresolved so far, and the problem of security – both for the protection of existing technologies and for the protection of stability of the entire financial system.

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The aim of this article is to examine features of the fintech industry, the related threats and potential opportunities to prevent them.

2 Basic Results of the Research

Nowadays the financial market is full of innovative tools and technologies that allow using the financial assets more efficiently, increasing equity, strengthening the financial stability and liquidity, and regulating financial risks. The development of new technologies related to the provision of financial services (or abbreviated - fintech) has been on the agenda of Davos World Economic Forum for several years. Rapid spread of such technologies, annual increase in the volume of investment in this field and transformation of the financial service market, occurring as a result, cause the lively interest from the side of academia. As the aforementioned processes have gained significant scale relatively recently, there is no established and universally accepted definition of fintech in the scientific literature yet. However, in 2016 the term 'fintech' was defined in the electronic edition of the Oxford Dictionary as the computer software and other technologies used to maintain or launch of banking and financial services. [19]

If we analyze the mass media articles and the latest review of major international companies posted for wide public, they usually use the term fintech for startups, which introduce new breakthrough technologies in the field of mobile payments, money transfers, loans, attracting capital and other financial services. However, upon closer study of the problem it becomes clear that this phenomenon goes beyond the startups and forms its own ecosystem where innovative technologies are implemented and used to improve the efficiency of the financial system. The regulatory authorities, at both the national and international level, investors and organizations which support creation of such products (various business incubators, accelerators, "sandboxes" for startups) and technologies' consumers (end-users as well as big corporations) belong to its main participants (besides of directly those actors who develop fintech products). At the global level, a number of creators of the new financial technologies include both large well-known financial institutions and large technology companies (Google, Yahoo, Amazon and others) acting in the field of financial services. They produce technologies that, in their turn, allow performing financial transactions much faster and easier. Among them are new enterprises in the IT sector, often they are fast growing companies (including start-ups) updating tools for carrying out mobile payments, cash payments, loans, fundraising, asset management, etc. [25]

The result of activity of mentioned subjects on the fintech market is divided into two categories. Some products, already long represented in the market, are software and services for the financial services – it means B2B model is used. Other products which have been especially actively developed in the recent years are focused on the end consumer (it means they cover B2C projects) and seek competition for traditional suppliers of financial services in the fight for mass client [15]. The most actively such transformations take place in the sectors of consumer banking and payments and in the near future revolutionary changes are expected in the areas of insurance and asset management [24]. According to research of the Venture Scanner Agency, which covered 1,379 fintech-companies, a company counted by fintech category today looks as shown in Fig. 1.

As the graph reflects, for today the most popular is the consumer lending sector, followed by business loans and personal finance. Thus, fintech-industry offers solutions which better satisfy the needs of customers, improve availability and ease of use of products and provide a personal touch. In this context, one of the key priorities of fintech became a concentration on the consumer, which meets more accurately the needs of generations of clients born in the digital age. At the same time, fintech development provides new opportunities for end-users as well as for companies - in fact they can offer far less expensive services now [25].

The changes in the financial sector caused by the emergence and development of fintech industry are becoming more noticeable each year. This is most clearly shown by the scale of funds invested in this industry. Since 2011 the financing of fintech-development demonstrates stable growth (see Figure 2).

According to data of Innovate Finance, nonprofit International Fintech-Association, the global volume of venture investment into financial technologies increased by 10.9% in 2016 to \$ 17.4 billion compared with \$ 15.6 billion in 2015. At the same time the number of transactions in the fintech sector declined slightly - from 1617 to 1436.

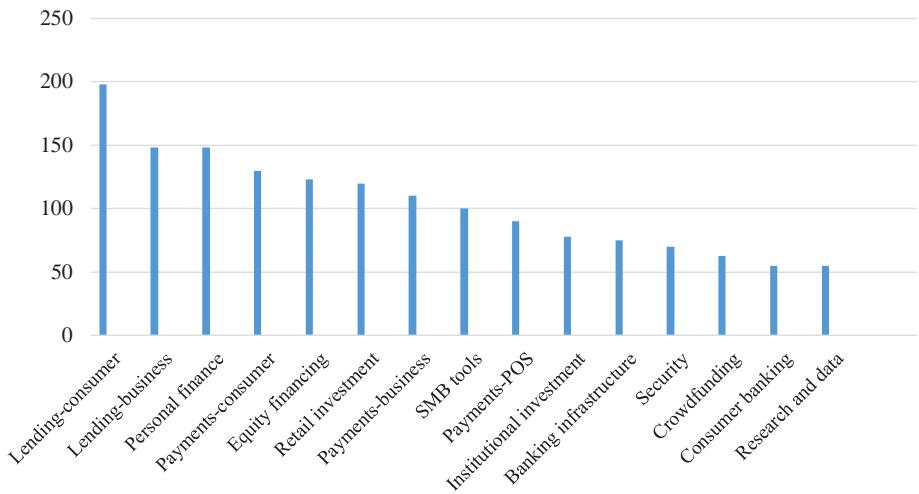


Figure 1. Company Count by Fintech Category

Source: [3].

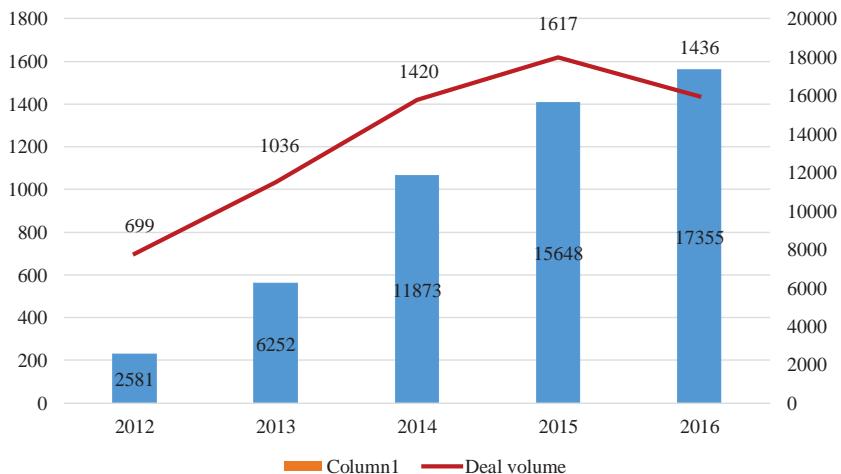


Figure 2. Global Venture Fintech Investment – 5 year Trend

Source: [13].

There are many ways to explain continuous growth of the investment and overall fintech expansion demonstrated on the chart. Summarized, the main growth factors are:

- rapid development of e-commerce sector, especially the part concerning mobile devices,

• noticeable increase in emerging economies, where customers are not so tied to the traditional banking model (it is primarily regions of Asia and, to a certain extent, Africa),

- decline in traditional banking industry and its focus on core business,
- liberalization of regulation and assistance of the state for fintech projects,
- simplifying of project testing procedure and availability of opportunities to scalability of business models,
- emergence of newest information technologies in the finance sector (cloud solutions, virtualization, etc.). [17]

The development of fintech occurs in the direction of saturation of certain markets by new financial solutions, as well as toward the expansion of geographical coverage (see Figure 3). Especially noticeable in 2016 was the fact that China reached the first position in the list of leading countries by the volume of fintech venture capital investment – first having outstripped the USA and doubled the amount of the previous year in the country. Thus, the first two positions by the results 2016 are occupied by such countries as China and the USA, where the level of invested funds reached \$ 7.7 billion and \$ 6.2 billion respectively. [11]

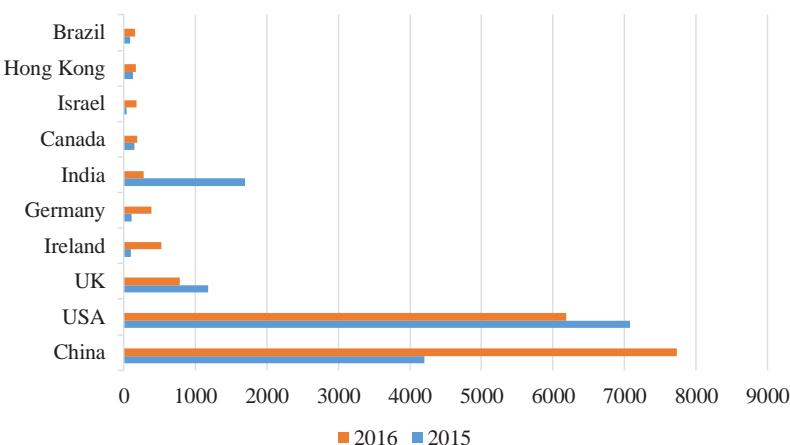


Figure 3. Venture Fintech Investment– top-10 countries, \$ billions
Source: [13].

Venture capital investments are not certainly a universal measure, as fintech products obtain a significant part of the financing within the intra-corporate developments. If we consider those developments together with the venture capital, China in 2016 has more than half of the global amount of fintech-financing. Experts associate this success with the growth of customers who have access to the Internet on the one hand, and with the increase of the total population, that has created a huge potential for market expansion on the other. [8]

Great Britain is also a very successful state in the area of fintech and ranks third in the top-10 list. Nevertheless, the country decreased the total amount of fintech-investment in the past year. According to the data of International Fintech-association Innovate Finance, it was largely the result of uncertainty on the market because of the situation with the exit of the UK from EU. [16]

It is obvious that the increased interest for the financial technologies and the scale of financing of their further development really have a rational basis, because the raise of the fintech-industry is currently generating many additional opportunities for future progress. For example, according to the experts from World Economic Forum, the main benefits of financial technologies are:

- expansion of access to financial services, mostly through mobile devices,
- reduced cost of services,

- improved risk management and risk diversification,
- empowerment of collaboration,
- increased competition. [9]

However, the Forum participants and analysts of leading companies in the financial sector converge in opinion that fintech could create new risks for both the financial system as a whole and for various aspects of businesses and consumers. For example, logical is the fact that increasing the technology efficiency often leads to reducing the labour consuming level for business processes, which, in turn, reduces the need for human capital. It should be noted that unemployment caused by such changes is quite specific, we are talking about the release of separate segments of grassroots and middle-level employees of banking, for which the option of emigration with employment purposes is also impossible, because the problem of employment of the whole social class is global. It is still early to talk about the social threat, but national social policy should take account of such risks. [20]

Also important risks are referred to peering (loans through p2p-platform, also named crowdlending). Its users may be faced with the loss of various sizes considering the fact that p2p-platforms often have less developed mechanisms of risk calculating, less stringent requirements for the reliability of the borrowers and more customers with poor credit history. Curious that such peer to peer lending is growing rapidly, for example in the UK peering reached 14% of new loans for small businesses and more than half of these loans cannot be provided by existing banks. [6]

The fight against money laundering and terrorist financing has been mentioned separately as a part of the threats which can be caused by fintech at conferences devoted to this subject. However, it should be noted here that these challenges have existed before. They are neither the result of fintech industry nor its main problem. Moreover, the new technologies can offer new and more effective ways to solve these issues. For example, the list of solutions in the field of protection from criminal transactions includes technology of digital identification. Cryptography and biometry can verify a customer's identity and propose reliable ways to ensure the access to financial system. In this area noticeable is the achievement of fintech companies from India, which has since 2010 produced more than 800 million of identifiers including those, which consumers can use to access the financial and government services. [12]

In the USA, where fintech sector is one of the most powerful and influential in the world, the Office of the Comptroller of the Currency emphasizes the fact that financial technologies should be seen as a threat to US banks, which are still uncompetitive relative to them. [22] A striking example until recently were p2p payment services such as Venmo (currently PayPal) and Square Cash. Exactly these services were used most actively, if consumers did not want resort to the cash or checks. Traditional banking alternative ClearXchange was not sufficiently competitive for them until 2016, because a transaction in the system occupied two or three days. [4] It is possible to agree only partially with remarks about the existence of a threat to traditional banking from the side of the fintech sector. Indeed, without appropriate measures on the part of banks part of profit really can go to some fintech companies and in some way shake the stability of the least innovative banks. However, these shifts indicate rather healthy competition in the sphere of banking services and further improvement of their quality than the risks for the stability of the financial system as a whole. In particular, experts urge banks to design a strategy of interaction with fintech sector which cannot be ignored. [25]

However, such changes still require qualitative responses from financial regulators who face problems with obtaining information and supporting market stability. There is a well-known fact that the standard regulatory instruments that are suitable for the banking sector cannot be effective in the management of fintech-firms. [14] Particularly, international regulatory institutions should carefully keep track of developments in the world of financial technologies to avoid cycles of crisis which always accompanied previous innovations in the world of finance. [6]

Investigating the potential threats generated by the development of fintech sector, it is worth to mention the theory of J.M. Keynes who supported the globalization of trade flows, but at the same time

warned about the dangers of globalization of international finance and about the importance of taking into account such risks in advance. In some ways modern fintech is comparable to the revolution, which was caused in this field by derivative financial instruments and to the crisis that occurred after their appearance. The new fintech sector could become a destabilizing factor for the global economy, as the rapidly developing derivatives are unpredictable and uncontrollable and have many attractive benefits for both their customers and developers. The most vivid fears may concern to that part of fintech, which is presented by the ideas about denationalized and decentralized bitcoin currency, which is almost beyond government regulation, as well as about blockchain-governments which theoretically are able to make public services more transparent, qualitative and essentially closer to the market, but also less controlled. These concepts in their final version of the development see the future in which necessity of the government virtually disappears, and its activities in the modern traditional form appear relatively ineffective. In other words, the phenomenon of regulation becomes quite relative, whereas the changes in the financial system become less predictable.

In this context, we should mention national security and defense issues, which like all the other areas of the economy and international relations, should be affected by the modern financial technologies. In the case of their destructive use new possibilities will arise for destabilizing attacks at the international financial markets. [20] Easy access to sources of funding applies to any kind of business, including the illegal, due to the absence of a rigid system of regulation.

Such a scenario is an exaggeration of the negative forecasts, that can be scientifically justified on the basis of available data about the current situation and a greater extent seems unlikely. However, it points to the growing need, if not in the control (given the fact that at this stage it is difficult to organize such a control-system), but in the permanent supervision of the constantly emerging innovations in the financial system, which are developing too fast. One of the organizations, which currently focus on monitoring of the fintech sector development, is the Financial Stability Board, based by the G20 in the context of the economic crisis of 2008 and aimed at coordinating efforts for prevention of recurrence of the disaster. However, according to its General Secretary, a number of changes in fintech-area, which are currently occurring in the world, still does not create any new risks or creates those which already have an effective solution. [23] It should be noted that despite the rapid fintech growth, its dissemination is not really very significant these days. Therefore, it is possible that such positive attitudes about the lack of threats will be slightly intermittent in nature, because the potential of this kind of developments is impressive.

The reaction of the central banks in many countries with the development of fintech industry was changed in the strongest terms and most vivid example is cryptocurrency. Understanding of the fact that these currencies could be the source of threats, as they already exist and their spread is inevitable, has led to recognition of the necessity of their development. In particular, the People's Bank of China and later Bank of England began to create national electronic currencies. At the corporate level, creation of interbank cryptocurrency is lead by several consortia. German Deutsche Bank, Spanish Santander and American Bank of New York Mellon are involved in a similar project initiated by the Swiss bank UBS. Similar projects were initiated by Citigroup and Goldman Sachs. In Russia Company Qiwi is engaged in creation of the financial consortium for this purpose. [20]

A number of governments have already attempted to introduce elements of regulation specifically for fintech industry in response to the current risk of new technologies in the field of finance. For example, US Office of the Comptroller of the Currency is currently forming a department that will deal with fintech-economy and with the implementation of 'smart innovations'. Also, the government offers fintech-companies in the US, engaged at least in one of the three major banking activities (deposits, loans or payments), to receive a banking license, which may give them a reputation of creditworthy institutions and increase the credibility of their work. [10] A decisive method of regulation is also a New York BitLicense which includes special regulations for organizations engaged in bitcoin and digital currencies' activities. This caused a controversial reaction of business circles because such actions led to the fact that many

companies decided to change the place of registration and functioning. [5] Following on the United States the Ministry of Finance of Luxembourg issued BitLicense to conduct financial activities for the US Snap Swap International SA company, which also works with cryptocurrency. In contradistinction to American standards, where financial services in every state need a separate license, in the EU it is possible to work with the same document in different countries. [22] In Britain a separate Department to monitor the payment systems (Payment Systems Regulator (2015) was established, whose task is to monitor the work of payment systems in terms of their profitability for business and citizens through healthy competition and implementation of innovation. [7]

But if we generalize, in most cases, the governments' actions rather have the form of promotion, support and assistance in testing fintech startups through various "sandboxes" and incubators than of the development of rules and frameworks of their activities in the future.

Speaking about the possibility of development of a proper system of regulation, we should mention the World Economic Forum and its main recommendations which must stop implementation of financial technologies, which could create systemic risk. These include the establishment of:

- global State forum to discuss technological innovations in finance,
- debate about the ethics of using data,
- international standards for monitoring fintech startups,
- private agency to monitor the appropriate behaviour of new players in the market. [18]

On condition that these recommendations are implemented in good time, one can really talk about positive effects of emergence and further development of fintech-field, as it creates so many benefits.

It should be mentioned that in the fintech area next to the products designed to accelerate, reduce the cost and improve the quality of financial services, such as prompt rates are developing technologies to ensure the protection of new products and those data they are working with. Currently the percentage of such start-ups in fintech is about 5%. [3] It is necessary that business incubators and accelerators pay the particular attention to them considering the fact that startups on protection of new technology and on testing its resistance to cyber-attacks should accompany each project in fintech.

In this way, it can be concluded that fintech itself is not a threat. Instead of this, careless use of fintech can create threats.

3 Conclusions

The main results of the study can be grouped into the following three theses. Nowadays, the global financial system is still at an early stage of transformation. However, the traditional financial institutions are currently faced with the question of adaptation to the challenges, which appeared together with a fintech sector. In order to maintain stability and competitive position in the market, it is necessary either to make significant investment in their own developments of new fintech services, or in collaboration with fintech-region on favourable terms. At the moment, despite significant amounts of funding, the rapid growth of fintech industry and undeniable existence of negative development options for traditional banking system, the share of digital financial instruments reaches no more than 1% of revenues in the consumer sector, so there is still time for adapting to the new conditions.

The development of fintech sector causes some positive and some potentially negative consequences. The possible threats include irreversible changes in the labour market, instability of new technologies, including very high risk of p2p lending, emergence of additional ways to promote the terrorist organizations, instability of the traditional banking sector, etc. It is necessary to separately highlight the systematic risks, associated with the lack of opportunities at the moment to organize an effective control over the new technologies in the area of finance and on this basis a potential threat for national security of individual countries and for the financial system as a whole.

Undoubtedly, the benefits of new technologies and the range of the opening possibilities require appropriate response not only from the traditional market players but also from its regulators. The discussion concerning the necessity of development of effective management practices has already started, but the systematic actions to update the regulatory system are still only planned. The potential change in the balance of forces in the finance market requires from the government not only measures to promote fintech projects, which are already quite popular today, but also to modernize the legal system and all its institutions so that it is ahead and prevents the malicious use of new technologies and ensures the proper control over their development and maintains financial systems stability.

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New Approaches to the State Industry Competition Policy

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Abstract: The purpose of the research paper is to define the new approaches to the state industrial competition policy based on the comprehensive study of the industry current situation and to develop evidence-based proposals and recommendations in this regard. In the paper an analysis of the current situation is made, the main features and focal approaches of the Azerbaijani industry are defined, the obtained achievements and problems so far in this sector are pointed out, the main trends of the state competition policy are explored, in addition the necessity of reforms for optimizing industry structure is justified, and the idea of applying human resource-investment-innovation-integration model of the state industry policy is proposed. Based on realizing this model, the necessary compound measures were drafted in order to diversify the industry, to intensify the development of non-oil sector, as well as to increase the competitiveness of the industry.

Keywords: Competition policy • Industry • Innovative model • State industrial policy • Competitiveness

JEL Classification: B21, B22

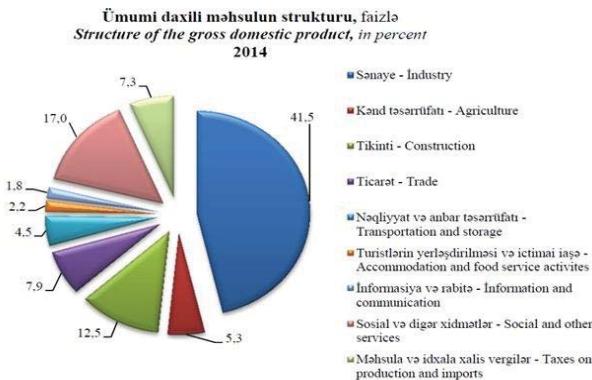
1 Introduction

The industry is one of the most developed sectors of the Azerbaijani economy. This sector constitutes 40% of the country's overall gross domestic product (GDP) (Graph 1). This essential sector, comprising chemistry, machinery, metallurgy, light and food industry and other sectors, in addition to the predominant energy sector of the Azerbaijani industry, has undergone a development process which contains a number of phases. As the result of widespread, fundamental reforms undertaken in the country toward the realization of the transition to market economy the crisis in the industrial sector has been solved and the noticeable results have been obtained in many industrial sectors. The contracts signed with big companies representing worldwide developed countries on cooperation in the oil and gas sector (20 September 1994) boosted the fast development of the oil and gas industry. (H.Allahverdiyev, K.Qafarov, A.Ahmadov. Baku. 2007).

Afterward the fast development of the extracting industry in Azerbaijan, the manufacturing industry has also experienced the rapid growth rate during the last years. The local production of some products, previously imported from foreign countries, has been started in Azerbaijan, and this has created opportunities for enriching the internal market and decreasing dependence on imports. About 200 foreign investment companies representing 63 countries are currently operating in the industrial sector, and thousands of new working places have been opened to date.

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Graph 1

The remarkable increase in the number of newly developed economic entities, expansion and dynamic growth of small and medium entrepreneurship, and more engagement of physical entities in business have been followed by the gradual expanding role of the non-governmental sector in the country.

