

## Fibonacci and Futility

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**Abstract.** The present paper deals with statements of a recently published book of the “Nauka” Publishing House (Moscow, 2005) on regularity of appearance of the Fibonacci golden mean as a quantitative characteristic in the social and economical sphere and necessity to follow it under increasing management efficiency. The present paper proposes a negative answer to the question on necessity of following the golden mean under managing social and economical systems. Such an answer is justified by formulation (as continued as required) a series of questions, motivated by real practice, which may not be scientifically answered, by a corresponding analysis, and by referring to serious relevant literature sources not mentioning the considered golden mean method. *Copyright © 2008 IFAC*

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### 1. INTRODUCTION

Prangishvili (2005a) has proposed applying *a scientific* approach to increase effectiveness of managing complex social (economical, organizational) systems. At that, as an element of such *scientific* methods, the Fibonacci golden mean, or golden ratio, method is indicated (Section 3.2 in (Prangishvili, 2005a); see also (Prangishvili, 2005b)).

“Leonardo da Vinci has referred the “golden mean” in man-made chefs-d’oeuvre of the sculpture, painting, architecture, and other objects of the material culture as the “golden ratio”. However, it was revealed that the principle, or rule, of the “golden ratio”, which has for the first time been discovered in the human body proportions and is observed in chefs-d’oeuvre of the world art, is widely propagated and is met everywhere: in Nature, engineering, society, and is therefore *a universal objective regularity of the Nature and society*.”

Obviously, if “golden means” reside to chefs-d’oeuvre of the world culture or in the physical body of a beautiful man, then an advanced society, which is contained from separate individuals, also possesses these “golden means”. Analogously to that, *a prosper business* is also brought under the “golden mean”. Therefore, one should subordinate *the business model organization* to the rules of the “golden mean” to receive *maximal profit* and *maximal size of money flow*, to increase assets and potential of a company. When potential of a company is increased as a result of the synergetic effect, *the company cost grows*” (Prangishvili, 2005a, page 181).

From one hand side, utilizing the Fibonacci numbers (when applied to social, economical systems) is known to be recognized as a successful *empirical* finding to forecast *some* indexes concerned with the financial market, the Elliott waves theory (Colby, 2004, Frost and Prechter, 2000). But, from another hand side, although the ideas of Prangishvili (2005a) are shared by a number of prominent scientist, *a scientific* justification of a *necessity* (by virtue of Prangishvili (2005a) statement) of applying *management effectiveness* causes fair doubts and is, in entity, the subject matter of the further consideration, especially taking into account the fact that the notion “management effectiveness” itself is by no means defined by Prangishvili (2005a). One just can assume that a qualitative index is kept in mind. A question arises: “How broadly the golden mean rule may be used under managing (increasing managing effectiveness) of social, economical systems?”

Is becoming apparent of the golden ration conforming to the laws of Nature, and is it necessarily be followed within such kinds of the economical relations, as, for instance, profit distribution between competing parties, distribution of state and non-state (private) ownership inside a country, income inequality of people in a country (the Gini index), problems of managing a company (even if such a regularity is peculiar to “the physical body of a beautiful man”)? Simultaneously, if one will take into account the fact that for the last years in about 800 relevant scientific journals (<http://www.ingentaconnect.com>), only one paper (of Amershi and Feroz (2000) is revealed that more or less corresponds to this branch, then corresponding inferences of the book of Prungishvili (2005a) were to pretend to the status of *a discovery!*

At that, the purpose of the paper of Amershi and Feroz (2000) mentioned was to empirically verify the null hypothesis that the occurrence of Fibonacci numbers, golden ratio and means in financial accounting ratios, is merely a random occurrence without any statistical significance. The aim and subject matter of the present paper is to motivate a negative answer to the question on necessity of following the Fibonacci golden mean under control and managing social, economical systems.

