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MACROECONOMIC PROBLEMS

The Correlation between Economic Growth and National Wealth Dynamics with Accounting for Intangible Capital

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Abstract—In this paper, the new content, estimations, structure, and model of national wealth; the correlation between wealth and gross product; and the tendency of marginal revenue fluctuation are considered. Factors of the national wealth dynamics and the role of intangible capital and its components, in particular, education, in the acceleration of economic dynamics are studied.

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Innovations and technological progress based on scientific advances are the basis of modern economic development. In 1966, Nobel Prize winner S. Kuznets stated in his final paper: "The great innovation, which is a characteristic feature of the current economic epoch, consists of expanded scientific application for the solving of production problems. The main conclusion is the application of science, and this refers not only to the economic growth as a result, but just as much to the feedback effect of scientific advancement; something like economic growth autostimulation occurs" [1, p. 9]. Kuznets also noted the long-term declining tendency of the relation between national wealth and gross domestic product (GDP). If W (wealth) is the national wealth volume, then GDP may be considered as a flow (dW) characterized by wealth accretion for a certain period of time (for example, a year). According to Kuznets, in the long run the value of W/dW is decreasing; i.e., the reciprocal value dW/W, the marginal productivity of national wealth, is increasing. Kuznets saw national wealth as a cost of only two types of capital: production and natural. This thesis is illustrated in Table 1 [1].

In concordance with the theory of marginal utility by W.S. Jevons and A. Marshall [2, 3], the marginal utility per one additional unit of a good or service decreases as their quantity increases. The law of diminishing marginal utility states that as more of a single good or service is consumed, the marginal satisfaction drops. However, the marginal utility of an additional unit consumed will decrease, tending toward zero, as the aggregate consumption grows. The marginal revenue product (*MRP*) or marginal resource productivity in money terms is an increase in income as a result of one additional unit of resource use. In the theory of the diminishing marginal productivity of productive factors by J. Clark, the invariance of even one factor of production results in a declining growth in output and a decrease in the marginal product of a variable factor [4]. In total, it may be noted that the traditional theory presupposes a decrease of the marginal productivity of national wealth dW/W (W/DW value increase) that contradicts Kuznets' calculations stated above.

However, national wealth is an aggregate of three types of capital:

(1) natural capital—bioresources, land, minerals;

(2) produced capital—machinery, equipment, urban land; and

(3) intangible capital—human capital and quality of institutions, governance.

Theoretically intangible capital may include the following elements:

(1) human capital (raw and skilled labor);

(2) formal (informal) institutions (governance, social capital); and

(3) foreign financial assets for which the country receives an income or pays interest.

Table 1. Correlation dynamics of national wealth and GDP*

Country	Years	W/dW of the beginning of the period	W/dW of the middle of the period	W/dW of the end of the period
United States	1850–1950–2000	3.5	2.7	2.7
UK	1885–1927–2000	8.2	4.8	2.5
Japan	1905–1935–2000	7.2	5.3	4.1

* Data for 2000 is calculated by the author.

The intangible capital calculation methodology developed by a number of researchers as part of the World Bank national wealth assessment project is one of the first attempts to estimate intangible capital [5, 6].

According to this approach, intangible capital is calculated as being residual, i.e., as the difference between the total national wealth volume and the sum of natural and productive capital.

The total national wealth volume, including all types of capital, is determined as the following integral:

$$W_t = \int_t^\infty C(s)e^{-r(s-t)}ds, \quad (1)$$

where W_t is the total value of wealth per year t, $C(s)$ is the consumption per year s, and r is the so-called social return on investment coefficient.

The social return on investment coefficient is defined in the following way:

$$r = \rho + \eta\frac{\dot{c}}{c}, \quad (2)$$

where ρ is the time preference net rate; η is the elasticity of utility in relation to consumption; and c is the consumption increase rate.