2 The formulating of Azerbaijani industry and its development

The development of Azerbaijani industry is characterized by two periods:

The first period: Azerbaijan is an integral part of the Soviet Union (1920-1991)

The second period: The independence period (after 1992)

During the Soviet period, covering over 70 years, most areas of Azerbaijani industry developed rapidly and comprehensively; in comparison to previous years, strong industrial potential was created. In addition to the achievements of the Soviet period, a number of serious inconsistencies and deficiencies in the course of economic development occurred. All these inconsistencies arose from the fact that Azerbaijani industry was an important integral part of the Soviet Union and in comparison with the other republics of the former USSR, the most part of Azerbaijani economy – 93% was directly dependent on the centre – Moscow. Azerbaijan was functioning as a dependent region and this was the reason why the progressive structure of the economy failed to meet national interests. Azerbaijan was a supplier of raw and semi-finished products within the Soviet Union. The ratio of raw materials usage in the production of finished products was low. For example, on the eve of the collapse of the Soviet Union, only 55% of crude oil, 30% of raw cotton, less than 15% of raw wool and wine, 10% of the fermented tobacco and 30% of aluminum out of total Azerbaijani natural resources were used for the production of the final products. Manufacturing of the number of other types of raw materials, e.g. iron ore, most of the non-ferrous metals and others was limited to the level of initial extracting. Thus, during development of the economy, the improvement of the industrial areas that meet national interests was limited for a long time, due to the fact that centre's interests were put forefront and this trend was stronger in Azerbaijan rather than in other republics.

The above-mentioned factors affected Azerbaijan and caused additional damage to the country during the collapse of the Soviet Union and the crisis of the transition from centralized to the market economy. So that, as the result of crashing traditional business relations and losing selling markets within the post-Soviet area, an average of 55% decrease occurred in the newly independent countries' industries, however, the loss in the Azerbaijani industry reached 70%.

In 1996-1997 the decrease in the Azerbaijani industrial production was prevented and trends for stabilization were observed. In the following years, the growth was started and approximately an average of 6% increase was noted during 1996-2000. With the entrance of the transnational companies, representing

the leading worldwide economies, a new phase of the Azerbaijani industry development commenced in the independent Azerbaijan. This phase was mostly related to the fast development of the oil sector. Via the investments to this sector valued in billions, important projects were realized and the oil extraction peaked in 2010 at the rate of 51 million tons in comparison to 11.7 million in 1991, so the share of oil factor reached 80 percent in the industry, non-oil sectors' positions were left far more behind from the oil sector's high growth rates, based on the huge volumes of oil extraction.

The oil extraction started to decrease steadily beginning 2011 as it was predicted following reaching the peak. In 2014 about 42 million tons of oil was extracted in Azerbaijan, and this was 3 percent lower than in 2013.

In 2012-2013 the added value in the non-oil industry increased by 2.2 times, along with 2.3 time increase in non-oil manufacturing industry. The share of added value in industrial product raised from 53.5% to 78%, the ratio of the added value created in the industry reached 50% from 40.4% in the GDP structure. The export of non-oil industry products increased by 5 times, the main funds in industrial companies increased by 3.9 times and reached 46.8 billion AZN. In the research, conducted by Lal K. Almas and Nazim O. Hajiyev on current and potential comparative advantages of Azerbaijan, it was specified that "There are a number of competitive fields existing in Azerbaijani industry, and there is also a high potential in the country to develop new and competitive fields in the future.[Almas, Lal K., and NazimUzbeyHajiyev. 2013, p.16]. As a result of realized diversification policy, the growth rate of the non-oil industry has been exceeding the growth rate of the oil industry sector for the last years.

In 2013 the industry production in Azerbaijan increased by 1.8% and reached 33.7 billion AZN in comparison to 2012, where 74.0% or 24.9 billion AZN was produced in mining field, 20.1% or 6.8 billion AZN in processing field, 5.3% or 1.8 billion AZN in electricity, gas and steam production, distribution and supply field, 0.6% or 218.7 million AZN in water supply, waste treatment and disposal fields. The production in oil sector increased by 1.1%, while the production in the non-oil sector increased by 4.8%.

43.1 million ton or 0.2% more crude oil was produced, 17.9 billion cubic metres or 3.6% more gas for selling and 1619 kg or 3.6% more gold.

Referring to State Statistical Committee data, in 2014 the oil produced in Azerbaijan was valued in 31.9 billion AZN. The 69.6% or 22.2 billion of oil products were produced in the mining field. In this field, 41.9 million tons of oil, 18.7 billion cubic meters of natural gas for selling and other products were produced.

The production volume in the processing sector constitutes 24% of the total industry production. 5.7% of the industrial production was indicated in the field of electricity, gas and steam production, distribution and supply, as well as 0.7% was created in the field of water supply, waste treatment, and its disposal.

If in 1995 only 5.5% of the total industry production was produced in non-governmental sector, in 2000 and in 2014 this figure reached 43.7% and 79.5% respectively.

The share of extracting is 70% in the industry, because of this each percentage of decreasing movement in this field influenced the total industry production value by the 0.7% ratio. In 2014 approximately 7% increase was noted in the processing industry. Despite high growth rate in this sector, its each increase percentage influenced the total industry growth by 0.24% ration, and this is 2.9 times lower than the figure for the extracting sector. Because of this, in spite of the fact that the 7% increase in processing industry is a high indicator, it influenced the general industry growth rate only by 2%. Therefore, the growth of 7% was able to compensate the negative effect of a decrease in the extracting industry, but in 2014 the industry of Azerbaijan specified generally 0.7% lower figures. It is evident that the 0.7% decrease in the industry in 2014 is just a temporary trend, based on the effect of the slowdown, observed in oil extracting after reaching its peak, under the condition that the share of the extracting sector is too high in the mining industry. 7% growth in processing industry for the last year was noticed as the result of the growth in production of food, beverage, tobacco, textile, clothing, chemistry, construction, electronic, metallurgy, automobile and other transportation means etc. This growth also influenced the industrial

structures. As it can be seen from the Table 1, if in 2013 the share of mining and processing fields in the total production were 74% and 20% respectively in 2014 mining represented 70% and processing share increased to 24%. During only one year the share of mining decreased by 4% and the share of processing increased by 3%.

TABLE 1. Manufacturing industry field structure
(referring to total sum, based on compared prices of 2005, in percentage)

| Years | The entire industry | Mining industry | Processing industry | Electricity, gas and steam production, distribution and supply | Water supply, waste treatment and disposal |
|-------|---------------------|-----------------|---------------------|--|--|
| 2005 | 100 | 67.4 | 25.9 | 5.7 | 1.0 |
| 2010 | 100 | 74.6 | 20.5 | 4.4 | 0.5 |
| 2011 | 100 | 76.8 | 18.3 | 4.4 | 0.5 |
| 2012 | 100 | 74.1 | 20.3 | 5.0 | 0.6 |
| 2013 | 100 | 72.7 | 21.4 | 5.2 | 0.7 |
| 2014 | 100 | 69.6 | 24 | 5.7 | 0.7 |

Note: Manufacturing industry field structure is given, not considering the operations of households.

Source: Azerbaijan Statistical Figures 2010. Baku, "Sədə" 2010, pp. 459-460, Azerbaijan in Numbers 2015, Baku, "Sədə" 2015, pp. 69-70.

More than 40 billion AZN have been invested in Azerbaijani industry for the last 10 years, measures for industry modernization and development a competitive industry meeting nowadays requirements have real results. The 2 regional programs implemented in Azerbaijan for last 10 years have such positive effects as a remarkable increase of regions' economic potential, the qualitative improvement of infrastructure and communal services, as well as launching modern companies. Totally 50.7 billion was spent on the implementation of regional development programs, 16 billion for the first program, and 34.7 billion for the second program.

As a result, GDP increased by 3.4 times, non-oil sector by 2.6 times, investments by 6.5%, population income by 6.5 times, 56 thousand new companies were put into operation and more than 1.2 million new working places (900 thousand permanent workplaces) were launched during the last 10 years.

In the regions during this period, the total production increased by 32 times, industry production by 3.1 times, communication services by 6.1 times, population incomes by 6.3 times, average monthly salary by 7.3 times, the chargeable public services by 6 times. It should be specified that the growth rate for the vast majority of regional indicators was much higher than the respective overall country indicators.

2014 was announced as an 'Industrial year' and measures undertaken in this field broadened, as well as the overall process of industrialization grew. In the mentioned period 64% of the privileged credits were canalized to the production and processing of agriculture products projects. So, 100 million credit was given to 39 poultry companies with the yearly production capacity of 55.000 tons poultry meat, 84 million stud, and 164 million eggs, industrial poultry production capacity was increased to 100.000 tons, the production of poultry increased 51% and reached 97.000 tons. As the result of these measures the import of poultry was decreased by 73%. Besides this, a cattle-breeding complex consisting of 20.000 cattle of 16 breeds, 7 milk production companies (with yearly production capacity of 175,000 ton) and 7 meat production companies (with yearly production capacity of 81,000 ton) were launched, the production of meat and milk, as well as the rate of self-provision, increased. At the same time, after putting into operation of 28 intensive gardening and grape households, 30 modern greenhouse complexes and 15 grocery manufacturing companies, the production and exporting potential in this field remarkably increased.

Production in the processing industry increased by sectors in the following rates: food production by 4.2%, oil production by 6.2%, chemistry production by 19.5%, pharmacology by 12.8%, construction materials production by 21%, metallurgy by 1.5%, electronics production by 14.6%, automobiles and

equipment production by 25.1%, automobile and trailer production by 28.9%. In 2013 20.6 billion kilowatt-hours electricity was produced by national electricity stations (0.6% more than the previous year).

TABLE 2. The growth rate of Azerbaijani industry during 2010-2014 and the predicted indicators of mining and processing industry sectors for 2018
(the ratio of the previous year indicators, in percentage)

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---------------------|------|------|------|------|------|------|------|------|------|
| Industry | 2.6 | -5 | -2.3 | 1.8 | -1 | - | - | - | - |
| Mining industry | 1.2 | -8.4 | -5.1 | 0.7 | -3.0 | -2.1 | 1.2 | -2.8 | 2.4 |
| Processing industry | 9.4 | 7.1 | 4.7 | 5.8 | 6.7 | 5.3 | 6.1 | 5.4 | 6.2 |

Source: Azerbaijan in numbers, Baku 2013. pp.72-73; Ministry of Economic Development and Industry of the Republic of Azerbaijan.

3 Development of the State Industry Policy

The national industry policy comprises implementation of the comprehensive measures in order to create favourable environment for industry development and to improve the industrial area and sector structure. Defining the relevant measures for structural improvement and provision of continuous development of national industry becomes possible within the framework of the comprehensive research. Because of this, it is impossible to achieve the effectiveness of the industrial policy without conducting comprehensive research towards defining the development trends of the industry. The state industry policy aims at structural improvement of the industry, as well as provision of economic growth. This intends creating favourable conditions for the development of certain sectors. This means that in order to increase the efficiency of the production in these sectors certain government spending incurred. In order to obtain efficiency of this spending, it is required to correctly prioritize sectors of the industry, to interrelate these priority sectors, and all relevant measures should be taken in order to achieve the targeted goals. The study shows that the mission to develop sectors lagging behind by using the income generated from the competitive sectors has not been always successful. Sometimes it causes problems in competitive sectors' production itself and prevents these sectors' development. Thus, while drafting the industry policy, it is important to correctly define the prioritized sectors and to assess precisely the improvement potential of these sectors.

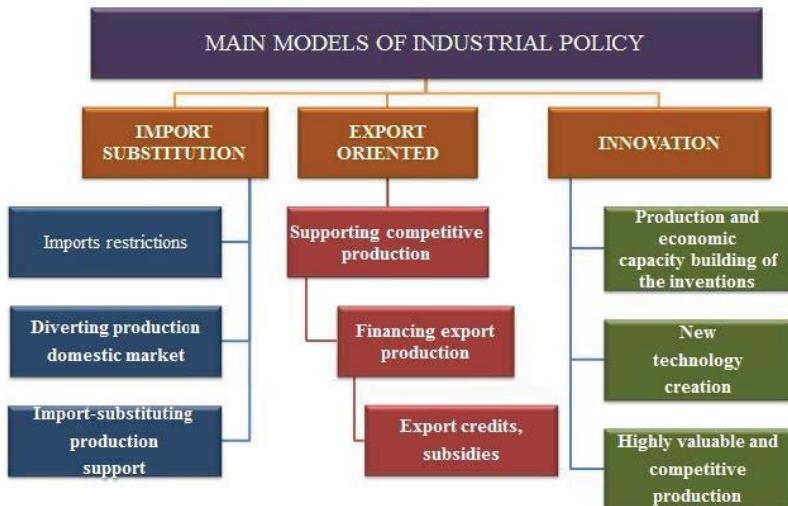
Generally, the state industry aims at serving public incentives and additionally the policy is supposed to provide the following goals:

- Increasing the competitiveness of national industry;
- Preventing imperfect competition and creating fair competition environment;
- Supporting the development of small and medium entrepreneurship;
- Protecting consumer rights, etc.

The main models of the industry policy are an export-oriented model, import-replacing model, and innovation model. It should be mentioned that it is possible to apply these models separately for the diverse industrial sectors and during different development phases (Graph 2).

The import-replacing model of the industry policy comprise the measures taken in order to ensure that the internal market requirements are met via local production. These measures include implementing the protectionism policy, preventing the strengthening of the national currency exchange rate, and providing local production with discounted credits, etc.

The influence of import-replacing policy on the development of the industry of Azerbaijan is limited. Azerbaijan belongs to small countries' group and the structures of production and consumption are rather different small economies. The volume of the internal market in small economy mostly is not enough to substantiate the minimum efficient rate of industry products production.



The export-oriented industry policy model intends to stimulate industry production for exporting. Dependence of small economy on the foreign economic relations increases the importance of implementing export-oriented industry policy. The government creates favourable conditions for operation and development of export-oriented sectors via applying tax and customs discounts, providing discounted credits, etc. It should be mentioned that realization of the export-oriented industry policy based on crude resources may cause negative consequences for the national economy. Consequently, high proportion of crude resources in exports leads to formulating the primitive structure of the national economy, decreasing the competitiveness of the processing industry. As the outcome of oil and gas export, the national currency is strengthened because of huge amount of incoming foreign currency and this factor affected the competitiveness of industry companies. In order to diminish the negative effects of the mentioned factor, it is required to use effective tax, customs, credits, and other mechanisms.

Innovation model of industry policy comprises provision of economic development based on applying high technologies and capital-intensive production. This model intends to increase national scientifically-technological potential, to establish educational institutions, to provide the economy with the high-skilled labour force, to develop complex production systems where the achievements of scientifically-technological progress are applied.

The successful implementation of oil strategy in the country and increase of oil incomes enables the government to realize comprehensive endeavours based on export-orienting, import-replacing or innovation models of industry policy. In this case, it is important to link effectively extensive and intensive methods of industry development and to apply long-term measures in order to increase the technological-economical level of production. The foremost goal of industry policy is to permanently develop industry via increasing efficiency of industry production and raising its competitiveness in internal and external markets.

In the mid-run the main goals of state industry policy are to provide sustainable and fast growth rate of industry production, improve industry structure, and increase its efficiency. In this regard, the main efforts will be diminishing the physical depreciation of production equipment, increasing national competitiveness, innovation and industrial activeness, stimulating faster development of non-oil sector and processing industry operations.

4 The Development Trends of Non-oil Sector

Oil-gas sector is the driving sector of Azerbaijani economy. Referring to 2014 indicators this sector constitutes 70% of the industry and more than 90% of exports. Because of this, decrease and low growth rates in this sector play a critical role in a slowdown in industry and in the entire national economy. Presently Azerbaijani economy, based on the high-level development of energy sector, faces new challenges because currently the economy is in the decreasing phase of oil extracting after 10-year fast growth and reaching its peak.

Nowadays, following the current high-level oil industry development model, it is necessary to apply the development model that will enable us to comprehensively use our human resources, oil incomes-financial resources, technical resources, as well as geopolitical resources. Such model can be A MODEL OF HUMAN RESOURCES-INVESTMENT-INNOVATION-INTEGRATION.

Based on the Human Resources-Investment-Innovation-Integration model, it is possible to transfer Azerbaijani industry into the innovation model development phase, and this will enable the creation of the competitive, sustainable, structurally balanced national industry, providing development of leading industry technologies and effective integration into the global technological environment. We propose the following necessary measures in order to realize the mentioned model:

- To create modern innovative infrastructure in order to develop new industrial sectors;
- To eliminate all barriers, preventing innovation goods' entrance into the market;
- To stimulate realization of innovation development using extra-budgetary funds;
- To decrease direct and indirect state finance to industry gradually;
- To improve and modernize technological basis of the perspective industry sectors;
- To stimulate researchers and initiatives on developing new technologies and materials;
- To eliminate imperfect competition and to create fair competition conditions for the companies in the market;
- To broadly stimulate the export of the highly valued products.

Further innovative development of the national industry will eliminate industrial slowdown, will upgrade this leading economic sector, it will also substantially increase the competitiveness and exporting opportunities of the national industry.

To this purpose, towards non-oil sector development, it is important to undertake the following measures, except the above-mentioned endeavors:

- To speed up the restructuring process;
- To continue implementation of the measures related to restoring and re-launching functioning of the industry entities, that are considered economically effective and demanded;
- To speed up applying international standards at the industrial companies, based on modern technologies;
- To speed up implementation of the measures related to stimulating investment;
- To strengthen the infrastructure of the research institutes according to the modern market requirements in order to develop science-intensive production.

In the period of upgrading to a new development phase, the state is required not only to develop infrastructure for the private sector and social entities, but also it is necessary to stimulate investment to certain industry production sectors. This is mainly related to limited opportunities for private sectors to realize big industry projects. From our point of view, state investment has an important role in ensuring development of the industry in Azerbaijan and it is extremely crucial to consider the influence of this investment on the expansion of the private sector. So that, as it was already mentioned, while drafting the industry policy, the industrial sectors, which the private sector is not able to develop, should be precisely defined and state investment should be directed to these sectors. Meanwhile this process, it is important for the government to implement measures in order to remove the disproportions limiting economic

development. Similarly, the competitiveness of industry sectors in the country is related to the existence of the relevant sectors. Therefore, industry policy should consider the interrelated development of the separate industrial sectors and the effects of the state-financed sector to the development of other sectors should be also considered.

It should be noted that, in order to increase the effectiveness of the government participation, it is important to define state mechanism for restoring state entities according to the modern requirements and launching joint companies in the form of foreign direct investments.

The taxation policy has a vital role in implementing the goals of state industry policy. Means of the taxation policy, influencing competitiveness of the industry, include decreasing the rates of added value and income taxes, realizing of capital investment, applying stimulating tax discounts, etc. Taxes are the main element formulating prices, because of this, changes in the tax rates influence incomes of the industry companies in the short-run and the value of demand for industry goods in the long-run. From this point of view, lowering tax rates raised the price competitiveness of national production.

The monetary policy means also have an important role in developing the competitiveness of the national industry. Monetary policy means have vital roles in the provision of financial stability in the country and aims to stimulate the development of the priority sectors of the industry. In this regard, in the transforming economies where the financial markets are weak and the market mechanism has limited opportunities for distribution and efficient utilizing the financial resources, the state is able to provide privileged finance to development of the prioritized industry sectors via influencing the structure of credit flows.

5 Conclusions

While defining new trends in state competition policy in the industry and meanwhile drafting proposals in this regard, based on the exploring current situation in the industry of Azerbaijan, the following results were obtained:

It is possible to divide the development of Azerbaijani industry into two phases:

The first phase comprises the period during 1920-1991 when Azerbaijan was an integral part of the Soviet Union.

During the Soviet period most areas of Azerbaijani industry developed rapidly and comprehensively, in comparison to previous years, strong industrial potential was created to develop chemistry, machinery, metallurgy, electronics, light economy, food and other industrial sectors in addition to the energy sector, that formed a basis of the national economy. In addition to the achievements of that period, a number of serious inconsistencies and deficiencies in the course of the economic development occurred. All these inconsistencies arose from the facts that Azerbaijani industry was an important integral part of the Soviet Union and in comparison with the other republics of the former USSR, the most part of Azerbaijani economy – 93% directly depended on the center – Moscow. Mainly because of this Azerbaijan lost a lot during the collapse of the Soviet Union and the crisis of transition from the planned into the market economy.

The second phase comprising independence years started in 1991.

It is possible to divide the development of Azerbaijani industry during the independence years into four periods:

The first phase comprising 1994-1995 could be titled as the decline of the industry and the crisis period. This phase is the period when the problems of Azerbaijani industry, caused by recession inherited from the Soviet period and by the economy shaped according to the interests of the Centre continued. As the result of Armenian occupation, more than 6000 industry and agriculture entities were devastated. The damage caused to the economy is totally valued to be more than 300 billion US dollars. Besides this loss, unstable economic and political situation deepened the crisis of the transition from centralized to the market economy. As the result of crashing traditional business relations and losing selling markets within the post-

Soviet area, an average of 55% decrease occurred during 1990-1995 in the newly independent countries' industries. However, the losses in the industry of the Republic of Azerbaijan reached 70%.

The second phase comprising 1996-2003 is the period of the way out of the recession, recovery and sustainable development of the industry.

In this phase, on the one hand, Azerbaijan started to realize new oil strategy intending to attract substantial foreign investment to the oil-gas industry. On the other hand, reforms for transition to market relations and liberalization of the economy were implemented. Important measures were taken for privatization of industry entities and market institutions were founded. As the result of the reforms the decreasing of industry production process continued till 1996 and beginning from 1997, new development stage started in this sector. GDP increased to 71.0% during 1996-2002. Meanwhile, the mentioned period the industry production rose to 23.6% or by 3.6% average per year. The share of industry added value in GDP reached 37.4% in 2002 and increased by 12.6% in comparison to 1993.

