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Topicality Investigation of Economic Definitions in the Cash Flow Area by the Tools of Internet-Analysis

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Abstract Results of analysis of topicality of researches in the cash flow area by the tools of Internet-analysis are presented. Selected definitions used for analysis are introduced. The topicality of researches in the cash flow area is confirmed. The necessity of further researches and creating new approaches and methods in the area of cash flow and its optimization was acknowledged.

Keywords: *cash flow, cash flow optimization, topicality, Internet-analysis, forecasting*

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1. Introduction

In modern conditions of operation and development of Ukrainian economy cash providing continues to be a task of paramount importance for managers. Cash flows ensure all types of company activities, namely operating activity, financial activity and investment activity. Cash flows regulation is important part of companies' administration because cash flows participate in all stages in production of goods and services and play key role in financial result receiving.

Enterprise's paying capacity and liquidity depend on cash flows structure and volume. That is why cash flow analysis is significant part of company's financial health estimating. Effectiveness of cash flows management influences to achievement of long-term and short-term objectives of company, goods and services production, carrying out company's obligations to employees, government, creditors and stockholders.

Problem of cash flow optimization is urgent for national producers today because of economic and political instability in Ukraine. It influences negatively to all spheres of business activity, causes stoppages and decreases enterprise's competitiveness. Consequently, cash flows management and optimization are relevant problems for the majority of Ukrainian economic entities. There are many researches done by foreign and domestic scientists about cash flows and their optimization. Therefore, it is necessary to do additional analysis of topicality of researches in this area.

2. Literature Review

There is a large literature that contains theoretical bases about cash flows operating and optimization. However, nowadays researches that show up relations between cash flows operation and other economic processes become more and more important.

Therefore, Ljungqvist and Richardson (2003) analyzed the cash flow, return and risk characteristics of private equity. They documented the draw down and capital return schedules for the typical private equity fund and showed that it takes several years for capital to be invested, and over ten years for capital to be returned to generate excess returns. Authors provided several determining factors for that schedules, including existing investment opportunities and competition amongst private equity funds. In terms of performance, they documented that private equity generated excess returns approximately five plus percent per annum relative to the aggregate public equity market. One interpretation of that magnitude was that it represented compensation for holding a 10-year illiquid investment [9].

Carpenter and Guariglia (2003) presented the following results. The interpretation of the correlation between cash flow and investment was highly controversial. Authors suggested that some argued that it was caused by financial constraints, others by the correlation between cash flow and investment opportunities that were not properly measured by Tobin's Q. That paper used UK firms' contracted capital expenditure to capture information about opportunities available only to insiders and thus not included in Q. When that variable was added in investment regressions, the explanatory power of cash flow fell for large firms, but remained unchanged for small firms. That suggested that the significance of cash flow stemmed from its role in alleviating credit frictions [3].

Mizen and Vermeulen (2005) have presented research about relationship between corporate investment and cash flow sensitivity. In that paper they offered new methods and results to determine whether differences are associated with structural explanations such as the nature of the financial system and industrial composition, or due to other firm-specific determinants such as size or creditworthiness. Authors were able to systematically control for competing explanations in their data from more than one country and thereby isolated what drives the relationship. They found that creditworthiness is the main driving force of cash flow sensitivity [11].

There is a large amount of cash flows optimization researches. Melo and Bilich (2006) represented that the economic agents try to find out the composition of different forms of wealth, and the amount of each, that maximizes total benefits. Authors confirmed that money demanded by firms and people is a function of the benefits and costs of holding it considering other forms of wealth. The Expected Balance Model (EBM) proposed by them minimized the Total Cost (combined Holding and Shortage Cost) of maintaining and transforming money from or into other forms of wealth. The EBM was an instrument of cash flow decision that represented the demand for money by firms according to their needs of maximizing the utility of total wealth [10].

U. Gafurova (2015) estimated the impact of cash flow on the effectiveness of financial means. Author claimed that cash flow optimization is a key factor in ensuring the financial viability and sustainability of a company. Efficiently organized cash flows were a sign of the financial health of the enterprise. It was said that the need to optimize cash flows aroused primarily from the movement of material flows of funds in the required quantities, at the right time with the use of the most efficient sources of funding. That article discussed the direction and methods of optimization of cash flows, was determined by the need to optimize the cash flow in order to ensure the financial sustainability of the organization [4].