Assuming $\eta = 1$ and a constant consumption rate increase, the national wealth can be expressed as

$$W_t = \int_t^\infty C(s)e^{-\rho(s-t)}ds. \quad (3)$$

In specific calculations, the time preference rate is set as 1.5%, and the upper limit of integration, according to formula (3), is restricted to 25 years, which is roughly equivalent to one generation.

Such a total national wealth calculation approach, embracing intangible capital, is practically analogous to the business cost estimation approach when its value is determined by the sum of discounted profit for a few years. This means that the higher the consumption level observed over a long time interval, the higher the corresponding level of total national wealth is.

The tangible capital (K_t) is calculated by means of the perpetual inventory method. The life expectancy is set to 20 years as an attempt to show the combination of slowly changing structures and the short life of machinery and equipment; correspondingly, the depreciation rate is set at 5%.

As a result, we obtain an estimation of the volume of tangible assets by the residual value in constant prices:

Table 2. Correlation of national wealth and GDP in 2000*

Country	W/dW	Country	W/dW
United States	14.7	Switzerland	18.6
UK	16.5	Sweden	18.5
Japan	13.4	Singapore	10.9
Germany	21.4	Korea	13.0
France	20.7	Turkey	16.0
Italy	19.3	China	9.9
Canada	13.7	Russia	21.9

* Source: according to the data in [7].

$$K_t = \sum_{l=0}^{19} I_{t-l}(1-a)^l, \quad (4)$$

where I is the volume of investment in constant prices and α is the depreciation rate.

In this case, the natural capital assessment is an estimation of the cost of urban land (U_t). It is determined as a fixed proportion of the physical capital volume at a rate of 24%:

$$U_t = 0.24K_t. \quad (5)$$

The total cumulative profitability of three types of capital tends to grow under the influence of intangible capital, based on information and knowledge. The reason for this is that intangible capital has an increasing, not decreasing, profitability. All other conditions being equal, the addition of a new unit of natural or physical capital is followed by a decrease of its contribution to the creation of added value. Meanwhile, the addition of intangible capital increases its contribution to the creation of added value. If we add the third type of capital (intangible) to the national wealth, the national wealth marginal productivity growth trend (dW/W) increases. The relations between national wealth and GDP (including intangible capital) are shown in Table 2.

The values of W/dW increased because the wealth increased due to the addition of intangible capital to the existing two types of capital, and the GDP estimation remained intact; i.e., the GDP estimation was inaccurate because the role of intangible capital in GDP is reflected incompletely. In particular, the expenses and costs of high-technology goods decrease rapidly. This leads to an artificial lowering of the dynamics of innovative industries and statistically underestimates the real return from information-intensive goods produced based on intangible capital. The accumulated national wealth volume is 13- to 21-times higher than the GDP per capita volume. Roughly speaking, the continuous reproduction process requires the accumulation of goods and services created by the national economy for 13–21 years. Low

Table 3. Structure of national wealth in dollars per capita in 2000

GDP per capita	Natural capital	Produced capital	Intangible capital	Total wealth	Natural capital, %	Produced capital, %	Intangible capital, %
Low-income	1925	1174	4434	7532	26	16	59
Middle-income	3496	5347	18773	27616	13	19	68
High-income (OECD countries)	9531	76193	353339	439063	2	17	80
World	4011	16850	74998	95860	4	18	78

Source: [7].

values of W/dW indicate a high marginal profitability of national wealth and the maximal inclusion of resources in the market turnover reflected in GDP dynamics (Table 3).

Similarly, at the microlevel information expenses are basically included in overheads; intangible assets in accounting are considered according to the tangible assets rules with cost amortization. Trade name usage does not decrease, but rather increases its value. Licenses are considered according to their registration costs, not by their real value. Equipment disposal prior to the expiration of the amortization terms is reflected in the balance as a loss; the unemployment of a skilled worker is not reflected at all. Education costs are considered as current costs, being in fact long-term investments. Intangible assets like consumer relations, qualification, and network business methods are usually not reflected in the balance. Thus, the intangible capital of 7000 American corporations in 2000 was estimated at 8 trillion dollars, which is two times higher than their financial capital, according to accounting records [8].

