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Intangible assets in Bulgaria, 1991-2006

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Abstract

Following the Corrado, Hulten and Sickel (2006) paper, we address intangible investments in Bulgaria and the factors involved in their contributions at the level of the firm, industry, and the economy as a whole.

The study encompasses the Bulgarian economy in the period 1990 – 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: 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 national income (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.

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1. Introduction

In a seminal paper Corrado, Hulten and Sichel (2006) (henceforth CHS) questioned the methodology of accounting for the contribution of intangible assets to economic growth and their implications for economic policy and business practices. They suggested that three broad categories of intangibles – computerized information, innovative property and economic competences – are largely neglected and counted as expenditures according to most accepted methodologies. However, a growing literature originating with the CHS paper consider these categories of expenditures as contributing to productivity and the future growth of firm capital and profits, and therefore as investment.

The objective of this study is to lay the grounds for further work, and facilitate the understanding and of the contributions of intangible investments to innovation, competitiveness, growth and productivity.

Whether certain expenditure of the firm is considered investment has profound implications for the conduct of business and for the society at large. Expenditures are driven by cost minimization considerations. Cutting down on expenditures is one way to restructure. On the other hand, cutting down on investment works against restructuring. Usually, new methods of organization and new technology require more intangible investment.

We consider the following types of investment into intangibles: 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.

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.

Economic competences that may propel future growth are advertising and market research into development of brand equity, firm-specific human capital such as in-house professional training of the companies and the organizational capital of the firm – the expenditure for strategic restructuring tuned to future rather than current performance.

Capturing and recognizing the strategic importance of all intangible assets may have vital importance for public policy. For example, it can affect the rates of tax deductions, the allowable rates of depreciation and amortization etc.

The study encompasses the Bulgarian economy in the period 1990 – 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: 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 national income (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.

The paper opens up with a brief overview of the various shocks in the Bulgarian economy throughout the 1990s – financial crisis, trade reorientation, and a shift from public – mainly

state owned – ownership to economy dominated by private property rights. To put the further discussion and valorization of intangible assets, we present some basic statistic underlying the changes.

Then we proceed to the valorization of each individual item of intangibles. We explain the methodology and sources used, and compute total value – for most items 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. If necessary, we also make adjustments for exports and imports.

We exclude the item of mineral exploration – mentioned in the CHS paper – as this sector is not relevant for the Bulgarian economy.

2. Economic developments 1990-2008

2.1. Structural changes in the economy during the 1990s

Later chapters will demonstrate gradual but persistent rise of the intangible assets in Bulgaria over the period 1990-2008. This growth was part of the spectacular overall economic growth in the second half of the period, particularly after 2001. It was prepared by the comprehensive structural changes of the Bulgarian economy throughout the 1990s.

In the last two decades Bulgaria re-introduced the functioning market economy that, after WW2, had been effectively suspended and exchanged for nearly half a century by a soviet-style centralized economic decision-making. The period toward the market since 1989 was marked by three major structural shocks in the economy: liberalization, privatization, and trade re-orientation from east to west. The economic development was perturbed by political instability and frequent change of government until 1997, two shocks of hyperinflation and currency devaluation in 1990-1991 and 1996-1997, and – due to Bulgaria’s specific geographic location – extra hurdles to the trade, particularly with the European Union, caused by the wars in former Yugoslavia. The comprehensive privatization of the economy resulted in a strong fragmentation of companies and the emergence of new markets and industry structures.

Liberalization, macroeconomic shocks and financial crisis.

More than any other east European country, before the peaceful revolutions of 1989 Bulgaria was dependant on trade within CMEA¹, the economic organization including the Soviet Union, all eastern European countries, Cuba and Vietnam. Table 1 demonstrates the high intra-regional trade within the CMEA area. Bulgaria’s exports within the trading block made up 82.59% of total exports, and imports – 75.32% of total imports. The shares of exports to, and imports from the Soviet Union alone are also very high - 62.34% and 53.52% of all exports and imports respectively. The table also shows, that in the direction of trade flows, Bulgaria is comparable only to Czechoslovakia but differs strikingly from Poland, Hungary, and Romania – who had a more balanced distribution of foreign trade between east and west.²

¹ Council for Mutual Economic Assistance, also known as COMECON.

² Poland and Hungary initiated in the early 1980s modest political and market-driven reforms, which contributed to the events of 1989. Romania, due to uneasy historical relationship with Russia, was enthusiastic member of the “non-aligned” movement, and had stronger economic relations with the developing world.

