UDC 336.6=111

D.V. Tikhomirov

THE DETERMINATION OF CONTRIBUTORY COSTS FOR THE VALUATION OF INTANGIBLE ASSETS

Д.В. Тихомиров

ОПРЕДЕЛЕНИЕ ЗАТРАТ НА УЧАСТВУЮЩИЕ АКТИВЫ В ОЦЕНКЕ НЕМАТЕРИАЛЬНЫХ АКТИВОВ

Theory and practice suggest several approaches and methods for thethe valuation of intangible assets. In absence of comparable asset prices, the appraiser may apply a methodology of the income approach to value intangible asset. However, the methodology requires several subjective assumptions and produces questionable results. The author considers peculiarities of the application of the income approach, in particular, multi-period excess earning method in the valuation of such intangible assets.

VALUATION, INTANGIBLE ASSETS, IMPAIRMENT OF ASSETS, FIXED ASSETS, GOODWILL, DISCOUNT RATE

В теории и практике известны различные подходы и методы оценки нематериальных активов. При отсутствии объектов-аналогов, оценщик может использовать методологию доходного подхода в оценке нематериальных активов, при которой принимается множество субъективных предположений, а результат обычно вызывает множество вопросов. В данной статье рассматриваются особенности применения доходного подхода, построения модели по методу многопериодных избыточных доходов и варианты расчета доходностей на материальные и нематериальные участвующие активы при оценке нематериальных активов.

ОЦЕНКА БИЗНЕСА, ОЦЕНКА НМА, ОЦЕНКА АКТИВОВ, ОСНОВНЫЕ СРЕДСТВА, ГУДВИЛЛ, СТАВКА ДИСКОНТИРОВАНИЯ.

In the area of multiple assets and businesses, there are three traditional approaches to the determination of the fair value of intangible assets: the income approach, the cost approach and the market (comparative) approach.

Obviously, the most reliable estimate of fair value gives the current market price of an intangible asset in an active market. If there is no active market for an intangible asset, the fair value may be measured on the basis of recent transactions with similar assets.

In absence of such information, the companies that are regularly engaged in the acquisition and sale of unique intangible assets commonly use alternative methods of estimating the fair value of intangible assets, such as discounting of estimated future net cash flows. Within the income approach, there are several methods to value intangible assets [the brief summary of all three approaches and methods are presented in 1, p. 6]. Relief from royalty method is the simplest and most often applicable to trademarks. For its application it is necessary to forecast revenues or operating profits of the business, and to find a reasonable royalty rate for the asset. However, the use of relief from royalty method is complicated by several facts. The first difficulty is the lack of, or a wide range of royalty rates, for discussions of different rates see e. g. [2, pp. 2–3]. The second factor is the presence of several identified intangible assets, together generating the cash flow, which requires the valuation of the combined intangible asset, followed by a breakdown into several intangible assets, or developing an alternative methodology.

If there are several intangible assets, it may be needed to stratify them into those that can be valued by a comparable approach, or the relief from royalty method, and the asset or a group of assets, together generating income, which are the most specific to the business and which will be valued by the method of excessive earnings. As described above, this method is used mainly in the valuation of well-established relationships with customers, as well as manufacturing technology. We will consider the method in detail.

The method of excess earnings is one of the methods of the income approach. To apply this method, you must select a group of assets that includes this intangible asset and other current and non-current assets, and generates revenue in the future. The valuation of this asset is conducted by the allocation of returns attributable to other current and non-current assets of the total revenues or flows of the group of assets, and subsequent discounting of residual returns attributable to the intangible asset. We will call these required returns of assets involved contributory asset charges of other (contributing) assets.

Therefore, for the correct application of the method, you must define the contributing assets of the group and their profitability and return on them.

The most common assets are working capital items (cash, receivables, inventories, net of accounts payable and provisions), fixed assets (land, buildings, machinery, equipment, etc.) and some intangible assets (trademarks, technology, software, qualified staff).

In determining these participating assets, we should note that they cannot (or are not supposed to) generate revenue on their own, and their presence is necessary for the operation of the business and the use of the intangible asset. For example, an excessive land plot or non-operating fixed assets should not be counted as assets involved in the calculation of the required yield.