As a result of continuous reforms during the third “**growth and dynamic development of the industry**” phase Azerbaijan GDP and non-oil sector increased by 3.4 times and 2.7 times respectively. National strategic foreign exchange reserves rose by 30 times and approached 50 billion dollars. If in 2003 the share of the industry in GDP was 38%, in 2013 this indicator increased to 48%. In 2013 the share of the non-governmental sector in industry production reached 81.1% and increased by 24.3% in comparison to 2003. Non-governmental companies constitute 77.7% in the total number of industrial entities. In the industrial sector during 2013, the goods and services in the total amount of 33.7 billion AZN were produced. The total production in the mining sector figured out 74%, respectively 20.1% was noted for processing sector, 5.2% for electricity, gas and steam production, distribution and supply, and 0.7% was created in the field of water supply, waste treatment, and its disposal.

If in 1995 only 5.5% of the total industry production was produced in non-governmental sector, in 2000 this figure reached 43.7% and in 2014 79.5% was noted for this indicator. This phase was mostly related to the fast growth of the oil sector. Via investment to this sector, valued in billions, important projects were realized and in 2010 the oil extracting peaked at the rate of 51 million tons in comparison to 11.7 million in 1991, so the share of oil factor reached 80 percent in the industry, non-oil sectors' positions left far more behind from the oil sector's high growth rates, based on the huge volumes of oil extraction.

The oil extracting started to decrease steadily beginning in 2011, as it was predicted, following the reached peak. In 2014 about 42 million tons oil was extracted in Azerbaijan, and this is 3 percent lower than in 2013.

Azerbaijan entered a new industrialization phase via declaring 2014 the “Year of Industry”. During this phase, the State Program on the Development of Industry in the Republic of Azerbaijan for 2015-2020 was adopted and its implementation started. The third State program for the socio-economic development of regions covering the period of 2014-2018 was adopted and its implementation started, in Baku and its regions new industrial facilities were launched. Transport and energy infrastructure of the industry is being improved via successful projects, the construction of highways on the Baku-Tbilisi-Kars railway, the North-South, East-West transport corridors. Building of power plants is also successfully continued. Building of South gas corridor (Trans-Anatolian Gas Pipeline (TANAP) was started. Azerbaijan already has 2 space satellites (AzerSpace and Azersky) and the measures for the development of the space industry are continuing.

Referring to official governmental predictions, in the middle-run perspective the growth rates of the mining industry in Azerbaijan will fall down. On the contrary, the processing industry raised by 5.3% in 2015, 6.1% in 2016 accordingly, and expected 5.4% in 2017 and more than 6% in 2018. However, a number of measures should be undertaken in order to ensure comprehensive development of Azerbaijani industry, to create optimal industrial structure and to provide competitiveness. In this context, in order to achieve the foremost goals of the national industry policy, it is necessary to implement reforms to create effective competition environment within the country. The respective measures should be undertaken via reforms in

order to prevent imperfect competition and create fair competition environment; to support development of small and medium entrepreneurship; to protect consumer rights, etc.

The following models are applied in the industry policy:

Firstly, import-replacing model The main features of this model are limiting imports, directing production into the internal market and supporting production replacing import.

Secondly, export-oriented model The main features of this model are developing competitive production, strengthening the financial support to export-oriented production, providing exporting credits, subsidies, etc.

Thirdly, innovation model The main features of this model are expanding production-economic potential via innovation, developing new technology, broadening production of high-valued and competitive products.

The research reveals that referring to the industry policy model, based on the highly-developed energy sector, elements of all three models are used in Azerbaijan, but the process of formulating the optimal model is still continuing. Following the current high-level oil industry development model nowadays requires applying the development model enabling combined use of the human, oil income, and technical resources, as well as geopolitical resources. In this regard, the transition to the HUMAN RESOURCES-INVESTMENT-INNOVATION-INTEGRATION model could be the optimal option with the aim to strengthen the competitiveness of the national industry.

Based on the Human Resources-Investment-Innovation-Integration model, it is possible to transfer Azerbaijani industry into the innovation model development phase, and this will enable the creation of the competitive, sustainable, structurally balanced national industry, providing development of leading industry technology and effective integration into the global technological environment. We propose the following necessary measures in order to realize the mentioned model:

- To create modern innovative infrastructure in order to develop new industrial sectors;
- To eliminate all barriers, preventing innovation goods' entrance into the market;
- To stimulate realization of innovation development using extra-budgetary funds;
- To decrease gradually direct and indirect state finance to industry and to canalize the state support only to the perspective projects;
- To improve and to modernize technological basis of the perspective industry sectors;
- To stimulate researchers and initiatives on developing new technologies and materials;
- To eliminate imperfect competition and to create fair competition conditions for the companies in the market;
- To broadly stimulate export of the highly valued products;
- To increase the efficiency of using integration opportunities;
- To broaden options for preparing high-skilled labour force, meeting modern demands.

To this purpose, towards non-oil sector development, it is important to undertake the following measures, besides the above-mentioned endeavors:

- To increase the restructuring process;
- To continue implementation of the measures related to restoring and re-launching functioning of the industry entities, that are considered economically effective and demanded;
- To speed up applying international standards at the industrial companies, based on modern technologies;
- To accelerate implementation of the measures related to stimulating investment;
- To develop traditional national craft-art fields;
- To strengthen the infrastructure of the research institutes according to the modern market requirements in order to develop science-intensive production.

In the period of upgrading to a new development phase, the state should not only develop infrastructure for private sector and social entities, but also stimulate investment to certain industry

production sectors. This is mainly related to limited investment of the private sectors to realize big industry projects. State investment has an important role in ensuring the development of the industry in Azerbaijan and it is extremely crucial to consider the influence of this investment on the expansion of the private sector. So that, as it was already mentioned, while drafting the industry policy based on HUMAN RESOURCES-INVESTMENT-INNOVATION-INTEGRATION model, the industrial sectors, which the private sector is not able to develop, should be precisely defined and state investment should be canalized to these sectors. Meanwhile, it is important for the government to implement measures in order to remove the disproportions limiting economic development. So that, the competitiveness of the industry sectors in the country is related to the existence of the relevant sectors. Therefore, industry policy should consider the interrelated development of the separate industrial sectors and the effects of the state-financed sector to the development of other sectors should also be considered.

It is necessary to strengthen the measures aiming at preventing monopolistic activities, strengthening the struggle against unfair competition, creating a sound competition, restrain dangerous low quality goods' entrance internal market, etc.

In order to increase the effectiveness of the government participation, it is important to define national mechanism for restoring state entities according to the modern requirements and launching joint companies in the form of foreign direct investment.

In order to realize HUMAN RESOURCES-INVESTMENT-INNOVATION-INTEGRATION model and to formulate competitiveness of the national industry, the efficiency of usage economic levels should be increased and monetary policy measures should play an important role in this regard. First of all, besides increasing the quality of local production, the respective systemized measures should be taken in order to increase the competitiveness of national production, to stimulate exporting opportunities via soft devaluation of AZN.

The reforms of the taxation system should be continued and the tax system should be improved towards positively influencing the competitiveness of the industry. The tax legislation should be improved in order to develop fiscal function, stimulating entrepreneurship in the country and boosting free competition. These reforms should be based on such measures as defining tax rates and tax discounts in order to provide the necessary level of efficiency in the prioritized production sectors. The rights of the taxpayers should be broadened and tax discounts should be directed toward creation of favourable investment environment. Taxes should stimulate innovative business activities and capital investment to the economy.

Nowadays, while the financial markets are poorly developed and the market mechanism has limited opportunities for distribution and utilizing efficiently the financial resources, the state is able to provide privileged finance to the development of the prioritized industry sectors via influencing the structure of credit flows.

Presently, one of the factors affecting the negative competitiveness of the industry companies is the level of management. From this point of view, besides training highly-skilled labour force, the government should implement such endeavors as preparing managerial staff, drafting effective regulation mechanism of the state industry activities, expanding the applying level of cooperative governance, etc.

Increasing the competitiveness of the industry depends on the development of the relevant sectors in the country. Therefore, the state should support the improvement of relations among sectors and the effective functioning of the overall economy.

The increasing competitiveness of the Azerbaijani economy mainly depends on the comprehensive development of entrepreneurship and implementation of the measures in order to improve the business environment in the country. In this regard, efforts for improving legislative basis of the entrepreneurship regulation should be continued, efforts for increasing the effectiveness of the state regulation of the economy should be accelerated, the entrepreneurship should be broadly supported by creating favourable conditions for competitive industry production, based on innovative and high technologies, the financial

support to the entrepreneurship should be strengthened, the accessibility of entrepreneurs to the financial resources should be expanded, the successful world-wide practice towards supporting production entrepreneurship should be broadly applied, developing of industry parks and business incubators should be continued, the process of creating special economic zones in Azerbaijan should be accelerated, management practices should be applied, high-qualitative and competitive production should be broadened by involving entrepreneurs, and compound measures should be undertaken in order to increase private sector activities on production of export-oriented goods and their transportation to world market, as well as increasing their competitiveness, to strengthen foreign market positions of national production, to protect national interests, etc.

Further development of the national industry based on HUMAN RESOURCES-INVESTMENT-INNOVATION-INTEGRATION model will eliminate industrial slowdowns, will upgrade this leading economic sector of the national economy, also it will substantially increase the competitiveness and exporting opportunities of the national industry.

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The Theoretical Aspects of Developing Economy at the Enterprises in the Modern Society

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Abstract: The theoretical aspects of emergence and development of the ‘knowledge economy’ in the conditions of modern economic relations are considered in the article, as well as chronological development of the ‘knowledge’ concept, its classification and separation as an independent discipline, and its influence on modern economic development. The need for emergence and development of this category was due to economic processes and changes occurring in the society (development of scientific and technical industries). The category of ‘knowledge economy’ is a collective concept based on two key aspects – knowledge and economics. Knowledge is very closely related to human resources, since it is the person who is able to perceive and rework knowledge, and then to create new information leading to further development. When considering the concept of ‘knowledge’ at the entrepreneurial level it is manifested through human capital. Thus, the development of *knowledge* contributes to the construction of ‘knowledge economy’ in the enterprise, which opens a new spectrum of opportunities for further economic development.

1 Basic Results of the Research

The modern age has created a new tendency of redistributing force of influences in the international economic relations. It is a long process when resources and capitalization take new positions. Nowadays, in the XXI century, the world community has been divided into three groups which have different influence on constantly changing processes. The leaders of the G-7 countries, which are the main players in the world, have an important role in this context. Developing countries (post-socialist countries) play a secondary role, and the third-world countries directly depend on the first two groups and represent the bulk of the world's resources and labour.

The scientific sphere in the field of economics actively develops in the direction of the construction and analysis of all running processes. Thanks to the scientific community, a huge number of indices have been created providing the output of numerous variables in order to display the key aspects of change in qualitative and quantitative forms. Based on the obtained data, different models are created to forecast future change and experiment with objects under consideration if necessary.

Rapidly developing changes exclude the ability to carry out and implement experiments, so modeling is necessary for qualitative process mapping. Model building is actively applied at both macro and micro levels, mainly by changing only the number and volume of external and internal factors of influence, on condition that key variable is unchanged.

Since ancient times economic development has created various models of growth. For example, in the end of the XVI century Francis Bacon focused his attention specifically on knowledge. It is exactly thanks to modeling that scientific community can apply various mathematical approaches to obtain the knowledge on underlying global processes, analyze them and make short- and long-term conclusions.

In the modern economic theory, there are a great number of models used under different conditions,

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but every model is based on different criteria, which lag behind the current trends of development. These models can be combined into one category *knowledge economy* whose main task is not to analyze each indicator separately, but to reduce them all to the same index which will reflect the total importance of all criteria influencing the whole development.

The modern society is the information one based on the use of high technology with round-the-clock access to information. The process of transition from an industrial to an information society is mainly the cause of changing human needs in rapidly developing Hi-Tech. The main criterion of the modern enterprise is the human potential which is an effective attraction of workers' knowledge into the process of production improvement.

Making a conclusion to the above, the main task for modern experts in the field of economics is to analyze the influence of knowledge on the improvement of qualitative and quantitative indicators not only at the national but also at the business level. Thus, in the context of the modern information society, analyzing the economic development of an enterprise, special emphasis is placed on human resources which are the main engine of progress. Based on the achievements in the field of knowledge, at the macro level, it is also necessary to analyze and derive a similar model, but for enterprises all external and internal factors should be taken into account.

The concept of *knowledge economy*, like many other economic categories, describes the relationship between different categories of *knowledge* and economy through economic processes and relations.

That means that it is spoken about inputs into creation of new goods – *knowledge*, its development (what processes accompany the emergence of *knowledge*), the features of its circulation in the system (accumulation, distribution and use), realization and storage, profitability etc.

Thus, the object under investigation is knowledge. What is knowledge? How can we present it in a qualitative form? How can it be measured?

Knowledge is all around us. We get and/or share knowledge with others every minute of our lives. In our opinion we can image this circulation in Fig. 1. Being an integral part of modern society, knowledge is disseminated through information channels in the communication process. At this stage, knowledge acts as one of the types of information, which society accumulates and processes. Here, information begins to turn into knowledge. Then, under the impact of various external and internal factors, it is necessary to improve that knowledge. After that a long process of transformation comes when humanity receives new knowledge (new achievements, discoveries, developments, etc.) that need to be processed: to collect, analyze, structure and disseminate.

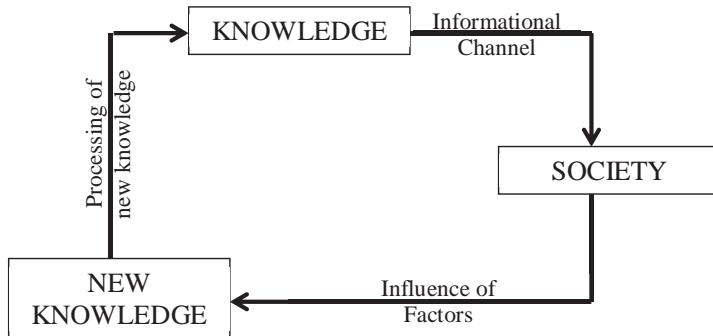


Fig.1 The process of knowledge transformation
Source: developed by the author.

To concretize the category of *knowledge*, let us consider the existing definitions which are given depending on the scope of research and researchers.

The concept of *knowledge* is very widely used in the scientific sphere. There are many approaches to the definition of this concept. The first philosophers who paid attention and actively developed the idea of determining knowledge were Plato and Aristotle.

Considering the definitions of Eastern European scientific thought, how the meaning of the category of knowledge has changed. In 1894 F.A. Brockhaus (Leipzig) and I.A. Efron (St. Petersburg) published an "Entsiklopedcheskiy Slovar" started by Professor I.E. Andreevsky and continued by K.K. Arseniev and Professor O.O. Petrushevsky. In this dictionary, the category of knowledge is described as "the most common expression for designating the theoretical activity of the mind, having a claim to objective truth (in contrast, for example, from thinking or thought that can be obviously fantastic)." In this context, *knowledge* is viewed as a philosophical category, which only began to stand out separately in the philosophy of modern times(F.A. Brockhaus, 1894).

Already in 1967 Nemchinov V.S. in the book "Ekonomiko-matematicheskie metody i modeli" provides the following definition of the category of knowledge – "this is information which was obtained by a person or a group of persons and which was reworked by them for subsequent distribution"(Krasilnikov, 2012).

In 1992, when the science was actively developing the idea of creating artificial intelligence, T.A.Gavrylova and K.R.Chernyavskaya in their book "Izvlechenie i strukturirovanie znanii dlya ekspertnyih sistem" take the basic working definition: "knowledge is the basic regularity of the subject area allowing a person to solve specific production, scientific and other tasks, that is, facts, concepts, relationships, assessments, rules, actual knowledge, as well as decision-making strategies in this area (in other words 'strategic knowledge')". Unlike previous definitions, at this stage the category of *knowledge* is considered almost as a separate direction formed on the basis of Knowledge Engineering (T.A. Gavrylova, 1992).

"Filosofskiy entsiklopedicheskiy slovar" edited by E.F.Gubskyj in 2009 gives an extended and in-depth concept of the category of *knowledge*: "the result of cognitive activity, checked in practice, its true reflection in human thinking; possession of experience and understanding, which are correct both subjectively and objectively and on the basis of which, it is possible to build judgment and conclusions which appear sufficiently reliable to be considered as knowledge" (Gubskyj, 2009).

For the true understanding of the term *knowledge*, let us give some examples of its definition according to Western European scientific thought. Starting from the 1950s, the Cognitive philosophers Ludwig Winstenhein and Michael Polanyi had studied the category of *knowledge* as explicit and able to have digital expression concept.

In 1996, the magazine 'Educational Psychologist' published the article 'Types and Qualities of Knowledge' written by pr. Ton de Jong and Monica G.M. Ferguson-Hessler. The article describes the concept of the 'knowledge base of a man', which consists of the term knowledge in different areas of its usage and directions. The authors do not give the definition to the term *knowledge*, but analyze the meaning, which was cited in the articles of other researches in the previous periods on which they cite (for example, Reif F., 1987; Reif F. & Allen S., 1992; Greeno J. G., 1978; Larkin J. H., 1989 and others)(Ton de Jong, 1996).

The further research in this field for a long time has been aimed at studying and structuring the received information. From the beginning of the XX century, the *knowledge* category gradually begins to transform. In many fundamental works of Western scholars of that time (for example Kewin 1992, Drucker 1993, Nonaka and Takeuchi 1995, Prusak 1997, Devantrop and Prusak 2000 and others), the *knowledge* is considered to be not only an integral part of the individual peculiarities of men, but also as the basis of the enterprise as well (companies)(Papoutsakis, 2007). This opinion gives impetus to the new trend of the definition of creation the *knowledge* term.

In 2003, in the magazine 'Journal of Intellectual Capital' an article by Ph. D. Darwin P. Hunt was published, 'The Concept of Knowledge and How to Measure It' in which the category *knowledge* is viewed as "a characteristic of a person that influences the person's behavioral potential"(Hunt, 2003). Thus, a person can manage to base decision-making processes on the meaning of the concept of *knowledge*.

George Siemens (a writer, researcher in the field of studying network technology, analytics, visualization and organization of efficiency in the field of computer technology), in 2006 in his book "Knowing Knowledge", describes *knowledge* as an opportunity for company management "to objectively analyze and take actions which are consistent with the changes that are occurring, which allow organizations keep pace with the times"(Siemens, 2006). According to his theory, knowledge has two characteristics: to describe and to explain some part of what is happening; and to give a chance to be used in the context of some actions.

Analyzing the set of cited existing definitions of *knowledge*, it is impossible to single out a concept that could form the basis of the concept 'knowledge economy'. In the context of the research, *knowledge* is viewed as an integral part of human existence (it manifests on the level of development and functioning of life activity), information exchange, world perception and decision-making process (in the context of not only individual peculiarities, but also in working conditions at any enterprises). At the macro and micro levels, knowledge is manifested as an opportunity and ability for the decision maker to perceive data objectively, which reflect production processes and make unable to predict the future.

Analyzing the *knowledge* concept, special attention should be given to its classification. As mentioned above, at the entrepreneurial level, knowledge is necessary for the decision-maker (DM). In any non-standard situation, there are many factors that can influence the decisions made, but the ability to classify the knowledge correctly is a fundamental factor in this process

The decision-maker (DM) is the player of the human resources of the enterprise, who is empowered to accept and is responsible for strategically important decisions in the production process.

Thus, knowledge, as the majority of economic categories, has its own classifications. The first classification of knowledge is considered to be the classification suggested by Aristotle, who divided knowledge into categories according to their content:

- theoretical and universal knowledge (know-why, "I know why");
- knowledge as technology of activity based on the concrete practice (know-how, "I know how");
- knowledge as normative activity based on life experience and a separate case ('practical wisdom', common sense)(T.E. Stepanova, 2008).

The above classification is universal, many scientists adhere to it. On its basis, individual typologies of knowledge are developed. For example, an interesting classification of knowledge was suggested by E. Brooking, according to him, knowledge is divided into:

- idealistic (world view, goals, system of concepts);
- systematic (knowledge of systems, schemes, methods);
- practical (skill to make decisions, actual knowledge to perform daily work);
- automatic (firmly mastered knowledge).

A further example of classification of knowledge may be the work of I. Nonaka and G. Takeuchi "The Company Creates Knowledge" (1995), where according to their form of manifestation knowledge was divided into implicit (not open, latent, in-mind, not codified, not documented) and explicit (open, codified, documented) (Nonaka, 1991).

There is no generally accepted classification of knowledge, but there are different authorial approaches to classification. According to our research we analyzed a lot of information about knowledge classification and extended table which was offered by T.E. Stepanova adding the last item (Table 1).

Thus, each type of classification has its value in constructing a complex concept of knowledge as an object inscribed in interdisciplinary relationships (Fig.2).

Table 1

The Approach to Classify Knowledge

| INDICATION OF CLASSIFICATION | CLASSIFICATION | AUTHOR |
|--|---|--|
| By the content | 1. Episteme: (know-why, "I know why") 2. Techne: (know-how, "I know how") 3. Phronesis: ('practical wisdom', common sense) | Aristotle |
| By the subjective characteristics for those who know | 1. Practical knowledge 2. Intellectual 3. Daily and entertaining 4. Spiritual 5. Not needed | F. Mahlup (1966) |
| By the belonging | 1. Personal 2. Collective | M. Polani (1966) |
| By the form of manifestation | 1. Explicit (codified, open, documented) 2. Implicit (not codified, not open, hidden, latent) | I. Nonaka, G. Takeuchi (1995) |
| By the type of appointment | 1. Scientific 2. Explicit 3. Techne - skills, skills (craft) | P. Drucker (1995) |
| By the method of formation | 1. Reflexive (new knowledge based on the past) 2. Intuitive (knowledge 'from the head' with a small amount of explicit knowledge) | V.N. Gunin, V.P. Barancheev, V.A. Ustinov, C.U. Lapina (2000) |
| By the content | 1. Know-what ("I know what") 2. Know-why ("I know why") 3. Know-how ("I know how") 4. Know-who ("I know who") | The experts of OECD (2000) |
| By the type | 1. Knowledge about the goal or idealistic knowledge 2. Systematic knowledge 3. Practical knowledge 4. Automatic knowledge | E. Brusing (2001) K. Viig |
| By the way of perception | 1. Intellectual knowledge, depending on the skills of abstract thinking and cognitive abilities (knowledge of "what") 2. Incarnate knowledge, action-oriented and, as a rule, only partially manifested (knowledge of "how"), 3. The knowledge embodied in culture, relating to the process of achieving a common understanding 4. Built-in knowledge contained in system procedures 5. Encoded knowledge transmitted through signs and symbols | F. Blekler |

Source: Adapted by the author on the basis of (T.E. Stepanova, 2008).