Table 1. CMEA countries: geography of foreign trade in 1988
(shares in total export/import, per cent)

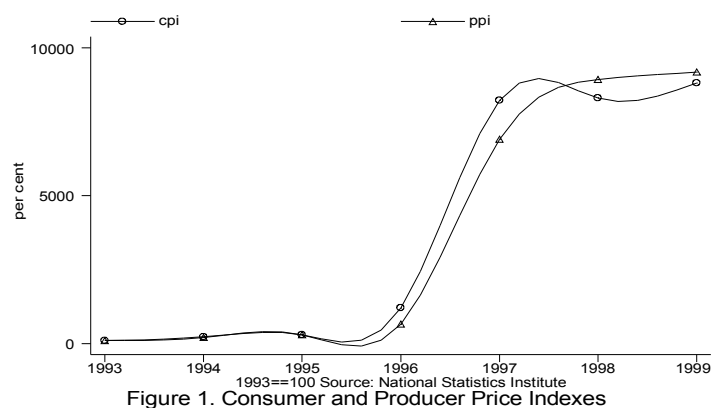
		CMEA		OECD	Other
		All	USSR only		
Bulgaria	Export	82.59	62.34	6.42	9.43
	Import	75.32	53.52	15.45	7.85
Czechoslovakia	Export	75.14	43.06	16.28	4.70
	Import	74.09	40.29	18.56	3.51
Hungary	Export	45.48	27.61	40.54	8.88
	Import	44.25	25.04	43.61	7.38
Poland	Export	41.10	24.53	43.53	9.94
	Import	40.90	23.30	45.89	7.00
Romania	Export	36.93	21.36	33.63	24.13
	Import	44.70	22.42	16.98	32.80
USSR	Export	58.18	-	21.85	14.25
	Import	61.24	-	25.09	8.22

Source: Economist Intelligence Unit Country Reports

Therefore, Bulgaria's economy suffered precipitously by the disintegration of the former Soviet Union, and the simultaneous collapse of the eastern trading block and its currency, the convertible ruble. Following a sovereign debt default, and in the face of economic calamities and precarious political stability, in 1991 a 'grand coalition' government introduced an IMF-led stabilization program leading to price, trade, and currency liberalization. The IMF 'austerity' package liquidated a huge monetary overhang by overnight inflating consumer prices by up to 400 per cent, abolishing most custom tariffs and making the Bulgarian currency fully convertible.

The fiscal prudence and restrictive monetary policies, combined with such price and trade liberalization, did not match the receptive capacity of the society at the time, and several governments were prematurely voted out of power. The scars on the social fabric and the ensuing political instability had a lasting effect and swayed opinions back to the left of the political spectrum, which at the time of the parliamentary elections of 1995 was occupied exclusively by the scantily reformed socialist party, the descendant of the former communists. Their loosening of fiscal and monetary controls and the ensuing expansion of soft credits accelerated the inflation and currency devaluation, and led to the financial crisis and hyperinflation of 1996/1997, the second and the most severe shock the economy had to endure in this decade. Figure 1 shows the extent of this crisis³.

³ On this figure, we ignore the 400% inflation of 1990-1991 which pales compared to the subsequent 10,000% inflation between 1995-1997.



Following massive street protests, new general elections installed a right-wing

government which embarked upon major overhaul of economic policies toward privatization and further westward trade re-orientation. The latter was supported by the formal start of Bulgaria's EU accession negotiations in 1997.

Trade re-orientation

In Table 2 we observe the complete overhaul of directions of trade in Bulgaria over the period 1988-2006. The markets of the European Union grew in importance from the puny 6.4 per cents of exports and 15.4 per cent of imports in 1988 to 71 per cent of exports and 61 per cent of imports in 2006, making the EU Bulgaria's major trading partner at present. Nevertheless, as a main energy supplier, Russia still holds a sizeable share, about a fifth of Bulgarian imports.

Table 2 also shows the gradual and incremental shift of the trading patterns over the years. They hold some clues for the size of intangible assets in the economy because the shifts of directions of trade was accompanied by a gradual change in the commodity structure of exports and imports, and a significant revamp of the ways of doing business for most companies. Prior to 1990, when CMEA was dissolved, trade flows and volumes followed plans drawn by governments, and little was left to grass-root initiatives of the firms. Some activities we now associate with intangible assets, e.g. marketing and advertising, barely existed in the CMEA trade – the bulk of Bulgaria's foreign trade turnover up until the early 1990s.

Table 2. Bulgaria: Geography of Foreign Trade 1988-2006
(shares in total export/import, per cent)

	Export		Import	
	Eastern Europe & Russia	EU	Eastern Europe & Russia	EU
1988	82.59	6.42	75.32	15.45
1989	79.67	8.45	69.23	18.10
1990	62.35	21.22	54.78	22.56
1991	48.22	34.23	46.34	35.54
1992	39.22	42.20	36.28	43.79
1993	35.14	43.17	42.45	47.63
1994	38.97	49.88	40.43	45.23
1995	32.06	50.33	40.62	44.68
1996	31.88	51.62	43.15	42.26
1997	26.58	57.79	39.38	46.62
1998	22.06	63.43	32.06	54.97
1999	21.37	66.16	30.76	57.88
2000	20.98	67.75	37.42	53.01
2001	10.70	66.32	23.85	64.84
2002	8.91	68.44	18.49	65.08
2003	8.65	69.85	17.67	65.90
2004	8.49	70.26	17.67	65.89
2005	9.46	68.97	20.69	62.89
2006	11.54	70.94	22.32	60.95

Notes: Data for Eastern Europe and Russia before 2001 includes the entire former soviet block but excludes ex-Yugoslavia. Data for EU after 2001 includes all new entrants. Data for Russia & Eastern Europe after 2001 includes Russia, Ukraine, Serbia, Macedonia, Croatia, Montenegro, Bosnia and Albania. *Source:* Statistical Yearbooks of the Republic of Bulgaria, respective years.