Shu-Shun Liu and Chang-Jung Wang (2010) have carried out research about profit optimization for multiproject scheduling problems considering cash flow. That study investigated cash flow for profit optimization and handled scheduling problems in multiproject environment. By identifying the amount and timing of individual inflow or outflow at the end of each period, contractors could observe the cash flow at specific time points according to project progress. Since most companies handled multiple projects simultaneously, managing project finance became complicated and tough for contractors. Therefore, that study considered cash flow and the financial requirements of contractors working in a multiple-project environment and proposed a profit optimization model for multiproject scheduling problems using constraint programming. Authors also presented a hypothetical example involving three projects to illustrate capability of the proposed model and adopted various constraints, including credit limit (CL) and due dates, for scenario analysis. The analysis result demonstrated that setting CLs ensures smooth financial pressure by properly shifting activities, and assigning due dates for projects helped planners avoid project duration extension while maximizing overall project profit [8].

3. Problem Description

On the modern stage of economic relations development, it is necessary to take into account the influence of international financial activity to nation economy's functioning. Scientists insist that financial globalization is the most dynamic element of globalization. It demonstrates increasing interdependency of financial and economic systems of countries all over the world. Therefore, financial globalization determines development direction of the national economies [14]. Cash flow is essential part of economic system of every country. Therefore, it can be supposed that globalization processes influence it. Consequently, we suppose that topicality of researches in the area of cash flow and its optimization can be related on the world-level and on the level of national economy (in this paper – Ukrainian economy). Therefore, the goal of this paper is to estimate relations between demand fluctuations of researches about cash flow and cash flow optimization in the world and that one in Ukraine and determine which factors influence to this demand in Ukraine more: foreign economic forces or internal economic, political and social events.

4. Theoretical Fundamentals

The method of Internet-analysis [5] was used during investigating and analyzing of the cash flow sphere. This method is used to get some estimation or family of estimations regarding analyzed definitions. These definitions, or terms, form categorical body of brunch of scientific researches. In this paper, analyzed definitions are "cash flow" and "cash flow optimization". Received estimations allow confirming expediency and needing of our research and formulate conclusions about growth of topicality for analyzed definitions due to the influence of economic, political and social factors of the environment.

The use of method is based on the specificity of query language that is used by all searching servers. It is determined with the form of inquiry. Results of the inquiry from a set of selected searching servers are averaged on defined period. Therefore, the dynamism of the research is obtained. The study period is 1990-2015 years. A set of searching servers includes Google, Yandex, Yahoo, I.UA, Mail, Alltheweb, Rambler, Bing, Meta, Nigma, Metabot, AltaVista, Wikipedia, UaPORT, Uaportal, Holms, Poshuk, Weblist, List, Lycos, UP, Infoseek, Magellan, Galaxy, Webcrawler, Dmoz, Jayde, Asiannet, REX, Euroseek, Search.MSN, Whatuseek. The amount of selected searching servers is enough to get representative sampling [5].

The process of investigation is divided on 4 stages.

First stage. Analyze of topicality of researches for definition "cash flow" (in Ukrainian) by tools of method of Internet-analysis. Graphic distribution of results is shown on the Figure 1.

We can see rapid growth of dynamics for the definition "cash flow" (in Ukrainian) (Figure 1) in 2010 (rise 45% compared with previous year and almost 5,5 times more compared with the beginning of the study period). It can be connected with inculcation of direct method of composition of statement of cash flow in Ukraine. Statement of cash

flow is one of the required financial statements for domestic entities [1,7].