Visually, the meaning of knowledge in the economic sense can be represented, for example, within the scope of a well-known theory of the life cycle of a product proposed by R. Vernon in 1966. At each stage of the cycle there is a need to own those or other data in a different sphere, not depending on the production itself. Therefore, for a forecast of sales, different knowledge is required. We can understand and describe this knowledge at the Table 2.

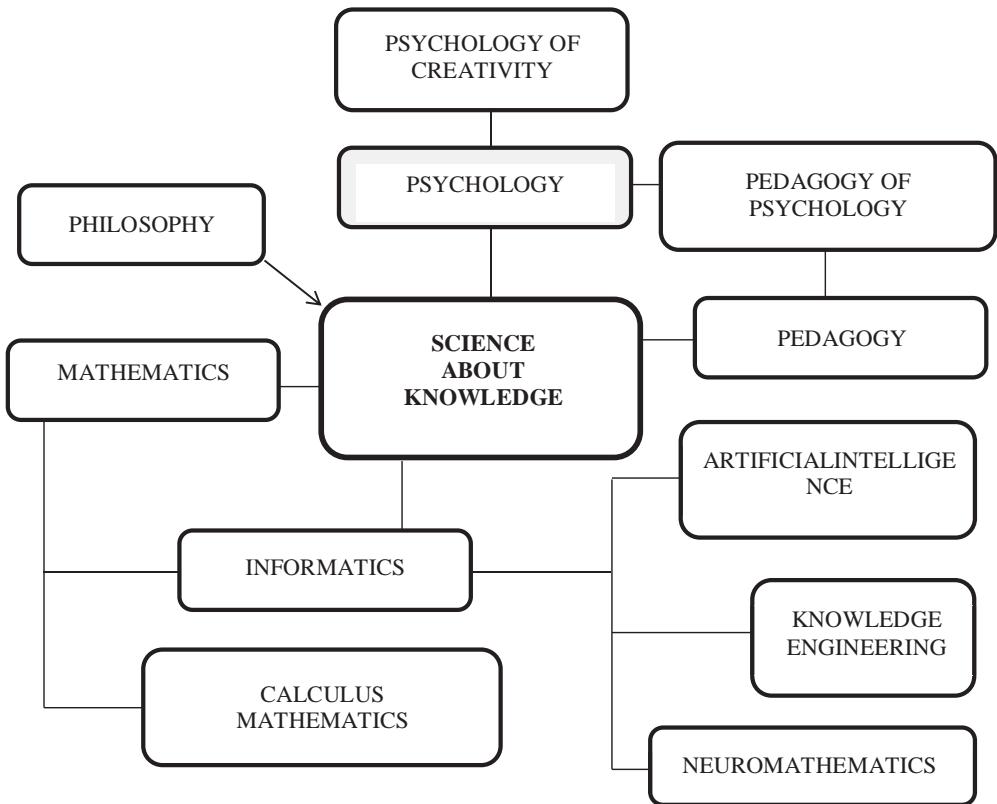


Fig.2 Knowledge in terms of interdisciplinary relationships
Source: Adapted by the author on the basis of (Drevyashnykov, 2016).

Thus, the category of *knowledge* is ‘at the interdisciplinary junction’. When considering *knowledge* in the economic aspect, this concept covers almost all spheres responsible for the viability of products: beginning from the moment of business planning and ending with the process of replacing the old goods with a new product (exit from the market).

Therefore, knowledge is an integral part of not only our daily lives, but also an important aspect of successful business activities, without taking into account political and economic factors. So, the way of competitive struggle in the market should be considered one of the most important factors of *knowledge*. Of course, knowledge at the enterprise is manifested through human resources, who, together, create a powerful intellectual potential of the enterprise, which, used properly, increases all key indicators of business success.

How to measure *knowledge* at the enterprise? What does it depend on? What is its influence? The *knowledge economy*, as a new branch of research, is trying to give an answer to all of these and many other questions.

Considering the constituent element of the concept *knowledge economy*, *knowledge* is a mechanism for analyzing the ongoing economic processes. But, how knowledge can be cost-effective or in what way we can measure economic profitability of knowledge. Let us consider a simple example: when a new employee comes to get a job at first he/she meets an HR manager. At this stage, it is impossible to answer clearly if a new employee is effective in economic terms. First of all, in this example, the HR manager is

able to analyze the knowledge of the new employee (his education, his ability to learn, accumulate and use new knowledge acquired in the course of his work), and on the other hand his ability to self-realization (for example, the creation of science-intensive product).

Thus, the self-actualization of the employee through professional skills increases the level of his skills, which, in turn, is displayed through products of intellectual labour and intellectual property – creation of high-tech equipment, implementation of the cost-effective proposal, writing of a profitable business plan, books, articles, patents, copyright and so on.

I. Nonaka and H. Takeuchi tried to explain the manifestation of knowledge in the context of the enterprise in their work "The Company Creating Knowledge"(Nonaka, 1991). According to their theory, the transformation of knowledge in an organization is based on a knowledge spiral (Fig. 3).

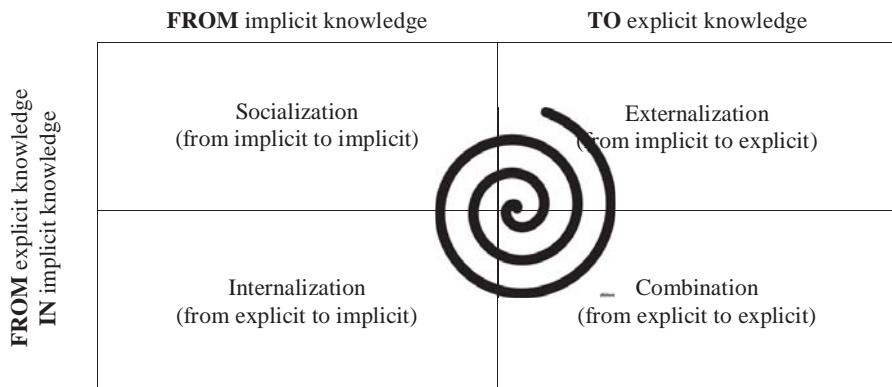


Fig. 3 The Knowledge Spiral according to I. Nonaka and H. Takeuchi
Source: (Nonaka, 1991)

Socialization involves the transfer of implicit knowledge from one person to another in an informal way when they interact. Externalization is the translation of implicit individual knowledge into explicit organizational knowledge. Combination (formation of system knowledge) means transferring explicit knowledge into the explicit one by connecting and transforming existing knowledge into a form that provides direct access to users. Internalization involves the transformation of the person of explicit knowledge into implicit knowledge, i.e. formation of new applied knowledge.

Based on the proposed theory by I. Nonaka and H. Takeuchi, one can imagine the effectiveness of the influence of knowledge on entrepreneurial activity (Fig.4).

According to this theory, the whole chain of factors that seemingly do not depend on each other, but are united by a single goal – to improve the economic performance of the enterprise, is open (Fig. 5). In this context, human resources, through the prism of used intellectual capital, act as one of the factors of production - labor. The profitability of labor is manifested through the level of wages, which, in turn, acts as one of the indicators of the efficiency of the enterprise. But labour itself affects other factors of production – land, capital, entrepreneurial abilities and information. If we consider each of them, in this context, for example: the quality of land use directly depends on the level of knowledge and ability of the owner to use this resource rationally; entrepreneurial abilities depend on the desire of executives to learn and improve their skills; etc.

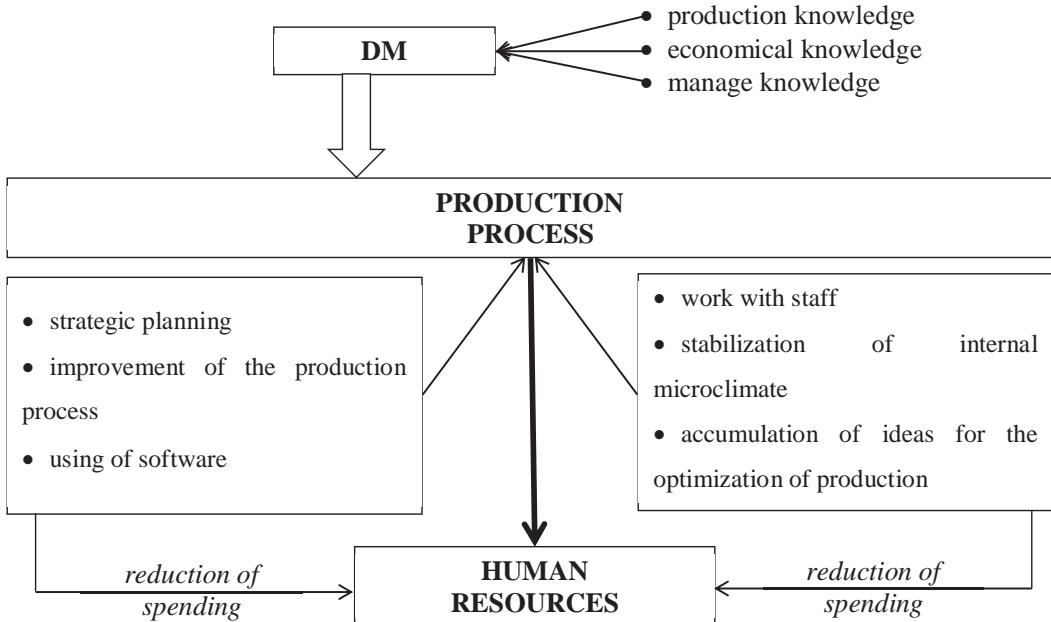


Fig. 4 The Influence of Knowledge Economy at the DM

Source: developed by the author.

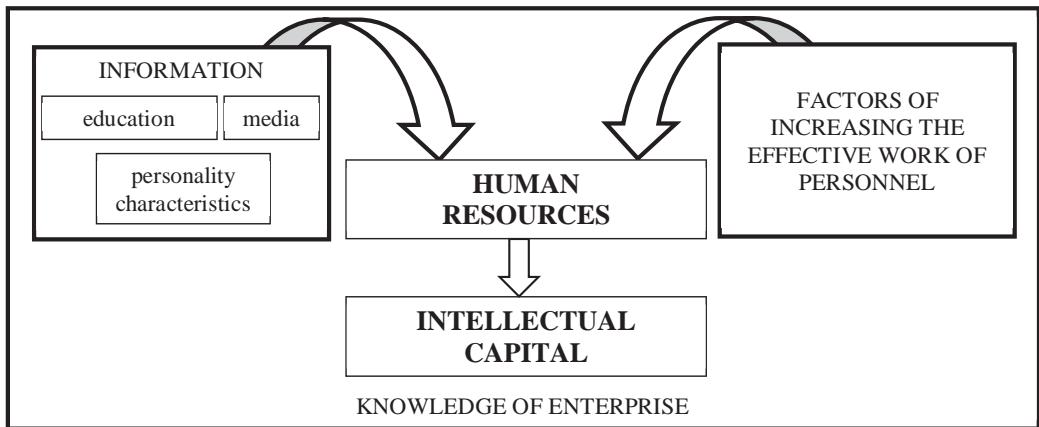


Fig.5 The factors, which influence at the intellectual capital

Source: developed by the author.

Knowledge is an integral part of intellectual capital, which on the basis of human resources creates a whole new direction – the knowledge economy (Fig.6).

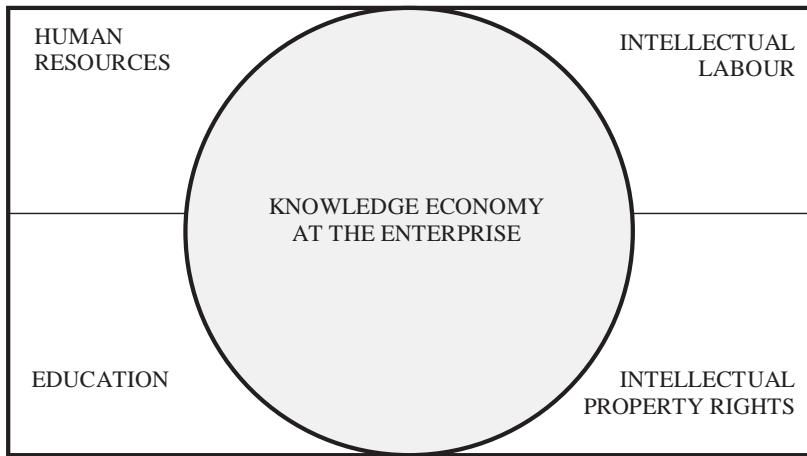


Fig.6 The Components of the Knowledge Economy at the Enterprise

Source: developed by the author.

Thus, human resources are a source of knowledge, and their knowledge is the knowledge of the enterprise. Many scientists address the idea of developing and studying human capital at the enterprise, for example L. Edvinson, M. Malone, P. Drucker, A.A. Chukhno, V.P. Antonyuk, O.Yu. Amosov, I.P. Buleev, V.M. Dyba, V.V. Bogatyreva, T.I. Ovchinnikov, V.L. Inozemtsev and others. This is due to the need to develop this direction, because the deeper effectively human capital is explored, the greater the volume of intellectual capital can be extracted, and, consequently, improve the efficiency of the enterprise.

Intellectual capital is a product that takes the form of an intangible asset. Intellectual capital as an asset is valued in monetary terms and is taken into account in economic activity. Human capital is a slightly different concept. It can be represented in the form of knowledge, skills, qualifications, and education that employees (knowledge holders) possess. It is based on human resources (human capital) responsible for improving production efficiency and increasing the level of profitability of the enterprise. Thus, human capital is a potential that can be used at the enterprise.

In his article "Intellectual Capital as an Important Factor in Increasing the Competitiveness of an Enterprise", Ya.S. Bruhoveztskyj emphasizes the peculiarities of the influence of intellectual capital on productivity and divides it into three different spheres (Table 3) (Bruhoveztskyj, 2014).

The knowledge economy is a new direction in the business economy, which helps to envelop all the components that combine intellectual capital, knowledge and production efficiency.

In economic theory, the pioneer of the 'knowledge industry' is the professor of Princeton University F. Mahlup ("Production and Dissemination of Knowledge in the US" and "Economics of Information and Human Capital"). Back in the 1970s F. Mahlup put forward the idea that the main branch of the modern economy is education (connected with production, science, labour market, information, its storage and distribution). In his first work, the scientist summarized the huge material and determined the economic efficiency of costs associated with the production and distribution of all types of information.

The category of *knowledge economy* links two completely different spheres of scientific activity: educational (mainly represented in the form of information) and economic. Investigating the knowledge-based economy (knowledge economy), F. Mahlup formulated a number of valuable methodological provisions:

Table 3

Characteristic Signs of the Results of Application of Intellectual Capital by Enterprises
(Bruhovetskyj, 2014)

| INTELLECTUAL CAPITAL - knowledge of the company's employees used in the production process to create a new cost of providing competitive advantages in the company | | |
|---|---|--|
| Economic Essence | A universal criterion for assessing the competitiveness of a company | The form of capitalization of intellectual potential |
| | Bearer - employees of companies creating new knowledge | The implementation criterion is the ratio of the market to the firm's book value (Tobin coefficient) |
| Factors of Using | Evidence of the firm's legitimate rights to the results of the creative activity of its employees, their natural and acquired intellectual abilities and skills, accumulated knowledge and useful relationships with other stakeholders | Provides formation and control of new created technology |
| | | Provides public recognition of the company |
| | | Forms a professional image of company employees |
| | Evidence of the organizational stability of the company in the face of rapid changes | Increases the competitiveness and capitalization of the enterprise |
| | | Promotes control of the end product of material production |
| | Accumulates scientific and professional technical knowledge, talents and experience | Promotes the formation of the country's authority |
| Forms of Building | Investment for research and development | Use of the attracted intellectual resource and payment of intellectual rent (for example, licensed production) |

- there are two opposite types of economy - the economy of uncertainty and the economy of certainty, the first type is less effective and more limited than the second;
- information economy is divided into 17 sectors (groups), each performing its own functions. The first sector is the economy of knowledge and general information, which emphasizes the importance of this sector. Other groups include production and dissemination of knowledge, risk and uncertainty, economic foresight and so on. The last group is human capital, knowledge accumulation and qualification;
- economic development is determined not so much by the availability and productivity of material and natural resources as by the volume of intellectual capital, the availability and speed of dissemination of information in society. As the choice is considered the core of the economy based on the synthesis and analysis of flows and information stocks. The analysis of information is carried out in two directions - theoretical and practical. The theoretical side consists of changing the meaning of knowledge (especially the economic one), information, use of modeling methods based on IT technologies and, first of all, computers;
- the main identified trends inherent in a knowledge-based economy are a higher rate of growth in the number of people engaged in the production of knowledge, compared with the same indicator employed in areas requiring manual labour and an increase of specific weight of workers engaged in the production of knowledge in the total number Employed;

- an increase in the share of incomes of subjects engaged in the production of knowledge in the total income, especially the growth of specific weight in the share of income of professional and technical specialists (Drevyasnnykov, 2016).

Based on the above postulates, what is the knowledge economy can be formulated. The knowledge economy is one of the directions about researching enterprise efficiency, in which the source of growth is both specialized (scientific) and everyday knowledge, as a result of which, along with natural resources, capital and labor, the processes of accumulation and use of knowledge become the dominant factor, As a result Which is constantly increasing the competitiveness of the economy.

Thus, in the concept of 'knowledge economy', the intellectual potential of the society on which it relies is the determining criterion and which is the total of the everyday (ordinary) and specialized (scientific) knowledge available in the minds of people and materialized in technological means of production.

2 Conclusions

Modern global economic processes put a number of the most complicated tasks before entrepreneurs, among them is the reduction of consumption of raw materials, due to increased efficiency of use of scientific developments in this or that sphere.

Realization of the tasks set, of course, largely depends on government support – legislative framework, tax support, etc. But, of course, the priority aspect is the enterprise's ability to actively use available human resources. This does not mean that business starts the process of degradation, that is, it leaves the mechanized labour and returns to the physical one. On the contrary, such a sharp change of direction is based on creation of new science-intensive production caused by the transition of modern society to a new highly developed information level. Thus, modern enterprises do not focus on production processes, but on human resources (effective staff selection, personnel management, etc.) Based on these ideas, a hierarchy of enterprise knowledge is built. Most of the existing enterprises are Hi-Tech enterprises with the staff sometimes not exceeding 20 people and the profit of billions of US dollars.

As already noted, under the existing conditions the economic efficiency of any enterprise depends on the level of employees' education (labour or human capital) when employees are able to create a new product that will include all the main requirements – reduce costs and time in the production process and increase the economic value of the enterprise itself.

After analyzing the economic profitability of applying the 'knowledge economy', states that long ago realized the importance of investing funds in the development of science actively sell intellectual property (patents, licenses, franchises, etc.), thereby occupying high positions in world ratings. These countries are included in the list of the developed countries, according to the distribution of the World Bank. A vivid example is the State of Israel where the development of science-intensive industry is a priority and is actively supported by the state (comfortable conditions for business are being created, a legislative base aimed at protecting entrepreneurship in a science-intensive sphere, tax incentives are being developed, is being developed etc.).

Therefore, an active study of the knowledge economy at the enterprise level is able to answer the main question: how to develop science-intensive production in the conditions of any economic situation?

Acknowledgements

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ASEAN: a Growing Trade Partner in Services

OLEKSANDR KRINITSYN¹²

Abstract: Association of Southeast Asian Nations (ASEAN) is a regional organization comprising ten countries with a combined population of over 620 million people and GDP of over 2.5 trillion dollars. These countries are well integrated into the global economy and they successfully benefit from this integration. In particular, integration of ASEAN helped increase regional trade flows without diversifying trade, improve trade logistics, reduce total trading costs, and increase regional investment flows. ASEAN Member States recognize the key role of the service sector in their development, and thus put trade in services in the centre of their integration agenda. Governments of the region recognize the fundamental role of services for economic growth and job creation, and have initiated a comprehensive program of regional integration, which aims to promote the free flow of services.

Dynamics and structure of ASEAN trade in services based on the latest available official statistics shows the growing role of the region.

Keywords: Association of Southeast Asian Nations • ASEAN • Trade in services

1 Literature Review

The basis of analysis used in the article consists of a wide range of sources including: official publication of teaching materials in ASEAN International Organization; ASEAN Economic Community; ASEAN Statistics Service; Statistics Service of the International Trade Centre. Notwithstanding the large number of publications, today the discussion of pros and cons of regional service markets continues, particularly due to the increasing trade globalization.

2 The Main Results

ASEAN economies have been developing rapidly over the past four decades, primarily as manufacturing and trading countries. Since 1967, when ASEAN was formed, the average growth rate of member countries with middle-income and Singapore was 7 percent per year until 1997. However, the growth slowed down after the Asian financial crisis in 1997, and has restored to the average of 5 percent per year over the last decade. Over the past two decades, such countries with low income as Cambodia and Vietnam also began developing sustainably. ASEAN economies grew due to agricultural sector and export-oriented manufacturing sector.

In recent years the services sector in the ASEAN economies became an important driver for both production and employment. On average, services account for about 40 percent of the total value added and 50 percent of total employment. Trade in services has also increased dramatically, although there are obvious differences between countries of different levels of economic development, availability of natural resources, and trade openness.

In terms of separate countries, it is clear that a larger share of service exports is generated by

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Singapore, which had an average of 46% of total exports in the last decade (see Fig. 1).

