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INVESTMENT IN INTANGIBLE ASSETS IN BULGARIA

This paper presents results of the breakthrough study that applies the methodology developed by Corrado, Hulten and Sichel in 2006 to measure investment in intangible assets in Bulgaria and the factors involved in their contributions at the level of the economy.
The study encompasses the transition and EU pre-accession period 1995-2006 and makes use of micro-level data aggregated to sector level, taking account imports and exports. We consider the following types of investment in intangible assets: computer software and computerized databases, innovative property, scientific R&D, copyright and license costs, new architectural and engineering design, brand equity and economic competences, market research and advertising as brand building, firm-specific human capital and organizational structure.
According to this nomenclature, we compute the share of these intangible assets in the GDP and make estimates of the potential adjustment of the GDP if these investments were to be taken into account. The study unfolds on the background of the profound changes taking place in the Bulgarian economy over the 1990s, including a critical mass of privatisation, fragmentation of industries, financial shocks and a massive entry of new firms and foreign investment.
JEL: O3; O52; P2

1. State of the art

Most experts agree that innovations based on new technology are one of the most important generators of economic growth. Investment in intangible assets, such as new technology and knowledge is, therefore, believed to be crucial for economic development. However, whilst these new products were apparent in the market, their effect on the macroeconomic productivity growth was slow to materialize. This was named the Solow paradox after Nobel Laureate Robert Solow's famous remark that "you can see the computer age everywhere but in the productivity statistics" (Solow, 1987).

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The traditional definition of intangible assets is presented best in the International Accounting Standards (IAS) and is explained as: "Intangible asset: an identifiable non-monetary asset without physical substance. An asset is a resource that is controlled by the entity as a result of past events and from which future economic benefits (inflows of cash or other assets) are expected." (IAS, 2014). Thus, the intangible assets created with enterprises' own means, such as goodwill, trademarks, publishing titles, customers' expenses incurred in connection with the establishment of business or commissioning, training costs, advertising and promotion and other similar costs, cannot be considered as an asset. Based on the traditional methodology these costs are reported not as an investment in intangible assets, but as ordinary operating expenses, such as costs for electricity, water, materials, supplies, labor and the like.

With the globalization of the economic activity, the value chain has been ruptured between the many companies that can be localized not only in different countries, but even on different continents. Therefore, nowadays companies and countries do not specialize in the production of final products, but concentrate on the development of comparative competitive advantages at various stages of the value chain. These processes begin to develop in the late 80s and early 90s of the last century and are considered by some researchers as the third stage of the post-industrial revolution, referred to as a trade in tasks (Grossman, Rossi-Hansberg, 2006).

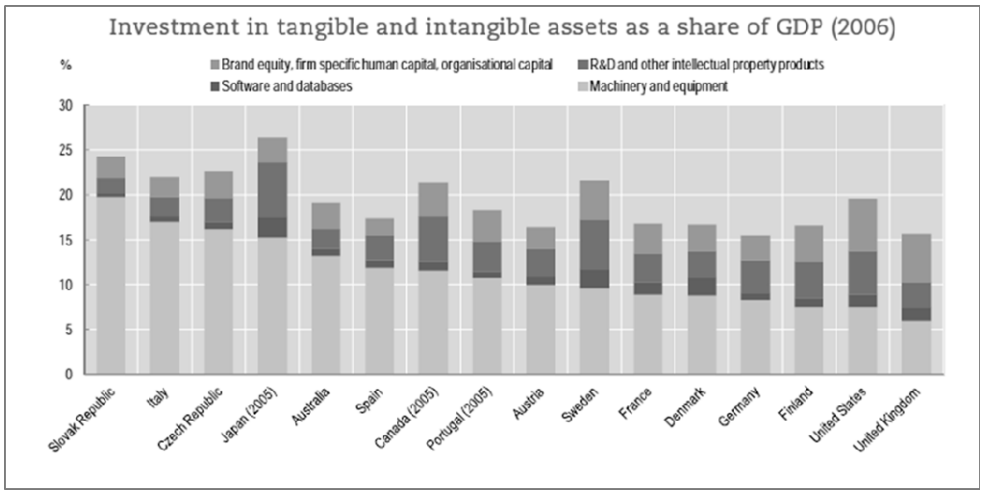
In this way leading companies separate from the organization and direct management of the direct production process and focus on additional activities of value chain such as innovation, marketing, logistics and distribution, design etc. This is how the products and services created directly by them have properties of intangible assets. Another effect of the globalization is the relocation of the direct production activities in places with cheap labor force, leading to a significant discrepancy between the value added, created in the supplementary and main production activities of value chain.

This trend can be observed in the data in figure 1. In knowledge based economies biggest part of company's investments are in intangible assets. In some countries (such as US, UK, Sweden) investment in intangible assets matches or exceeds investment in traditional capital such as machinery, equipment and buildings. Intensified global competition, ICTs, new business models, and the growing importance of the services sector have all amplified the importance of intangible assets to firms, industries and national economies. At the other extreme are emerging economies like Slovakia, Czech Republic, along with Italy, Australia, Spain, as well as other economies that are not so much impacted by the relocation of production and have a significant share on the industrial sector. Approximately equal distribution of investments in the two types of assets can be noticed in France, Germany and Denmark (see figure 1).