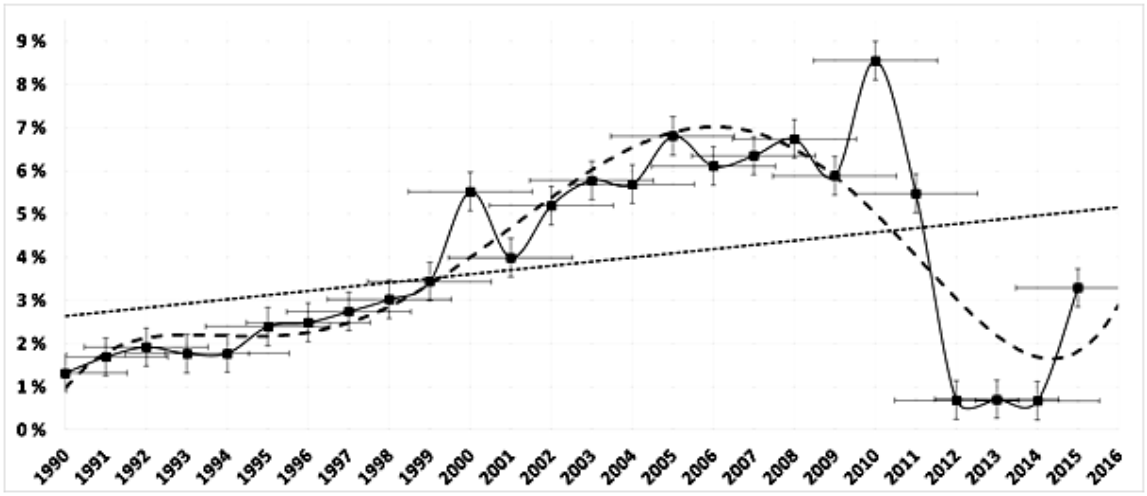

Figure 1. Distribution of the topicality of researches dynamic for definition "cash flow" (in Ukrainian)

There is high growth recession of dynamic (down 87% compared with previous year) in 2012 and dynamic stabilization at respectively low level (down close to 48% compared with the beginning of the study period) in 2013-2014. Therefore, interest level for the definition "cash flow" (in Ukrainian) has fallen down rapidly and continues to be low. Nevertheless, in 2015 there is topicality growth for researches in this area (almost 4 times more compared with 2014). It can be connected with economical slack progressing in Ukraine [12]. In 2016 forecast estimation of topicality dynamic for the definition "cash flow" (in Ukrainian) does not differ from the figure of the previous year (2015). Additionally forecasting trend model based on the polynomial model of 5th degree was calculated:

$$y = 4E-07x^5 - 0,0041x^4 + 16,608x^3 - 33249x^2 + 3E+07x - 1E+10 \quad (1)$$

It's accuracy of the approximation R^2 is high enough (R^2 = 0,7591).

Second stage. Analyze of topicality of researches for definition "cash flow optimization" (in Ukrainian) by tools of method of Internet-analysis. Graphic distribution of results is shown on the Figure 2.

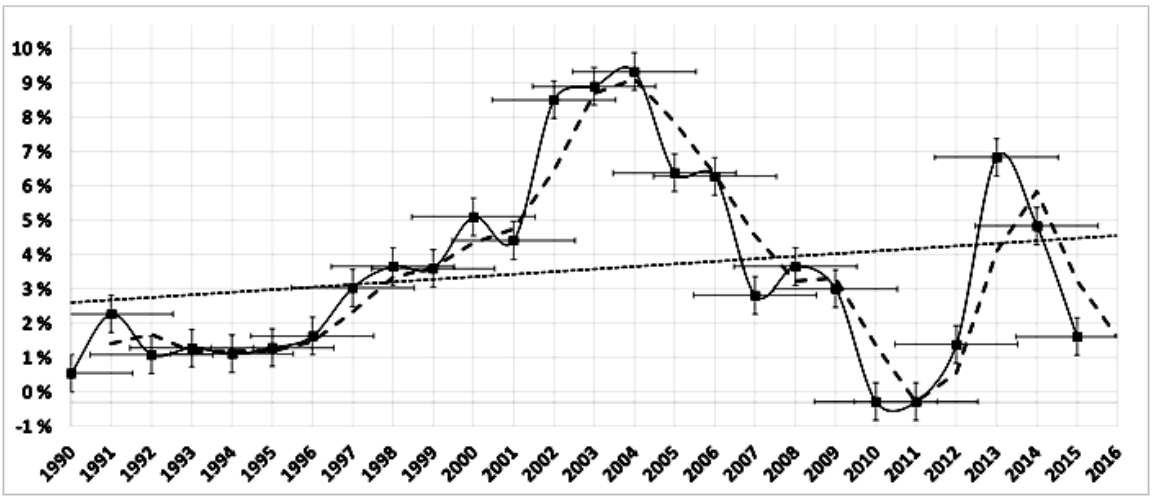

Figure 2. Distribution of the topicality of researches dynamic for definition "cash flow optimization" (in Ukrainian)