### 2. ON DISTRIBUTION OF SHARES

To the opinion of Prangishvili (2005a), “the principle, or rule, of the “golden ratio”, or the “golden mean” is a universal and objective *regularity* or even a law and is effectively used not only in *chefs-d’oeuvre of the culture* (in visual art, painting, sculpture, architecture, subject of life, music, poetry, etc.), but in *Nature and engineering, economics, business, and, the main one, in managing any complex market systems*.”

A high effectiveness of managing complex systems, such as a state, regions, cities, economics, manufacture, business, social structures, science, education, may be achieved under applying the principle, or rule, of the “golden mean”. Such systems governing on the basis of the principle of the “golden mean” will find oneself *more stable, sustainable, and harmonic ...*

An analysis of existing and investigation of new systems show that to assure *system and structure harmony* of any complex systems in the branch of

manufacture, economics, public-and-social, natural, as well as in painting, architecture, music, and other spheres of the world culture, *it is necessary to set between the main indexes the relationships corresponding to the principle, or rule, of the "golden mean"* (Prangishvili, 2005a, page 180).

After the citation presented from the book of Prangishvili (2005a), one just should say: "Amen!", similarly to Lawrence Garfield – "Larry the Liquidator" – a hero of a Jerry Sterner's play (Sterner, 19XX). However, instead of that let us consider the world system of manufacturing passenger aircrafts in which just two competitors act, the "Airbus" Corporation and "The Boeing Company" (all others are only a "round-off error"), as well as the world system of manufacturing micro-processors in which just two competitors act, the corporations "Intel" and "Advanced Micro Devices" (AMD). If one will consider activities of competing market subject under the assumption that only two competitors are available, then for sustainable development Prangishvili (2005a) states the necessity of distribution of a main index of their activity in accordance to the relationship  $\left(\frac{-1+\sqrt{5}}{2}\right)\times 100\%$  and  $\left(3-\sqrt{5}\right)\times 100\%$ . Countries, to which the above mentioned corporations belong, are conventionally related to countries with a high level of development. Which *necessity* of sharing "the main index" in accordance to the golden mean method may be a discussion about? And, which "effectiveness" of which "management or control" is at that decreased?

A special interest is caused by a statement of Prangishvili (2005a) on *necessity* of meeting the golden mean rule under distribution of the state and private ownership in a country. At that, a subject of criticism is "unbalanced" Russia, while a "golden benchmark" is presented by such countries as USA, United Kingdom, Germany, France, Sweden (as countries possessing high efficiency of management, and, as a consequence, high scale of life of population). "An analysis of distribution of the ownership share between the state and private owners in civilized countries has shown that the distribution of the ownership share also obeys to the law of the "golden mean", while in Russia that law, or rule, is considerably violated, what denotes its non-effectiveness" (Prangishvili, 2005a, page 180). What may, at the same time, affirm on the management effectiveness of the "golden-mean" USA, if, for instance, to take in to account the report of Nord et al. (2005) of the United States Department of Agriculture. In accordance to Nord et al. (2005), in the USA being one of the most reach countries of the world, 38.2 millions inhabitants are chronically undernourished; about 14 millions of them are children. In accordance to the research, the quantity of hungering Americans is increased from a year to a year, and during the last five years has been increased on 7 millions. At that, Prangishvili (2005a) points out that in the "socially oriented economy" of Sweden the percentage ratio of the state and private ownership is just 62% to 38% ("approximate" golden mean), in the above listed "liberally oriented economies", the opposite ratio takes place: the state ownership share is 38%, private one, 62% (i.e. also "approximate" golden mean). In Russia, to opinion of Prangishvili (2005a), an explicit percentage skew of the state and private ownership takes place (in favorable of latter), what makes conditional (by virtue of Prangishvili's (2005a) postulate on *necessity* of the golden mean) non-effectiveness of managing Russian economy and Russian state in whole. Namely:

"As a rule, availability of the "golden mean" (0,62 and 0,38, or 62% and 38%, or 2/3 and 1/3) between shares within main economical elements or indexes of an economical system serves as indicator of the sustainability, stability, and harmony of the economical system. So, for a socially oriented economy, those countries are closest to a stable status, in which the share of the state ownership is close to 62%, and private one, to 38% (for instance, in Sweden), while for a liberally oriented economy, the share of the state ownership is close to 38%, and private one, to 62% (for instance, in Japan 35%, in United Kingdom: 40%, Germany 39%). As to Russia, the share of the state ownership of which is 15-20%, then it take far from stable status, both from social and liberal economy, and from the point of view of the necessary ratio (62% and 38%) has neither socially, nor liberally oriented economy. Analogously to that, the distribution of the share of the gross product, incomes, expenses, profits, and taxes, etc. between the state and private sectors follows" (Prangishvili, 2005a, page 182).

Such a frequent use of the expression "to opinion of Prangishvili (2005a)" above is casual. The percentage ratios presented in the book of Prangishvili (2005a) are nowise confirmed by references to trustworthy statistical sources. At that, it is absolutely not clear, what do these percentage ratios assume: quantity of enterprises (in pieces), percentage of stocks, quantum of manufactured output (in natural or value terms), quantity of employees? Again, it is impossible to understand why the list of the "harmonized" countries in the book of Prangishvili (2005a) is restricted to the above presented ones. In which details, in the sense of the quality of life (and, obviously, as the basis, in the management effectiveness), Australia, Belgium, Canada, Denmark, Finland, Ireland, Iceland, Italy, Liechtenstein, Luxembourg, Netherlands, New Zealand, Norway, Switzerland are worst then them?

Is all-around meeting the golden mean necessarily for management effectiveness within specific types of economical activity? NACE Rev.1.1 – Statistical classification of economic activities in the European Community – involves 848 alignments; CPA 2002 – Statistical Classification of Products by Activity in the European Economic Community – involves 4589 alignments; PRODCOM list 2003 (List of PRODUCTS of the European COMMunity), 2003 version involves 5498 alignments; OKP – All-Russian classifier of production – sets 53358 types of products and serves united in 98 sections; OKVED – All-Russian classifier of types of the economical activity – determines 1826 types united in 31 sections (subsections).

If one will follow to the postulates of the book of Prangishvili (200a), then in accordance to "the rules of the "golden mean", it is *reasonably* to select *the relationship* between the *state and market* systems of the economy control. However, in which cases it is advantageously to have more state ownership share, and which cases, more the market one, that depends on specific sectors of the economics" (Prangishvili, 2005a, page 182). In the light of the statements of the book of Prangishvili (2005a), it is quite appropriate to ask a question, if in the above mentioned lists of the types of activity and productions those ones, for which meeting the "golden mean" with regard to the relationship of the state and private ownership is not necessary?

1) If *no*, then indeed a violation of the golden mean in the part of relationship of the state and private ownership, for instance, within such a brain of activity as "Manufacture of carpets and rugs" (NACE 17.51) or "Manufacture of

television and radio receivers, sound or video recording or reproducing apparatus and associated goods” (NACE 32.30) will not permit (the condition of meeting the golden mean is, by the assumption, necessary) to increase the management effectiveness within these branches?

- 2) If yes, then what are namely *scientific* criteria to attribute types of products or branches of activity to those for which meeting the golden mean is necessary, at that, with dominance either state, or private shares of the ownership?
- 3) If for a type of products or branch of economical activity the golden mean distribution of the state and private ownership is not necessary for increasing management activity, then what are criteria of attributing these types or branches to a class “non-compulsory with regard to the golden mean”, and how may that occur due to the “universality” and “totality” of the golden mean (to the opinion of Prangishvili (2005a))?

The questions may be continued based on other examples.

