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## **ANALYSIS OF DEPENDENCE IN UKRAINIAN ENTERPRISES' ECONOMIC INDICATORS FROM MEASURE OF THEIR INNOVATION ACTIVISM**

**ABSTRACT.** The paper presents the results of an empirical analysis of differences between the economic activity indicators of enterprises with unequal innovative activity. On the basis of a sample survey of Ukrainian enterprises we attempted to verify the theoretical thesis about the relatively higher profitability of the more innovative companies. Revealed that the average of profitability and return on investment for a group of the most innovative companies are lower than for firms with less innovation activity. We have proposed the thesis of the laws of innovative activity reduction in the Ukrainian economy, as long as the main factor of business profitability is not innovation activity, but other reasons.

**Keywords:** innovation, differentiation of profitability, human capital, incentives to invest, distribution of the benefits from innovation.

### **Introduction and review of literature**

Innovative activity of enterprises to a large extent determines the economic preconditions for the economic progress of the society. The processes of globalization, the growth of information saturation of production creates for any economic system the new opportunities and opens up access to overcoming the limited availability of natural resources and accumulated capital. But these processes place high demands on the ability of the national business environment to transform new knowledge and technical capabilities to the growth of industrial and social efficiency. Many scholars have noted that innovations become not a prerequisite for improving individual performance level of production over the socially necessary (most often use the term "industry average"), but prerequisite compliance industry standards of efficiency and maintain competitiveness (see for example Stewart, 2007 or Sveiby, 1997).

Traditionally, the understanding of the economic mechanism of innovation reproduction suggests that the motivation to make an additional effort and costs related with innovation based on a fairly rigid dependence "above the innovative activity – higher

profitability". This basic principle of innovation theory suggests that the market rewards successful innovator exceed the reward its colleagues who use traditional methods. In addition, it is an additional fee for the majority of successful innovators enough to justify the effort and expense, and thus create incentives for the continuation and spread of innovation. These provisions are the cornerstone in the theory of economic development (Schumpeter, 2011, Knight, 2000), and in the theory of reproduction major modern factor of innovation activity – human capital (Becker, 1964, Mincer, 1975).

However, the ability of market mechanisms to reliably provide sufficient incentives for high innovation activity of enterprises is far from certain.

Karl Polanyi notes that the market under certain social conditions regularly rewards more for abuse of dominant position or cruel exploitation of the labor force than for innovation and investment in human capital development (Polanyi, 1944). Outlined by Karl Polanyi principles were developed in the works of the founders of the theory of human development based on the fact that the functioning solely of market mechanisms are not sufficient for the realization of the human potential of society (HDR, 2010).

D. North, indicates that it is difficult to imagine a more devastating mistake, rather than the belief that markets automatically push to increase production efficiency, regardless of the specifics of the National Institutes which regulate the distribution of power and knowledge in the area of economic activity (North, 2010).

The many problems that prevent the transformation of innovation activity into an integral component of managing the company were indicated in the works of well-known scientists, who decided the problems of modern economic management (Chesbrough, Vanhaverbeke, West, 2008, Archibald, 2002, Berdashkevich, 2002). These researchers attributed such problems with the shortcomings of management. We do not consider them as a manifestation of non-compliance management procedures to managers' tasks. We are investigate the narrowness of the tasks that must be solved by managers in the conditions of a market with little competition and a lack of tradition of innovative entrepreneurship. Thus, understanding the complex set of reasons which form the enterprises level of innovative activity is required to conduct empirical research to evaluate the effectiveness of the motivational mechanisms that have been established in respect of employees and entrepreneurs in the national economy.

Numerous domestic studies of innovation (see, for example, Kraus, 2013, Gayduk, 2012, Kolodiychuk, 2012, Zaharin, 2010, Nadruga, 2014, Korin'ko, 2010) are combined together by combination of paradoxical features. On the one hand, they are united in the assessment of innovative activity of domestic enterprises as critically low. On the other hand, they relate that situation with or shortcomings of government regulation, or with error of management. But no one of the known studies of low innovation activity considers it as a consequence of the narrowness of market motivation in the emerging economic system. Empirical backgrounds for such findings were obtained in (Verba, Tereshchenko, 2006), but in it, the authors focused on the impact of financial institutions and government policy. At the same time, weak capacity of the main market-based incentive (differentiation of profitability) to encourage enterprises, which are more prone for innovation in transformation economy, remained without attention of our scientists.