In the same time, a lot of studies reveal that intangible investment is not properly measured because they are not capitalized in companies' accounting documents. Lack of reliable statistics on intangibles assets may incorrectly or incompletely inform policy making. While the economic and policy communities agree on the key role played by intangibles in the knowledge economy, the rational, design and evaluation of any policy targeted to support investment in intangibles requires a solid measurement of them.

Figure 1

Investments in tangible and intangible assets, per cent of GDP



Source: OECD, 2006.

Research community tackles this problem by developing new methods for measuring intangible assets. Following Sichel (2008) the most recent approaches to measuring them in the economic literature can be classified into three groups:

- Financial market valuation
- Alternatives performance measures
- Direct expenditure data.

The first group is based on the assumption that the presence of large amounts of unrecorded intangible assets is where there is a serious difference between the market capitalization of the company and its carrying value. Several authors (Brynjolfsson and Yang, 1999; Brynjolfsson, Hitt and Yang, 2000 and 2002) found statistical correlation between investment in computer technology and the increase of the market capitalization of the company. Their calculations show that each USD dollar invested in such technologies leads to an increase in the market capitalization of companies by between 5 and 10 dollars. Problems with this method arise from the market valuation of the company, which is influenced by the attitudes and preferences of investors. They always have a limited idea of the value of the company and in particular of its intangible assets. For these reasons, the use of estimates of financial markets can be used for initial indication of the possibility that the intangible assets of a company are undervalued in the balance sheets.

The second group of methods for evaluation of intangible assets uses alternative indicators of company performance, such as expected profit, sales revenue etc. It is accepted that the intangible capital is manifested through the specific way in which firms combine different factors of production. It is believed that the intangible capital is measured as the difference

between the market value of the factors of production and corporate value of these factors. Under the corporate value of the factor is understood the value they have in the production process of the company itself. The difference between the two values is due to the adjustment costs of the company that it wants to maintain in order to use the various factors of production. This method is used by Cummins (2005), and through it, he realized he could not find substantial intangible assets at the cost for R&D or advertising, as opposed to organizational capital created through ICT. Other authors (McGrattan and Prescott, 2005) by applying a similar methodology found that the value of intangible capital is within the range from 31 to 76% of GDP in the USA economy (using a broad definition of intangible assets).

The third method was originally developed in the studies of Nakamura (1999, 2001), perfected by him in 2003, 2008 and 2010 and is considered to be the most promising. The foundation of this method is the understanding that besides the intangible assets reflected in the accounting, there are those that are created by the company itself, but not recorded in any way. Nakamura defines the gross investment in intangible assets as the sum of costs for RTD, software, advertising and marketing studies, together with the salaries of managers and creative staff of companies in the US. He finds that the investment in intangible assets in the US economy in 2000 will amount to about $1 trillion, which is equivalent to the made investment in tangible assets. His studies were further developed and enriched by Corrado C.A., Hulten C.R., and D.E. Sichel (henceforth CHS) in two fundamental publications from 2005 and 2006. Following the new methodology for measuring intangibles CHS estimated that investment in intangibles averaged $ 1.1 trillion between 1998 and 2000 (1.2 times the tangible capital investment) or 12% of the GDP in USA.

The Corrado, Hulten and Sichel methodology has been applied in a number of other country studies. Marrano and Haskel (MH) (2006) show that the private investment in intangible assets in the UK economy is 11% of the GDP in 2004. Other researchers (Jalava, Aulin-Ahmavaara and Alenen, 2007) calculated that this indicator is at the level of 9.1% of the GDP in the Finnish economy in 2005. Similar studies were made for the economy of Japan (Fukao, Hamagata, Miyagawa and Tonogi, 2007; Kyoji et al., (2007), Sweden (Edquist, 2009 and 2011), Germany and France (Manole, Van Ark, Hao, 2008), Italy, The Netherlands (Van Rooijen-Horsten, Van den Bergen, and Tanriseven, 2008) and Spain (Oliveras and Castillo, 2008). All studies show a significant underreporting of intangible assets in the application of conventional methodology. In 2008, through 7FP, the European Commission decided to finance two large research teams to develop this methodology and establish intangible assets in the EU member states - Competitiveness, Innovation and Intangible Investment in Europe (COINVEST) and Intangible Capital and Innovations: Drivers of Growth and Location in EU (INNODRIVE). The figures in the studies are results received within the project COINVEST.

According to the CHS methodology, the intangible assets can be classified in three main groups. These three groups are:

- Assets in computerized information;
- Assets in innovative property;

- Assets in economic competencies.

Computerized information is the investment of firms into computer software and computer databases. While the contribution of computerization to labor productivity is widely discussed in the literature, the specific importance of continuous development of software enhancing smooth operation of the business activities is often attributed to mere operational expenses rather than to the activities maximizing the future stream of incomes. Similarly, the storage of information into databases for the purposes of future, rather than just current use, is often neglected as a factor for higher future productivity and profitability.