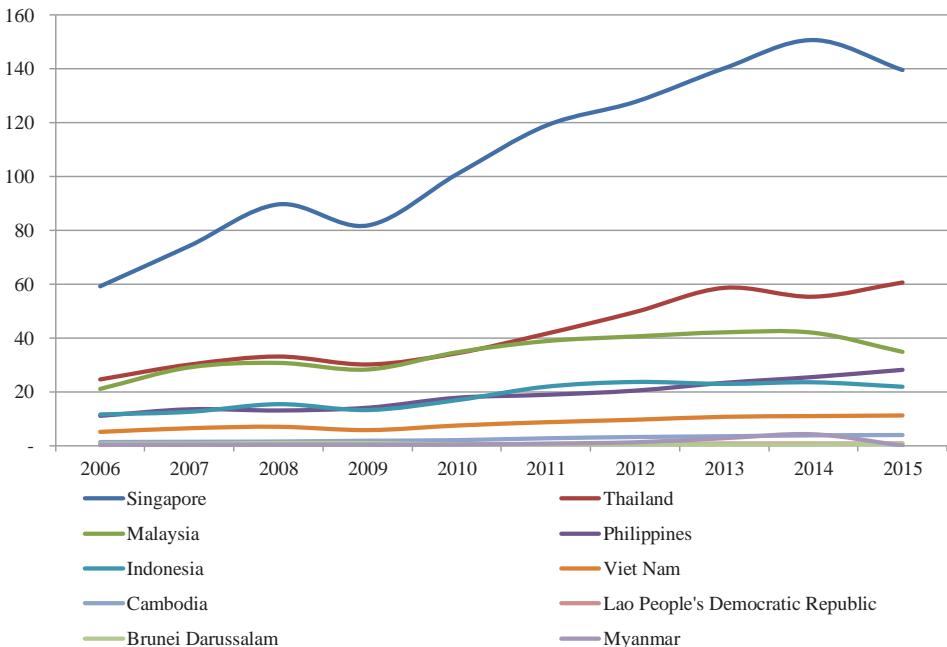


Figure 1. ASEAN Member State Service Exports during 2006-2015, bln dollars

Source: International Trade Center.

Further on, for the growth of ASEAN economies to the level of average and above average income, the service sector will become increasingly important as a source of growth and employment. Firstly, the share increase of services in GDP and employment means a significant increase in services sector which is necessary for the overall growth. Secondly, productivity growth in the services sector will stimulate the productivity in other sectors.

The growth of the services sector for ASEAN countries is closely related to a big problem, namely how to overcome the middle-income level countries stage. The problem is that the majority of middle-income level countries cannot proportionally improve their performance while remaining competitive by increasing their salaries. The majority of middle-income countries are not able to innovate and diversify their economies to more efficient production and services. As a result, countries with an average income yield in traditional sectors comparing to other developing countries where wages are lower. On the other hand, countries with an average income cannot compete with the economies of high-income countries, where productivity and technological development is much higher. Increased productivity and competitiveness of the service sector will remain at the top of the agenda in development strategies due to their significant contribution to improving innovation and productivity in all sectors.

In this context, international trade and integration in the service sector also plays a key role. Trade in services can help in creating opportunities for countries to expand the presence of its services in sectors where they have a comparative advantage, thereby creating jobs, promoting growth and obtaining foreign currency. Thus, exports of services can be an important part of growth strategy of a developing country. Trade in services can significantly improve economic performance, increasing competition and international practice, involving advanced technology and investment capital. Openness to international, including regional, service providers can offer better services to domestic consumers at lower prices, thus

stimulating productivity and competitiveness of domestic enterprises by reducing their production costs.

Services represent a continuously increasing part of gross domestic product of ASEAN economies. As of 2013, ASEAN Member generated on average 45% -55% of its GDP by the service sector, compared to agriculture and industry. Myanmar had the lowest figure, where services generated 38% of GDP, while in Singapore this figure was 72%, which is the highest among all member states.

In terms of international trade in services, the exports of ASEAN increased from 135.2 billion dollars in 2006 to 301.7 billion dollars in 2015 or by 9.9% on average annually. In the same period, imports of services increased from 158.5 billion dollars to 308.8 billion dollars or by 8.2% on average annually. So over the last decade exports increased by 2.23 times and imports by 1.95 times, indicating a steady upward trend. As at 2015 the region's share in world service exports was 6.3% and 6.7% of imports, making ASEAN one of the major centers of trade in services.

Comparing the ratio of intra-regional trade to the foreign trade in services, it is noteworthy that during 2010-2015, ASEAN member countries exported 18.6% of total services to other member states on average and imported about 18.1% from other ASEAN members (see Fig. 2).

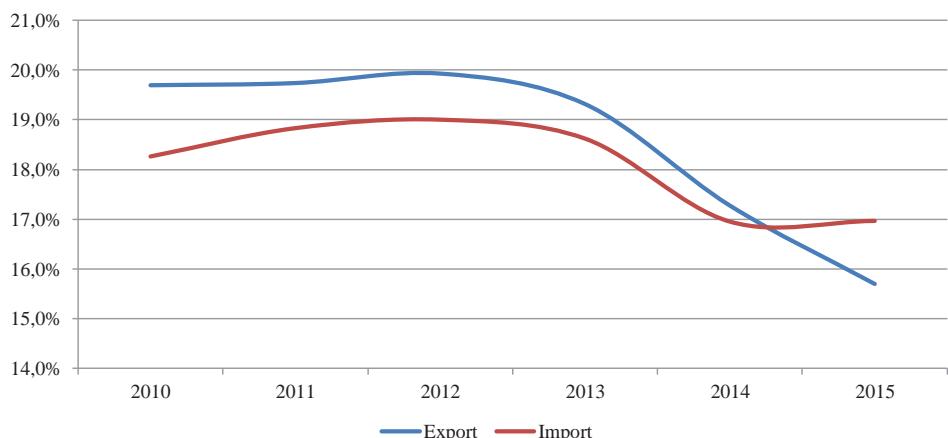


Figure 2. Share of intra-ASEAN Trade in Services in all Exports and Imports of the Member-states during 2010-2015.

Source: Own calculations based on official ASEAN statistics.

The dynamics indicates a decline in the ratio of intra-regional trade comparing to extra-regional trade, which shows the trend towards targeting the trade flows of ASEAN services to the world market.

Travel, transport and other business services dominate in the export and import of services. Considering exports alone, the first place is occupied by travel services, while import is dominated by transport services. Taking into account that the major three components of foreign trade in services are constant, starting from the fourth place exports and imports begin to differ. In exports the 4-th ranked component is taken by financial services, while in imports it charges for the use of intellectual property (see Fig. 3).

3 Conclusions

ASEAN is not only actively integrating the economies of its member states, but is also going beyond the regional level participating in negotiations on free trade areas and agreements on comprehensive economic partnership which significantly increases the trade flows.

Digital technology enabled services to become more global. In addition, an increasing percentage of services can be maintained and implemented digitally, avoiding usual trade barriers relevant for physical goods. A good example of such digitally enabled growth is Singapore.

As a result of technological development, services have become an important component of intermediate goods for manufacturing and industry. At the same time, synergy of manufacturing and services is becoming tighter as services have become an important part of global value chains. A productive service sector helps to attract foreign direct investment, including intra-regional investment and stimulate domestic investment in manufacturing and services with a high added value to create a more competitive market. Thus, modern services are considered important for overall economic growth by increasing efficiency in other sectors both directly and indirectly. Many service sectors such as finance, communications and transport not only provide support to the manufacturing sector, but also promote the development of trade through support operations.

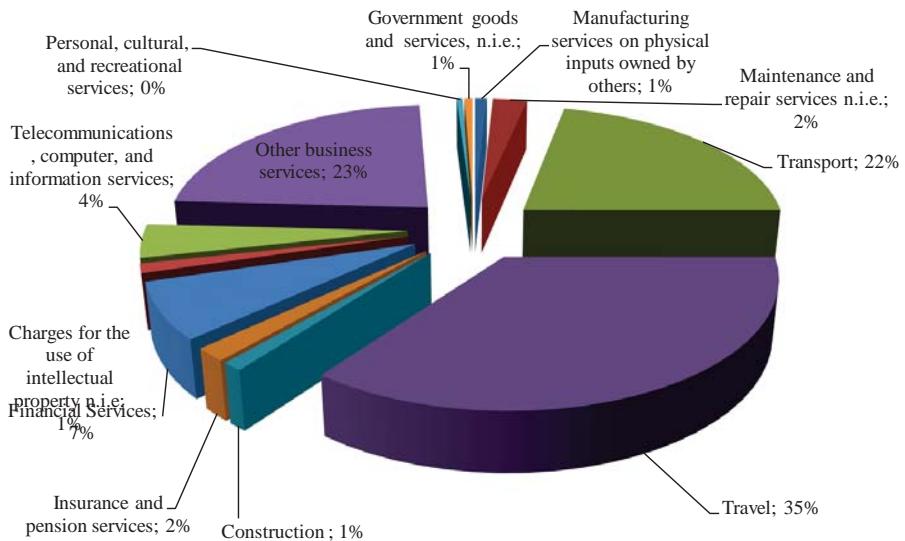


Figure 3. ASEAN Trade in Services by Major Categories¹³ in 2015
Source: Official ASEAN statistics.

Thus supporting and liberalizing service sector strategy in ASEAN made it possible for the region to grow in terms of foreign trade and become a reliable trade partner on global markets.

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¹³ These service sectors are classified based on IMF Balance of Payments Manual, 6th Edition. Data on Manufacturing Services based on submission from 3 countries for export and 2 countries for import; while data on Maintenance and Repair Services are based on submission from 5 countries.

Sustainability of the Enterprises: Design and Development of the Performance Evaluation

SHAHLA ALIJANOVA¹⁴

Abstract: A generalized scientific view has appeared that approaches to measure business sustainability can be divided into two main groups: those which review sustainable development as activity for building up indicators and achieving certain benchmarks of the business and those which explain sustainable growth as a process of qualitative changes and transformations.

It is generally agreed that the usage of performance indicators is the most effective way to evaluate sustainability performance, but design/ choice of sustainability performance indicators and their application need to be explored at both national and enterprise levels until the consensus on the most effective performance indicator systems and methodologies for their application is achieved.

This article summarizes different sustainability performance evaluation systems with identification of their strengths and weaknesses. It also gives recommendations for development/ selection of sustainability performance indicators that would make it possible to increase effectiveness of decision-making. Moreover, it can promote application of preventive measures and give suggestions of how the process of sustainability performance evaluation could be implemented by industrial enterprises in real-life practice.

Nowadays, many researchers consider the following: so-called ‘components’ of sustainability (TBL), the potential of the enterprise, operating stability, resources and innovations as the main elements of enterprises’ sustainability.

Keywords: Sustainable development • Sustainable industrial development • Sustainability performance evaluation • Performance indicators • Sustainable enterprise development • Manufacturing enterprises • Components of sustainable development • Operating stability • Key abilities

1 Introduction

Sustainable development of enterprises has recently gained increasing awareness based on the range of dimensions, relevant aspects and performance metrics for each indicator. Generally, manufacturing enterprises are considered the core of the developed countries from the economy and associated social perspective and they stimulate other sectors in the economy. Since sustainability is defined as the way for improving the life quality and well-being for the present and future generations, it is difficult to identify the criteria and ways of maintenance of sustainability in the enterprises.

A popular way to estimate sustainable development at the organizational level is described as a *triple bottom line* (TBL) that divides performance into economic, environmental and social dimensions (Topfer K., 2000). The concept has inspired not only many enterprises, but also national and international organizations, academic institutions to search for the ways to use the tools for measuring and evaluating sustainability progress.

Collaterally, optimisation process in manufacturing enterprises is recommended. It is addressed to

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identify the time and cost to be sustainably organised. Therefore, two mathematical formulations were developed: minimum sustainable time and minimum sustainable cost. These sustainability optimization models are taken into consideration with the *triple bottom line* (TBL) aspects and their associated issues/aspects.

In this context, sustainable industrial development can be interpreted as a process of maintained improvement of environmental, economic and social performance of enterprises and sustainability performance is interpreted as a result of management of sustainability aspects in enterprises (Staniškis J., Arbačiauskas V., 2004).

As stated above, elements of sustainability in producing enterprises are based on three traditional pillars/dimensions: economic; social and environmental (TBL). Sustainability based on the TBL concept has a complex multi-objective optimization. Each pillar/dimension comprises several aspects/issues.

Table 1 illustrates the main aspects/issues in each pillar of sustainability. These criteria/aspects represent the requirements for each manufacturing enterprise to be sustainable and survive. Thus, considering them on the top of infrastructure hierarchy is fine and they need to be updated and upgraded as running items. This running means, they need time and cost and can be considered as development or enhancement items.

Table 1: Components of Sustainability (TBL model)

| Economic Sustainability | Social Sustainability | Environmental Sustainability |
|----------------------------------|------------------------------|-------------------------------------|
| Globalization issues | Work management | Environmental management |
| Emerging issues | Human rights | Use of resources |
| Reconfiguration | Societal commitment | Pollution and dangerousness |
| Competitive strategies | Customers issues | Natural environmental |
| Appraisal performance | Business practices | |
| Flexible organization management | | |
| Innovation | | |

Source: Ibrahim H. Garbie / Procedia CIRP 26 (2015) 504 – 509.

There is considerable difference regarding basic components of sustainable enterprise development. Thus, further research, in particular elaboration of management mechanism of sustainable enterprise development, becomes difficult. So the analyses of the concept sustainable enterprise development and definition of its components require further improvement. Currently, the views of scientists about the concept of "sustainability of the enterprises" can be separated into 2 main groups.

The first group represents researchers' suggesting that sustainable development for enterprises is: "an activity for building up indicators and achieving certain benchmarks of the business functioning". The second group consists of scientists who interpret sustainability for enterprises development as a process of qualitative changes or transformations within the production and distribution process.

So, the usage of performance indicators is the most forthright and popular tool for sustainability performance assessment. Indicators enable systematic performance evaluation and they present information in a suitable form for decision-making. Pressure from stakeholders to publish sustainability performance information is usually perceived as a main driving force for sustainability performance evaluation in industrial enterprises. It could also be related to the establishment of 'socially responsible' investment funds and investment rating systems (e.g. Dow Jones Sustainability Index) (Ballou B., Heitger, D.L., Landes, C.E., 2006).

Because solution of macro problems is impossible without micro (enterprises, private sector) level, over the years we can observe creation of new evaluation standards. They have been devised and put into international practice which stimulates sustainable development at the corporate level and appears as following initiatives:

1) Dow Jones Sustainability Indices (DJSI) – The World stock index sustainability of corporations. It was introduced and calculated in 1999 on the ground of many indicators, grouped into three areas: company's economics, ecology of manufacturing and social policy;

2) Global Reporting Initiative (GRI) – the international standard of the Global Reporting Initiative in the field of sustainable development. It was introduced in 1997 and maybe is the most well-known initiative that develops and spreads the globally applicable sustainability reporting of the guidelines that set up the core economic, social and environmental indicators of corporate activity. The indicators are divided into the following groups: economic, environmental, human rights, employee and workplace related, product related and social indicators. 70 in total, key indicators are recommended, and these indicators are presented in detail in the indicator protocols (GRI, Global Reporting Initiative, 2006);

3) Another worldwide known approach for performance evaluation is eco-efficiency assessment that was developed by the World Business Council for Sustainable Development (WBCSD) in 2000. The WBCSD methodology divides indicators into general indicators suitable for all activities and activity specific indicators. WBCSD also makes clear recommendations how to achieve the entire eco-efficiency evaluation process up to the development of an eco-efficiency report (World Business Council for Sustainable Development, 2000). A key feature of this method is integration of two sustainability dimensions: environmental and economic. Social aspects are not covered by this methodology, but this could be solved by adding socio-economic indicators as suggested by Schaltegger et al. (Schaltegger S., et al., 2002).

Considerable progress has been made. In many enterprises, designing production processes, products and workflows to make sure their long-term compatibility has become an important management task, indeed one for top management. The goal is to conserve the natural basis for life.

Though, a lot is still to be achieved in the entrepreneurial task of gearing business operations and management structures to the goals of sustainable economic activity. The absolute environmental burden associated with business activities is still far too great. In the interests of sustainable resource management, therefore, it is essential to achieve a marked improvement in the ecological effectiveness of environmental protection by business enterprises.

This definition is especially important because it indicates the attempt to cover the impact factor in the stability of the production environment. As a result of this approach and as for systematization of scientific work in this area, we can identify three scenarios of the operating system stability loss. These scenarios depend on the environmental factors and destabilizing actions.

The first option of the stability loss comes as the result of bifurcation, namely changes in system parameters. The second is resulted because of significant influence of external factors, incompatible with stable system operation. Third option of scenarios of the system stability loss is the consequence of the internal factors, such as abuse of system of structural relations.

Another theory of sustainability of the enterprises is determined to be its innovation/ innovative activity. The article reviews the developed form of stability, in which an important role-played by innovations, they allow company to adapt to the market and consumers.

This can be reached by the improvement of key management skills, which become clear through the complex of knowledge and staff skills because of the gained experience from their realization. The successful combination of innovation with the ability of its effective implementation shows the essence of enterprise abilities and is the basis for achieving sustainable enterprise development. That is in more detail below in the Tab.2.

Thus, more significant influence on sustainability of the enterprise is observed in Technological and Manufacturing innovation (Table 2). However, the failure in introduction of new products and technologies may lead to a loss of competitiveness of the enterprise. It is, therefore, necessary to establish a management system to provide reduction in the duration of an unstable state of the enterprise period.

Influence of the main types of innovation on elements of sustainable development of the enterprise
 (Tab.2)

| Innovations | Features of innovation | The impact of innovation on sustainability: | | | |
|--------------------------------------|---|---|---------------|---------------|--------|
| | | economic | manufacturing | environmental | social |
| Technological | Creation and development of new products and technologies; modernization of equipment, reconstruction of buildings and facilities | S | M | M | |
| Manufacturing | Expansion of production capacity, diversification of production, improvement of the organization of production and labour | M | | | M |
| Organizational and managerial | Improving the organizational structure, decision-making and control methods | M | | | S |
| Economic | Changing methods of production planning, motivation of the personnel | M | | | |
| Commercial | Changing the sales activity | M | | | |
| Social | Improvement of labour conditions and social security of workers | | | | S |

Note: S – Significant influence on sustainability of the enterprise; M – Minor influence on sustainability of the enterprise.

2 Management of Industrial Enterprises for Sustainable Development

One of the main tasks of industrial development is the formation of the mechanism of management decision-making at the enterprise level to ensure their sustainable development. This problem generally is caused by the financial and economic conditions of the economy, the interaction of market participants and companies in the industrial relations and activities of enterprises.

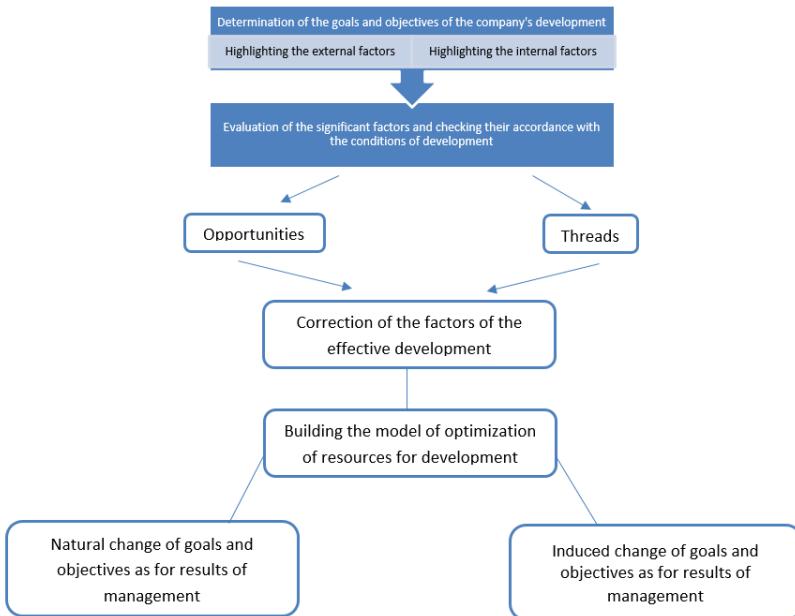
The logical model of the control mechanism of effective development of the company is represented at Chart 1. First, one should determine the goals and objectives of the company's development. Further, to control industrial enterprise it is necessary to identify the factors that will ensure the effective development of the company. The external factors include those of external macro and microenvironment, which the enterprises can hardly affect. The internal factors include the internal environment factors that the company can impact directly.

Among numerous different factors that determine sustainable development through the management prism, we can highlight the following:

- Company reputation;
- Competitiveness of the company and product;
- Structure of production;
- Level of qualification of the personnel;
- Flexibility of organizational structure;
- Level of specialization of production;
- Level of costs and their dynamics;
- Structure of the financial resources;
- Structure of information flows of the company;
- Innovational and investment potential, etc.

Such issues as sustainability of technology and processes concern a number of scientists while studying the problem of enterprise stability. The question of maintenance of industrial and technological base, equipment, and machinery of an enterprise is especially important.

Chart 1



There are a large number of research papers discussing many topics on a wide-ranging sustainability of enterprises issues such as:

- value creation;
- product design for resource efficiency and effectiveness;
- manufacturing process and systems;
- life cycle engineering and assessment;
- maintenance and repair;
- remanufacturing, reuse and recycling;
- sustainability as a service;
- green supply chain;
- information and communication technologies;
- sustainability assessment;
- renewable energy;
- water resource management;
- qualification for sustainability engineering;
- adequate environments for entrepreneurial initiatives;
- sustainability awareness;
- society policy;
- education for sustainability engineering and etc.

It should be mentioned that optimization of the work process of industries/enterprises as a factor of their sustainability has not been discussed, except very few articles mentioning optimization for sustainability issues.

ASAN service is a bright example of a sustainable entity/ enterprise in Azerbaijan which is the State Agency for Public Service and Social Innovations headed by the President of the Republic of Azerbaijan. Being one-stop-shop body it delivers services rendered by the state entities in a uniformed and coordinated manner. It centers function based on the principles of operativeness, transparency, ethical behaviour, responsibility and comfort which clearly embodies TBL components described above in the article.