At the beginning of the study period, there is quite rapid growth (in 1991 figure of dynamic rose almost twice compared to 1990) of topicality of researches for definition "cash flow optimization" (in Ukrainian). However, in 1992 dynamic fall down 46% compared with previous year.

During the 1992-1996 there was gradual growth (rise near 10% every year compared with previous year) of interest to the definition "cash flow optimization" (in Ukrainian). It can be connected with the general growth of interest to economic researches in period of national economic reforming in accord with the market principles of economy functioning [15].

There is rapid growth of topicality of researches in the area of cash flow optimization in 1997 (rise 73% compared with previous year), 2000 (rise 39% compared with previous year), 2002 (rise 87% compared with previous year). There is small stable growth (rise 5% annually) of demand of researches in this area in 2003-2004. It can be connected with appearance and developing of new types of entities which are not distinctive for command-administrative system, for example, investment companies which widely use methods of cash flow optimization during operating activity [6,13].

We can see slow decrease of dynamic of topicality of researches for definition "cash flow optimization" (in

Ukrainian) from 2005. In 2005 interest fall down 31% compared with 2004. In 2007 interest fall down 53% compared with 2006 and 68% compared with 2004 (maximum peak during the study period). There is small growth (rise 27% compared with previous year) of demand of researches about cash flow optimization in 2008. However, in 2009 dynamic fall down and achieved its minimum in 2010-2011 (down twice compared with previous 2010 and on the average down 97% compared with the beginning of the study period).

During 2005-2011, downward dynamic of topicality of researches in the area of cash flow optimization can be connected with saturation on the research market for this definition during previous years (1990-2004). In 2012, we can see growth of the interest to definition "cash flow optimization" (rise 6440% compared with previous year). This growth continues in 2013 (rise 3 times compared with 2012). It can be connected with need of rethinking of available researches about cash flow optimization with purpose to fit these researches to modern economic conditions [16]. However, in 2014-2015 there is downward dynamic of topicality of researches again (down 28% in 2014 and 63% in 2015 compared with 2013 and 2014 accordingly). In 2016-forecast estimation of topicality dynamic does not differ from the figure of the previous year (2015). Additionally forecasting trend model based on the linear flow was calculated.

Third stage. Analyze of topicality of researches for definitions "cash flow" (in English) and "cash flow optimization" (in English) by tools of method of Internet-analysis. Graphic distributions of results are shown on the Figure 3 and Figure 4.