The innovative property of a company, according to CHS, includes scientific and engineering R&D captured by license or patent, mineral exploration, particularly R&D in the mining industries, copyright and license costs in the "creative industries" such as radio, TV, electronic publishing, audio and video-media, product development in the financial services industries, new architectural and engineering design, R&D in social sciences and humanities. All these items usually remain beyond casual observations and, short of licenses and patents, are not included in the intangible assets reported in the operational accounts of the companies.

The objective of this study is to measure investment in intangibles made in the Bulgarian economy in 1995-2006 by applying the methodology developed by CHS. This period covers the most important and turbulence stages in the Bulgarian transition as well as the preparation of the country for accession to the EU. The uniqueness of this period raised a question whether and how CSH methodology could be apply in such conditions.

2. Organisation of the study, sources of information and classifications

Methodological notes

The study encompasses the Bulgarian economy in the period 1995-2006, and makes use of micro-level data aggregated to sector level, taking account of imports and exports. We consider the following types of investment into intangibles to be relevant to Bulgarian economy: computer software and computerized databases, innovative property, scientific R&D, copyright and license costs, new architectural and engineering design, brand equity and economic competences, market research and advertising as brand building, firm-specific human capital and organizational structure. We exclude the item of mineral exploration – mentioned in the CHS paper – as this sector did not play an important role for the Bulgarian economy in that period.

According to this nomenclature, we compute the share of these intangible assets in the GDP and make estimates of the potential adjustment of the GDP if these investments were to be taken into account. Policies contributing to the build-up of these assets are also considered. The study unfolds on the background of the profound changes taking place in the Bulgarian economy over the 1990s, including a critical mass of privatisation, fragmentation of industries, financial shocks and a massive entry of new firms and foreign investment.

Then we proceed to the valorization of each individual item of intangibles. We explain the methodology and sources used, and compute total value of intangibles and their shares in GDP. Mainly business statistics data and the national accounts are used to capitalize spending on each item. For some items, e.g., vocational training and employment, we use the results of specific surveys conducted by the National Statistics Institute (NSI). If necessary, we also make adjustments for exports and imports.

The computations reported in the paper are based on various sources drawn from officially published statistics, as well as special surveys conducted by the NSI and other institutions. There have been two major changes of the main industry classification over the period. In 2005 the EU NACE 3.1 was introduced to secure full compliance to EUROSTAT standards. Later, we briefly report the micro-work to make transitions between classifications consistent.

Data sources

The Business Statistics data of the National Statistics Institute is the major source of information about intangible assets in Bulgaria. It comprises data gathered from the detailed accounts of firms – balance sheets, profit and loss accounts, and about 15 detailed account supplements.

By law, all firms with legal status other than one-man companies with single-entry bookkeeping submit to the NSI their annual balance sheets and profit & loss accounts, including all supplements mentioned above[4]. Thus this source encompasses as a minimum the entire population of firms that use double-sided accountancy and is the closest approximation of the population of firms in the national economy for which full data is collected.

We use Business Statistics data to compute gross output, total number of employees, and gross remuneration for the national economy, and in the respective four-digit industries (see Table 1) corresponding to such intangible assets as computerized information and databases, R&D, architectural and engineering design, advertising, market research and new organizational structure.

The National Statistics Institute publishes annual National Accounts by taxonomy roughly equivalent to a two-digit NACE classification. Data on labour expenditures aggregated in the National Accounts is used in the computation of capitalized expenses of the firms for vocational training. Data on gross output and value added is used to compute intermediate consumption, needed to estimate the capitalized expenses for new products in finance.

[4] One-man companies with single-entry bookkeeping are required to report only the profit & loss account and only selected items from their balance sheet. However, many of the sole traders – particularly in the years after the financial crisis of 1997, and the subsequent withdrawal of the state from economic activity, have presented the entire balance sheet, and are therefore included in the respective annual datasets. A possible reason for this is the fact that full data disclosure facilitates better access to bank credit.

The Structure of Earnings Survey is part of the larger Enterprise Survey on the Number of Employed Persons, Wages, and Other Labour Costs, conducted every 4 years to capture more details on employment policies of the firms compared to what they report for the Business Statistics section of the NSI. Two surveys have been carried out in 2002 and 2006. We use these surveys for approximating the capitalized own-account expenses on organizational structure below.

Table 1

NACE industries producing intangible assets

NACE codes	Industries
7220	Software consultancy and supply
7240	Database activities
7310	R&D in naturals sciences and engineering
7320	R&D in social sciences and humanities
7420	Architectural and engineering activities and related technical consultancy
7440	Advertising
7413	Market research and public opinion polling
7414	Business and management consultancy and activities

Source: Prepared by the authors.

The Survey on Continuing Vocational Training in Enterprises, conducted by the NSI in 2004 and 2006 (NSI, 2005 and 2007) is the source for estimating the firm-specific human capital. The survey covers representative samples of approx. 4,000 firms from the populations of firms over 100 employees in the respective years.