We should note that the use of an intangible asset as the contributory asset is not directly related to the possibility of its recognition as an intangible asset in the financial statements. For example, a qualified personnel does not meet the criteria for the recognition of intangible assets in the financial statements in IFRS, but is involved in the flows of the assets, e. g. in a 'technology' intangible asset. Therefore, to value the technology by excess earnings method it is necessary to estimate the value of qualified personnel participating as an asset and to determine its required return. Note that in practice, some of such participating assets may not be valued under the assumption that their values are not significant, or their effect will be not significant. In this case, intangible asset valued under excess earnings method will have 'conditional' fair value, which may be slightly higher than its fair value.

It should be noted that the method of excess earnings has several drawbacks, among which are many subjective factors, the use of which may produce a result that is different from the fair value of the asset, as well as the assumption that all residual income relate to the intangible asset valued (and, therefore, the value of the asset may be overstated).

This method involves accounting for returns on different assets, but does not take into account the synergy of these assets and other effects that are not directly associated with the intangible asset. These non-identified assets may be needed to be presented separately, or they should be included in goodwill, e. g. [see 3, pp. 2–3]:

- established systems, processes and procedures;
- access to capital;
- policies in the management of expenses;
- systems of quality control, etc.

These factors are not valued separately and are not recognised on the balance sheet as assets, therefore, in case they could have significant impact on the company, you need to be cautious in applying the method of excess earnings for the identified assets, such as customer relationships. Let us discuss these participating assets and their costs in detail.

Contributory costs of working capital. It is obvious that working capital is one of the major participating assets because its components are directly related to the ability of the business to generate cash flow. Traditionally, working capital includes minimum cash at a level necessary to support operations, inventories and accounts receivable less accounts payable. Therefore, net working capital is used, which does not include excess cash and debt financing.

The value of the net working capital used needs to be normalised from two perspectives:

- at the date of the analysis – to include only those components and in the amounts that are required for functioning of an intangible asset valued,
- later in the forecast – in case that at the date of the analysis, the value of the working capital was not optimal for the business (it is then normalised based on history, approved policies, comparable companies, etc.).

This forecast of the optimal level can be achieved in different ways: through the turnover rates for components (accounts receivable, inventories, accounts payable) in days, or the

ratio of the total net working capital value as a percentage of the revenue. The optimal values can be taken based on historical ratios (for example, for the previous 3-5 years), ratios for similar companies, industry average data.

The value of working capital can be positive or negative, if appropriate for business models, such as in the case of significant prepayments (in construction industry). It is obvious that the assumption of a negative working capital or working capital lower than the current level will have a positive impact on the forecast flow and increase the value of an intangible asset being valued; the higher required return on working capital, the greater the positive effect on the value.

Therefore, normalisation implies a forecast of optimal levels for an asset or business, not only disregarding non-recurring items or transaction. In case of a significant difference between working capital of the company and a target industry average or average historical level, it is necessary to analyse the possibility of such a transition and normalisation. The ability to reach optimal values of net working capital may be achievable in some, perhaps, medium-term period.

Return on working capital is generally the lowest yield compared with other assets (fixed assets, other intangible assets). To determine the yield, different sources of information may be used. The most common approach is to use the company's short-term borrowing rates. It is also possible to use the average yield on all short-term loans, or rate of the latest loan, the closest to the date of the analysis. In absence of short-term loans, the company can use the available market information, including Bulletin of Banking Statistics (issued by the Central Bank of Russia), rates on short-term (30–90 days) government bonds. In case of different risks of components of working capital it is possible to analyse the components separately: for example, to make adjustment (additional premium) to the required rate of return for dubious receivables. However, in our view, it is more reasonable, in practice, to write off such receivable and to apply an average rate of return to the total adjusted amount of working capital.

According to the comments of the working group of Appraisal foundation [see 4, p. 4 and 5], an exclusive use of borrowing rate is incorrect, because in most cases working capital is financed not only by debt; it may require a determination of the weighted average cost of capital (debt and equity). In our opinion, this approach introduces additional complexity and is unlikely to lead to a significant increase in the quality of the estimates in case of not significant differences between the cost of equity and debt, and the assumption that the greater part of the working capital may still be financed by borrowings. In case of significant balances of working capital, an additional analysis of sources of finance should be done, which again may require (e. g. in construction industry) the use of cost of debt, not weighted cost.