- 4) Recently, 100% stocks of the famous company “Électricité de France” (EDF) have appertained to the state. Should one consider that the sale of 15% of the stocks of the company is just a halfhearted measure on the way to increasing the “management effectiveness”? At that, in accordance to the French legislation, the share of the state stocks in the company may not be less then 70%. Should one consider (following to that legislation norm) the EDF to consider doomed to non-effective management (due to *necessity* of meeting the golden mean in the distribution of state and private ownership)?
- 5) Just 62% stocks of the Italian aviation company “Alitalia” have appertained to the state. Should one consider the present crisis of the company as a result of inefficient activity of its managers?
- 6) SNCF, the French national railway company, is fully appertained to the state. Should one consider that it is and will always be managed ineffectively (due to *necessity* of meeting the golden mean in the distribution of state and private ownership)?

Et cetera, et cetera ...

### 3. ON THE GINI INDEX

“The world-known and widely used coefficient of *Gina*, threshold value of which is equal or close to the “golden mean” (0,62) or to its square (0,38), in case of effective, or *equilibrium*, economics or under a *balance* of the economical interests *describes* the distribution of incomes of population, organization of the economy of a state, region, or a local market, and is used for analysis of the equilibrium economy status” (Prangishvili, 2005a, page 182).

Firstly, “the world-known ... coefficient of *Gina*” in the professional literature is conventionally referred as the *Gini* index (or coefficient). Secondly, is the golden mean, as a quantitative characteristics of inequality of incomes of a country population, a regularity, i.e. is the regularity the income inequality determined by the relationship of  $\left(\frac{-1+\sqrt{5}}{2}\right)\times 100\%$  to  $\left(3-\sqrt{5}\right)\times 100\%$ ? One should be noted, that, for instance, to opinion of (World Bank, 2007a), these values of the Gini index negatively characterize the income inequality and can not serve as a benchmark for increasing the management effectiveness, see also (Soubotina,

2004). Following to Prangishvili (2005a), one could conclude that the golden mean characterizes the “equilibrium economy” of such countries as Central African Republic (0,613), Bolivia (0,606), while for the “squared golden mean”, of such countries as Tanzania (0,382), Guinea (0,381), Jamaica (0,381), East Timor (0,38), Georgia (0,38)! (The data are from (World Bank, 2007a)).

In comparison with the value  $0,382 \approx (3 - \sqrt{5})$ , fig. 1 graphically represents the Gini index values (on incomes) for a majority of the world countries in accordance to (World Bank, 2007a).

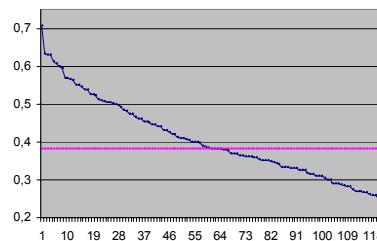


Fig. 1. The Gini index values (ordered with decreasing) for countries from (World Bank, 2007a).

At that, one should be noted the following. Per se, the Gini index value being close to 0,382 is considered as quite large, (high level of the incomes inequality) (World Bank, 2005) and can not serve as the “golden benchmark”.

The average value of the Gini index for fig. 1 is 0,4051. Closeness (in a manner) of this average to 0,382 has, from a substantial point of view, the same sense as “the average temperature over a hospital”. Statistically, the Gini index has a weak relation to the income level (the correlation coefficient between these two characteristics is of “order” 0,4). More informatively, grouping countries in accordance to certain categories looks. Table 1 present the average values of the Gini index for a number of such categories of countries (the income level is from (World Bank, 2007b)).

**Table 1**

Categories of countries	Average value of the Gini index
Countries with high income level	0,32
Countries with income level higher than middle	0,39
Countries with income level lower than middle	0,43
Countries with low income level	0,43
European countries with high income level	0,31
European Union Countries (27 countries)	0,31
Countries of the “old” European Union (15 countries)	0,31
Countries of the Community of Independent States	0,36

As can easily be seen from Table 1, the Gini index value is already far from 0,382 for these categories of countries, and, one also can conclude that, generically, the Gini index is the smaller than the development level is higher. All that consideration shows absence of a reasonable connection between the Gini index values and the golden mean.

