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A METHODOLOGY FOR THE VALUATION OF INNOVATIVE PROJECTS AS AN IN-KIND CONTRIBUTION

Key words

Contribution in-kind, innovative project, in-kind contribution capacity of innovation outputs, valuation of innovation outputs.

Summary

The paper presents a method for the valuation of innovative project outputs as the object of in-kind contribution to a commercial company. In-kind contribution of an innovative project can be treated as a form of technology transfer. The realisation of technology transfer in the form of the in-kind contribution requires an estimate of its value. Assuming that a research project is a value carrier in the process of valuation, this value should be estimated in terms of its ability to cover liabilities, which is the attribute of each in-kind contribution. The presented valuation method is based on the philosophy adopted within the framework of the income valuation methods, i.e. on the capacity of innovative project outputs to generate current cash flows from the company profits in the future. Innovation in itself is not, however, the source of profits. It is, in addition to financial capital, part of the overall capitals that finance operational assets. Thus, the process of innovative project valuation must be preceded by the measurement of innovation outputs generated by the project, i.e. its innovation potential. "The duration of the competitive advantage" achieved through the implementation of innovation in the company

can be one of the methods to measure the innovation potential. This indicator can be widely applied both as the indicator for the leader that leaves the competition behind due to the in-kind contribution of an innovative project and as the indicator for the company that reduces the distance separating it from the leader.

Introduction

The realisation of research projects requires material expenditures. Material expenditure can be limited at the initial stages of the innovative concept. However, as the work progresses to further stages the expenditure rises considerably and reaches the highest value at the stage of industrial implementation. All stages of an innovative project are rarely carried out by one entity with a uniform ownership structure. Sometimes even at the initial stages of the project there arises the need for technology transfer between entities. This transfer can be carried out in a variety of ways, each of them, however, requires, to a smaller or larger extent, the project valuation at the stage when the transfer occurs. The aim of this paper is the presentation of one of the methods of innovation valuation based on the concept of competitive advantage. Innovation valuation is always based on the assessment of the innovation potential. While the innovation potential can be estimated using a variety of analytical and synthetic indicators [5], the valuation must result in the estimated value of this potential.

1. Important concepts concerning the measurement of the innovation potential for its valuation

The measurement and the valuation are not identical categories. The measurement is a wider category and means the choice of an indicator for a particular category. This indicator can be a natural unit, a conventional unit, or even a value (currency). The valuation, on the other hand, aims to establish a theoretical value, "a value in itself." The measurement of the innovation potential of research project outputs has a much wider application than the preparation of the foundations for its valuation.

There are many reasons why it is necessary to carry out this kind of measurement. These include the following [5]:

- 1) The need for project accounting,
- 2) Streamlining the transfer process,
- 3) The demonstration of project value, and
- 4) The analysis of the probability of the project's success based on the evaluation of the project potential before making the decision on its realisation.

The process of measuring the innovation potential, however, is essential if the transfer of research project outputs should be carried out by commercial means. The transfer of research project outputs is carried out by commercial means not only in the case of their sale in a specific form (e.g. a licence) but also in the form of in-kind contribution when these outputs take the form of innovation potential contribution in exchange for the company shares.

The measurement can be carried out either by the seller or the purchaser of these outputs. The seller is mostly interested in the reimbursement of expenses incurred during the project implementation; while the purchaser is mainly interested in the potential that affects their operational, non-material and legal assets (e.g. a production licence) or intellectual assets that serve to continue the research activity, since the purchaser aims to present the innovation potential in the form of assets listed on the balance sheet.

The literature describes many interesting methods to measure and evaluate the innovation potential of research project outputs. The authors of the book *Wybrane metody i mierniki oceny transferu technologii w obszarze innowacyjnych projektów i ich efektów rynkowych* ("Selected Methods and Indicators for the Assessment of Technology Transfer in the Area of Innovative Projects and Their Market Effects") describe one such method [5]. They point to two different approaches to the project evaluation:

- 1) *Ex ante*, before conducting the transfer, with a view to making the decision on the commercialisation of the acquired solutions, its scope and intensity; and,
- 2) *Ex post*, when the evaluation is carried out in order to summarise the project results and its accounting in terms of the effectiveness of the expenses incurred.