When calculating the required costs of working capital, average working capital for the period or balance at the end of the period should be taken into account. Changes in the value of working capital itself affect the flow (free cash flow to shareholders, investors), so accounted for separately.

Contributory costs of fixed assets. Fixed assets also play a significant role in ensuring the future flows from the use of the intangible asset valued. Property, plant and equipment, in this case, include land, buildings, machinery, equipment, construction in progress and equipment for installation, plus assets under finance lease, prepayments for property and equipment, investment property, despite the fact that there is no clear guidance in the standards of reporting and valuation of these assets.

Since most of the groups of fixed assets are subject to depreciation (physical, moral, economic), the forecast may need to include expenses for their replenishment through capital investments. The value of fixed assets should also be normalised – for example, by projecting to achieve the necessary fixed asset base and production capacity within the forecast period. A particular company may have an excess or lack of fixed assets, which will be taken into account in the forecast of capital expenditures and flows from use of assets. When analysing them we need to keep track of changes in the value of the assets to analyse the impact of the turnover or assets, and to compare them with historical data of the company or peers.

In the analysis, in addition to the separation of operating and non-operating assets, it may be needed to separate the value of land. Firstly, such

asset as land is not subject to obsolescence and therefore not depreciated, therefore its separation may increase the quality of the projection of depreciation and the value of assets. Secondly, the land is significantly less risky and less profitable asset: for example, based on our experience in valuation of several real estate properties, the level of capitalisation rates for office real estate can reach 8–12 %, whereas the capitalisation rate on commercial or agriculture land plots, obtained by the extraction method could be 2–5 %.

To determine the return on fixed assets, a variety of approaches and sources of information can also be used as was a case with working capital costs: the rate of medium- or long-term borrowings of the company, the borrowing rate for a particular asset if it can be determined, weighted average cost of capital is also often used. A number of companies, including international and Russian companies, use the so-called mini-WACC approach, i. e. weighted average cost of capital conditionally applying ratio of debt to equity of 60/40, assuming this ratio to be optimal for financing fixed assets. Another possible approach is the use of interest rates on long-term loans with a premium for the risk of investments in fixed assets.

The forecast of the required rate of return on fixed assets as participating assets, according to the analysis of Appraisal foundation, can be produced by different methods.

Contributory costs of intangibles. Intangible assets, as well as working capital and fixed assets, may be involved in the generation of estimated future cash flows of the intangible asset valued. In addition to intangible assets recognised in the financial statements, such as trademarks, software and other non-identified intangible assets that do not meet the criteria for the recognition in the financial statements may also participate in producing cash flows. In particular, this applies to the qualified personnel. Goodwill cannot be treated as an asset involved, since it is a residual asset and its inclusion in the assets involved would lead to a paradox – reducing the value of other identifiable assets at the expense of high returns on goodwill. This is also one of the drawbacks of the approach.

An international consulting company Ernst & Young analysed more than 700 transactions of business acquisitions in 2009 to review the intangible assets recognised as a result of transactions. As a result, they found the following distribution of the value of the acquired businesses: 30 % was attributable to the property, plant and equipment, financial and other current and non-current assets, 23 % – to the value of intangible assets, 47 % – was recognised as goodwill [see 6, p. 1]. Currently, goodwill is not normally depreciated and therefore tested for impairment at the end of reporting periods. However, in accordance with new discussions, it may be depreciated in certain cases, e. g. amortized on a straight-line basis over the useful life of the primary asset of the acquired entity, not to exceed 10 years for certain private companies statements [see 7, p. 3 and 12, 13].

In case of significant amount of goodwill and understanding that goodwill includes some intangible assets that do not meet the criteria for recognition, or cannot be reliably measured, it is nevertheless useful to separate them from goodwill, including them as contributory assets or presenting sensitivity analysis of the final value of the intangible asset valued to the value of such intangible asset. If, however, a reliable valuation of the asset involved is impossible, another method to determine expenses for the participation of the asset may be considered – e. g. a distribution of the flow on such asset and therefore reducing the value of the intangible asset valued. There are a lot of research papers on the analysis of goodwill and intangibles, however, the analysis is sometimes too theoretical with overcomplicated models difficult to apply and to prove statistical data [e. g. see 8].