Intangible capital increases the marginal productivity (dW/W) and the national wealth volume. When in the country's national wealth the percentage of intangible capital increases and the percentage of natural and productive capitals decreases, the wealth productivity grows. This provides opportunities for the acceleration of economic growth. If the percentage of intangible capital does not increase, then the law of the decrease of the marginal profitability of wealth corresponding to its volume growth is reinstated. The nonlinear innovative production dynamics, based on intangible capital, expressed in the growth of the supply of brand-new goods and services under continuous innovative process is characteristic of countries with high GDP per capita. Countries with midlevel GDP per capita create added costs by means of improving existing goods and services. Negative dynamics is observed when there is a low percentage of intangible capital in the national wealth of a country.

An increase in the percentage of intangible capital in the national wealth accelerates economic growth. If the percentage of intangible capital does not change, then the national wealth marginal profitability decreases. The basis of intangible capital is information. In a postindustrial economy, information (In) in the form of investments becomes one of the economic resources along with labor (L) and capital (K). The information substantially differs from tangible resources because of its inalienability during exchange and sale, which leads to the constant growth of its volume ($dIn/dt > 0$) and oversupply. For example, if original particles cease to participate in further interactions after a new quality occurrence during a physical collision of atoms, then in operations with information the original resources remain after the "collision" (multiple collisions are possible). It is the intangible capital that provides the nonlinear economic dynamics for postindustrial economics in a blow-up regime: $Y/(t - tf)^n$, where Y is the yield; tf is the blow-up time, and there are not ordinary dynamics of Y/tf. The blow-up regime (a dynamic law, when one or several modeled values become infinite for a finite period of time (blow-up time)) is formed as a result of the activity of the nonlinear positive feedback mechanism.

Intangible capital constitutes more than 80% of the national wealth of leading countries (Tables 4, 5).

The higher the development level of a country, the higher the percentage of intangible capital in national wealth. The maximum wealth and economic development level is characteristic of economies producing innovative goods and having knowledge-intensive industries. A country's development level is determined not by high natural resources but by intangible capital and the level of development of the economy in the sphere of information technologies and continuous innovations. Intangible assists are reputation and reusable technologies, which may be applied to more than one field of activity without a detriment to their utility. The use of an intangible asset does not decrease its value, but rather increases it. The essence of intangible assets is information. Information has the following properties providing for an increase in the marginal capital profitability: (1) it may be used simultaneously, (2) it does not wear out in time, and (3) mixing information creates a brand-new product.

Russia and Germany have the same ratio between national wealth and GDP, which equals 21, but the

Table 4. Countries with maximal national wealth in 2000

Country	A person's wealth, $ per capita	Natural capital, %	Produced capital, %	Intangible capital, %
Switzerland	648241	1	15	84
Denmark	575138	2	14	84
Sweden	513424	2	11	87
United States	512612	3	16	82
Germany	496447	1	14	85
Japan	493241	0	30	69
Austria	493080	1	15	84
Norway	473708	12	25	63
France	468024	1	12	86
Belgium–Luxemburg	451714	1	13	86

Source: [7].

Table 5. Structure of national wealth in dollars per capita in 2000

Country	Natural capital	Produced capital	Intangible capital	Total wealth
Switzerland	5943	99904	542394	648241
United States	14752	79851	418009	512612
Germany	4445	68678	423323	496447
Japan	1513	150258	341470	493241
France	6335	57814	403874	468024
UK	7167	55239	346347	408753
Italy	4678	51943	316045	372666
Canada	34771	54226	235982	324979
Singapore	0	79011	173595	252607
Turkey	3504	8580	35774	47859
Russia	17217	15593	5900	38709
China	2223	2956	4208	9378

Source: [7].