Classifications and manipulations

We need to clarify the use of classifications because the time series of any economic data in Bulgaria for the period 1995-2006 are far from unambiguous. Various classifications have been published for short periods which we had to merge. In fact, not a single time series for the entire period has been published by the NSI, and the merging has absorbed detailed work at industry and even company level. This concerns primarily the deflators affected differently by the two structural breaks of 1991 and 1997. In the computations that follow we try to avoid deflators as much as possible by relating figures on intangibles to contemporaneous GDP at current prices. We cannot ignore, however, the changes that have occurred in the various classifications.

Most important of all is the industry classification. Four different classifications have been used over the period: Classification of the Industries of the National Economy KONS (1972), National Classification of Economic Activities (NCEA) (1994), NACE (2001) and

NACE (2003)[5]. Of those, the transition between KONS and NCEA has been the most difficult, requiring company-level computations and aggregations.

At a macroeconomic level, this information is credible precisely at the level of economic development of Bulgaria in the period covered in this study. The gradual introduction of the market, and turbulence of the economy as described in the beginning of the paper, lends credibility to a presumption that for all "intangible assets" industries bar computer software, databases, patents and licenses[6] we can consider Bulgaria a "closed" economy, with only negligible amounts of imports and exports.

In a "closed" economy, the output of the NACE industries presented in Table 1, if sold on the domestic market only, would constitute the total expenditure of all other firms for the services offered by these industries.

As mentioned above, for all industries except 7220 (Software consultancy and supply), and 7240 (Database activities) we assume Bulgaria to be a "closed" economy in the period 1995-2006. For the three IT industries we adjust the data with the available data for export and import.

3. Intangible assets by types

Computerized information

Computer software

To compute the capitalized expenditures of all Bulgarian firms for software, we take as a base the sum total of all sales revenues of NACE industry 7220 "Software consultancy and supply": the revenues of the software industry are expenditures of all other industries. This figure has to be augmented by the imports, and reduced by the export of the software industry. Estimates of import and export of software and databases published by the magazine "Computerworld Bulgaria" for the period after year 2000 demonstrate that they almost balance out. In addition, we account for in-house production of software (and databases), using the method suggested by Morano and Haskel (2006). For our purposes, from the National Classification of Professions and Occupations, we take the number of employees corresponding to the classifications such as computing services department managers, computer system designers and analysts, and computer programmers. In the calculations, we also use data on average wages in the NACE industry 7220.

Figure 2 reports the share of computer software in GDP after the adjustments made to account for exports and imports.

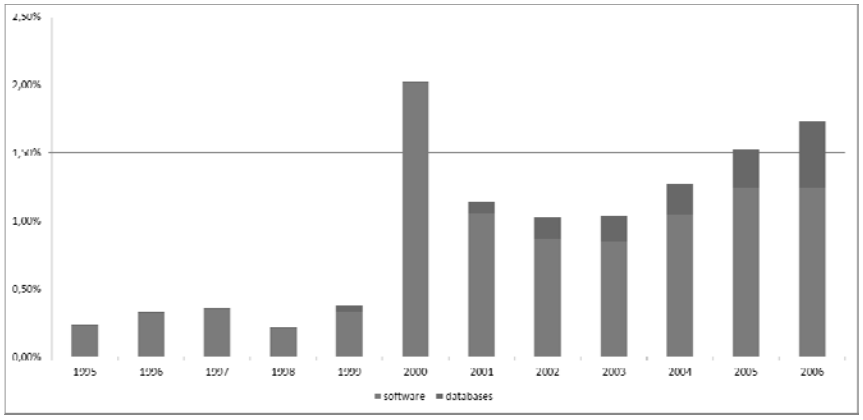
[5] KONS is the Bulgarian acronym for this classification. The English abbreviations of the NCEA and NACE classifications have acquired some legitimacy, as in the mid-1990s, when NCEA was conceived, the country was already on the path to EU membership.

[6] As described below, in the computation of patents and license costs we use data from firms' balance sheets, which already accounts for export and import.

Notably, until 2003-2004 the export and import of software is relatively low compared to the size of the industry output; it varies between 10% and 30% in different years. Beginning from 2004 however, and particularly in 2006 and 2007, the export of software gradually increases. Much of the total inward investment – as high as 25% of GDP in 2007 – lands in the services sector of the economy, a sizeable fraction of which includes subcontracted software development for USA companies like Microsoft, IBM and HP.[7] As an example, in 2006 the export of the Microsoft affiliate in Bulgaria almost equals the sales (import) of Microsoft on the Bulgarian market. These exports have to be deducted from the industry output, which leaves the fraction of computer software in GDP relatively low, at 1.3% of GDP in 2005 and 2006.

Figure 2

Computerized Information, per cent of GDP



Source: Authors' calculations.

Figure 2 also presents the investment into software in the period of monetary stability 1998-2006, when the Bulgarian currency was pegged to the Deutsche Mark and subsequently to the euro. The absolute numbers illustrate the 13-times increase of this item from 50 million BGN in 1998 to 644 million BGN in 2006, while the GDP has grown only 2.2 times over the period – from 22.4 to 49.4 billion BGN. There is a one-off spike of software investment in 2000, a possible explanation for which might be a governmental hike on illegal distribution of software.