For example, when the participating asset was valued by the relief from royalty method, the forecast flows for an estimated intangible asset can simply include royalty payments.

A case when the company does not assume long-term use of the intangible asset involved may be considered separately. For example, the company plans to stop using the trademark of the acquired company and extrapolate its trademark on the acquired assets. In the case of such a change, it is necessary to use the purchaser's trademark, as it is supposed to be used. With this new trademark, the business and assets can be even stronger than previously, and this will lead to increased flows and ensure a greater rate of return, for example, through the royalty rate.

To predict the flows in such a case, it is necessary not only to project the yield of the asset, but also the compensation for the asset, e. g. marketing, advertising and other expenses, depending on the asset, other costs and expenses.

In the case where the participating asset is valued by the relief from royalty method, royalty rates may be used as the rate of return, and the analyst may pay attention to the type of royalty rates (gross or net rate) and include marketing expenses when needed.

The biggest problem might be in case of several intangible assets to be valued by the method of excess return, for example, production technology and customer relationships. It is obvious that, in this case, circular references for returns on assets at each other will arise. Despite the fact that these calculations may be implemented in practice, it is advisable to avoid such situations and try to separate flows and models, i. e. build models independently of each other, or to evaluate any of these assets using other methods (relief from royalty, the cost approach, etc), leaving only one asset to be valued by the method of excess earnings.

The rate of return on intangible assets is generally higher than the rate on working capital and fixed assets as intangible assets are more risky and more specific to the business, i. e. less liquid assets. Since intangible assets are often financed from one's own funds or a combination of equity and debt, in most cases it is advisable to use the cost of equity and weighted average cost of capital with a premium for the risk. There are also other approaches to determine rates to be used in the models [e. g. see 9], however, in most cases they are of theoretical nature and do not produce significantly higher precision level.

Changes in value of the contributory assets. As shown above, the costs of assets involved – working capital, fixed assets, intangible assets can vary significantly among themselves. During the forecast period, you can observe changes in the value of assets as a result of two factors:

- Firstly, assets are subject to depreciation and amortisation, at different rates and with different levels of reimbursement, which can affect the combination of the assets involved, and hence the overall costs of the assets involved;
- Secondly, the required rate of return itself may also change over time, such as with floating weighted average cost of capital rate.

To check the reasonableness of costs of intangible assets (as well as of other assets), their trend can be analysed. In case of a mature business, costs could be fairly stable. In case of a start-up business, a gradual reduction in the costs of assets involved, as the business matures, is probable.

Final checks and conclusions. In the allocation of the purchase price and checking the reliability of the results obtained, a comparison of WACC, WARA and IRR could be done. In this case, IRR is the most general concept that reflects the expected internal rate of return on investment but usually neglected. The comparison of WACC and WARA is done to compare weighted average cost of capital (from the liabilities side of the balance sheet) with the weighted average return on assets (assets side of the balance sheet) [for details see 10, p. 12, for the analysis of WACC rates and the determination of WACC for financial reporting see 11].

Therefore, in case the transaction was done under non-market conditions, there is no need to perform this analysis. If the difference is not significant, no investigations are required. However, a significant difference between WACC and WARA, as a result of the analysis, can show that there are some non-identified intangible assets, costs of the assets or fair value of the assets identified are not reasonable and need reconsideration and recalculation, including the analysis of the goodwill impairment.

As discussed in the article, the methodology of the income approach for the valuation of intangible assets could be applied in some cases, but the results will be very sensitive to values of other assets and contributory costs. If it is still necessary to value the intangibles, one must bear in mind that this valuation and a split of the group of assets' value among different assets is a theoretical exercise, and due consideration should be given by the appraiser not to overstate the value of the intangible assets.