On the other hand ASAN service is number one in the world to deliver so many services by the state to the public in one centre using high technologies and reduced cost & time waste. With the establishment of the State Agency for Public Service and Social Innovations, Azerbaijan enters a new phase of governance development while both number and quality of public services for citizens and businesses is growing

rapidly. The Agency is expected to become not only a front-office provider of existing and planned services online, but also to act as the principal integrator of e-Government solutions at both the back- and front-ends according to its Statute.

We believe that it is necessary to reveal operating stability shown in ASAN services' case as an important component of sustainable enterprise development. Operating stability of the enterprise is considered as a system that provides continuity and stability of business processes in different conditions, stability of the production process, and ability of the company to resume activities after adverse emergencies.

The existence and development of operating stability has a significant influence on the sustainable enterprise development because in practice it can affect the numbers of failures in business processes, downtime duration, amount of repair costs, stability of product quality, and reliable relationships with customers.

3 Conclusions

Based on systematic research we can conclude that the views of scientists on understanding the concept of 'sustainability of enterprises' can be split up into two major groups: 1) performance indicators, or achieving certain targets of functioning of business and 2) a process of qualitative changes such as innovative activity or optimization and automatization process.

At the same time, manufacturing potential of the enterprise, its financial stability, resources and innovation are considered as essential for sustainable development of enterprises. They were found to be most influential while applying triple bottom line concept.

It is also crucial to emphasize operating stability of the company as an important component of sustainable development of the enterprises. It will help to provide continuity and stability of business processes in different conditions, stability of the production process, and ability of the company to resume activities after adverse emergencies.

As for innovative activity, it plays a key role in ensuring sustainable development of the enterprise. It aims at providing economic and social benefits, and the environmental safety of the enterprise. It's important not only to have innovation and to implement/ effectively use them through development of key management skills. That is why management of an enterprise is considered as one of the most important components of sustainable enterprise development.

The following points show the role of innovative activities in the sustainable development of enterprises:

- Enlargement of the product range. If the products are in various stages of the life cycle, it reduces the risk of loss of stability;
- Reduction of the cost of production and sale of a product unit by mobilizing reserves of the already used technology or development of a new process;
- Ability of the enterprise to adapt to customer requirements, improve product quality and give it the properties necessary to the consumer;
- Introduction of more effective methods of organization: specialization, cooperation, concentration, and diversification.

Nowadays, it is advisable for the industrial/manufacturing enterprises or any other entity to take into account the factors of sustainable development in order to be able to adequately (and timely) respond to changes in the external or internal environment.

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Problem of Marine Oil Pollution and Prospects of its Solution

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Abstract: The article analyses the problem of oil pollution. The main effects of oil pollution have been determined. The key aspects of solving this concern have been studied. Special attention is paid to the measurement problems of the impact of oil spills on human well-being. The current analysis is based only on losing income. It does not include other serious factors that have a great impact on the well-being - oil spills take a heavy toll on labour force, thus, reducing effectiveness and productivity. To this end, an integrated indicator consisting of different aspects should be created, that will include net disposable income, polls, main health characteristics, indicators of inequality, Human Development Index in certain proportions and, which is crucial, deducted lost advantage.

Keywords: Oil spills • Effects of oil pollution • Shoreline cleanup costs • Oil pollution prevention • GDP • Human well-being

In 2015 WWF released a report which estimated the asset value of oceans at 24 trillion dollars and the value of annual goods and services provided by the oceans at 2.5 trillion dollars[1]. In other words, the oceans make the seventh largest economy in the world, although the report's authors, who include the Boston Consulting Group, say this is an underestimate as it does not factor such things as oil, wind power and intangibles, such as the ocean's role in climate regulation. However, the vast economic worth of world's oceans is declining due to pollution, climate change and overfishing.

Nowadays oil is the fastest source of deterioration to the ocean, being far more harmful than trash and waste. Oceanic oil spills became a major environmental problem in the 1960s, mainly as a result of intensified petroleum exploration and production on continental shelves and the use of super tankers capable of transporting more than 500,000 metric tons of oil. The public generally takes notice of the problem of marine oil pollution when an oil tanker breaks up in heavy seas or a disaster occurs at an oil platform, one example being the Deepwater Horizon incident in the Gulf of Mexico in spring 2010, or, the more recent one, Santa Barbara oil spill in California in 2015.

Nowadays, these large oil spills from wrecked or damaged super tankers are rare because of stringent shipping and environmental regulations (Figure1).

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Nevertheless, thousands of minor and several major oil spills related to well discharges and tanker operations, as well as pipe leakage, are reported each year, with the total quantity of oil released annually into the world's oceans at the rate of 3.5 million to 6 million metric tons a year (Figure 2).

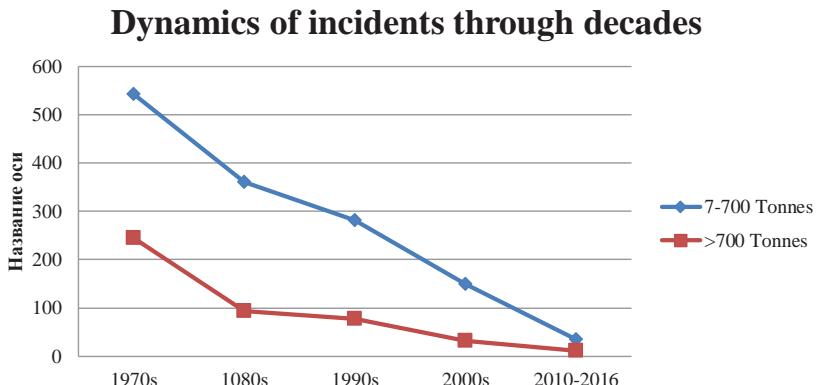


Figure 1. Dynamics of incidents through decades [2].

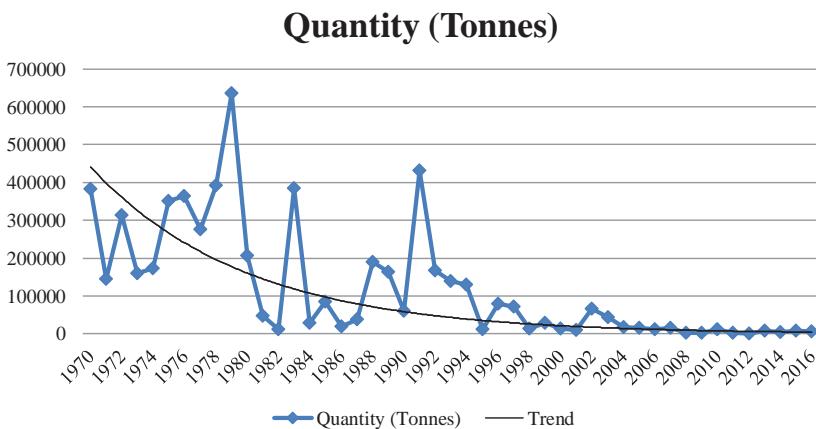


Figure 2. Total quantity of oil released annually, metric tons [2].

Yet, oil tanker disasters account for only around 10 per cent of this amount. Around 5 per cent comes from natural sources, and approximately 35 per cent comes from tanker traffic and other shipping operations, including illegal discharges and tank cleaning. Oil inputs also include volatile oil constituents which are emitted into the atmosphere during various types of burning processes and then enter the water. This atmospheric share, together with inputs from municipal and industrial effluents and from oil rigs, accounts for 45 per cent. A further 5 per cent comes from undefined sources.

Effects of Oil Pollution

Speaking about effects of oil pollution, we should distinguish between two categories:

- Direct effects, including most notably oil spills,
- Hidden effects that cannot be estimated properly (e.g. effects of oil entering water from the

atmosphere)

Based on the subject affected by pollution, they can be divided into:

1) Health effects

The main effects of oil spills on humans may be due to direct and indirect contact with the spill. The main oil spill effects on humans include a variety of possible health, economic, as well as recreational and aesthetic impacts;

- *Direct exposure to oil spill* – a variety of health effects may develop when the oil spill occurs close to where people live or work and may come in contact with humans through breathing gaseous oil compounds and/or oil compounds adsorbed on particulate matter (dispersed through air). Another exposure pathway may relate to activities in contaminated ground (e.g., soil) or through skin absorption when touching spilled material;

- *Indirect exposure* through consumption of contaminated food or water – especially relevant in the case of consumption of fish that was in contact or in an oil spill polluted environment. This is because some oil components have ability to *bioaccumulate* in living organisms. This means that if a fish lives in a polluted environment it will keep adsorbing some oil components (without excretion) in its body, which may reach concentrations several orders of magnitude higher than those of the surrounding waters. Through consumption of such polluted fish, humans may become seriously exposed to higher concentrations of oil components than in the surrounding environment or as compared to ingestion of the polluted water or bathing in the polluted water.

2) Effects on the Economy

These include the following:

- *The cost of oil cleanup* requires a lot of financing. Although the company responsible for the oil spills and their effects has to clean it up, there is a lot of government help required at this point. Putting all the methods of recovery into place and monitoring them takes away resources from other more important work and hits the economy in subtle but powerful ways;

- *Long-term ceasing of activities* such as fishing in polluted waters – for example the BP oil spill in the Gulf of Mexico had already impacted normal activity of many local fishermen and fisheries and this looks like a long-term effect due to the very large amount of spilled oil;

- *Reduction of property value* – depending on the magnitude of the oil spill, this negative effect (on property value) applies not only to those properties directly affected by the oil spill, but to all the properties in a certain area exposed to oil spill pollution or risk to become polluted at some point in time;

- *Reduction of tourism in affected areas* – tourism industry suffers a huge setback as most of the tourists stay away from such places. Dead birds, sticky oil and huge tarballs become common sight. Due to this, various activities such as sailing, swimming, rafting, fishing, parachute gliding cannot be performed. Industries that rely on sea water to carry on their day to day activities halt their operations till it gets cleaned;

- *Disturbance of traffic* (e.g., marine traffic) – affecting import-export activities;

- *Recreational and aesthetic impact* – obviously relates to the visible effects of oil spill (e.g., oil slick, sheens) on coast waters, shorelines and beaches, wetlands, etc. In case of more serious impact the complete closure of such recreational areas to general public enjoyment may also occur, at least temporary, until the spill removal or cleanup.

In order to prevent disasters like the Horizon oil spill in the future, the international community has to strengthen co-operation in three fields:

a) Strengthening cooperation and response to an oil spill between states;

b) Restoration and re-cultivation of affected regions;

c) Prevention of oil pollution in the future by developing a common methodology for evaluating risks and losses.

No thoroughly satisfactory method for cleaning up major oil spills has been developed yet, though the spectacular spills of the last decades of the 20th century called forth great improvements in technology

and in management of coordinated responses. Essentially, responses to oil spills seek to contain the oil and remove enough of it so that economic activity can resume and natural recovery processes of the marine environment can take over.

Observation and control

The first order of business to prevent offshore spills is observing what is going wrong and correcting it. No amount of planning, training, standard setting, incentive structuring, institution-building or culture-imbuing can substitute for this fundamental recognition. Problems will arise and we must spot them when they occur and prevent them from occurring again. This is the centerpiece of any risk management effort: collect data, track performance, learn lessons, and improve results. This means setting up a quantitative risk-performance tracking system that reports real-time operating data to feed spill-focused learning models to illuminate patterns of mishaps occurring as drilling proceeds.

Another important issue is cooperation between countries. The majority of large spills in 1970-2015 occurred underway in open waters, not regulated by a country's jurisdiction. In other words, a state's response plan is likely to prove ineffective. That's why there is a pressure for an international response plan. The first attempt to strengthen cooperation was the Bonn agreement (1969), signed to ensure mutual cooperation in avoiding and combatting environmental pollution, namely, oil pollution. However this agreement, as well as others after it, proposed only half measures that rarely had an impact on oil pollution.

However, two agreements require special attention - The International Convention for the Prevention of Pollution by Ships in 1978 and The Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic in 2013.

The International Convention for the Prevention of Pollution by Ships (MARPOL 73/78)[4] included regulations regarding subdivision and stability which were designed to ensure that, in any loading conditions, the ship can survive after being involved in a collision or stranding. In 1992 MARPOL was amended to make it mandatory for tankers of 5,000 dwt and more ordered after 6 July 1993 to be fitted with double hulls or an alternative design approved by IMO. The requirement for double hulls that applies to new tankers has also been applied to existing ships under a programme that began in 1995. The phase-out of single hull ships ended in 2015.

This allowed to greatly reduce the number of oil spills caused by tankers. In some collisions involving these double-hull tankers, not a drop of oil was spilled. Twenty years after the Exxon Valdez oil spill, for instance, the Norwegian tanker SKS Satilla collided with a submerged oil rig in the Gulf of Mexico. The collision tore a huge hole in the tanker's side, but none of the 41 million gallons of crude oil on board was spilled.

As for the second agreement, The Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic [5], adopted in 2013 by the Arctic Council, in the event of an oil spill anywhere in the ecologically sensitive Arctic region, the circumpolar countries are hoping that this new agreement is the tool will help them work together to clean up. It sets out guidelines for things like communicating between countries, coordinating personnel and figuring out who needs to do what. It could prove to be an effective instrument for oil containment.

However, it is limited to the Arctic region. For such measure to prove effective, a similar agreement should be drawn up in international agencies, such as the UN, or the International Maritime Organisation, that accounts for 99% of the world oil transportation by sea.

Rapid and relatively accurate damage assessment from an oil spill is of the utmost importance because the assessment is the basis for compensation and environmental restoration. In general, the comprehensive loss of oil spill was divided into many parts. For example, Noguchi Saburo from Japan divides the loss into statutory compensation (insurance), statutory compensation (company's commitment), non-statutory compensation, human loss, material loss and special loss [6]. W.H. Heinrich divides the loss into direct loss and indirect loss. The ratio of these is 1:4 [7]. The International Labour Office (ILO) always adopts this

method for loss assessment. R.H. Simonds also divides loss into direct loss and indirect. However, the ratio is not a fixed value. The value is determined by different oil spill feature information. The U.S. National Security Council always adopts this method for loss assessment [8]. D. Pham from National Research and Safety Institute (INRS) divides loss into insurance, wage, production loss and material loss [9]. The International Convention on Civil Liability for Oil Pollution Damage 1969 (CLC1969) and International Maritime Organization Protocol of 1992 (CLC1992) report damage in three categories including clean-up costs, economic damage and natural environmental damage. Each category is evaluated individually based on properties and characteristics, and total damage is a combination of each category.

There is mutual understanding that the technical factors such as type of oil, physical, biological and economical characteristics of the spill location, weather and sea conditions, amount spilled and rate of spillage, time of the year, and effectiveness of clean-up have an essential influence on the cost of oil spills (Figure 3).

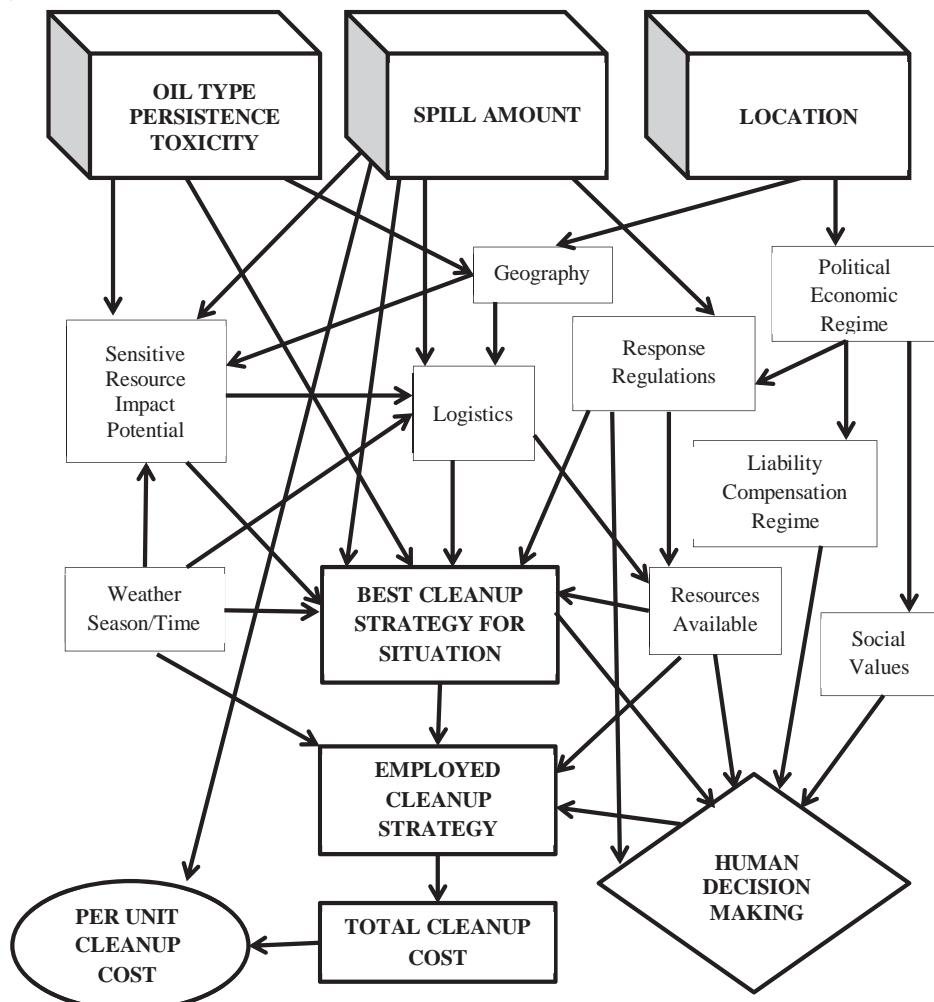


Figure 3. Factors determining per unit oil spill clean-up costs (Etkin, 1999)

Moreover, shoreline cleanup operation costs include: labour, equipment, disposal, materials (e.g., disposable sorbents or chemicals), and logistical costs. Shoreline cleanup costs are not only the most expensive part of response operation, they are probably also the most unpredictable due to the very political nature of the results. The question of “how clean is clean?” plays an important role in determining costs. The standards of *cleanliness* and degree of oil removal balanced with stakeholder concerns and practicality can determine the scope of a shoreline cleanup response operation. The degree to which stakeholders and response officials are willing to allow responders to rely on *natural cleansing* or less-aggressive but potentially more environmentally beneficial treatment options, as determined by a net environmental benefit analysis, can have a significant impact on costs.

Four basic approaches to estimating shoreline cleanup costs for projected shoreline oiling for hypothetical spill scenarios based on oil spill trajectory modelling are:

- 1) Estimate the length of shoreline oiled and estimate the oil removal cost per unit shoreline oiled length (e.g., \$/km);
- 2) Estimate the area of shoreline oiled and estimate the oil removal cost per unit area shoreline oiled (e.g., \$/m²);
- 3) Estimate the amount of oil on the shoreline and estimate the oil removal cost per unit of oil on the shoreline (e.g., \$/tonne); or
- 4) Estimate the oil removal cost based on historical data on shoreline oiling [10].

In real spill situations, the actual degree of oiling and the nature in which the oil penetrates the shoreline substrate as well as the most effective and efficient strategies for shoreline cleanup operations are, of course, dependent on the very specific characteristics of a particular shoreline.

Legal Basis for Compensation

The payment of compensation for damage caused by ship-source oil spills to a large extent depends upon the legal regime applicable within the country where the incident or damage occurs.

Four International Conventions provide the basis for compensation in the majority of countries:

- The Civil Liability Convention (CLC) provides compensation for spills of persistent oil carried in tankers up to the ship owner's liability limit and is paid by the vessel's insurer;
- The Fund Convention provides a second tier of compensation for spills of persistent oil from tankers paid by receivers of oil in countries that have signed the convention. A Supplementary Fund is available providing a third tier of compensation;
- The Bunkers Convention applies to spills of bunker oil from a variety of ships, again up to the ship owner's liability limit and is paid by the vessel's insurer;
- The Hazardous and Noxious Substances (HNS) Convention applies to spills of other oils such as non-persistent hydrocarbon oils, vegetable oils and chemicals, carried in bulk and in packaged form. The HNS Convention is not yet in force [11].

There are several sources of compensation for oil spills:

1) Ship owners' Liability

In the case of a spill of crude oil or fuel oil (i.e., persistent oil) from tankers, the *International Convention on Civil Liability for Oil Pollution Damage* makes the ship owner liable. The limit of liability depends on the size of the ship and is backed by compulsory insurance. The maximum liability for the largest tankers is approximately \$145 million per incident.

If the amount of damages exceeds the ship owner's liability, international and domestic funds provide additional compensation.

In the case of a bunker oil spill (bunker oil is used for ship engines) from any other type of ship, the *International Convention on Civil Liability for Bunker Oil Pollution Damage*, 2001 makes the ship owner liable. Again, the limit of liability depends on the size of the ship. The current liability limit is \$88 million for the largest ships and backed by compulsory insurance. Recently adopted amendments by the International Maritime Organization increased the limits of liability by over 50% in 2015.

2) International Funds

The International Oil Pollution Compensation Funds administers two international compensation funds for oil pollution damages caused by persistent oil. The first is the 1992 Fund and the second is the Supplementary Fund. Both hold levies collected from the oil cargo companies. Combined with tanker owner's liability coverage, these funds provide about \$1.2 billion in compensation for a tanker spill of persistent oil.

Oil Pollution Prevention

Common Methodology: Oil spills are a transnational problem and establishing a common standard methodology for Oil Spill Risk Assessments (OSRAs) is thus paramount in order to protect marine environments and coastal communities. It is essential to identify the strengths and weaknesses of the OSRAs carried out in various parts of the globe. A generic and recognized standard, i.e. ISO 31000, can be applied in order to design a method to perform OSRAs in a scientific and standard way.

Implication of Common Standards: For example, ISO has developed an action plan on International Standards that could help the oil and gas industry prevent or mitigate disasters like the Deepwater Horizon oil spill in the Gulf of Mexico in 2010 and the Montara oil spill off the coast of Western Australia in 2009. This includes:

- Drawing a plan on the lessons learned from disasters;
- Providing an inventory of relevant standards that are already available;
- Proposing a programme for development of new standards or improvement of the existing ones.