In this work, we attempt, based on a sample survey of Ukrainian enterprises, held in March – June, 2013 to assess how strong the connection in conjunction "higher innovation activity – yield growth of economic activity" and to identify some of the characteristics of economic activities on enterprises which relatively high innovation activity in the Ukrainian economy.

## **1. Analysis of the economic indicators by enterprises with different levels of innovation activity**

### ***1.1. The initial hypothesis and the principles of interpretation of statistical indicators***

Greater innovative activity than in other enterprises sector (region) must be linked, in our opinion, with the differentiation of the parameters of economic activity. This is determined by, first, the need of some prerequisites to ensure a relatively high innovation activity.

So, if according to the ideas of Schumpeter main source of funding for innovation are the loans from financial institutions, these conditions must be manifested in terms of the operating capital structure. Then a more innovation-active enterprises should be characterized and more debt.

If, financing of innovation costs in the domestic economy is increasingly based on the use of enterprises' own resources (which would indicate the urgency of the problem credit resources availability for the development of the non-financial sector), the more innovation-active enterprises should have a higher yield.

The latter thesis may seem controversial, due to the fact that ignores the effect of the profit distribution between the entrepreneur's consumption fund and reinvestment fund. As well as the distribution of investments between the reproduction of capital within the framework of traditional technologies and innovative effort. However, the need to link between greater innovation activity and greater profitability is still no difficult to justify if the higher profitability be considered not so much a prerequisite as the necessary result of innovation activity. At a minimum, the additional costs due to the innovation activities, in most cases, should be compensated by the additional innovators income. Otherwise, innovation does not receive the required fees and attenuates, left without the most important economic stimulus. On the macro-economic level it manifests itself in the low level of innovation activity of enterprises, entailing a concentration of national production and exports in the extractive industries and sectors of primary processing of raw materials, which are characterized by low value added.

Thus, we believe that the higher profitability of more innovative active companies is essential to the continuation and spread of innovation its outcome. It is essential that the relationship between the additional profits and increased innovation activity requires a relatively long time to develop, so the data sampling should cover the time span of several years. Since the surveyed companies provided data for the four years of the economic activities and for the calculation used the average for the period (in terms of specific indicators – weighted average) values, we believe that a database of this study satisfies the above requirement.

Furthermore, among the resource assumptions greater innovation activity we highlight the enterprise's better provision of skilled labor resource. At the same time, we believe that a higher level of staff qualifications requires the company to bear higher labor costs, respectively, a sign of better provision of human resources will be a higher earnings and the share of wages in production costs.

Accordingly the above, we calculated by the surveyed enterprises four groups of indicators.

The first group – the indicators characterizing feature of classification – the innovative activity of enterprises

The second group – the indicators of organizational and technical level (labor productivity and profitability, the share of material costs in the total cost on a production).

The third group – the characteristics of the financial condition of companies (the scale of extra funding use, payback loans at the current level of profitability, the indicators of investment activity and return on investment).

The fourth group – the indicators of enterprise endowment skilled labor resource and its use (wages, the share of labor costs in the production costs, the specific dimensions of the costs of staff training).

## **2. Algorithms of the database, grouping companies and estimate the parameters of their business activities**

### **2.1. Formation database**

The data sampling Ukrainian enterprises is used in this paper.

Sampling was conducted by Institute of Labor and Employment (subordinated to the Ministry of Labor of Ukraine) in the framework of the planned research "Creating highly productive working places in the economy of Ukraine in the process of state programs and infrastructure projects implementation" (2013) state registration number 0113U004861 (Research Institute of Labor and Employment, 2013). The survey was conducted between March and June 2013 by mailing questionnaires. Questionnaires was filling in by the staff of companies, trapped in the sample. The principle of enterprises' selection is quotas random sampling. In this case, the task of quoting was not ensuring the representativeness, but the predominance in the sampling frame of economically active medium-sized and large companies, involved in the implementation of state programs and infrastructure projects. It was defined by the tasks of research: its object was the sector of enterprises most successfully adapted to modern conditions and capable to participating in government programs with high demands on the efficiency of investing.

Information base for filling the questionnaire was compiled using companies' accounting and statistical reporting, including form of structural business surveys (F№1 – Business, annual); survey of industrial enterprises' innovation activity (F№1 – innovation, annual); Statistics of capital investment (F№2 – investments quarterly); monthly reports on economic indicators (F№1PE, monthly).