wealth of Germany with fewer natural resources is 13 times higher due to intangible capital. In absolute terms, because of the small amount of intangible assets, Russia's wealth is 6.5 times smaller than Singapore's, which has no natural resources; 13.2 times smaller than the United States; and 16.7 times smaller than Switzerland's. The ratio (in percent) of natural, productive, and intangible capital is 44 : 40 : 16 in Russia; 0 : 69 : 31 in Singapore; 3 : 14 : 85 in the United States; and 1 : 15 : 84 in Switzerland. In countries with high natural resources, the ratios are as follows: 60 : 30 : 10 in Venezuela; 65 : 21 : 14 in Guyana; 84 : 32 : 15 in Syria; 71 : 47 : (–18) in Algeria; and 147 : 24 : (–71) in Nigeria. A negative level of residual intangible capital occurs because intangible capital is calculated as the difference between the present wealth value and the sum of productive and natural capitals. A negative intangible capital value indicates very low levels of gross national income and consumption per capita and of the net profit ratio of productive, human, institutional capitals. This is a classic example of the "resource curse" [9, 10].

It is intangible capital and information-intensive production, based on new knowledge, that provide the accelerated dynamics of the Organization for Economic Cooperation and Development (OECD) countries. Only countries with high intangible capital have reached the level of labor productivity of the United States, which was taken as 100% (2006): 86% in Switzerland, 84% in Canada, 80% in Sweden, 75% in Great Britain, 73% in Japan and Germany, 71% in France, 66% in Italy, 53% in Korea, and 20% in Turkey [11]. Factors providing the economic dynamics of OECD countries from 1960 to 1995 are shown in Table 6.

GDP growth due to labor (L) is possible under the following conditions: (1) an increase in the number of

Table 6. Factors of economic dynamics in OECD countries from 1960 to 1995 (per capita, %)

Index	United States	Canada	UK	France	Germany	Italy	Japan
Output growth	2.11	2.24	1.89	2.68	2.66	3.19	4.81
Capital stock	1.35	2.35	2.69	3.82	3.76	4.01	3.49
Growth in hours worked	0.42	0.14	−0.50	−0.99	−0.67	−0.17	0.35
Labor quality	0.60	0.55	0.44	0.85	0.43	0.31	0.99
Productivity	0.76	0.57	0.80	1.31	1.33	1.54	2.68

Source: [12].

Table 7. National wealth of Canada in dollars per capita in 1986

Year	Total	Human capital	Year	Total	Human capital
1963	206955.41	185476.76	1978	290474.33	251261.79
1966	235425.05	209011.55	1981	284699.15	238247.48
1969	237448.19	206728.90	1984	271477.37	225615.54
1972	291387.22	259689.46	1987	336605.83	278736.16
1975	295053.40	260322.16	1990	312487.27	250362.55

Source: [13].

the working population and (2) an increase in labor quality and human capital. The effective labor capacity may grow even under a smaller capacity of physical labor. Formally, it is expressed by the following relations. Let us determine an efficient labor capacity (Le) as the capacity of physical labor (L) adjusted to its quality coefficient (Q):

$$Le = LQ. \quad (6)$$

Correspondingly, the rate of the increase of the effective labor capacity will be

$$\Delta Le/Le = \Delta Q/Q + \Delta L/L. \quad (7)$$

For example, the annual GDP growth rate of the United States from 2002 to 2007 was 2.9%, which is higher than in Japan with its 2.1%. However, the population of the United States has increased by more than 1% due to migration and a high birthrate. The population of Japan, on the contrary, has been decreasing since 2005. If the calculations were based on GDP per capita, then the annual growth rate of Japan for 5 years would prove to be higher than real growth in the United States. In other words, the Japanese economy developed more successfully.[1]

Table 8. Profitability of educational investments in 2004, %

GDP per capita level	Primary education	Specialized secondary education	Higher education
Low-income	21.3	15.7	11.2
Middle-income	18.8	12.9	11.3
High-income	13.4	10.3	9.5
World	18.9	13.1	10.8

Source: [15].

According to another national wealth estimation method [14], intangible capital (the term "human capital" is used) is about 80% of the total wealth of Canada (Table 7). Human capital (a part of intangible capital) changes the traditional neoclassic growth pattern.

