

Absence of butterfly arbitrage corresponds to the existence of a risk-neutral martingale measure and the classical definition of no static arbitrage. A slice is said to be free of butterfly arbitrage if the corresponding density is non-negative. For this, I use BS formula for a European Call Option. I define function $g(k)$ as a density function of log strike prices of the European Call Option:

$$g(k) := \left(1 - \frac{k\omega'(k)}{2\omega(k)}\right)^2 - \frac{\omega'(k)^2}{4} \left(\frac{1}{\omega(k)} + \frac{1}{4}\right) + \frac{\omega''(k)}{2}$$

A slice is free of butterfly arbitrage only if $g(k) \geq 0$ for all $k \in \mathbb{R}$ and $\lim_{k \rightarrow \infty} d_+(k) = -\infty$.

In conclusion, in this section I elaborated by means of Kellerer's theorem necessary conditions that ensure that implied volatility surface of the parametrized SVI model is static arbitrage-free.

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FINANCIAL INSTRUMENT OF ADJUSTMENT OF THE INVESTMENT PROCESS

The current post-crisis state of the Ukrainian economy, the emergence of the need for significant investments, unprofitable in terms of private capital, but necessary to continue reproduction on a national scale, and the failure of the «free market» to address these problems, require state intervention in the process of investment regulation. On the other hand, the course of political processes, the presence of the so-called «shadow» sector of the economy and, at the same time, the absence of clear mechanisms for the implementation of the chosen investment strategy negatively affect the investment climate and, in particular, the international investment image of Ukraine, which causes both losses of potential investment resources and outflow available capital.

The works of many prominent Ukrainian scientists are devoted to the urgent issues of constructing an effective investment regulation system in Ukraine. But despite the widespread coverage of the problem in the scientific literature, Ukraine has not yet created a well-founded system of state support for investment activity. As a consequence, the Ukrainian investment environment has created a vicious circle: the lack of investment is aggravated by the decline in production, which, in its turn, leads to a reduction in the investment potential of both individual economic entities and the state as a whole.

In conditions of free competition, the determining factor for investor motivation is the financial component, namely, the projected return on investment and the procedure for obtaining it. Therefore, in order to develop effective proposals for improving the management of investment processes in Ukraine, it is necessary to generalize and systematize scientific approaches to the essence and possibilities of using financial instruments to influence investment activity. The purpose of the study is to generalize the theoretical foundations and determine the prospects of using financial instruments for regulation of investment activity.

Implementation of state investment policy is carried out by creating an investment mechanism based on the use of a set of methods of direct and indirect state regulation. All methods of state influence on the investment process are divided into administrative and economic ones. The first involves direct state interference in the production process, influence on direct production parameters. The second is the use of market instruments to influence the interests of the commodity producer. Financial methods of influencing the investment process are usually identified in the scientific literature with economic ones. However, despite the fact that the basis of financial and economic methods of management are monetary relations, the differences allow to distinguish financial methods from the composition of economic: if economic methods cover all monetary relations, then the financial is based only on monetary relations related to the formation, distribution and using funds of money resources.

Financial management methods are closely linked to the distribution and control functions of finance and ensure their implementation. In turn, financial instruments are a set of financial indicators through which the management system can affect the economic activity of the enterprise, namely:

in regulation of relations «enterprise-state»:

- taxes, duties and other payments to budgets of different levels, tax breaks, tax credits;

- financial incentives (subsidies, subsidies, targeted loans, administrative state support, system of state guarantees, project financing, etc.);
- financial sanctions (fines, penalties, other);
- depreciation rates;
- in regulation of relations «enterprise - other economic entities»:
 - prices for goods, work, services and resources;
- in regulation of relations «enterprise - financial and public organizations»:
 - credit instruments (interest rate, provisions of obligatory reserves for banks, leasing payments);
 - currency (exchange rate of the national currency, currency reserves of banks, etc.);
 - insurance (insurance indemnity, insurance premium rates);
 - charitable contributions;
- in regulation of relations «enterprise-employees»:
 - wages, as well as financial incentives and sanctions;
- in regulation of relations «enterprise structural divisions»:
 - profit, dividends and bonuses;
 - internal transfer prices.

The state, performing in this case the role of the management system, through the use of appropriate instruments regulates all types of financial relations. Taking into account the current economic situation in Ukraine, the most effective measures to revive investment activity will be the following:

- reduction of tax pressure on enterprises in order to leave business entities from the «shadow», and, in particular, to small businesses in order to attract a small domestic investor to the investment process. The purpose of tax policy should be not only the filling of the budget, but the priority stimulation of the investment activity of economic entities;
- reduction of benefits for unprofitable sectors, instead realization of the favorable terms declared in the legislation on taxation of profit of enterprises, which direct the received profit for research development and introduction of the newest technologies of production;
- state price regulation, price support necessary for the public reproduction of industries (in particular, agriculture);
- introduction of measures to liberalize the movement of foreign capital, unimpeded repatriation of profits received on the territory of Ukraine, free foreign trade;

- restoration of public confidence in the domestic banking system, conducting of incentive measures, guaranteeing and insurance of deposits, as well as involvement of banking institutions in financing investment projects, development of non-bank financial institutions;

- strengthening of state control over the volume of foreign capital, which has a debt nature, regulation of foreign exchange flows through branches of foreign banks;

- introduction of control over the purposeful use of depreciation funds in cases when enterprises choose non-linear methods of depreciation; acceleration of decommissioning of physically and morally depreciated fixed assets;

- state assistance in the development of saving types of insurance as a source of investment resources (creation of preferential terms of taxation of insurance payments, inheritance, etc.);

- development of stock market and financial services market;

- revival of the practice of SEZ and TPD with the simultaneous implementation of measures to guarantee the rights of investors, as well as preventing the distortion of the competitive environment, violation of the principle of fairness of taxation and the emergence of corruption risks.

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