Sectoral structure of the sample and the distribution proportions of the surveyed companies by the scale are not representative, so the dissemination of the samples quantitative characteristics into the parent population is incorrect. Accordingly, the high standard errors (almost for all indicators, they exceed 30% of the range of studied variables) does not prevent the use of sample data for this study. Our study does not purport to description the quantitative indicators of domestic enterprises' economic activities, but operates only the most common comparative characteristics of enterprises, which differ in the level of innovation activity. At the same time the significance level for the differences between the average for groups indicators of economic activity is sufficient. It suggests that most of the differences between indicators are significant with a probability of at least 95% (see *Table 1*).

Sectoral structure of the sample and distribution of all number of enterprises in the sample by the scale of economic activity and by the type of ownership are shown in *Table 2*.

However, the total amount (100 companies) and wide regional coverage (enterprises from all economic regions of Ukraine are represented) allow us to consider the results of this sample is quite revealing and displays the general trend of link between innovative activity and other parameters of enterprise's functioning.

About the possibility of using the results produced with small samples for qualitative assessments of social processes, see, for example, Lincoln, Yvonna (2010), Maxwell, Joseph A. (2002).

To explore such links, the method of grouping is used. Differences between the characteristics of economic activity in groups, in most cases significant at  $p = 0,05$  (evaluation of the significance of differences for each indicator is shown in *Table 1*).

Table 1. Significance of differences between groups surveyed enterprises\*

Name of index	Values
Labor productivity at a cost of goods sold	$p = 0.05$
Labor productivity in the added value	$p > 0.05$
The share of material costs in total costs of production	$p > 0.05$
Specific investment in fixed capital per employer	$p = 0,01$
Specific debt (regardless of maturity) per employee	$p = 0.05$
The average investment payback period through profit	$p = 0.05$
The average total debt payback period through profit	$p = 0.01$
The average cost to pay for labor and material incentives per employer	$p > 0.05$
The share of wages in total costs of production	$p > 0.05$
Return on total production costs	$p > 0.05$
The profitability of labor	$p > 0.05$
Specific costs of training and staff development per employee	$p = 0.05$
Return on equity	$p > 0.05$

\* Set the lowest level of significance for differences between the first – second and first – third groups.

Source: own calculation.

Table 2. The distribution of the total number of firms in the sample (N = 100) on a sectoral accessory, the scale of economic activity and type of ownership

	Small				Medium-sized				Large				Total
	private	government	communal	$\Sigma$	private	government	communal	$\Sigma$	private	government	communal	$\Sigma$	
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
Agriculture	1	0	0	1	2	1	0	3	1	0	0	1	<b>5</b>
Engineering	0	0	0	0	3	1	1	5	5	1	1	7	<b>12</b>
Building materials industry	1	0	0	1	4	1	0	5	1	0	0	1	<b>7</b>
Chemical industry	0	0	0	0	0	0	0	0	3	1	0	4	<b>4</b>
Light industry	2	0	0	2	3	0	1	4	1	0	0	1	<b>7</b>
Manufacture of pharmaceutical products and pharmaceutical preparations	0	0	0	0	0	0	1	1	1	1	0	2	<b>3</b>
Food processing industry	1	0	1	2	1	1	0	2	2	0	0	2	<b>6</b>
Production and distribution of electricity	0	0	0	0	0	0	3	3	0	1	0	1	<b>4</b>
Construction	0	0	0	0	2	0	1	3	2	1	0	3	<b>6</b>
Transport, storage, postal and courier activities	0	0	0	0	2	0	2	4	1	0	0	1	<b>5</b>

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Communications and telecom	0	0	0	0	1	0	1	2	0	1	1	2	4
Financial and insurance activities	0	0	0	0	4	1	0	5	0	0	0	0	5
Government	0	0	0	0	0	2	1	3	0	0	0	0	3
Education	0	0	0	0	0	1	0	1	0	4	1	5	6
Medicine and social security	0	0	0	0	1	0	1	2	0	1	1	2	4
Other services	1	0	0	1	3	0	1	4	3	0	0	3	8
Wholesale and retail trade	1	0	0	1	4	0	1	5	1	0	0	1	7
Activity of hotels and restaurants	2	0	0	2	1	0	0	1	1	0	0	1	4
<b>Total</b>	<b>9</b>	<b>0</b>	<b>1</b>	<b>10</b>	<b>31</b>	<b>8</b>	<b>14</b>	<b>53</b>	<b>22</b>	<b>11</b>	<b>4</b>	<b>37</b>	<b>100</b>

Source: own calculation.