The traditional Cobb–Douglas production function is written as

$$Y_t = A_t K^{\alpha} L^{\beta}, \quad (8)$$

where Y_t is the volume of production during the time period t; A_t is the exogenous technological factor; L, K are labor capacity and basic capital, respectively; and α, β are the elasticity coefficients of production to labor and capital.

[1] GDP per capita growth rate is better than simply the GDP growth rate; it characterizes the economic dynamics. For example, for a given period among developed countries, Australia showed the most rapid growth of 3.3% for the past 5 years [9]. However, Australia had one of the highest population increases, which is why real GDP per capita growth in this country is lower than in Japan. During these years, GDP increased at an average of 4.5% per year, which is less than growth rate in 1960 (5%). However, the world's population has increased by 1.5 times, compared to the level of the 1960s, and as a result the world GDP per capita grew faster than earlier [14].

Considering human capital, this model transforms into the relation

$$Y_t = A_t K^{\alpha} L^{\beta} H^{c}, \quad (9)$$

where H is the human capital capacity and c is the elasticity coefficient of production of this factor.

First of all, human capital growth is defined by education investments. These investments have a high profitability with a maximal output for countries with a low level of GDP per capita (Table 8). A numerical evaluation of human capital is possible by means of wage capitalization if the wage is considered as interest on human capital. The possible indices of its estimation are as follows:

(1) added value per one employee;

(2) sales per one employee;

(3) number of years of the education of employees;

(4) experience and length of service of employees;

(5) education costs per one person employed; and

(6) the number of labor days per year spent on the professional development of employees.

Intangible capital (R) may be considered as a function of inner human capital, including the number of years of education of the working population, human capital abroad as the sum of funds transferred by working abroad, and management/social capital (expressed in the rule of law index) [7]:

$$R = AS^{\alpha_S} F^{\alpha f} L^{\alpha f}, \quad (10)$$

where A is a constant, S is the number of education years per employee, F is money transfers from abroad, and L is the rule of law index calculated by the scale from 1 to 100. Coefficient α expresses the intangible capital elasticity R, for example, α_S estimates the intangible capital percentage growth if the number of years of education increases by 1%p.p. Intangible capital is not additive, it cannot be disintegrated, and the sum of estimations does not coincide with the overall evaluation of intangible capital. It is necessary to combine qualitative human capital with an efficient institutional structure and management. Three factors explain 89% of all intangible capital alterations: the average number of years of education, the rule of law, and received money transfers per capita (Table 9).

In Table 9, the growth of intangible capital when every factor increases by 1p.p. is shown. On average, according to the calculation results for all countries, 1% of legitimate power brings the biggest dividends, increasing intangible capital by 0.83%. Growth in the number of education years and money transfer volume per person by 1% increases intangible capital by 0.53% and 0.12%, respectively. Growth in the average years of education per person by 1% leads to an increase of national wealth per person to about 840 dollars in countries with a low development level, 2000 dollars in countries with an average development level, and 16000 dollars in highly developed countries.

The cost of a good is formed by the marginal utility of the last additional unit of a product received by society. A. Smith [16] noted a logical contradiction, a paradox of value, when cheap water is more useful to a person than less useful expansive diamonds; i.e., the low cost of water is explained by its excessive supply and the much smaller supply of diamonds. Industries in which natural resources are developed and processed, such as agriculture, coal, and metallurgy industries, preserve the law of diminishing return. Industries with high intangible capital, based on information and knowledge (software development, the Internet, education, and insurance services), have an increasing profitability in the long term.

Intangible capital determines the dynamics and competitive advantages of a company. In Table 10, the relation coefficient P/BV of price to book value and the coefficient P/E of share price and earnings per share of companies in the United States according to the industry are shown. The book value of a company's equity is the difference between its book value (originally paid price) of assets and liabilities. The market multiplier P/BV increases as the profitability of a company's equity (*ROE*) grows and decreases as it is shrinks. In 1980, the value of P/BV for the S&P 500 index was 1.5, and for *ROE*, 7%; in 1990 they were 2.5% and 13%, respectively; and in 2000 they were 3.5% and 18%, respectively. High values of the P/BV multiplier and profitability of a company's equity *ROE* for communications, software, education services, and insurance are explained by the degree of intangible capital in the total capital (Table 10).