Computerized databases

Similar to software, here we take as capitalized expenditures of the economy for computerized databases the output of the NACE industry 7240 "Database activities" [8].

[7] Postal survey of the top 30 firms in the IT industry indicate that the share of export has increased in 2007 and 2008.

[8] We assume that NACE industry 7230 "Data processing" does not contribute to intangible investment.

Figure 2 presents the results of the computations. No revenues are reported by any company prior to 1995 and, as we can observe in the figure, the numbers reported up to 1999 are miniscule.

The extremely high growth rate of this class of intangibles after 2000 merits attention: it grows almost six-fold between 2001 and 2006 as a share of GDP, while the GDP itself grows almost twice in the same period (see Figure 2). One explanation could be the rapidly expanding banking sector after 2000 – a huge consumer of computerized database software – which started virtually from zero rather late in Bulgaria, around the turn of the millennium. Another is the rapid increase of internet coverage and density in the last 6-7 years, as well as the advances of e-commerce, ever more demanding for firms to invest in computerized databases. Furthermore, there are concerns that some activities may have remained unrecorded, as in the age of internet many programmers work extra hours from home.

Innovative Property

Scientific research & development

The ultimate source of scientific R&D is the National Accounts for the respective years. The original sources are the business accounts of NACE industries 7310 "R&D in natural sciences and engineering" and 7320 "R&D in social sciences and humanities", which include mainly the capitalized expenses of research institutes within such national institutions as the Bulgarian Academy of Sciences, the Academy of Agricultural Sciences, independent research institutes, etc. They exclude, however, research expenditures of universities (classified under "Education") and estimates for unreported research expenses of the businesses.[9]

The data, as presented in the National Accounts, coincides with that available in Eurostat,[10] and is presented in Figure 3.

These expenses are stable around 0.5% of GDP over the years, and grow only in accord with the growth of GDP. This gives little evidence of changing research intensity of the national economy.

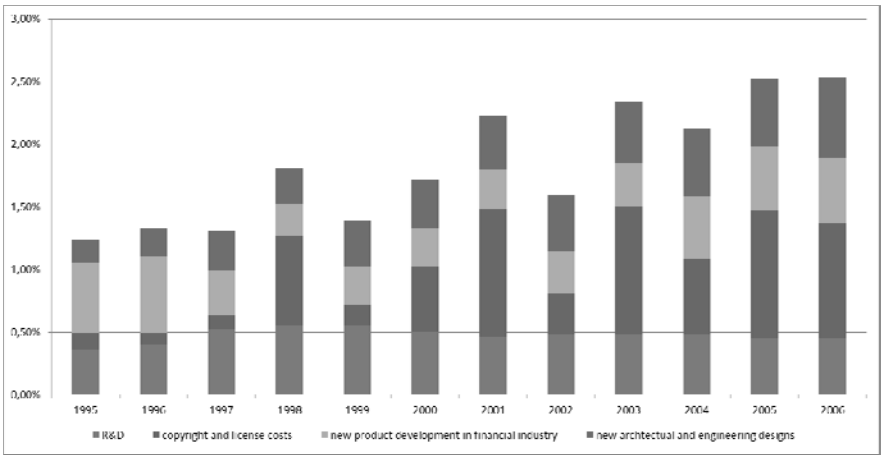
Again, we assume that all research output is consumed within the country, which will become a potential concern in future years with the increasing internationalisation of science.

[9] This is due to the distinction between research and teaching in the former Soviet block, a legacy that still survives in most countries, including Bulgaria. In this system, universities were predominantly places for teaching in higher education, whereas research was concentrated in separate research institutes affiliated with the academies of sciences. Gradually, nowadays universities also grow in research.

[10] The source of the data available in Eurostat is the NSI of Bulgaria.

Figure 3

Innovative Property, per cent of GDP



Source: NSI and authors' calculations.

Copyright and license costs

The copyright and license costs are reported in the firms' accounts, section "Long-term intangible assets", and can be aggregated for each year across the industry. To estimate the capitalized expenses in this item, we take the difference between two consecutive years, assuming 20% depreciation. The results are presented in Figure 3.

These estimates are within range of other selective research, e.g., Chalakov, Borisova, Keskinova et al, (Chalakov, Borisova, Keskinova et al 2004) in aspects of copyright and patents.

New product development in the financial industry

Following Manole, van Ark, and Xiaohui (2008), we assume that new product development is 20% of the intermediate consumption of the financial industry. Intermediate consumption is computed as the difference between gross output and value added in the industry, as reported in the National Accounts.

The results are also presented in Figure 3. They support the hypotheses that the expansion of the financial industry after 2000 has been a big consumer of computerized databases as well. The years prior to the financial crisis in 1996-1997 show high relative share but of financial services, correspondingly of research by the method used. This may be inflated by the growing financial bubble and depreciation of the national currency. In the years of fixed exchange rate after 1998, we observe an increase of these expenses from a very low level to about 0.55% of GDP in the end of the period, and a stable and high share of new products in finance in the last three years of the series.