Surveyed firms reported the characteristics of its operations for the period 2009 – 2012. The average for the period (in terms of specific indicators – weighted average) performance are used for calculations.

### 3. Classification of enterprises into groups according to the level of innovation activity

For the classification of the firms surveyed by the level of innovation activity are calculated three indicators. The first – the specific volume of production of innovative products per employee (thousand UAH. / Person).

$$IP_{pp} = \frac{OIP}{NE}, \quad (1)$$

where:

*OIP* – volume of production of innovative products, thousand UAH,

*NE* – the average for the accounting period headcount, persons.

Second – specific innovative cost per employee (thousand UAH. / Pers.):

$$IC_{pp} = \frac{IC}{NE}, \quad (2)$$

where:

*IC* – the costs for innovative events throughout the accounting period (thousand UAH.).

The third – the proportion of innovative products in the total volume of production during the accounting period (%):

$$SHIP = \frac{OIP}{TO} \times 100, \quad (3)$$

where:

*TO* – total production output during the accounting period, thousand UAH.

For the classification of enterprises the above-mentioned indicators are integrated into one complex. To do this, first each indicator was normalized by formula to bring them to a single dimension:

$$IN = \frac{I_k - I_{\min}}{I_{\max} - I_{\min}}, \quad (4)$$

where:

$I_k$  – Indicator of n-th enterprise,

$I_{\min}$  – the same minimum rate for a group of firms surveyed,

$I_{\max}$  – the same maximum rate for a group of firms surveyed.

Then, out of the three normalized indicators the integrated index was defined by the formula simple arithmetic average:

$$II = \frac{IN_1 + IN_2 + IN_3}{3}, \quad (5)$$

where:

$IN_1$  –normalized indicators of the specific volumes of innovative products,

$IN_2$  –normalized rate of specific cost for innovation,

$IN_3$  –normalized indicator on the share of innovative products.

Depending on the level of the integral indicator of innovation activity of all surveyed companies were divided into three groups.

The first group included companies with relatively high innovation activity – their individual performance over the standard deviation above the average for the entire sample rate, for which the following condition:

$$II_k - e > II_a, \quad (6)$$

where:

$II_k$  – integrated indicator of innovation activity for the k-th enterprise,

$II_a$  – average for all enterprises surveyed integral indicator of innovation activity,

$E$  – standard deviation, calculated from the formula:

$$e = \sqrt[n]{\frac{\sum_k^n (II_k - II_a)^2}{n}}, \quad (7)$$

A second group of companies with an average (most common) level of innovative activity, for which the condition:

$$II_a + e > II_k > II_a, \quad (8)$$

Finally, the third group includes enterprises with innovation activity level below the average for the sample for which the following condition:

$$II_k < II_a, \quad (9)$$

The distribution of the total number of enterprises surveyed in groups depending on the innovation activities (10% of the firms surveyed fell into the first group, 50% – in the second and 40% – in the third) as a whole, consistent with the theoretical concepts of widespread distribution companies in terms of innovation activity: most is enterprises with innovation activity level close to the average, a significant part of – a level below the average and a minority – companies with a high level of innovative activity.

#### 4. Algorithms for calculating the indicators of economic activity of the firms surveyed

To characterize the organizational and technical level of the enterprises surveyed the measures of productivity, both in terms of the gross proceeds from the sales and the sum of labor costs, staff training, and profits are calculated.

In addition, as a sign of a higher organizational and technical level of the enterprise the indicators of the share of material costs in cost of sales are considered. However, because the sample included companies from various industries, which naturally tend to different intensity of using material resources, these figures were only used to compare the organizational and technical level of enterprises from the same industry and similar scale of production activities.

To characterize the financial condition of the firms surveyed were calculated following indicators: the specific volume of investment in fixed assets for the accounting period per employee, the specific volume of loans per employee, the average investments payback period at the current level of profitability (in years), the average payback period of borrowing at the current level of profitability (in years), profitability of labor, profitability of the total production costs, profitability of own capital.

To characterize the security of the firms surveyed by qualified personnel and policy on the use of labor the following parameters are calculated: the average cost of pay and incentives per employee, the share of expenditure on pay and incentives in the total costs, specific costs of training and staff development.