### 4. COMPANY MANAGEMENT

Today, when dealing with the problem of the company management, a main association refers to the Balanced Scorecard (BSC) concept (Kaplan and Norton, 1996). "The balanced scorecard is a management system (not only a measurement system) that enables organizations to clarify their vision and strategy and translate them into action. It provides feedback around both the internal business processes and external outcomes in order to continuously improve strategic performance and results. When fully deployed, the balanced scorecard transforms strategic planning from an academic exercise into the nerve center of an enterprise."<sup>1</sup> Neither the book of Kaplan and Norton (1996), nor the cited web-site, and no BSC referencing books or papers contain just a mentioning on the golden mean with regard to company management issues.

To the opinion of Prangishvili (2005a), "as an analysis of experience of civilized countries shows, *distributing incomes in the society, establishing optimal shares of state and private ownership, establishing the salary of employees in state and private firms, distribution of the sales proceeds in a manufacture (under realization merchandises at markets) between allocation of the tax to the common budget, process costs, and own income, distribution of duties, rights, and responsibility between federal, regional, and local powers, and many others, are necessary to be built in accordance to the rules of the "golden mean" to obtain maximal system's stability and effectiveness.* If one will account the laws of the harmony, or the "golden mean", in managing Russian enterprises and economic sectors, regions and the country in whole, then one may overcome our economical crisis and transfer to a process of *normal* social and economical development of Russia" (Prangishvili, 2005a, page 180).

Following to the advice of Prangishvili (2005a), let us go in considering the problem of "normal" social and economical development of Russia based on the implemented analysis and investigation of "the productive indexes and their rational relationships" (Prangishvili, 2005a), which "enables one to affirm that in accordance to one of the main market law – the principle of equivalence of exchange and the law of value or pricing, *manufacturers of merchandises or services under pricing and primary distribution of their incomes may not only support the manufacture breakeven or profitability at the level of the optimal ration being equal to the number 1,62, but observe the principle of the "golden mean", or the principle of harmony, under optimal distribution of the share of the proceeds from realization of the merchandises and services on the process costs (a<sub>1</sub>), taxes paid to the common budget (a<sub>3</sub>), and on a part of the income remained in the disposal of the manufacturer (a<sub>2</sub>), on the main branches (sector) of consumption of the national economics"* (Prangishvili, 2005a, page 192).

At that, to opinion of Prangishvili (2005a) for the above values (a<sub>1</sub>, a<sub>2</sub>, a<sub>3</sub>), the following relationships are to be met (in relative units):

$$(1) \quad a_1 = a_2 = 0,62, \quad a_3 = 0,38.$$

At the same time, to the opinion of Prangishvili (2005a), observing this principle requires "just" two conditions of activity of Russian enterprises: "*The first condition is that the remuneration of employees of Russian enterprises should not be related to their process costs, but should be related to their incomes; the second condition is that under primary distribution (tax assessment) of the incomes of Russian enterprises, the harmonic principle, or the principle of the "golden mean" is to be*

used" (Prangishvili, 2005a, page 195). The fact that the first of the cited conditions is an economical absurdity requires no clarifying<sup>2</sup>. The fact that the second of the cited conditions requires an absolutely complete revising actual taxation system in Russia, while the system should be pointed out to be present very close to that of a majority of European, "civilized" (in terms of (Prangishvili, 2005a)), countries is also obvious.