Table 9. Marginal returns of intangible capital factors (in dollars per capita) and the factor of elasticity (%)

Countries group	Marginal returns		
	Achooling	Rule of low	Foreign remittance
Countries with low income	838	111	29
Countries with midlevel income	1954	404	39
Countries with high income (OECD)	16430	2973	306
Factor of elasticity	0.53	0.83	0.12

Source: [7].

Table 10. The price and book value multiplicator of companies in the United States in 2007

Industry	*P/BV*	*P/E*	*ROE*	Industry	*P/BV*	*P/E*	*ROE*
Residential development	0.67	25.23	10.96	Telecommunications	4.00	39.65	14.72
Railroads	2.35	12.69	14.10	Electronic commerce	4.85	96.34	5.05
Automobile industry	2.41	17.61	13.71	Software	5.98	39.94	20.03
Steel production	2.57	10.90	15.99	Internet	6.39	63.72	11.11
Oil extraction	2.72	13.72	18.30	Education services	8.24	45.68	21.70
Natural gas extraction	2.79	18.40	15.40	Insurance	16.90	25.39	15.99

Source: [17].

Table 11. Revenue saving in 2000 (in % of gross national income)

Country	Gross national savings	Consumption of fixed capital	Net national savings	Education expenditures	Energy depletion	Mineral resources depletion	Net forest depletion	Pollution damage	CO_2 Damage	Genuine saving: 11 = 4 + 5 – 6 – 7 – 8 – 9 – 10
1	2	3	4	5	6	7	8	9	10	11
UK	15.0	11.5	3.5	5.3	1.0	0.0	0.0	0.1	0.2	7.3
Germany	20.3	14.9	5.4	4.3	0.1	0.0	0.0	0.1	0.2	9.3
Italy	20.1	13.7	6.5	4.4	0.1	0.0	0.0	0.2	0.2	10.3
Canada	24.6	13.1	11.5	6.9	4.9	0.2	0.0	0.2	0.4	12.7
United States	17.4	11.7	5.7	4.2	1.2	0.0	0.0	0.3	0.3	8.2
France	22.0	12.6	9.4	5.1	0.0	0.0	0.0	0.0	0.2	14.3
Japan	28.4	15.9	12.5	3.1	0.0	0.0	0.0	0.4	0.1	15.1
China	38.8	8.9	29.8	2.0	3.6	6.3	0.1	1.0	1.6	25.5
Russia	37.1	10.0	27.1	3.5	39.6	0.4	0.0	0.6	3.4	–13.4

Source: [8].

Currently, the value of the *P/BV* coefficient varies from 0.67 for industries with low dynamics to 17 for information-intensive industries with high growth rates.

The *P/E* coefficient shows the investor's price versus the company's income. For example, the investor is ready to pay 13.7 dollars for each dollar of income in an oil business and 96.34 dollars in e-commerce. Industries and companies with prospects for considerable income dynamics have a higher *P/E*, i.e., investors will have higher and quicker returns (dividends and a rise in share prices). The great difference in a company's price and the smaller difference in the price of its tangible assets indicate a high assessment of the company's intangible capital: personnel quality, management systems efficiency, and effectiveness of management. Information-intensive companies have significant tangible assets. It is harder for traditional companies from the automobile, chemical, steel making, and other industries to earn revenue because a significant amount of funds are "paralyzed" by tangible assets. For example, traditional insurance companies owned assets, such as real estate, loan securities, and shares, which bring revenue to policy holders. New insurance products are life annuity and variable annuity. The assets belong to policy holders, and the insurance company manages them for a premium income.