It seems that, from the perspective of the commercialisation of research project outputs, these approaches are not mutually exclusive and the application of either of them is related to the particular stage of the commercialisation process. Transfer can be conducted after each stage of the evaluation of the degree of implementation maturity. Thus, such concepts as "the funnel of ideas" or "stage-gate" presented by the authors are, in our opinion, very useful in the process of the measurement of the innovation potential that subsequently enables its valuation. The method of assessing the degree of implementation maturity (DIM) created by the team at the Exploitation Technology Institute, National Research Institute, in Radom [3] can be particularly useful in the process of the valuation of the innovation potential that constitutes the object of the in-kind contribution. The authors of this method distinguished several phases and levels of the evaluation of the innovation potential in terms of its implementation readiness. It can be said that research project outputs can be commercialised after each positively evaluated development stage; therefore, the need may arise to carry out the valuation of these outputs after each of the phases.

2. Selected aspects of the valuation of the innovation potential

The innovation potential constitutes an element of intellectual assets. It is possible to accept a very wide definition of innovation and thus suggests that organisational and market assets fall into the concept of innovative assets, because they encompass organisational, product and technological innovations. However, it seems more correct to accept that the value carrier is an important asset criterion. The carriers for particular outputs of the innovative project are so dissimilar that it is justified to distinguish innovative assets as a separate component of intellectual assets. The methodology of the measurement of the innovation potential presented below is the result of four cases of in-kind contribution to the company of “know-how,” which is the output of the research projects carried out by their sellers. For the seller, the know-how contribution is the moment of the sale of research project outputs with the established innovation potential while retaining control over the further research process. For the purchaser, it is the source to acquire this potential without using his or her own capital. In each analysed case, the innovation outputs were not listed on the balance sheet of the owner. Each time the process of making an in-kind contribution to the company in the form of innovation outputs was carried out in three phases:

- 1) Their identification was carried out, which served to determine “the capacity for know-how contribution” (the description of the outcomes of the innovation potential application).
- 2) The measurement was carried out to assess the outcomes resulting from the application of the outputs in the company purchasing them.
- 3) Their valuation was carried out.

The problem of know-how contribution capacity as the carrier of the innovation potential aroused a lot of controversy at the beginning of 1990's; although, it is hard to argue the thesis that the creation of know-how requires expenditure and that the know-how purchaser gains notable benefits. The controversy concerning the in-kind contribution capacity of innovative assets was the subject of many court decisions. The know-how contribution capacity was approved by the *Voivodeship* Court in Warsaw in the ruling of 2nd July 1990. The in-kind contribution capacity is attributed to technical secrets as well as confidential trade and organisational information of the company.

Far less controversy is raised at the know-how valuation if the whole company is the object of in-kind contribution, not a separate element in the form of know-how. However, the separated know-how can also be the object of in-kind contribution, provided certain conditions are met, since difficulties are caused by the function of in-kind contribution as a factor covering the declared equity and the function of basic capital. Taking into consideration these functions, the following criteria of the in-kind contribution capacity of any asset, hence the innovation potential contained in know-how, should be adopted:

- It should demonstrate the capacity of transferring ownership onto a business entity.
- It should have a notable balance-sheet value as an enterprise component of the asset acquiring entity.
- It should enable debt collection in order to satisfy creditors' claims.

These criteria constitute a significant challenge for the in-kind contribution capacity of the innovation potential present in research project outputs, particularly when these outputs are the result of early development phases. They also offer guidance for all the parties concerning what the process of this type of in-kind contribution should look like.

First of all, the fact of making the in-kind contribution to the company in the form of research project outputs ought to be documented in no uncertain terms to prove that the ownership transfer took place (the identification phase). Problems could arise, particularly in the case of confidential information comprising the output and constituting, for example, technical secrets. The contributed information should be precisely detailed in a confidential document to enable its identification.

The measurement and the valuation of the innovation potential should be carried out by thoroughly pointing out its application as well as its capacity to participate in business trading (the capacity to commercialise research project outputs). In the case of a joint stock company, there arises the necessity to verify the in-kind contribution value by chartered auditors. The in-kind contribution in the form of research project outputs should also have a selling value that determines their capacity to cover debts in case the company becomes insolvent and needs to declare bankruptcy.

3. The outline of valuation methodology for innovative projects as an in-kind contribution

Innovative projects are carried out in various legal and organisational structures. It is a rare occurrence for all the phases to be carried out within the framework of one entity. The outputs of individual phases can be transferred to other entities, and in-kind contributions to commercial companies may be a form of such a transfer. The approach to the valuation of innovative projects can differ depending on the valuation methodology. This paper presents the methodology applied in several such cases.