Thus, the "proposals" of Prangishvili (2005a, page 192-195) should be just considered as a utopia. At that, an internal contradictoriness of the reasoning of (Prangishvili, 2005a) should be pointed out. So, from one hand side, to opinion of Prangishvili (2005a): "Any commodity producer (an enterprise or organization) in accordance to the "golden mean", main market laws, and own interests is to try to receive for its disposal an income share (a<sub>2</sub>) being equal to its process costs (a<sub>1</sub>), i.e.  $a_1 = a_2$ . For that, it is to invest into the manufacture such resources or such an amount of the labor force, which will enable it to have the total income of the amount being not less 162%, or the ratio of the total income (100%) to the process costs (62%) is to be 162%, i.e.  $(a_2 + a_3):a_1 = 1,62$ " (Prangishvili, 2005a, page 193). From another hand side, as mentioned above: "*The first condition is that the remuneration of employees of Russian enterprises should not be related to their process costs*" (Prangishvili, 2005a, page 195).

Nevertheless, to analyze more thoroughly the proposals of Prangishvili (2005a) "for development of manufacture and economical growth of Russia", it is of interest (from a hypothetical point of view) to consider a problem of meeting relationship (1) in "civilized" countries where "distribution of the sales proceeds in a manufacture (under realization merchandises at markets) between allocation of the tax to the common budget, process costs, and own income ... are necessary to be built in accordance to the rules of the "golden mean" to obtain maximal system's stability and effectiveness" (Prangishvili, 2005a, page 180).

One may affirm that "standard" tax load on any enterprise, associated with its economical activity, is determined by two taxes, at first turn: the value added tax (VAT), the main tax on enterprises in European countries involving Russia, and, at second turn, the profit tax. At that, in any "civilized" country the value a<sub>1</sub> in (1) is the sum of process costs of two types: costs implemented with paying the VAT to a supplier (marketer) denoted here as λ, and costs implemented without paying VAT, denoted here as μ. Let v be the VAT rate related to 100%, i.e.  $0 < v < 1$ ; let p be the profit tax rate also related to 100%, i.e.  $p < 1$ . Then, under assumption of meeting conditions (1), one may write:

- The process costs:

$$(2) \quad \lambda + \mu = a_1 = 0,62;$$

<sup>2</sup> At the same time one should be noted that such an economical absurdity took place in Russia at the earl stage of the market reforms, when the profit taxable base was increased on the amount of exceeding of the actual remuneration over the fourfold (then, six-fold) amount of the legislatively set minimum remuneration (per each employee). Taking into account that such a legislatively set minimum remuneration was extremely low, one may affirm that at this stage of the market reforms in Russia the remuneration was not actually related to the process costs.

<sup>1</sup> <http://www.balancescorecard.org>



- The VAT amount contained in the proceeds (“the outgoing VAT”):

$$(3) \quad V_{out} = v(a_1 + a_2 + a_3)/(1 + v) = v \cdot 1,62/(1 + v);$$

- The VAT amount in the process costs purchased with VAT (“entering VAT”):

$$(4) \quad V_{ent} = v\lambda;$$

- Amount of the profit tax:

$$(5) \quad P = (1 - v \cdot 1,62/(1 + v))p.$$

Then, by virtue of (1), one may write

$$P + V_{out} - V_{ent} = a_3 = 0,38,$$

where from, by virtue of (3)-(5), it follows

$$(6) \quad \lambda = (1/v - 1,62/(1 + v))p + 1,62/(1 + v) - 0,38/v.$$

Value (6) is the amount of the process costs purchased with VAT, and assuring meeting relationships (1) under given rates of the VAT and profit tax. At that, by virtue of (2), the following condition is to be hold

$$(7) \quad 0 \leq \lambda \leq 0,62.$$

In Table 2 presented below, for 28 most developed European countries (involving those of the European Union except Cyprus) there are indicated VAT and profit tax rates, and corresponding to that rates the values of  $\lambda$  calculated from (6).