New architectural and engineering design

To capitalize expenses in the area of new architectural and engineering design, we aggregate the revenues of NACE industry 7420 "Architectural and engineering activities and related technical consultancy", and exclude 50% of the totals.

It is very unlikely that exports and imports may have any influence in this industry, and its output is assumed to correspond to the respective inputs of the rest of the economy. Results of this growing item of intangibles are reported in Figure 3.

Economic competences

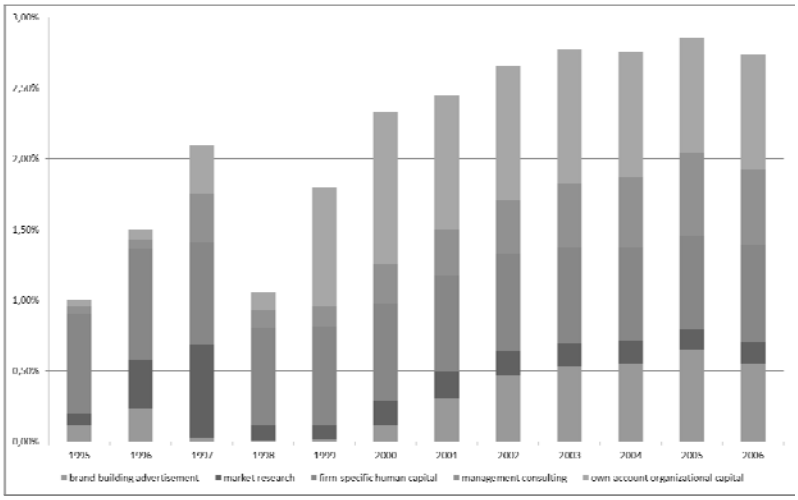
Brand equity, advertisement

NACE industry 7440 "Advertising", aggregated from the Business Statistics data of the NSI gives the most complete record of total industry revenue. Records of firms in the industry, even though negligible, are available from 1995. The number of firms in the industry, and the volumes of their revenues consistently increase with the gradual introduction of the market through privatization, competition, and economic liberalization. This is particularly obvious in the years after the financial crisis, when the critical mass of the economy is already private and the number of firms has grown to ensure sufficient competition.

To capture only the elements of intangibles within advertising, we follow Corrado, Hulten and Sichel (2006) and Marrano and Haskel (2008), and only take 50% of the total advertising revenues. Presumably, thus we capitalize only the brand-building fraction of all advertising expenses and leave aside the classified ads published in the media. The results are presented in Figure 4.

Figure 4

Economic Competences, per cent of GDP



Source: Authors' calculations.

Notably, in the crisis years of 1997 and 1998 firms have spent very little on advertising. Occasional data gathered by the Advertising Association looks rather incomplete – its volume is about 30% lower, compared to the above industry aggregation. We can also safely assume that this is a "closed" domestic industry, without much interference of exports and imports of commercial advertising.

Brand equity, market research

The capitalized expenses on market research consist of services purchased from companies operating in the market research & consultancy industry, and own-account market research conducted by the firms themselves. To take into consideration the contribution of the own-account research, we follow again CHS and MH and double the total revenues of the market research industry.

The relevant NACE industry is 7413 "Market research and public opinion polling". We assume most of the output of the industry to be in the category "market research". There are only a few established opinion pollsters in Bulgaria specializing on "purely political" surveys – such as ranking of politicians and predicting election results - and their contribution to the total industry output is not believed to contaminate the gross output of the industry. Moreover, details of "political" surveys are often sold to commercial companies estimating political risk, etc. Figure 4 presents the results.

A spike in the crisis year of 1997 remains unexplained and may be due to misreporting in the balance sheets.

Firm specific human capital

In the Survey of Continuing Vocational Training of Enterprises, firms in the sample report, among other things, their total expenditure on training. It is not clear whether they include in this number just the direct expenses of the training activities – such as fees paid to tutors, teaching aids, etc. – or they also count the wages for the man-hour of their personnel, spent on training. Therefore, we proceed in two steps. First, we compute the share of training expenses in the total wage bill of the firm. As the survey is representative, we assume this to be valid for the total wage bill in the national economy as reported in the National Accounts. This gives us a first approximation to the expenditures on vocational training in the economy.

From the survey, we then compute the share of the wage bill for the man-hours spent in training only, and obtain a coefficient representing the ratio of this share to the total expenditure on training reported by the firms. We use this ratio to adjust the results for the national economy obtained in our first approximation of the preceding step. Figure 4 reports the results for 2004 and 2006 – the years of the survey for which NSI deems results credible.

Organizational structure, purchased

The gross output of the NACE industry 7414 "Business and management consultancy and activities" is a credible approximation of the organizational structure purchased by the rest of the economy. Figure 4 reports the results. Occasional evidence suggest that after Bulgaria's entry into the EU in 2007, these numbers have grown substantially due to the increased technical assistance provided by EU firms and funded by the Union.