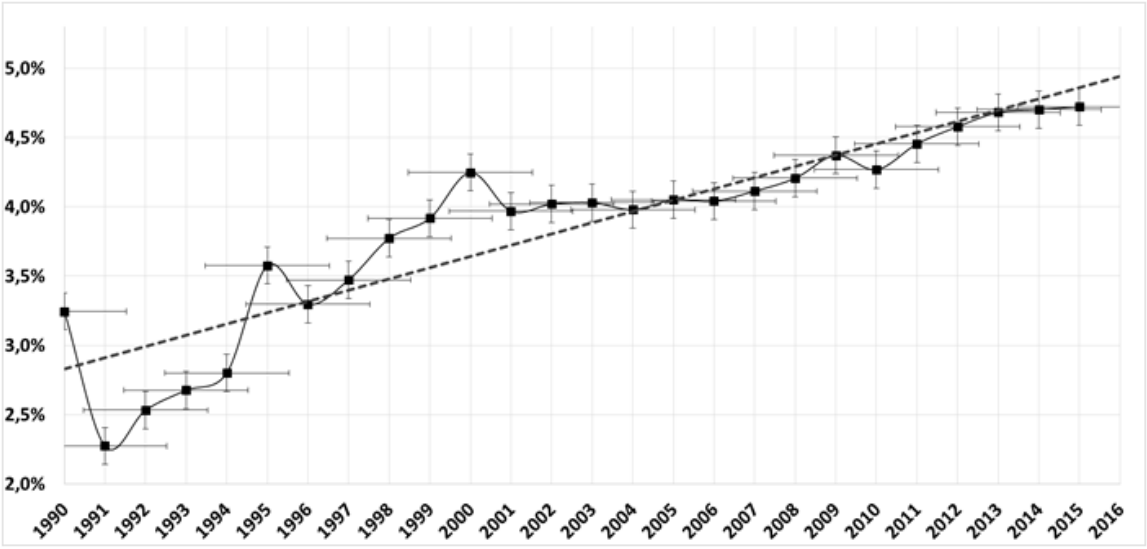

Figure 3. Distribution of the topicality of researches dynamic for definition "cash flow" (in English)

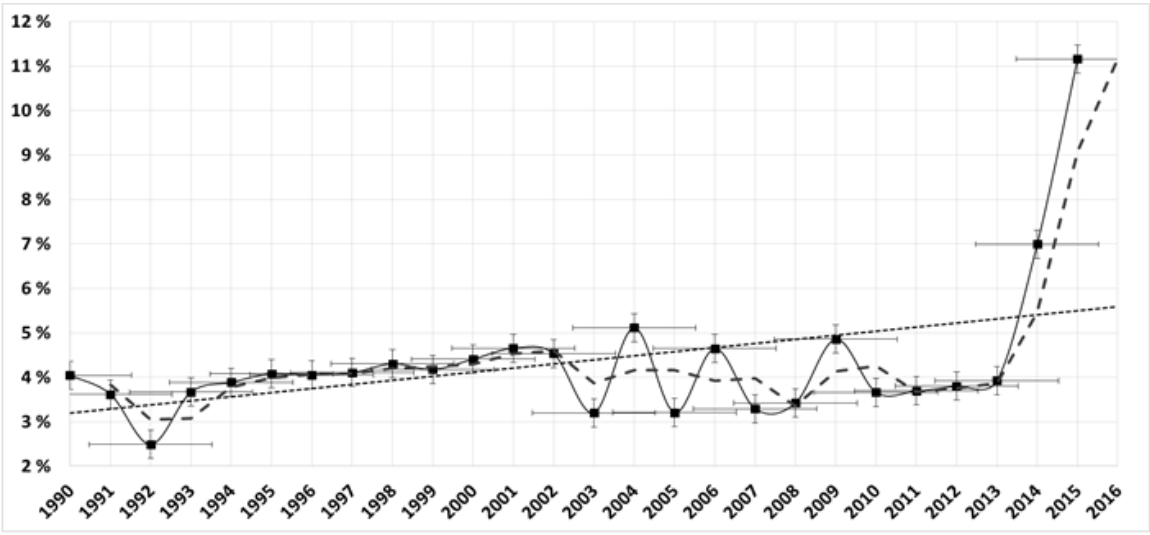

Figure 4. Distribution of the topicality of researches dynamic for definition "cash flow optimization" (in English)

We can see at the graph (Figure 3) that dynamic of topicality of researches for definition "cash flow" (in English) is positive and growing. In 2015 The rate of growth is 45,5% (compared with basic 1990 year). Forecasting linear trend model was calculated for received distribution of results:

$$y = 0,0008x - 1,5883 \quad (2)$$

It's accuracy of the approximation R^2 is high enough ($R^2 = 0,8288$).

Stability of growth of topicality of researches for definition "cash flow" (in English) has provided high estimation of the accuracy of approximation R^2. It allows

getting perfect forecast of topicality dynamic for this definition in future.

At the graph (Figure 4) we can see that that dynamic of topicality of researches for definition "cash flow optimization" (in English) is positive. There is stability of the dynamic growth. From 2013, there is rapid growth of demand of this definition (in 2014 rise 89% compared with 2013 and in 2015 rise 64% compared with 2014). Forecasting trend model based on the linear flow was calculated for received distribution of results. Therefore we can say that interest to definition "cash flow optimization" (in English) stays stable in spite of the rapid growth of demand of researches in this area during two last years (2014-2015).