REFERENCES

1. Purchase price allocation. 2009. 8 p. URL: www.kpmg.com
2. Royalty rates: the key drivers. Brand valuation news. August 2006. 5 p. URL: http://www.intangiblebusiness.com/news/marketing/
3. Financial executives international. Observations on income approach valuation methods. August 2, 2012. 4 p.
4. Best practices for valuations in financial reporting: intangible asset working group – contributory assets. 60 p. URL: www.appraisalfoundation.org
5. Defining issues. Appraisal foundation issues guidance on contributory asset charges. August 2010, no. 10–33. 4 p. URL: www.kpmg.com
6. Acquisition accounting – what's next for you? February 2009. www.ey.com, 13 p.;
7. Valuations insights. Q3 2013. Duff&phelps. 8 p. URL: www.duffandphelps.com
8. Accounting discretion and purchase price allocation after acquisitions. 2007. 55 p.
9. Estimating capitalisation rates for the Excess earnings method using public companies. 1999. 7 p. URL: www.aaahq.org
10. Illustrative example of intangible asset valuation. The Canadian institute for chartered business valuators, 2010. 31 p.
11. **Tikhomirov D.V.** Impairment of assets in financial statements: methodology and trends for 2008–2010. *Journal of St. Petersburg State University of Economics and Finance*, 2012, no. 3, pp. 7–16 (rus)
12. **Teregulova K.R.** Conceptual approaches and models of value-based management of intangible resources by industrial enterprises. *St. Petersburg State Polytechnical University Journal. Economics.* 2012, no. 6 (161), pp. 120–125 (rus)
13. **Monakhov G.O., Chechurin L.S.** Spectral analysis of growth of the world internal gross product and patent activity. *St. Petersburg State Polytechnical University Journal. Economics*, 2012, no. 3(149), pp. 176–179. (rus)

СПИСОК ЛИТЕРАТУРЫ

1. Purchase price allocation. 2009. 8 p. URL: www.kpmg.com
2. Royalty rates: the key drivers. Brand valuation news. August 2006. 5 p. URL: http://www.intangiblebusiness.com/news/marketing/
3. Financial executives international. Observations on income approach valuation methods. August 2, 2012. 4 p.
4. Best practices for valuations in financial reporting: intangible asset working group – contributory assets. 60 p. URL: www.appraisalfoundation.org
5. Defining issues. Appraisal foundation issues guidance on contributory asset charges. August 2010, no. 10–33. 4 p. URL: www.kpmg.com
6. Acquisition accounting – what's next for you? February 2009. www.ey.com, 13 p.;
7. Valuations insights. Q3 2013. Duff&phelps. 8 p. URL: www.duffandphelps.com
8. Accounting discretion and purchase price allocation after acquisitions. 2007. 55 p.
9. Estimating capitalisation rates for the Excess earnings method using public companies. 1999. 7 p. URL: www.aaahq.org
10. Illustrative example of intangible asset valuation. The Canadian institute for chartered business valuators, 2010. 31 p.
11. **Тихомиров Д.В.** Отражение обесценения активов в финансовой отчетности компаний: вопросы методологии и тенденции 2008–2010 гг. // Известия Санкт-Петербургского университета экономики и финансов. 2012. № 3. С. 7–16.
12. **Терегулова К.Р.** Концептуальный подход и модели стоимостно-ориентированного управления нематериальными ресурсами промышленного предприятия // Научно-технические ведомости Санкт-Петербургского государственного политехнического университета. Экономические науки. 2012. № 6(161). С. 120–125.
13. **Монахов Г.О., Чечурин Л.С.** Спектральный анализ роста мирового валового внутреннего продукта и патентной активности // Научно-технические ведомости Санкт-Петербургского государственного политехнического университета. Экономические науки. 2012. № 3(149). С. 176–179.

TIKHOMIROV Dmitry V. – St. Petersburg State University of Economics.
191023. Sadovaya str. 21. St. Petersburg. Russia. valuation-mail: DTikhomirov@bk.ru

ТИХОМИРОВ Дмитрий Викторович – докторант кафедры «Корпоративные финансы и оценка бизнеса» Санкт-Петербургского государственного экономического университета, кандидат экономических наук.
191023, ул. Садовая, д. 21, Санкт-Петербург, Россия. E-mail: DTikhomirov@bk.ru