The effective valuation of innovative projects is subject to an initial [1] and in-depth [4] evaluation of the potential for commercialisation. Its results are placed in the appropriate report that contains the following:

- 1) The assessment of the strategic criteria,
- 2) The assessment of the potential for direct benefits,
- 3) The assessment of the market potential and barriers to market entry,

- 4) The direct assessment of the technology,
- 5) The assessment of the degree of end consumers identification,
- 6) The assessment of the determinants connected with the protection of intellectual property,
- 7) The assessment of the technical condition, and
- 8) The assessment of the necessary resources (expenditure).

In order to confirm the in-kind contribution capacity of research project outputs, the presented evaluation results should contain conclusions that refer to the following:

- 1) The degree of implementation maturity,
- 2) The subsequent development stages of the project outputs,
- 3) The duration of subsequent phases, and
- 4) The duration of the competitive advantage.

The presented methodologies in literature that measure outputs of research projects generally offer a rather extended system of indicators. The effective valuation depends on the possibilities of finding synthetic indicators that convey the essence of benefits derived from the implementation of research project outputs. The “period ahead of the competition,” which determines the degree of competitive advantage achieved by the entity implementing the transferred technology, can be such a synthetic indicator. The period ahead of the competition (PAC) can be defined as the period when the innovation becomes disseminated to the extent that every company can initiate production based on the given technology without the necessity to purchase the rights to this technology. The period of innovation dissemination cannot be longer than the period of the economic depreciation of the value of innovation outputs.

The observation of the cases of in-kind contribution of innovation outputs confirmed that the determination of such an indicator is possible. Evaluation teams that evaluate innovative projects can be assigned the task of PAC determination. In the analysed cases, the outputs of the innovation process were the ideas, formulas, and models of the output that constituted the innovation and allowed the company acquiring them in the form of in-kind contribution to achieve a competitive advantage of, for example, 5 years, 3 years, 2 years, etc. The evaluation of the period ahead of the competition was carried out with the intention of the transfer of the outputs in the form of in-kind contribution to commercial companies. The positive completion of the work undertaken for the evaluation purposes leads to an important conclusion that “the period ahead of the competition” can be a synthetic indicator to evaluate innovations. This period can be estimated by the innovation experts based on the analysis of the market, competition, and innovation progress. There is no reason to believe that there is more subjectivity in this evaluation than in any other method to measure the innovation potential.

In one of the analysed cases, the object of in-kind contribution was the innovation output created as a result of research activity carried out for three

years on the construction of the cab of the “air taxi,” which is a four-person aeroplane. The research was conducted by an individual running a registered business and was financed, among others, by the funds of the State Committee for Scientific Research. The continuation of this research required more funding. In order to raise the funds, the concept of a limited joint-stock partnership with the general partner’s in-kind contribution in the form of the existing outputs of the research project and with the limited partner’s in-kind contribution in the form of the financial resources for completing the research was developed. Accounting assets of the individual’s company referred to the conducted business activity that was outside the scope of the “air taxi” production, so they could not be the basis for the in-kind contribution valuation.

The outputs of the completed phase of the research project were defined as follows:

- The documented proprietary technology of plane geometry reconstruction and mould manufacturing for the production of composite aeroplanes,
- The proprietary construction and technological solutions applied in the construction of composite aeroplanes.

The essence of the technological value was the possibility to construct the aeroplane – the “air taxi” – designed for professional purposes with the following features important for the user:

- Great accessibility, confirmed by users during trial flights,
- The ease of getting into the aeroplane, and
- The spacious interior that allows the transport of luggage, approx. 20% bigger than the interior of the aeroplanes currently manufactured.

The in-kind contribution value in the form of the above mentioned innovation outputs enabling further work on the construction of the cab for the “air taxi” was valued based on the assumption that the basic indicator of implementation effects is the possibility to start the production and sale of aeroplanes 2 years ahead of the competition (after taking into consideration the estimated period needed for the continuation of further research and the deployment work). Thus, the estimated outcome of acquiring these outputs by the company was determined as the difference between the sum of the discounted 5-year revenue from the sales of the aeroplanes calculated on the assumption that the revenue will appear directly after the in-kind contribution is made and the sum of the discounted 5-year revenue based on the assumption that revenue will appear after 2 years since the investment completion, i.e. after the innovation is disseminated so much that the output implementation will not necessitate the purchase of the licence. It was assumed that the innovation has no influence on the residual value of the company, since its value is depreciated in “the period of ahead of the competition.” Thus, the residual value was omitted in the calculation of the in-kind contribution valuation.