General principles for calculating indicators of economic activities of the surveyed enterprises, the procedures for conducting group and approaches to the interpretation of the statistical information used in our work are consistent with international standards of management accounting (Atkinson, Banker Kaplan, Young, 2005), (Drury, 2005), and corresponding with the methodologies which are used for justification of managerial decisions in domestic enterprises (Savitskaya, 2004).

#### 5. Analysis of the differentials in economic activity in groups of surveyed companies with different levels of innovation activity

The first group includes firms with integral indicators of innovation activity over the standard deviation above the average for the sample rate (10% of the total number of enterprises in the sample).

Characteristics of innovation activity by groups of firms surveyed are summarized in *Table 3* and other indicators of economic activity – in *Table 4*.

Table 3. Indicators of innovation activity by groups of firms surveyed (average for the reference period 2009-2012)

Name of index	measure	I group	II group	III group
The share of innovative products in the total sales revenue	%	42,3	17,8	2,5
The specific amount of annual revenue from the sale of innovative products per employee	thousand UAH	362,0	58,9	9,4
Specific annual cost on innovation per employee	thousand UAH	522,7	46,0	24,0

*Source:* own calculation.



For the interpretation of the results obtained, it is important that within each group, selected respectively innovation activity, the share of large enterprises has no significant differences from their share in the total sample. I.e. distribution of large enterprises by groups, roughly equivalent to the share of the each group in the total number of firms in the sample. This means that absence of certain scale companies' concentration in any group protects our sample from the threat of spoofing of influencing factors.

Table 4. Economic activity by groups of firms surveyed (average for the reference period 2009-2012)

Name of index	measure	I group	II group	III group
Productivity of labor by gross output	thousand UAH /employee	856,3	330,8	382,7
Productivity of labor by added value	thousand UAH /employee	203,7	148,1	165,9
The share of material costs in total costs of production	%	80,3	70,1	76,8
Specific investment in fixed capital per employee	thousand UAH /employee	266,9	21,1	10,4
Specific debt (regardless of maturity) per employee	thousand UAH /employee	173,72	67,8	189,3
The average investments payback period through profit	years	2,0	0,2	0,1
The average total debt payback period through profit	years	1,3	0,7	1,5
Average annual expenditures for payment and material incentives of labor per employee	thousand UAH /employee	72,5	48,8	43,6
The share of wages in total costs of production	%	11,1	22,3	16,3
Return on total production costs	%	20,1	45,1	45,7
The profitability of labor	thousand UAH /employee	131,0	98,7	122,2
Specific annual costs for training and staff development per employee	thousand UAH /employee	0,1	0,6	0,1
Return on equity	%	3,8	27,9	51,4

Source: own calculation.

It is revealing that the overall picture of economic indicators' differentiation between groups can not talk about a stable trend of their changes with the growth of innovative activity. For example, profit margins for companies with higher innovation activity (group 1) is clearly lower than that for companies with low (3 group.), productivity and investment activity in group 1 is clearly higher than in group 3, but the figures of 2 groups fall from the trend. They occupy an intermediate position between 1 and 3 groups only in a 4 cases of 13 calculated indicators.

However, we are not trying to identify a functional relationship between the integral indicator of innovation activity and dependent indicators of economic activity. Rather, we are talking about the three types of economic behavior models. The first type (first group) is bound to high innovation activity. The second type (the second group) – with the minimum necessary to maintain competitiveness. Third – the stagnation of innovation. And the profitability and financial stability are on average higher in the second model of behavior than in the first. But even Bole critical that a third type of economic behavior is, on average, more attractive to employers in terms of profitability and financial stability than the first. Thus, we

do not attempt to determine the extent of the reaction of medium level profitability to changes in the level of innovation activity. We only note that the groups, which are markedly differentiated by the level of innovation activity is observed as strongly differentiation in terms of profitability.

Building a more detailed and correct model to identify the functional relationship between indicators of innovative activity and indicators of profitability will be the subject of our further research.

Differentiation of innovation activity indicators is very high: the average share of innovative products for the first group of firms surveyed is 42.3% of total revenues, while the second group – only 17.8% in the third – 2.45%.