As an international industry, the lessons learned from an accident in one country must be transferred globally. International Standards developed by ISO/TC 67 are a way of achieving this.

The inventory includes 71 existing standards and related documents available from ISO or other organizations, particularly the American Petroleum Institute (API). The programme proposes 31 standards or related documents for development or update by ISO, the API, or other organizations.

The ISO/TC 67 management committee recognizes that it will require considerable effort and resources to develop the new and updated standards it proposes in the action plan. These include development and implementation of health, safety and environmental management systems, and competence of personnel.

The preparation of this report has also demonstrated the value of direct communication between multidimensional stakeholders. These shall all be involved and engaged in the on-going work. They include:

- Countries involved in the international oil industry
- Oil companies
- Equipment manufacturers
- Contractors
- National regulators
- Certification bodies
- Professional and trade associations
- Standards' organizations.

The Impact of Oil Spills on Well-Being: the Problems of Measurement

Nowadays the problems of calculating GDP (Gross Domestic Product) are widely discussed all over the world because it is not a perfect indicator for demonstrating prosperity. Leading scientists cooperate in order to improve the measurement of negative effects on the human well-being.

For example, in accordance with 'The Report by the Commission on the Measurement of Economic Performance and Social Progress' the leading scientists in the spheres of economy, ecology and politics

believe that the GDP only demonstrates the level of production but not the level of well-being [12].

Of course, we can say that some countries like the Russian Federation and members of the Organization of the Petroleum Exporting Countries (OPEC) have a high level of GDP, mainly due to petroleum export [13]. But the indicator doesn't take into account the negative aspects of such activities.

In our opinion, the effect of oil spills should be included in the GDP as they take a heavy toll on labour force, thus, reducing effectiveness and productivity. That is why it is important to work out better indicators for measuring the negative effects of oil spills on well-being.

Our main proposal in this sense is to calculate the lost advantage of labour force, fishing industry, etc. and to correlate it with the GDP.

We would like to use the tragedy of Deepwater Horizon as an example. Yes, there are figures that 100,000 businesses and 405,000 individuals claimed that they suffered serious economic damages [14]. But was it the real cost of the oil spill? In this particular case we can see that the affected wildlife is not valued directly in the economic system in the same manner as the impact on the well-being of the local population. For example, it is estimated that it may take up to ten years for oyster beds to recover.

So, we believe that the efforts must be concentrated not on such indicators like gross domestic income or GDP but on health and environmental problems. Maybe we should develop some type of *Satisfaction with Life* Index but it should include not only polls. In theory it should be an integrated indicator consisting of different aspects. For example, it may include net disposable income, polls, main health characteristics, indicators of inequality, Human Development Index in certain proportions and, which is crucial, it must deduct lost advantage.

According to the abovementioned, if we conduct the analysis based only on losing income it will not include other serious factors having a great impact on the well-being. In our case (Deepwater Horizon) we must pay a special attention to indicators like human intoxication caused by oil evaporation, results of contact of human skin with oil, number of deaths caused by such contamination, costs of medical bills, etc.

We also think that we should pay great attention to the potential lost advantage of labour force. For example, in Louisiana in such spheres like Oil and Gas Extraction, Crude Oil and Natural Gas, Drilling 100, 400 and 200 working places were lost respectively. In Texas 23,000 working places were lost. In other words, workers lost their potential income [15]. We are convinced that these data must also be included in the integrated index in a proper way.

Potential losses must also include the following perditions [16]:

- 1 million seabirds were likely killed (scientists estimated that 32% of the northern Gulf population of laughing gulls was killed along with 13% of the royal tern population, 8% of the northern gannet, and 12% of the brown pelican population;

- 170 marine mammals were injured or killed;

- 1,000 sea turtles were found dead;

- potential losses of tourism (60 percent of hotels surveyed in Louisiana, Alabama, Mississippi, and Florida had experienced cancellations, and 42 percent of these hotels were having difficulty booking future events), etc.

Conclusions

There are health (direct and indirect exposure to oil spill) and economic (the cost of oil clean-up, long-term ceasing of activities, reduction of property value and tourism, disturbance of traffic, recreational and aesthetic impact) effects of oil pollution.

The main factors that have essential influence on the oil spill clean-up costs are type of oil, its persistence and toxicity, the amount of a spill and its location.

We are convinced that the effect of oil spills should be included in the GDP but in the sense of the lost advantage of labour force, fishing industry, etc. We believe that our model will facilitate new discussions about the measurement of impact of oil spills on prosperity.

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RESEARCH MATERIALS

Futures Contracts in the Energy Sector

MYKOLA MAMONTOV¹⁹

The global market environment has high qualification requirements for national financial elite and its willingness to accept financial innovation and risk, skillful use of information on the changing situation in global financial markets and more.

Countries with market economy have provided development of science and practice, stock markets, including the terminable (commodity, currency, stock, etc.). Accumulated enough great experience, especially in recent decades, the organization Futures markets. It should be noted that in comparison with currency and commodity markets futures trade in Ukraine's energy sector, especially in power, unfortunately, has not been properly developed. To a large extent the slow reforms of the Ukrainian energy sector prevent it despite this country's accession to the European Energy Community and taking the obligation to conduct necessary reforms in the energy sector.

Knowing this, we should use the unique opportunity to study the experience of countries that much earlier captured the theory and practice of market economy. Let their experience clarify the role and purpose of futures trading on the energy market.

During 400 years exchange trading form in the European countries has developed from forward transactions with real assets (commodities) to financial futures contracts. For more than 200 years the term market developed as a commodity one and only in 1972 in Chicago, the first financial futures exchange was organized. Since then, the global market of financial derivatives started dynamic development, offering new kinds of derivatives. Term contract trade have become a phenomenon on the international level. Creating a global network of futures exchanges establish and ties between them allows the round-the-clock derivative trading.

Modern markets whose issuance and circulation mechanism is connected to sale of certain financial or physical assets use futures contracts as their common derivatives. Futures contracts are essentially an agreement between a buyer or seller on the one hand and futures clearing house of the exchange on the other, on the supply (reception) of a standard number of underlying instruments at an agreed price on a specific date in the future. That is the presence of two parties, one of which is always a clearing (settlement) house, which serves as a guarantor of implementation of all contracts, is mandatory. The main purpose of futures trading is not a sale of commodities, its main purpose is to redistribute financial markets or, otherwise, neutralize (insure) price risks. The contracts provide a record of all the conditions of a future transaction (purchase, sale, exchange, etc.) with an instrument which is the subject of the transaction. In this case, according to classification by the Bank for International Settlements, we consider the exchange commodity (power, oil, oil products, coal, electricity) as the basic instrument. Thus, the price of the derivative is 'tied' to the price of a certain type of power or index of motion for commodity groups.

Futures is a kind of a forward contract, but differs from it by placement at an organized exchange and it is standardized. Its advantages are that it is a highly reliable and cheap insurance instrument.

Futures and optional markets of oil and petroleum products as the most demanded energy commodities have become the sphere of active work of almost all members of the industry, from oil producing and refining companies, including their marketing departments, trading companies, distributors, and large

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consumers. This, in turn, has led to significant changes in competition in the oil market, as well as forms and methods of trade.

Transactions in the stock markets of oil and petroleum are performed by several categories of participants, each with their own purpose and working conditions. The list of basic operations they perform most often includes selling-buying futures contracts to reduce the cost of storage of goods, sale of all or part of the stocks through exchange of futures contracts for real goods, use of futures contracts as cover of changing position on real goods, purchase of futures contracts to fix the purchase price of raw materials and petroleum products as well as for hedging price and arbitration by the difference in prices at real and futures market, and more.

In fact, the first sale of diesel fuel was launched for futures transactions on the stock exchange in Amsterdam in 1974. At the same time, the New York Commodity and Cotton Exchanges began trading oil and oil products. The Contract from Cotton Exchange, which was passed to Commodity Exchange, has been valid so far. The number of daily transactions has changed from 2-3 to 20-40 thousand since then. In 1984 the New York Stock Exchange imposed a contract on non-treared gasoline, and began to conduct operations on crude oil futures contract, widely used as a reference point by oil companies and speculators, and experts estimate it to be a guide for the entire oil industry. Later on this exchange introduced the practice of exchange of futures contracts for real goods, which greatly increased the demand for such operations. Attempts to extend the exchange trade on these contracts on other exchanges were unsuccessful.

Except Amsterdam, exchange trade in Europe began in 1981 at the specially organized London International Petroleum Exchange. The first was a contract for diesel fuel, but in 1983 the contract for crude oil was unsuccessful and the oil market participants used the New York Stock Exchange. Later in 1988, a contract was refined and the London Petroleum Exchange continued to trade in crude oil and this contract has been successfully used by oil companies and speculators. In 1989, the first contract for liquid fuel (fuel oil) appeared on the Singapore International Monetary Exchange. The emergence of the stock market in the new region allowed to extend the time of trading futures contracts to 18 hours a day. In 1989 trading oil and oil products began in Rotterdam Optional and Futures Exchange, but this contract is different from London only in physical delivery.

Trading on the London Stock Exchange takes place every day at the time specified for each product taking into account futures markets in other countries, primarily in New York and Singapore.

Today both old and new contracts work. More than 300 companies are currently trading at the London Petroleum Exchange. It is the world's leading oil futures market where 50% of turnover is accounted for large companies and international monopolies. The New York Mercantile Exchange is the second global oil futures market. Trade goes on six futures contracts and on three options on oil, diesel fuel, unleaded gasoline, propane and natural gas (since 1991).

Coal, as an energy resource, has its specific trade forms and organization according to its characteristics and more even distribution around the world, unlike oil and gas. Because of the need to observe quality, significant investment in creating railways, ports, vessels and others for transporting coal, 80% of the volume is realized through long-term contracts. Depending on export or import of coal two prices had been formed by late 1990s. Since the early 2000s, the practice of bilateral negotiations on prices under long-term contracts, despite an increase in transactions within short-term contracts and spot transactions (those that do not involve long-term relationship). There are two spot prices, especially for thermal coal for power exporters FOB Richards Bay and FOB Newcastle and importers CIF ARA (Amsterdam-Rotterdam-Antwerp).

Less than 20% of world coal production, first of all high-quality thermal coal and coking coal, is sold on international markets.

Increased trade, rising coal prices and development of e-commerce have changed trading methods and pricing for this energy resource, although it was believed that futures trading was not suitable for coal with a high number of brands and quality of coal, and moreover, close relationship between mining companies

and end users. The most successful futures were imposed on Chinese Zhengzhou Commodity Exchange. So far futures markets for coal have not reached the level of oil markets, and payments for contracts are executed in cash in accordance with the published price indices. This situation confirms that coal trading is in transition from spot markets to trade on the futures contract market, but its impact on coal prices has become more significant.

Reforms of the electricity and gas market in the EU began in the late 1990s with the adoption of the first European Directive on the Liberalization of the European Market. As a result energy exchanges developed and involved a wide range of participants – and power production and supply companies, large electricity consumers, traders, financial institutions, and so on.

Norway, Sweden, Finland and Denmark are successful in organization of energy market in their countries. The experience of the United Kingdom is an interesting enough example of consistent policies to achieve this goal. In particular the UK started reforms in the electricity sector in 1947. By 2000 it had gone through a number of models of organization of electricity market, pricing and trade electricity modes – from the government approved rules on the wholesale tariff and pricing power pool through a competitive mechanism to bilateral forward and futures contracts with the balancing mechanism and creation of power exchange UKPX (UK Power exchange) in 2001. New NETA rules on trade in electricity in England and Wales have led to the lion's share of electricity sold or purchased on exchanges or bilateral contracts, while providing a mechanism for close to real-time payments for imbalances between actors who buy and sell, produce and consume electricity. [1]

The main volume of transactions on the exchange takes place on the spot market, which is an addition to the market of bilateral long-term contracts. The Exchange trades the following types of contracts, depending on the hours of supply (contracts for base and peak load); depending on the period of supply (seasonal, quarterly, monthly, daily, spot, etc.).

These reforms were mainly caused by limited participation of demand in pricing which led to formation of high economically unjustified prices; complexity and non-transparency of pricing and limited competition which hampered development of the market of financial instruments; existence of single power pool prices rather than prices in contracts between sellers and buyers prevented the influence of demand on pricing.

Scandinavian countries established the electric power exchange and introduced ‘a day ahead’ electricity price quotes and futures contracts exchange trade in 1993. The Norwegian-Swedish Electric Power Exchange Nord Pool started working in 1996. In 1998 Finnish Exchange joined it as its representative and Finland successfully entered the domestic Scandinavian market with ‘a day ahead’ price quotes. Denmark was the last to join the Nord Pool in 2000. Over time, the process continued – based on exchange EPEX Spot SE, the Netherlands-British Exchanges APX – ENDEX, and Belgian Belpex the combined markets of France were integrated with those of the Netherlands, the UK and Belgium between 2006 and 2010.

Energy exchange Powernext was created in Paris in 2001, and in 2002 German Power Exchanges in Leipzig and Frankfurt merged in exchange EEX. And in 2008, Powernext and EEX created EPEX Spot SE (European Power Exchange), where all segments of Electricity Spot ‘a day ahead’ market trading take place. Since 01.01.2009 it has been one of the leading energy exchanges according to trading volume and turnover which provide spot trade on the combined market of Germany, Austria, France and Switzerland, which consumes 30-40% of EU electricity. Electricity, gas, coal, etc. futures are traded here. The Exchange defines three prices – in France, Germany / Austria and Switzerland. For example, on 01.02.2011 the baseline electricity price in France was EUR 58,48 per MWh, in Germany – 55.55, in Switzerland it was 59.75. The stock index, which is the weighted average price, has been adopted in the market. The volume of electricity sales on EPEX Spot SE in 2010 amounted to 280 mlrd. KWh, where 60-70 billion KWh were produced from renewable energy [2]. It was 20-22% of total consumption in these countries. It should be noted that Germany sells 50% and France about 30% of total electricity consumption through the stock

exchange. In addition EPEX Spot SE exchange provides services in market management to Hungarian HURX, which began operating in 2010, with a trading system located in Paris, and buyers and sellers – in Hungary.

The leading power exchanges operate in three areas: organization and market trading, clearing (settlement) and providing information. Since the purpose of the exchange is to create an efficient market with a high level of reliability for participants, futures and forward contracts going on the market are designed to hedge risks of bidders. Contracts of futures and forward markets are concluded for a period not exceeding three years. The difference in trading futures and forward contracts is to calculate changes in the cost of the contract. For futures contracts portfolio the value is calculated daily and amounts of winnings and losses are determined and listed for buyers and sellers daily. Futures can be one-day, weekly, block (4 weeks) and quarterly. Forward operations are only quarterly, payments are not made until the start of the supply, but are accumulated daily for the entire period of trading contracts.

In conclusion one should mention that the European experience in the futures markets shows that the futures contracts are eventually transformed into a real spot one, while supply possibility and supply itself serve as an important economic function, they provide link between futures market and real goods' market.

In futures trade agreements ending in real supply account for 0.6% – 1.2% of the exchange turnover in different markets and others end by conclusion of reciprocal agreements. This process is called elimination of a contract and can occur in three procedures: actual delivery; cash settlement when the asset is not supplied and the buyer receives an amount of money equal to the value of the asset; and in offset agreements. Distribution of futures trading in 2013 shows that the share of energy accounted for 5.8% [3].

One should remember that the futures exchange as the exchange of real goods is not needed because its task is not to supply goods but to perform macroeconomic functions: pricing, hedging, information and stabilization. It is to a greater extent a barometer that will formally quote (log) prices of stock instruments having the stabilization effect in the economy [4].

Futures contracts in power economy are advantageous in terms of risk management, but from another perspective, the contracts set the price level that can be monitored and evaluated by the whole society. This makes it possible to determine the real cost of power, to predict the direction of future development, and to avoid corruption.

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Role of Foreign Investment and Innovation in Promoting Energy Security of Economy of Ukraine

OLEKSANDR YAROSHENKO²⁰

At the beginning of the XXI century, in conditions of the escalating global competition, prolonged recession, and crisis in the financial, economic, political, and energy systems, the paradigm in economic development is shifting in order to ensure competitiveness of participants of international economic relations through the continued use of innovation, increasing intellectual and social capital, and business development. Energy use is not just an important, but essential factor for the existence of the modern state. Provided with adequate, sustainable and affordable energy resources to ensure a country can ensure its sustainable development and overall safety. Therefore, energy security should be a priority of a forward-looking public policy.

The purpose of the paper is to determine the impact of investment and innovation in ensuring the energy security of Ukraine.

The issue of energy security of Ukraine is particularly relevant in the context of the hybrid war with Russia and the transition to the path of comprehensive reforms that have exacerbated the problem of energy security as one of the key factors of economic security of Ukraine. Energy security and efficiency define the technological level of the country, affect its general condition and reveal the situation of sustainable development. Aggravating problems in the energy sector Ukraine on the background of war and political crisis have a negative impact on other components of sustainable development: economic, defense, social, environmental and others.

Since after the formal transition of Ukraine to market economy, the structural work aimed at achieving energy sustainability has not been conducted, the current energy intensity index is 2-4 times higher than in developed countries and the world. The energy industry is technologically obsolete and mostly uses fossil fuels; the level of use of new, environmentally friendly, innovative technology remains at extremely low levels [1]. This challenging situation points to the need to formulate a comprehensive system of measures to ensure energy and economic security, which cannot be achieved without deep structural changes in the industry based on innovation, which in turn needs attracting significant investment. The innovative approach reduces the potential risk of foreign political and economic dependence on imported energy and due to exhaustion of its own natural resources, and it is the most favourable in environmental terms.

The plan of the unified energy system of Ukraine for 2016-2025 was developed including the directives of the European Union, which Ukraine undertook to perform. The power plants running on alternative sources should work according to the corresponding " National Action Plan on Renewable Energy for the Period to 2020 ", approved by the Cabinet of Ministers of Ukraine dated 01.10.2014 No 902-p. [2]. The plan was developed by the system operator DP NEK Ukrenergo, the calculations did not include the power plants located on the temporarily occupied and uncontrolled territories. Based on the current state of the electricity sector and evaluated problems and prospects of its development, the main tasks and activities of the development plan are aimed at ensuring reliable and efficient production and

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transportation of electricity for domestic demand, as well as for its export and transit in compliance with modern requirements for environmental standards and energy efficiency. The tasks and steps of the plan are designed to best coordinate future plans of power generation sources and power networks with each other, to optimize their technical, technological and investment components [3].

Foreign investment is regarded as a tool enabling to integrate the economies of different countries at the level of production in the globalized world economy by providing a range of assets, including technology, capital, management skills and knowhow, and access to foreign markets. They also stimulate technological capacity-building for the development of production and business in the broader framework of strengthening the national economy through direct and backward links[4].

The dynamics of foreign investment from the beginning of the financial crisis in 2008 to 2013 shows that the FDI inflows were regular and stable. However, in 2014, only \$2,451,700,000 were invested. In 2015, foreign financiers invested \$3763.7 million into Ukraine's economy and withdrew \$891.3 million of direct investment (equity). There are many reasons for this slowdown: the war in Ukraine, macroeconomic slowdown, stopping a number of industrial enterprises, rapid devaluation and inflation, and decline in consumption. The chart displays the dynamics of foreign investment from 2008 to 2015.

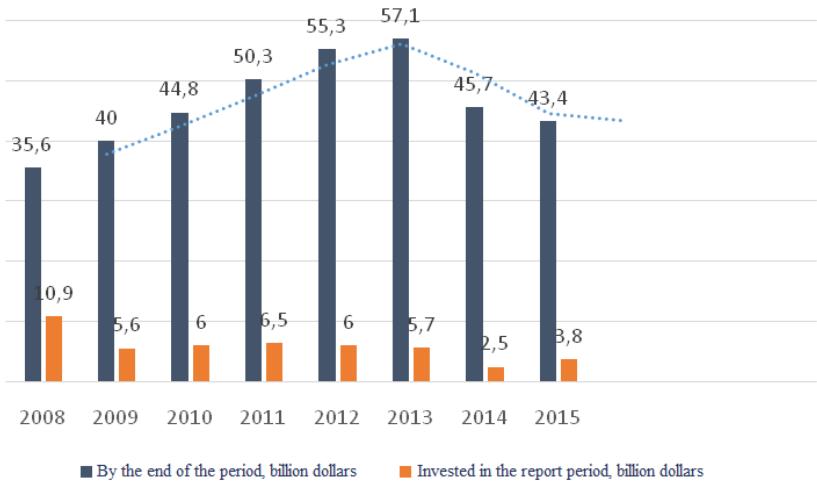


Figure 1 Direct Foreign Investment Attracted in Ukraine

It should be noted that foreign direct investment was largely focused on the financial sector (banking and insurance activities) or the purchase of existing production facilities. They neither had the character of capital investment nor created any new economic potential. Ukraine was considered a country for getting quick profit. A significant proportion of investment in Ukraine came from offshore zones and had Ukrainian and Russian origin [5, p.43].

However, Ukraine has significant potential to use environment-friendly and renewable energy sources. According to prospects for renewable energy development in Ukraine until 2030, which were developed for Ukraine in April 2015 by International Renewable Energy Agency (IRENA), the following prospects are foreseen: if Ukraine adheres to this policy, which is set out in the National Action Plan for Renewable Energy (NPDVE) the share of renewable energy in the final total energy consumption (TEC) will increase from 3% in 2009 (base year under the NPDVE) to 13.2% in 2030. But this figure may grow to 21.8% if the options defined in this study are used. Increasing the share of renewable energy to 21.8% will save \$175 million in 2030. In fact, after taking into account the benefits of reducing the impact on health and reduction of carbon dioxide emission, the savings could increase to 1.3 billion dollars per year

by 2030, according to conservative estimates, and up to 5.5 billion dollars of saving – for more aggressive scenario [6].

Ukraine produces only 1.3% of total electricity from renewable energy sources (including hydropower), while in Europe this figure is more than 24% [7]. China, which pays more attention to renewable energy, according to research conducted by the National Centre for Renewable Energy in China in 2015, would cover 85% of electricity and 60% of primary energy from renewables by 2050. The total capacity of wind power stations in China is 124.71 GW in June 2015 (4% of the world wind electricity) [8]. In 2015 China planned to build photovoltaic power stations with aggregate production of 17.8 million kW [9].