We observe a rapid growth of this item of the intangibles in the years after 2001, mainly due to the rapid influx of foreign direct investment. On one hand, the foreign-owned firms are big consumers of consultancy services; on the other, consultancy services represent a big part of the foreign direct investment (FDI) operating in Bulgaria through local affiliates.

Again, a spike in the crisis year 1997 remains unexplained.

Organizational structure, own account

Following CHS and MH, we approximate the capitalized expenses for own-account organizational structure to 20% of the wage bill of Class 1 (senior managers) of the National Classification of Professions and Occupations. Two versions of the classification have been used for the periods 1995-2000 and 2000-2006. For the first period, we use the old classification of 1996. In 2005, the Bulgarian classification has been changed to bring it to concordance with other occupational classifications used in the EU. Respectively, data back to 2000 has been updated according to the new classification. For transition codes between the two versions applied we use the respective codes of the International Standard Classification of Occupations (ISCO-88).

The numbers of employees in class 1 for each year are available from the Business Statistics section of NSI back to 1995. Their wage bill, however, is only available for 2002 and 2006, as reported in the two waves of the Structure of Earnings Survey. We compute the ratio of the average wage for Class 1 occupations and the rest of the economy for the two years, take an average and apply this coefficient to the rest of the period. The results for this item of intangibles are reported in Figure 4.

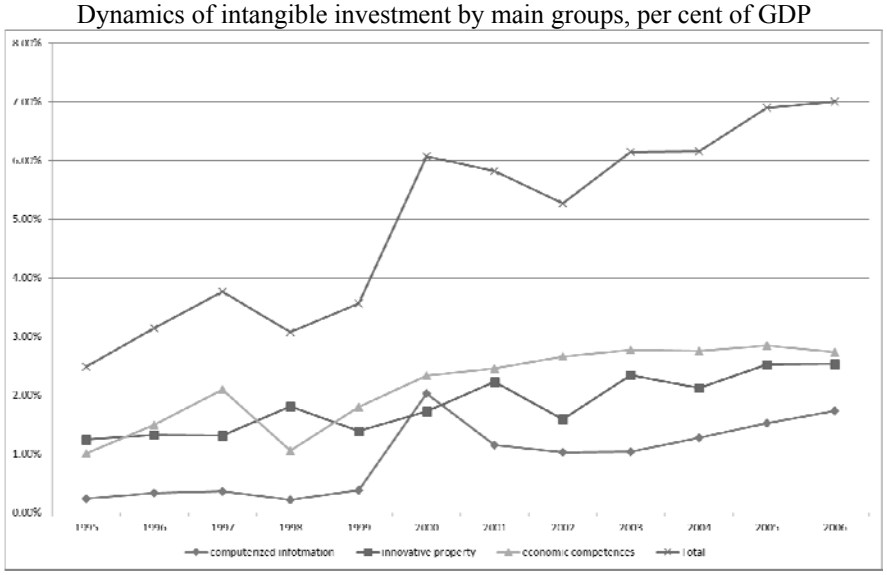
Intangibles by Main Groups

Summarising the results of the elements of the three main groups of intangible assets at CHS, it can be found that the share they take in the period 1995-2006 is in the range of 2 to 7% of the GDP (see Figure 5). Their dynamics during the period was positive; only in two time segments after 1997 and 2000 downturns can be seen.

The main groups of intangible assets have similar trajectories of development (see Figure 5). Moreover, their relative shares are very close in value. For example, in 2006, they fall within the range of 1.73 to 2.74% of the GDP. The largest share of intangible assets occupy economic competences. This is typical for the entire period except for the 1995 and 1998 (see Figure 5). On the second place is the innovative property, and the lowest share among the intangible assets has the computerized information.

Figure 5

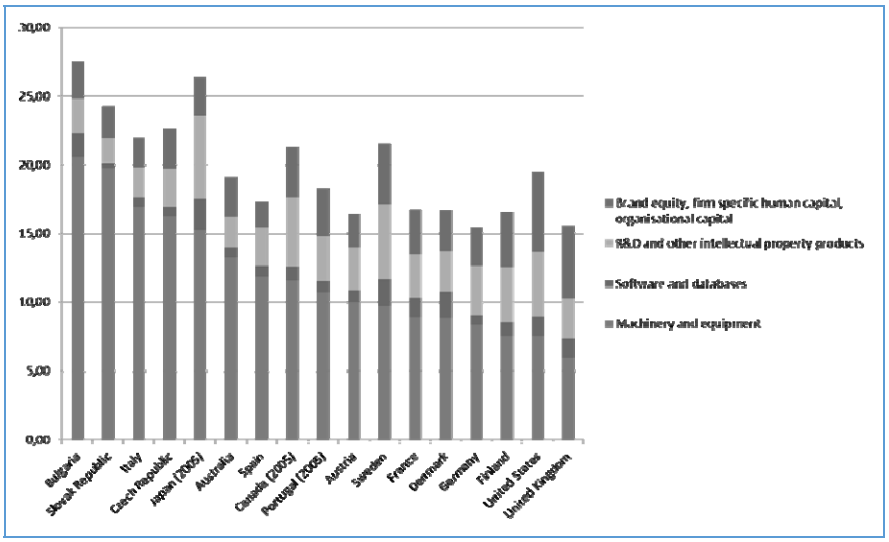
Dynamics of intangible investment by main groups, per cent of GDP



Source: Authors' calculations.