**Table 2**

No.	Country	VAT rate, %	Profit tax rate, %	Value of $\lambda$ in (6)
1	Liechtenstein	7,6	8,5	-2,50398
2	Switzerland	7,6	8,5	-2,50398
3	Estonia	18	0	-0,73823
4	Bulgaria	20	10	-0,185
5	Latvia	18	15	-0,11083
6	Romania	19	16	-0,01437
7	Slovakia	19	19	0,102689
8	Germany	16	25	0,234914
9	Lithuania	18	24	0,265612
10	Poland	22	22	0,308465
11	Slovenia	20	25	0,3625
12	Czech Republic	22	24	0,372817
13	Luxembourg	15	30	0,452754
14	Finland	22	28	0,50152
15	United Kingdom	17,5	30	0,507964
16	Sweden	25	28	0,53312
17	Norway	30	28	0,563897
18	Denmark	25	32	0,64128
19	France	19,6	33	0,652423
20	Portugal	19	34	0,687961
21	Austria	20	34	0,691
22	Spain	16	35	0,720259
23	Greece	18	35	0,725706
24	Netherlands	19	35	0,726979
25	Hungary	25	36	0,74944
26	Italy	20	37	0,8005
27	Belgium	21	39	0,864313
28	Ireland	21	40	0,898544

Table 2 clearly demonstrates that for majority (60%) of the countries, the affirmation of Prangishvili (2005a) on necessity of meeting relationship (1) in a “harmonized” case is not met even theoretically (condition (7) is violated). As to the resting countries (less than 40%, emphasized in Table 2) for which relationship (1) theoretically might be met, then in the real practice of these counties one also is not able to say that about due to, at least, in all “harmonized” countries from Table 2 the remuneration decrease the taxable profit (i.e. is related to the process costs) and, hence, *the taxes are not paid to the budget in accordance to the amount which is assumed by relationship (1)*.

## 5. ON DISTRIBUTION OF THE REMUNERATION OF LABOR

*“The remuneration of labor of employees of a “good” enterprise, organization, firm for maximal stability and sustainability is also expediently to be set in accordance to the rules of the “golden mean”. In accordance to that rule, the remuneration of any employee of the (n-1)-th level personnel arrangement hierarchy is to be on 62% less than the remuneration of the employee of the more high, n-th, level .... In accordance to that rule, there is to be composed a unique wage rates distribution in which the level of the remuneration of labor of each employee of the n-th labor grade is to be on 62% (0,62) less than that of higher, (n+1), labor grade, what today in real life is unfortunately not implemented.*

In a complex competitive system, the optimal distribution of shares of the remuneration between competitors is implemented in accordance to the “golden mean” or by use of the Fibonacci series, where the value  $a_n$  is equal to the sum of two preceding values in the Fibonacci series, i.e.  $a_n = a_{n-1} + a_{n-2} \dots$ ” (Prangishvili, 2005a, pages 182-183).

As an example, in the book of Prangishvili (2005a) “there is presented in accordance to the rules of the “golden mean”, or the rules of the Fibonacci series, a calculation of the remuneration of a collective consisting of 1024 persons being at 11 levels of the hierarchy. From the calculation, it is seen that if, conditionally, the minimal remuneration for the I labor grade is 600 rubles, then for the XI labor grade it should be 65971 rubles, i.e. the remuneration of each subsequent one is determined as 1,62 of the preceding one or as the sum of remunerations of two preceding ones ( $a_n = a_{n-1} + a_{n-2}$ ). ... it is seen that the ratio of 17% of high-paid employees to 17% of low-paid employees is 9,5. Setting the employees remuneration in accordance to the rule of the “golden mean” will assure more stability and interest of the employees and, hence, more stability in the personnel system and will exclude the disintegration and degradation” (Prangishvili, 2005a, page 183).

So, if is it indeed necessary meeting the condition under which the remuneration differentiation at an enterprise in dependence on the an employee’s position is to be subordinated to the condition of the golden mean, that is the remuneration at each next level of the labor grade hierarchy is to be just in 1,618... times higher than at the preceding level (as a necessary condition of the management effectives) as it is stated in the book of Prangishvili (2005a, pages 182-184)? If one will answer affirmatively to that question, then one will have to admit that the number of employees of such a “good” enterprise is always to correspond to a degree of 2, i.e. 2, 4, 8, 16, ..., 1024, ..., and that the world-famous book of Milkovic and Newman (2004) contains an exclusively considerable drawback completely depreciating the book’s substance (since Milkovic and Newman (2004) by no means mention the golden mean). Obviously, this may not be the case.