The revenue from the sale of innovative products per employee for the first group was 362 thousand UAH per year, while the second group – is just 58.9 thsd., on the third – 9.37 thsd. UAH. More than six-fold excess of the average size of the index for the group of innovative companies over the group with an average innovation activity shows qualitative fundamental differences between them. Similarly, there is high differentiation in terms of innovative cost: 522 thousand UAH on average in the first group of companies and 46 thousand – for companies in the second Group and of 24.1 – for the third.

Accordingly, we can assume that, if the differences on the basis of the classification between enterprises of different groups are so significant, that characteristics economic activity which explain their, should be equally strong differences. Level of innovative activity characteristic of the first group of companies can be extended to bulk of the domestic business only if the parameters of their economic activities will be significantly changed. Thus the problem of the concentration of innovation in a very limited range of domestic enterprises targeted by foreign investment or participating in the implementation of major sectoral programs is likely to remain relevant in the short term. A significant change in the proportions of the distribution of domestic enterprises by the level of innovation activity requires such a large-scale resource support, which can not be accumulated in a short period of time.

The dynamic growth of organizational and technical level - it is rather an exception than a mass phenomenon for domestic enterprises. Macroeconomic indicators that can be measure of some trends' prevalence in the economy as a whole, eloquent testimony to the stagnation of labor productivity: Ukraine is the only country in Eastern Europe, has still not reached the level of GDP inherent for 1991. Periods of dynamic growth of productivity (2003-2005) were associated with more favorable conditions in the metals and products of the chemical industry markets, which allowed more profitably use the existing, very outdated technical potential of export-oriented industries. The most important prerequisites for dynamic restructuring in the case of domestic enterprises are not available. Loans to most organizations of non-financial sector are virtually inaccessible, or require a very fast return on investment, which is almost impossible in conditions of radical technical re-equipment of production. The local stock market is virtually non-existent (the number of players and the amount of trading on it is so small that it makes it more likely the sphere of conscious manipulation than environment of interaction "atomic" supply and demand). Specific financial arrangements for innovative financing are not developed, and access to government support is blocked by a corrupt bureaucracy (enough to get acquainted with the ratings of Ukraine in Doing business). Finally, effective management, both at the level of the organization, and in the sphere of state regulation, is a rare exception rather than the statistical norm in Ukraine.

So we're not just talking about the high differentials in economic indicators of enterprises with different levels of innovative activity, but about extremely rareness of high propensity to innovate in the domestic economy. The totality of existing conditions in it, in our opinion, blocks the rapid positive changes on the prevalence of innovation.

According to the characteristics of organizational and technical level of the enterprises surveyed, the indicators of the first group are also significantly higher than the second and third. Productivity, calculated on the gross value of goods sold on average in the first group was 856.3 thousand UAH, in the second 330.8 thsd., On the third – 382.7 thsd. When calculating the sum of wages, social security contributions, benefits and costs of staff training, advantage of the first group is retained, while becoming less pronounced (203.7 thsd. versus 148.1 for the second and 165.9 for the third group). The differences between the averages in group share of material costs in total costs of production are not large enough to hold their significant characteristics of the organizational and technical level of firms surveyed (80.3% in the first group, 70.1% in the second and 76.8% in the third). Such differences may be caused by different resource intensity of production in various industries, more than differences in the organizational and technical level of the enterprises included in the sample group.

Characteristics of labor by enterprises of different groups also significantly differentiated. The share of wages in total costs of production of the first group enterprises less than a second and a third group. So, if the average of the most innovative companies, the figure is 11.1%, that of the enterprises with the average innovation activity – 22.3%, while the average for companies with low activity in the innovation field – 16.3%. Thus, despite the impact of sectoral differences in production's wage content, it can be argued that, at least in the sample, the greatest innovation activity of enterprises are not accompanied by an increase production's wage content.

The very high branch differentiation of wages is inherence for Ukrainian economy, which, like in many other post-socialist countries, is often a more significant factor of the differentiation of individual earnings, than the level of the qualification (see for example, Lukiyanova, 2007). In this case, the sectoral structure of the sample is far from the structure of the general population, and the significance of differences between groups in samples by indicator "the share of wages in total costs" can not be expected to preserve the estimates obtained by extrapolating to the whole population.

Accordingly, the growing importance of staff for enterprise performance, increasing requirements for the qualification and the burden on the staff at the surveyed companies are not accompanied by an increase in the wage share in the total cost. In our opinion, this is evidence of violation in the system of reproduction of innovative activity: the lack of a strong connection between the growth of innovative activity and the increase of the share of wages in the cost of production leads to a lack of wage for compensation the extra effort and growth requirements to employees qualifications. This situation makes innovation external, single action, but prevents turn it into an integral component of the staff's work.