Figure 6

Comparison between Bulgaria and other countries by share of tangible and intangible assets in GDP in 2006



Source: Authors' calculations based on OECD data base.

In comparison with other countries, the Bulgarian economy still relies heavily on investment in tangible assets (see Figure 6). Their share is the highest in the country. It is

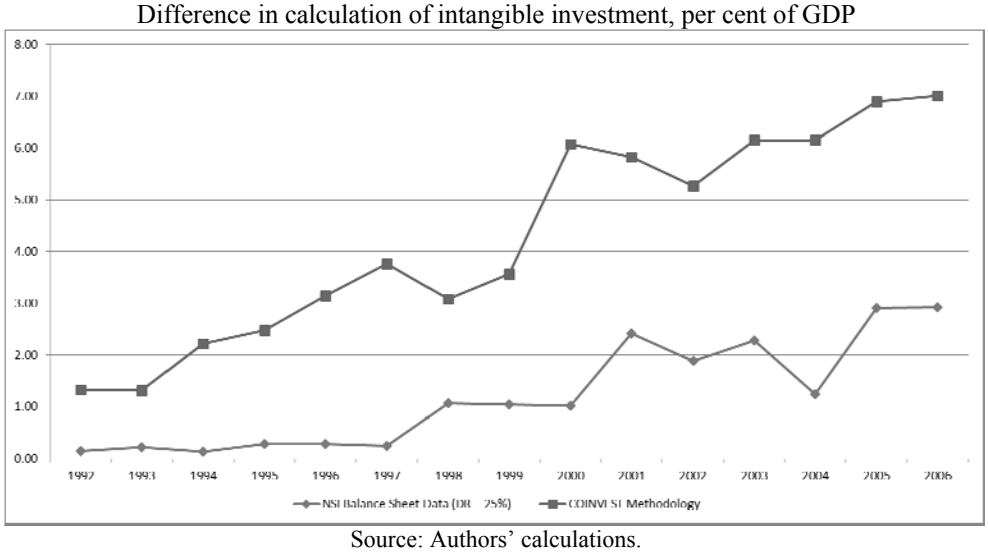
noteworthy also that the overall investment level is the highest in the country, while other, more developed countries achieve better economic results with less investment.

Regarding the relative share of computerized information in Bulgaria's GDP, it is comparable with other countries. Retardation is observed in the other two main groups of intangible assets: economic competences and innovative property. In this line of thoughts, it should be noted the very low share of Bulgaria in innovative property.

Finally, in the figure 7 we compare the intangible assets computed according to the COINVEST methodology with the share, computed out of the data, reported by the firms on their stock of intangible assets. On the latter, we assume 25% depreciation. This comparison shows clearly failure to take account of investment in intangible assets, as the gap between the proposed methodology by CHS and the traditional one continuously grows during the observed period.

Figure 7

Difference in calculation of intangible investment, per cent of GDP



Source: Authors' calculations.

Conclusion

This paper reports the growth of intangible assets in Bulgaria over a period of serious adjustments of the national economy. We observe gradual but significant growth of intangibles, particularly after the financial crisis of 1997. Some of the landmarks of the developments include:

- From the beginning of the 1990s, as the economy gradually switched from manufacturing to services dominated. We, therefore, observe a rapid growth of services-dominated intangibles as innovations in finance, computer databases and new software development.

- From the mid-1990s of 20th century the privatization process of the Bulgarian economy has been initiated and the economy became more private ownership dominated. This coincides with the growth of more market-oriented intangibles as organizational structure, brand building through advertising that are part of economic competences.
- From the beginning of 20th century the Bulgarian economy became more FDI dominated. This is reflected in higher level of investment in intangibles like new product design, market research and advertising that belong to the groups of innovative property and economic competences.
- After the financial stabilization in 1997 and restructuring of the country's economy, the volume of intangible assets began to grow rapidly. This growth is remarkable especially after 1999 until the end of the studied period in 2006.
- Measurment of intangible assets is a real challenge, especially in countries in transition such as Bulgaria. On the one hand a reliable statistical and financial information, and the other - absent sufficient as themes and periodicity specialized research and information sources that provide background information for applying the new methodology for measurment of intangible assets. Despite the difficulties, after adaptation of the methodology of CHS shown that it can be applied in transition countries from an administrative to a market economy. It is necessary, however, to improve statistical reporting of intangible assets in the country, and to conduct periodic surveys of implementation of the new methodology of CHS.
- In the course of the study, it was found that due to the lack for reliable statistical information it is not realistic to obtain an accurate picture of the intangible assets in the country before 1995.
- The discovered delay of the country in terms of investing in intangible assets should be overcome by creating a policy to stimulate such investments, which should be laid down in the national and operational progammes for strengthening of national competitiveness and in the Rural development programme.

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