Table 1. An example of the valuation of innovation outputs transferred in the form of in-kind contribution

Periods	0	1	2	3	4	5	6	7
Time ahead of the competition (years)	2							
Discounted values (in thousands PLN)								
a) after the in-kind contribution of innovation outputs		1279.6	1219.7	1162.6	1108.2	1056.4		
b) without the in-kind contribution of innovation outputs				1162.6	1108.2	1056.4	1006.9	959.8
The sum of the discounted values								
a) after the in-kind contribution of innovation outputs (in thousands PLN)	5826.6							
b) without the in-kind contribution of innovation outputs (in thousands PLN)	5294							
The effect of the acquisition of the innovative outputs (in thousands PLN)	532.6							

Source: Author's compilation based on [2].

A similar methodology of the valuation of innovation outputs was applied in the three other analysed cases. There were differences in the valued periods of the competitive advantage achieved due to the acquisition of the innovation and the size of the discounted cash flows generated by the company.

Conclusions

In general, it can be assumed that one of the methods to measure the innovation potential present in innovation outputs can be the duration of the competitive advantage resulting from their application. This indicator can be used widely, both as the indicator for the leader staying "ahead" of the competition and for the company that has decreased its distance from the leader due to the acquired or created innovative assets.

It can be said that the measurement of the innovation potential over the periods when the competitive advantage lasts is possible for each company, even for an outsider. The value of innovation outputs, however, has a relative character and is positive when the innovation shortens the distance to the leader

and, in the case of the leader, when the “ahead” period over the competitors has lengthened due to the innovation. In our opinion, it would be difficult to talk about a negative innovation value. If despite the innovative activity, the distance between the given company and the leader has grown, there has been no innovation in or its value equals zero. It should be emphasised that the measurement of the innovation potential is seen as the precondition to carry out their valuation by the means of the method presented here. This measurement can be carried out within the framework of the aforementioned methods of the evaluation of technology transfer or with the use of the methodology that evaluates the degree of implementation maturity of technical innovations (DIM).

Despite the fact that the analysed cases used to establish the above presented method concerned the in-kind contribution of innovation outputs (technology transfer phase), they allow one to draw the conclusion that this method can also be applied to carry out the valuation of the created innovation outputs when these outputs are transferred to the next development stage within the same research entity.

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Recenzent:

Alicja SOSNOWSKA

Metodyka wyceny projektów innowacyjnych jako aportu

Słowa kluczowe

Aport, projekt innowacyjny, zdolność aportowa produktów innowacyjnych, wycena produktów innowacyjnych.

Streszczenie

W artykule zaprezentowano metodę wyceny produktów projektu innowacyjnego jako przedmiotu wkładu do przedsiębiorstwa zarobkowego (aportu). Aport projektu innowacyjnego można traktować jako jedną z form transferu technologii. Realizacja transferu technologii w formie aportu wymaga oszacowania jego wartości. Przyjmując, że projekt badawczy jest nośnikiem wartości w procesie wyceny, należy określić tę wartość w kontekście atrybutu każdego aportu, którym jest zdolność do pokrywania zobowiązań. Zaprezentowana metoda wyceny bazuje na filozofii przyjętej w ramach metod dochodowych wyceny, czyli na zdolności produktów projektu innowacyjnego do generowania bieżących strumieni gotówki w przyszłości, których źródłem jest osiągnięty zysk przedsiębiorstwa. Innowacja nie jest jednak samoistnym źródłem zysków. Jest ona, obok kapitału finansowego, częścią ogólnych kapitałów finansujących aktywa operacyjne. Dlatego proces wyceny projektu innowacyjnego musi być poprzedzony pomiarem produktów innowacyjnych generowanych przez projekt, czyli potencjału innowacyjnego. Jedną z metod pomiaru potencjału innowacyjnego może być „okres trwania przewagi konkurencyjnej” osiągniętej dzięki zastosowaniu innowacji w przedsiębiorstwie. Miernik ten może być stosowany szeroko zarówno jako miernik dla lidera, który dzięki aportowi projektu innowacyjnego „wyprzedza” konkurencję, jak i dla firmy, która w ten sposób skraca dystans do lidera.