Fourth stage. Correlational analysis of relations between definitions "cash flow" (term was considered as "грошовий потік", ГП), "cash flow optimization" (term was considered as "оптимізація грошових потоків", ОГП), "cash flow", CF and "cash flow optimization", CFO. Results of correlational analysis are shown in Table 1.

We can see (Table 1) that relation is close to zero between definitions CFO and ОГП, so there is no connection between these definitions. Relation is weak between definitions ГП and ОГП, ГП and CFO (index of relation moves from 0,1 to 0,3). Relation is moderate between definitions CF and ГП, CF and ОГП, CF and CFO (index of relation moves from 0,3 to 0,5) and it is polysemantic. Relation is negative between definitions CFO and ГП, so it is weak and inverse and we can say that these definitions are independent.

5. Results

Graphic distribution of results were received. They are presented at the Figure 1 - Figure 4. All data were been normalized and reduced to single scale of distribution (in percent from total).

At the Figure 1 we can see that dynamic of the topicality of researches for definition "cash flow" (in Ukrainian) is linear and positive. General dynamic is positive even after sudden increasing of topicality in 2000 (rise 61% compared with previous year) and in 2010 (rise 45% compared with previous year) and decreasing in 2011 (down 36% compared with previous year) and in 2012 (down 87% compared with 2011 and down 92% compared with 2010). General dynamic confirms unremitting interest to researches about cash flow and its optimization and topicality growing for definition "cash flow" for some periods of time (2000 and 2010 years) in Ukraine.

At the Figure 2, we can see that dynamic of the topicality of researches for definition "cash flow optimization" (in Ukrainian) is linear and positive. General dynamic is changeable. Therefore, the interest to researches about cash flow optimization is variable in Ukraine.

At the Figure 3, we can see that dynamic of the topicality of researches for definition "cash flow" (in English) is linear and positive. General dynamic is positive. Therefore growing of the interest to investigated definition is stable. Furthermore, the demand for researches about cash flow is constantly growing in the world.

At the Figure 4 we can see that dynamic of the topicality of researches for definition "cash flow optimization" (in English) is positive. Stable development of interest to this definition is observed in the world. Demand fluctuations for researches about cash flow optimization move from 3% to 5% during the investigated period of time (except 1992, 2014 and 2015 years).

Table 1. Results of correlational analysis of observed definitions

	ГП	ОГП	CF	CFO
ГП	1			
ОГП	0,271122	1		
CF	0,35675	0,310746	1	
CFO	-0,12379	0,027249	0,42095	1

There are results of correlational analysis of relations between definitions "cash flow" (term was considered as "грошовий потік", ГП), "cash flow optimization" (term was considered as "оптимізація грошових потоків", ОГП), "cash flow", CF and "cash flow optimization", CFO in Table 1. Estimating of results of correlational analysis was based on the Cheddok's scale [2].

6. Conclusions

As a result of analysis of topicality of researches about cash flow and its optimization forecasting trend models were calculated. Due to them next conclusions can be drawn. Firstly, the demand of researches about cash flow has stabilized in Ukraine. Additional researches and new approaches in this area are needed. There are not enough scientific researches in the investigated area, therefore researches about cash flow are topical in Ukraine. Secondly, the demand of researches about cash flow optimization has cyclical disposition in Ukraine. There is necessity for investigating and creating new methods and approaches to cash flow optimization, which will be more adapted to the modern economic conditions of entities development.

Due to the correlational analysis between investigated definitions next conclusions can be drawn. Investigated definitions do not have close relations. Therefore, demand fluctuations of researches about cash flow and cash flow optimization in the world do not influence to demand fluctuations of researches about cash flow and cash flow optimization in Ukraine. So internal economic, political and social events influence to the interest to researches in the investigated area more than foreign economic forces.

Acknowledgement

This research was done in the context of payment analysis and optimization in enterprises. It confirms the topicality of researches in the investigated area. The directions of further researches are formation of the stages of the payment and searching ways of the payment optimization for enterprise.

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