Besides that, it is of interest to consider an inequality index on incomes of employees of such a hypothetical enterprise. Fig. 2 presents the Lorenz curve for the cited example from the book of Prangishvili (2005a, pages 183, 184) in comparison with the line of absolute equality. The Gini index value corresponding to that example is 0,37 what is commonly considered as a values which may not serve as an indicator of "welfare" (for instance, the value considerably exceeds the Gini index value for mature industrial countries (Table 1)). Hence, from the inequality indexes point of view, there are also no reasons to affirm: "Setting the employees remuneration in accordance to the rule of the "golden mean" will assure more *stability* and *interest* of the employees and, hence, more *stability* in the *personnel* system and will exclude the *disintegration* and *degradation*" (Prangishvili, 2005a, page 183). Quite the contrary, implementing such an approach will promote the growth of the social tension between the employees pregnant with all possible consequences at that case.

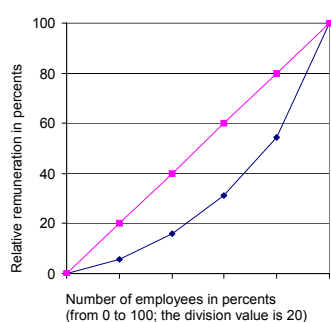


Fig. 2. The Lorenz curve for the example of calculating the number of the personnel hierarchy and remuneration from the book of Prangishvili (2005a, pages 183-184).

## 6. CONCLUSIONS

Prangishvili (2005a) points out "that for effective management, in practice, the *technology* of the "golden mean" is *much simpler and more convenient* than complex classical optimization techniques using which for complex multiply connected systems is quite *difficult*" (Prangishvili, 2005a, page 188). That affirmation (on simplicity and convenience) hardly ever may be accepted as a proof or, at least, as a reasonable scientific judgment. Any regularity, involving a system one, has a sense, i.e. may serve as a tool for, ultima analysi, decision making, if and only if it is scientifically explained. Otherwise, applying any regularity is similar to using folk omens for weather forecast. That, however, does not prevent Prangishvili (2005a) to make a far-reaching inference that one of causes of "the management crisis in up-to-date Russia" is "ignoring scientific methods of effective system management. In particular, the rule of the "golden mean" is not applied in management..." (Prangishvili, 2005a, page 232).

If a statement is failed to be proven, "to remove" the skepticism it may be declared as an axiom. Just that method of "proof" has been applied by Prangishvili (2005a) arguing "that there exist a large number of correct *sense statements* which, from the point of view of the *science*, i.e. existing axiomatics, *may not be proven*, while from the point of view of the *practice*, *they may not be refuted*, so they are accepted as a new *axiom* not requiring proofs. *The necessity* of availability in all effective systems of any nature of the rule of the "golden mean" practically presenting and widely propagated in all *chefs-d'oeuvre of the culture* (sculpture, architecture, painting, music, poetry, etc.), as well as in mathematics, physics, chemistry, astronomy, biology, physiology, human habitus,

in *effective* engineering, economical, political, scientific, educational, medical, financial, social, business- and other effective systems yet, *from the point of view of the science*, is failed to be proven, but simultaneously, from the point of view of the *practice*, this rule may not be refuted. So, the universal rule or regularity of the "golden mean" is necessary to be accepted unproved, as a new axiom" (Prangishvili, 2005a, page 188).

In contrast to such a judgment of Prangishvili (2005a), the present paper has proposed a justification of the negative answer to the question on necessity to follow the Fibonacci golden mean under managing social/economical systems. And the negative answer is natural: the problem of increasing effectiveness of managing complex systems may not contain, as a necessary condition, a requirement of setting several simple quantity relationships degenerating its entity.

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