The final aspect of the estimation of economic dynamics with regard to intangible wealth elements, according to the World Bank methodology, is the calculation of the genuine saving level in the gross national income. Net national saving is obtained by the subtraction of the gross national savings from the basic capital consumption. By adding the current education expenditures (as investments to human capital) and subtracting the natural resources depletion costs (energy, metals, minerals, and wood), the genuine savings and adjusted net savings are obtained. In Table 11, there are estimations of the genuine savings level, and in Table 12 the changes in the national wealth per capita in different countries are shown.

In countries with a negative savings gap, a reduction of national wealth per capita is observed. Nonlinear dynamics of national wealth is possible when big

Table 12. Changes in wealth per capita in dollars from 1970 to 2000

Country	Gross national income	Population growth, %	Adjusted net saving	Change in wealth	Saving gap, in % of national income
United States	35188	1.1	3092	2020	
UK	24606	0.3	1882	1725	
Japan	37849	0.2	5906	5643	
France	22399	0.5	3249	2951	
Germany	22641	0.1	2180	2071	
Canada	22612	0.9	3006	2221	
Italy	18478	0.1	1990	1947	
Switzerland	37165	0.6	8611	8020	
Singapore	22968	1.7	8258	6949	
Turkey	2980	1.7	476	273	
China	844	0.7	236	200	
India	446	1.7	67	16	
Russia	1738	–0.5	–164	4	
Eqypt	1569	1.9	91	–45	2.9
Venezuela	4970	1.8	–94	–847	17.0
Algeria	1670	1.4	–93	–409	24.5
Nigeria	297	2.4	–97	–210	70.6

Source: [7].

stocks of intangible capital are accumulated, when the level of the average income of the population per capita is high, and the quality of human capital is good. In countries with small stocks of intangible capital and with a low average income of the population per capita, usually the wealth growth-rate dynamics is lower than the population dynamics, which results in a welfare decrease.

The support of the long-term dynamics of the Russian economy requires major investments in human capital and information-intensive industries in order to increase the percentage of intangible capital in the national wealth of the country and decrease the percentage of natural capital, which will create conditions necessary for a transition to innovative economic dynamics.

REFERENCES

1. S. S. Kuznets, *Modern Economic Growth: Rate, Structure and Spread* (Yale University, New Heaven, 1966).
2. W. S. Jevons, *The Theory of Political Economy* (Macmillan, London, 1871).
3. A. Marshall, *Principles of Economics* (Progress, Moscow, 1993).
4. J. B. Clark, *The Distribution of Wealth*, (Economy, Moscow, 1992).
5. S. Ferreira, K. Hamilton, J. Vincent, *Comprehensive Wealth and Future Consumption* (Washington, 2003).
6. K. Hamilton, J. M. Hartwick, "Investing Exhaustible Resource Rents and the Path of Consumption," Canadian Journal of Economics **38** (2), (2005).
7. K. Hamilton, *Where is the Wealth of Nations? Measuring Capital for the 21s' Century* (World Bank, Washington, 2006).
8. P. A. Strassman, *Assessment of Productivity, Technology and Knowledge Capital* (Strassmann, New Canaan, 2000).
9. R. M. Auty, *Resource Abundance and Economic Development* (Oxford University, Oxford, 2001).
10. T. Gylfason, "Natural Resources, Education and Economic Development," European Economic Review, **45**, (2001).
11. OECD Stat Extracts, http://stats.oecd.org/Index.aspx
12. D. W. Jorgenson and E. Yip, "Whatever Happened to Productivity Growth?," in *New developments in Productivity Analysis, Studies in Income and Wealth*, Ed. by C. R. Hulten, E. R. Dean, and J. M. Harper (University of Chicago, Chicago, 2001), Vol. 63, pp. 509–540.
13. R. T. Macklem, "Aggregate wealth in Canada," Canadian Journal of Economics, (1), (1997).
14. Economist (2008).
15. G. Psacharopoulos, H. A. Partinos, *Returns to Investment in Education: A Future Update* (Education Economics, World Bank, 2004).
16. A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (Lamartis Moscow, 2006; W. Strahan and T. Cadell, London, 1776).
17. *National Bureau of Economic Research* (Cambridge, 2007).