Recent studies within INOGATE programme indicate that in 2015, investment in renewable energy sector surpassed 320 billion dollars including \$156 billion investment in China, India, Brazil and other developing countries. They 2 times surpassed investment in fossil energy sources. Absolutely contradictory processes are currently taking place in Ukraine. Since 2014 Ukraine has been experiencing a sharp decline in investment in renewable energy. Judging by the Regional Report on the Status of Renewable Energy in the UNECE REN21 in 2015, Ukraine has virtually become a country without any investment flows. [10]

The total need for investment in generation capacity and transmission (international) power networks of the unified energy system of Ukraine for the period 2016-2025 is estimated in the amount of 487.6 billion UAH, including 274.8 billion UAH or 56.3% of total needs for the next three years (2016-2018). The indicative allocation of investment in 2016-2018 (total - 274.8 billion UAH, 100%) is planned from the following sources of funding, billion UAH:

- own funds of the companies - 81.9 billion UAH (29.5%);
- credit funds - 183.1 billion UAH (67%);
- state budget - 0;
- other sources – 9.688 billion UAH (3.5%).

It is planned to raise part of credit from international financial organizations, particularly to improve safety, extend lifespan, increase reliability and efficiency of power units, modernize existing hydroelectric power facilities, construct the Kaniv PSPS, as well as for reconstruction and building transmission networks.

It is planned to build generating capacity in alternative WWS energy sources totalling 4 439.8 MW for the unified energy system of Ukraine, its total cost is estimated at 181.5 billion hryvnias, including wind farms – p 2725 MW (121.3 billion UAH) solar power - 1 550.7 MW (52.9 billion UAH), biofuel power plants – 164 MW (7.3 billion UAH).

Most investment in green energy must be made in advance, before the system begins to function. From the investor's point of view it means that the general investment risks are increasing. To offset this risk, investors need a higher level of return on their investment, which increases the cost of capital for investment in renewable energy.

Primarily risk for investors are the common risks existing in the country, including the political, and the presence of certain barriers to business which affect the fluctuating value of projects on renewable energy in various European countries.

Ukraine, with a slightly higher average level of "green" tariff than in the EU (18.20 vs. 14.76 € ct), is not "attractive investment" due to expensive loans to finance projects from RES. The average interest rate in Ukraine is 3 times higher than in the EU.

Given the fact that carbon fossil resources will exhaust themselves in the near future, and renewable energy market is growing rapidly and will increase further, and the existing country's significant renewable energy potential, Ukraine should create all possible favourable conditions for attracting investment in the "green" sector: both in new generating capacity and scientific technological developments.

The experts name wind most promising type of renewable energy in Ukraine. Today the operating wind power capacity is only 470 MW. Taking into account the climate potential, wind farms with total

capacity of at least 15 GW can be built in Ukraine. For comparison, the European Union generated 142 GW of wind power at the end of 2015, which is 15.6% of the total [11].

The potential of solar energy in Ukraine today is estimated at 4 GW. The potential of small hydropower plants is only 150 MW, as it is characterized by major capital cost of construction it is only promising for foothill and mountain areas.

Biofuel power plants using biomass and biogas also have a very high potential for Ukraine. Because of the advanced agriculture waste is an excellent abundant feedstock for bioenergy and there is urgent need for civilized solid waste recycling. An independent Ukrainian company Baker Tilly, a member of the international network of Baker Tilly International, which provides audit services and business consulting, estimates biogas market at unpretended 52 billion M³. Today, there are only 10 biogas plants in Ukraine, while Germany has more than 9000. Biogas market experts estimate at more than 10 billion dollars and expect its active development before long. [12]

For 25 years of its independence Ukraine continued to operate legacy of Soviet power generation facilities based mainly on the use of fossil and nuclear sources ignoring the need for energy conservation. It is urgent to use the experience of leaders in the field of renewable energy, China, Austria, the Netherlands, Germany, and Turkey. Ukraine needs to create conditions for attracting investment to maximize renovation of productive assets and transform the energy sector towards maximum utilization of the considerable potential of renewable sources. Qualitative changes from the old cost-effective and low-tech to high-tech innovation of production will require significant financial resources. State Agency for Energy Efficiency estimates that Ukraine needs about 15 billion euro to achieve 11% of energy from renewable sources (the total balance sheet) by 2020, under obligations to the international community.

In this context, we need to investigate the experience of countries that used to have similar problems. Turkey's experience demonstrates the systematic and consistent approach to energy security. Over the past decade, the economic growth and development of the energy sector in Turkey has become one of the highest in the world. As a result of successfully implemented privatization program, the private sector is engaged in the distribution of energy in the country, with the planned transition of power generating companies to the private sector. As a result, the energy sector has become a highly competitive structure open to new prospects. The electric power is expected to grow from 74 GW to 120 GW by 2023 to meet the growing demand. Turkey offers investors the following incentives: reduced rates, guarantees procurement, priority connection, exemption from licensing with regard to the type and capacity of power plants. The government conducted large-scale reforms in the field of power generation creating a competitive energy market. Privatization of production facilities combined with a strategy aimed at improving the conditions for investment has led to the increase in the share of private companies in the sector of electricity generation from 32% in 2002 to 75% in 2015. It is significant that not offshore but well-known companies from different countries, such as Goldman Sachs USA, Twiway Oil Norway, E.ON Germany, Inter RAO Russia, Oteko Group Russia, Samsung Korea, BR Energy UK, SOCAR Azerbaijan invest in energy sector in Turkey [13].

An effective step by the Turkish authorities was the creation of energy exchange, which will increase transparency and maintain the balance between supply and demand.

Turkey has many possibilities of application of renewable energy sources - water, wind, solar, geothermal and others. The authorities have made a priority to increase the share of renewable energy in the total capacity of the country to 30% in 2023. The concept of energy saving promoting energy efficiency investment is effectively working in the country. Technologies of recycling and reducing greenhouse gas emissions are not inferior to renewable energy in Turkey's energy strategy [19].

This combination of factors makes a significant impact on the energy sector of the country, making Turkey one of the most attractive investment regions. Due to the favourable for investors regulatory framework, active increase in demand, the Turkish energy market is becoming more dynamic and competitive, attracting the attention of an increasing number of investors in each link in the value chain of the energy sector industries.

As for innovation in energy sector industry, a number of startups were investigated, they could successfully find wide application in Ukraine. Among the ambitious projects of alternative wind energy is the development of a Ukrainian engineer – Onipko Rotor. The peculiarity of its design is the unusual shape which provides high efficiency, making the device practically inaudible and able to generate electricity even at low wind of 0.3 m/s, while the blade windmills remain inactive in the following conditions.

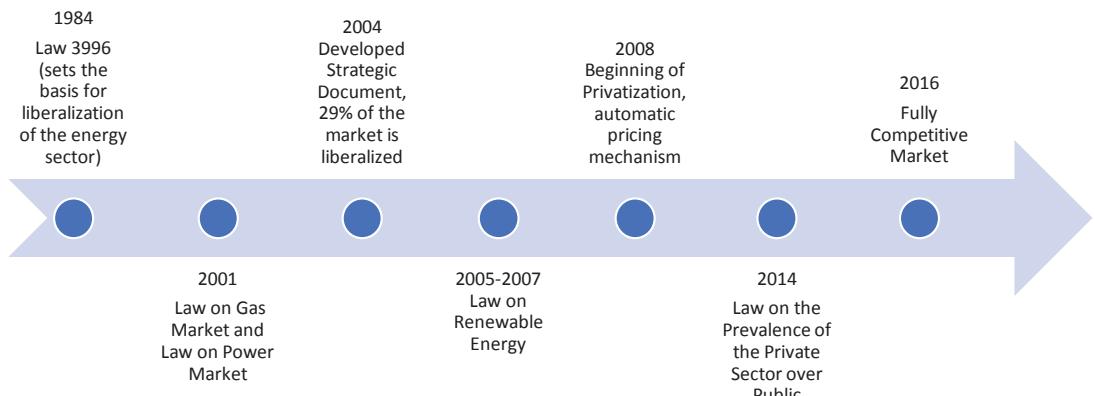


Figure 2 Transition of Turkey from Fully State Energy Management to Liberal Competition

According to the invention of the Ukrainian scientist has received numerous awards and prizes, the Commission comprising representatives of famous brands, including manufacturers of wind turbines General Electric, Siemens and others, decided to recommend the project for financing by program EUROGIA 2020 to finalize and commercialize Onipko Rotor [14].

Due to crowdfunding platforms young scientists are able to develop their designs and submit them to the world. Development of Vortex Bladeless Turbine is an alternative to existing wind farms. Spanish scientists David Yáñez, Raúl Martín, and David Suriol have thought of another way to get wind power. Their startup, which raised 69,515 dollars – 128% of the necessary amount and over a million dollars from private and government investments from Spain [15], involves the use of vertical turbines, where electricity costs about 40% less than energy by wind turbines. Because of the bladeless turbine design, their maintenance and production require lower costs. They generate 30% less energy than conventional windmills, but they can install more columns than traditional windmills at one and the same area, and they are also quieter. Vortex is working on different sizes of turbines. The commercial 12.5-meter "mini" model will be ready in 2016, while the larger industrial model will be ready by 2018 [16].

Another example of work on the efficiency and capacity of wind power is Sandia National Laboratory which published their plans to create an ultralight segmented morphing rotor (Segmented Ultralight Morphing Rotor, SUMR) – a giant wind turbine whose blades are comparable to the size of 4 football fields. Its goal is to develop a low-cost offshore wind turbine capacity of 50 MW, which will have a blade length of 200 m. These dimensions are 2.5 times higher than of today's biggest blade wind turbines with the maximum capacity of 8 MW.

They plan to place these brand new wind SUMR turbines on floating platforms in the sea 10 - 20 km off the shore. And since transportation of facilities of such huge proportions is a very labourious process, the turbine will have a modular design, and the blades themselves will consist of individual segments.

The cost of production, installation and maintenance of traditional wind turbines with more than 10-15 MW capacity is very high. They must be hardy to resist fatigue and reduce to a minimum the risk of destruction from strong winds. Todd Griffith, a leading blade designer and Technical Project Manager in the Offshore Wind Energy Program, says that such rigid blades weigh a lot and their weight has the direct

impact on the value, and at large scale, becomes an even greater problem with increasing gravity loads and other factors.

The new giant turbines, unlike conventional, will be located on the leeward side, so that the blades can fold in gales. According to the designers, this will allow them to withstand hurricane winds of speeds up to 320 km / h. Accordingly, the blades-transformers will be disclosed to the optimum state at lower speed winds.

The engineers were inspired to create this design of the blades of wind turbines by common palm trees and the way they withstand the storm. These plants have trunks with segmented cylindrical sections that bend under the force of the wind, while maintaining the integrity of the overall structure.

Giant wind turbines can significantly contribute to the objective of the US Department of Energy – to increase the share of wind power to 20% of energy produced in the country by 2030.

The project team, except Sandia Laboratory, includes researchers from the University of Virginia, University of Illinois, University of Colorado and the National Renewable Energy Laboratory and partners General Electric Co., Siemens AG and others. [17]

In addition to power generation, we should also pay attention to developments and start-ups in the field of energy saving which are very important for Ukraine. Domestic saving is especially important because an average Ukrainian consumes 4 times more energy than an average German. A Ukrainian startup that has successfully completed the campaign on the popular crowd funding platform Indiegogo represents the energy savings system Ecois.me. The team planned to raise \$ 50,000 to design the finished product and launch the production of the first small batch of devices. The collected amount was 135% of the planned.

The Ecois.me team also met a business angel Bas Godska at the IDCEE Conference in 2014. The angel decided to invest in the startup based on three aspects. "First, the region - I love Ukraine. Second – the team are smart, efficient, friendly guys, thirdly, the sector is unsaturated, growing and good for the planet. I can also support Ecois.me, for I have 15 years of experience and links. Finally, I approve the assessment of the company supported by the premium investors in the sector. In general, I have a good hunch, but time will tell". These arguments of the investor again emphasize the relevance of these start-ups and the overall trend of sustainable development, which includes energy security.

Ecois.me is a home energy system connected to an electric power cable at the power panel and measures the power consumption in the house. All data on energy consumption are put into detailed database that helps to analyse the excesses and see the opportunities for savings.

With push-messages on the smart phone the system prompts the user when it is better to run the washing machine to save on washing, or that he has forgotten to turn off the iron. Also, Ecois.me provides the feature of integration with the Internet allowing remote control of the connected appliances [18].

Considering startups in energy production, we can conclude that currently there are many successful developments that are not yet widely embodied in various countries due to lack of funding. However, there is a clear trend to sustainable development, which involves the use of alternative energy and widespread introduction of energy saving technology. And Ukraine must adhere to it to achieve energy security and sustainable economic development.

Conclusions

The energy sector of Ukraine has the physically and morally obsolete industrial base and uses mostly fossil carbon sources, and the level of use of new, environmentally friendly, innovative technology is extremely low. This difficult situation points to the need to formulate a comprehensive system of measures to ensure energy and economic security, which cannot be achieved without deep structural changes in the industry based on innovation, which, in turn, needs to attract significant investment. An innovative way can reduce the potential risk of political and economic dependence of the country on imported energy and due to exhaustion of its own natural resources and it is the most environmentally favourable.

Thus, the energy sector is an interesting area for research of its current development stage and relations between the government and commercial interests. And for energy independence, environmental maintenance, reducing costs of energy there is no other way than to invest in alternative energy. Ukraine should take an example from China, the USA, leading EU countries where alternative energy develops, makes a significant contribution to the economy, and improves the investment climate. Investment in energy production is the only true way of development for any country, including Ukraine.

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The Necessity to Define the Term "Budget" In Order To Determine the Most Effective Budget Strategy Policy

LIUDMYLA PIDCHOSA²¹

At the present time, the economic prospects are characterized by great moderation in the global economic recovery, as well as doubts concerning policymakers, especially their ability to take appropriate and prompt action. In view of this, groundbreaking rise of world economy risks and financial systems can be observed. So, especially in that instant the budget and the budget policy should be ready to rapidly respond to the situation to provide economic growth and reduce vulnerability.

The situation with budgets around the world has deteriorated dramatically and this has created a situation of public debt coefficient growth. Budgetary risks are rapidly increasing. Stable growth of risks and low inflation even further complicate the task of debt ratio reduction. Also, the increasing volatility and stiffness of global financial conditions may considerably increase the interest of expense in the period of gross funding requirement growth. Unfavourable economic outlook also increases the probability of materializing its contingent liabilities. Finally, elections or political dead-end situation could complicate the policy or restrain the decisive action for strong measures in 2016. Therefore, as a consequence, the prospect definition is very uncertain and the probability scenarios extend the period of lower growth. In these high-risk conditions, it is necessary to conduct comprehensive fiscal policy to improve the prospects for growth and sustainability of the economy. But first, the etymology of the term 'budget' should be understood to determine the correct fiscal policy.

Too optimistic and pessimistic assessment of the economic situation has been presented at the current research. This paper aims to identify the nature and the etymology of the 'budget' term to determine the most effective strategy for fiscal policy.

For the first time, the budget appeared in England in the XVII century and after that in France in the XVIII as a form of emergencies and expenditure of public funds. In the XIX century the practice of budgeting was already used in many other countries and is also engender in England and France.

The term 'budget' comes from the Latin word 'bulga' and is defined as a purse or a small size bag. Also, the Irish word 'bolg' can be considered as the origin of the term and defined as a *bag* or the word *bouquette* (or its reduced form *bouge*) – a leather bag. In English in the XV century the word *budget* was used to mean a small leather bag. And only at the end of the XVI century, the usage of the word 'budget' significantly extended to form definition to determine the content of the bag [10]. While using the term 'budget' it can imply brought news or a detailed list. Consequently, this term entered the name of the newspaper "The Budget Opened".

In economic paradigm, the 'budget' term first appeared in "The Budget Opened" in 1733 in a publication by an unknown author who published information about the sources of government revenue and ridiculed and criticized the government policy. The term 'budget' already entrenched in the government vocabulary since the second half of the XVIII century, which originally appeared as a joke.

Until the XIX century it is only possible to follow the attempts of legal nature to the 'budget' term on the European continent. And at this time it starts the evolution of the idea of the private law budget from (purely economic estimates kind) to the idea of the highest legal act (which indicate the accuracy of all

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expenditure and parishes of the state and existing relationships in the financial sector, the implementation of which is ensured by strict liability of executive power and its control) [10]. And even during the last years, tracing the history of violations of constitutional rights of popular representation, it is only possible to follow a gradual and slow development of consciousness binding budget law for the executive branch.

Ann Blyberg and Helena Hofbauer define the *budget* as the main means by which the government can give understanding of access to quality education, excellent healthcare, reliable and safe working environment, potable water, and other opportunities, goods and services necessary for dignified life [9].

The budget is the proposed plan spelling out receiving and spending money for the indicated government programs, functions, activities or targets for the financial year under US law, Subchapter III. Budgets and Fiscal Control; Part 1, Budgets [11].

The budget is a plan which helps US Federal Government to make decisions concerning the amount of funds, e.g. how much money will be spent on each of the elements, like national defense, social security, security of services, space exploration and others [5], according to the information presented by the Federal Reserve Bank of New York.

Regarding Ukraine, budgeting is treated by the Budget Code of Ukraine (Article 2) today, where "the budget" is a plan of forming and using financial resources for the tasks and functions which are carried out during the budget period by the government and local authorities [1].

The State Budget plays the leading role and because of the centralization of funds redistributed about 30% of GDP and conducted the economic and the social policy, much less in the conditions of globalization conversions and transformation of the economy.

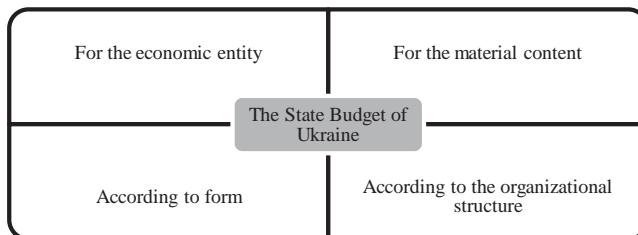


Figure1 Aspects of the State Budget of Ukraine*

* Compiled by the author. Based on the source [1]

Economically, The State Budget is characterized by certain monetary relations arising in the formation of the fund's financial resources and their use on social and economic development (according to state functions) between the state, corporations and individuals.

According to the material content 'the budget' is a centralized fund of state resources consisting of the input and output flows that are in constant motion. As the State Budget provides centralization of funds under the current legislation, which, in turn, helps to pursue common economic and social policies on the whole territory of the state and perform its functions.

The budget is the basic financial plan, the balance of revenues and expenditures of the state in due form. This is a document, which should be approved annually, it has the force of law, and whereby the consolidated financial balance of the state and reached mutual solution of the system of financial balance.

The budget is the central element of the state financial system according to the organizational structure. The budget, as the main monetary fund, affects the cash amount and proportion of each part of the financial system through distribution and redistribution of financial resources (between economic sectors, regions, election and social areas, and different segments of the population).

Taking all the aforesaid into consideration the state budget is a part of the state budget system.

The term 'budget' began to appear in the XIX century. It was indicated that the definition of the budget has several meanings. On the one hand, the budget acts as both material and abstract. The budget

acts as an economic and legal category and defining it as a property expressed in monetary terms is totally unacceptable. On the other hand, because revenues and expenditures have some definite purposes and are assigned to specific administrative bodies, the assumption about a budget of retained assets becomes impossible.

The concept of the budget as a separate category used in administrative, civil and constitutional rights can be applied. In many different legal acts the budget is noted as a source of payment or a place to receive payments. As a scientific category or practical matter, the budget is studied as the financial law not only for financial and economic sciences but for all spheres of public life; especially critical are the results in implementation of the budget expenditures.

As an economic and legal category, the budget has produced several derivative categories, such as budget expenditures, budget revenues, intergovernmental relations, a budget process and budget system.

The volume of the state treasury is uncertain. As to its composition it contains escheat, and property that has no owner, and natural resources and so on. Correction of the content of the budget involves imbalance in state revenues and expenditures, so that it should be clearly calculated and evaluated. Should also be noted the existence of an assumption as to how a thesis about state treasury combining categories such as property and budget, referring to the ‘budget’ term. The property which is intended for taxes and coins that were in circulation in reality amounted to a property. Their nominal value almost coincided with the actual in the era of metal currency [2]. As a matter of fact, the value of the coins decreased or was lost altogether because of erasable property. The state treasury was formed on an equal footing as metallic money and other property (land, state-owned enterprises) – literally national treasures. Budgeting interpreted as a fund of coins which were intended for public spending. This evolution of the monetary system initially led to paper and then to non-cash circulation. However, the budget has not been removed from the understanding of the state treasury, which led to the unification of concepts such as budget and public property in the same concept of the state treasury. Consequently, there are two parts of the state treasury: money (budget) and non-monetary part. Such part of the state treasury as the budget - has personal status, because of its relations with all other components. The implementation of any replenishing assets of the state treasury is reflected in costs and revenues. And of course, the realization of assets of the state treasury aims to balance the budget.

In summary it can be said that the concept of the budget as a separate category is used in administrative, civil and constitutional rights. The budget is defined as a source of payment or as a place to receive payments in many different legal acts. As a scientific category or as a practical matter, the budget is studied not only in financial and economic sciences, but also in the financial law. And for all spheres of public life, the results on the implementation of the budget expenditures are very important.

Hence, analyzing the etymology of the term ‘budget’ and understanding the history of its origin and the most appropriate strategy for the fiscal policy can be selected.

In situations where legislative interest rates in advanced economies are close to zero, the governments of these countries should be ready to use budgetary policy (or tax - budget policy) to support demand and monetary - credit policy as needed, and if there are budgetary possibilities. One of the essential points is the focus on tax - budgetary measures that increase the rate of growth in both: the short and the medium term (such as investment in infrastructure) and policy measures that promote structural reforms.

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