At the same time, the average and material incentives for labor the first group enterprises are significantly higher than the second and third. Thus, the average cost to pay per employee in the first group (including social security contributions) 72.5 thsd. a year, and for the second – 48.9 thsd., on the third – 43.6. These figures show a significant exceeded the absolute wage for the most active in the innovation sector enterprises (almost 49% compared with the second and 66.2 in comparison with the third). However, in our opinion, these data reflect, to a large extent, higher standards of innovation active enterprises for the qualification level and labor intensity of their employees. Pay for work of equal qualifications for innovation active enterprises is unlikely to be significantly greater than in enterprise from II and III groups. It evidenced by lower for the first group of enterprises share of labor costs in the total cost. Also confirming this assumption appears and higher returns to labor surveyed innovation active enterprises. Thus, the average size of the first group of companies gross annual profit per employee was 131 thousand UAH., and in the second – 98.7 thsd., on the third – 122,2 thsd.

These data indicate that the growth of innovative activity in the surveyed enterprises is accompanied by an increase in the concentration of income, not the alignment distribution. Such a situation does not generate sufficient economic incentives for active investment in human capital, which, in turn, limits the possibility of expanding the scale of innovation.

The gap between innovation activity and increased investment in human capital is also confirmed by data on the specific (per employee) expenses for training and staff development. The absolute size of these costs are low in all three groups of firms surveyed, but for enterprises with an average level of innovation activity they most of the other groups – 0.61 UAH. per employee per year. The most innovation active enterprises spend on these goals 0,15 th. per year, while the least active in the field of innovation – 0.1 thsd.

According to the characteristics of the financial position, the surveyed enterprises of the first group had significantly worse position than firms with less innovative activity. Thus, the average investment payback period of the first group is more than two years (2.04 years) and the second group – only 0.21 years, on the third – a little more months (0.09 years). The average for the first group of companies payback period of total loans was 1.3 years, for the enterprises of the second – only 0.7 years, the third – 1.6 years.

Thus, the impotent position of the theory of innovation about a higher level of enterprise profitability as a necessary result of the relatively higher innovation activity is not supported by the sample survey of domestic enterprises. The business with the highest innovation activity hasn't higher profitability, but those that choose a model minimally sufficient innovation inputs and innovation. High innovative activity in the domestic economy rather leads to a weakening of financial stability, rather than to an increase in profitability.

The evidence about differentiation of own capital profitability also confirm these findings. For enterprises of the first group the annual gross profit is only 3.8% of the average cost of own capital, and the second group – 27.9%, in the third – 51.4%.

These data can be interpreted as a sign of the inability of market motivation mechanisms in the domestic economy to ensure adequate compensation for innovative activity. Accordingly, the spread of innovation, substantial growth of innovative companies will only be possible in the case of a profound change of the competitive situation in the markets, the creation of macroeconomic and institutional prerequisites for the conversion of innovative activity into the decisive factor in profitability. It can be assumed that otherwise, innovation will increasingly be concentrated in the range of enterprises, faced with the need to restructure the production or being subject to foreign investment. But this model of innovation deprives the economy of the most important stimulus to growth, because it limits the demand for human capital.

## **Conclusion**

1. According to a sample survey of domestic enterprises, we can formulate the following comparative characteristics of the most innovative companies economic activities.

First, for their peculiar a higher absolute level of wages, but a smaller share of wage in the total production costs. In combination with the higher profitability of labor on innovation active enterprises this suggests that the benefits of innovation for the employee are insufficient to stimulate significant expansion of investment in human capital and the transformation innovation into an integral component of economic activity.

Second, they are characterized by a much higher reliance on debt financing that in domestic conditions leads to a significant reduction of financial stability. The profitability of own capital, return on loans and investments of the most innovation active companies is lower than of companies with medium or even low innovation activity. Therefore, the market

incentives to expand the scale of innovation are insufficient and with respect to businessmen's.

2. The above characteristics indicate that a violation of the principle of "relatively high innovation activity – additional revenues of the company – expanding the incentives to invest in human capital" in the domestic economy is an important factor in under-funding processes of accumulation of human capital and, thus, limits the opportunities for economic growth and promotes more unequal distribution of benefits from it.

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