The new markets of the European Union required a higher quality of the Bulgarian goods and services, and much better organizational skills and managerial techniques. Therefore, we could expect to observe a substantial increase of such intangible assets as brand-specific advertising, improved organizational structure, and more firm-specific training. Regrettably, the statistical apparatus of the state was not tuned at the time towards capturing at a macro-level such aspects of the economic activities of the firms. For example, the first survey on vocational training was conducted in Bulgaria only in the year 2000.

Privatization, corporate governance and market structure

Before 1989, Bulgaria was a state-dominated economy with public ownership of almost all productive assets. With the exception of small agricultural plots for private consumption and private housing, all tangible assets were in the hands of a public authority. Technically, the public ownership had various legal forms. A principal to a managerial contract could be the

state, a municipality, a public agency such as, for example, the Union of Hunters and Fishermen, the Academy of Sciences, a university, even a cooperative⁴. Such a disarray of institutional ownership allowed for some local initiative and often created conflicts of interest but in principle, the decision-making process was top-down, with residual rights vested with the executive power of the state and the communist party, which took precedence over all lower-level executives and could supersede even the decisions of the courts.

The consecutive waves of liberalization after 1990 included the creation of proper corporate relationships leading to a critical mass of privatizations and a comprehensive shift, over a decade, of the economy to one dominated by private ownership. This is illustrated in Table 3: whilst in 1991 as much as 98.3% of GDP was created by firms in public ownership, this share fell to only 11.9% in 2004.

Table 3. GDP by ownership type 1991-2004
(per cent of total)

	Public	Private		Public	Private
1991	98.3	1.7	1998	55.8	44.2
1992	97.0	3.0	1999	49.6	50.4
1993	95.1	4.9	2000	25.4	74.6
1994	91.3	8.7	2001	22.3	77.7
1995	86.5	13.5	2002	18.2	81.8
1996	85.5	14.5	2003	12.1	87.9
1997	66.4	33.6	2004	11.9	88.1

Source: Statistical Yearbook of the Republic of Bulgaria, respective years.

The exuberant literature on world-wide privatizations purports that private property rights breed market efficiency through allocation of residual rights of control over assets to their highest valued use. One could argue that economy dominated by public ownership has little need of intangible assets. For example, mechanism design of allocations and distributions subordinated to a central plan leaves little scope for independent decision-making usually associated with activities such as marketing and advertising, or organizational design to boost productivity. At the same time, a counter-argument could insist that a public-ownership dominated economy can invest no less, perhaps even more, in such intangible assets as research & development,

⁴ Cooperatives are reported by NSI (see Table 3) as ‘publicly-owned’ up until 1997. Partially therefore, Table 3 reports that the GDP produced by the private sector grows steeply from 33.6% in 1997 to 44.2% in 1998. Legally, as a ‘collective’ enterprise, the cooperatives had not been abolished in 1945. However, over the period 1995-1990 they had been made devoid of any property rights and functioned as any other state-owned company. After 1991 they gradually reclaimed their residual rights of control and, particularly in agriculture, many of them disintegrated.

vocational training, computerization and firm-specific software. In some cases, the incompleteness of markets, usually associated with public ownership, may even encourage more in-house activities where otherwise market solution would easily be available.

In the specific conditions of countries such as Bulgaria, the ability to measure the intangible assets went in tandem with the introduction of proper corporate governance with clearly divided responsibilities and residual rights, typical for the institution of private property. Therefore, a brief account of the process is in order.

The initial legal framework for “incorporating” a company in Bulgaria was given by the Decree No. 56 for Economic Activity of January 1989⁵, which re-established the company structure that had been in existence before 1951, when the old Commercial Code was abolished. In June 1991 a new Commercial Code superseded Decree 56, but the preceding incorporation of companies under Decree 56 was recognized. A short-lived and ineffective Law on Incorporating Single-Owner Firms with State Property⁶ (also known as the “first privatization law”) was in force for several months in 1991. Final and comprehensive legal procedures for incorporation of state-owned enterprises (SOEs) was provided by the Privatization Law of February 1992, subsequently amended many times to reflect the changing priorities of incumbent governments.⁷

A new impetus in firm privatization came in the late 1990s, particularly after a voucher privatization campaign of 1997 including over 800 SOE’s. The voucher privatization increased the share of private property in GDP creation from 14.5% to 33.6% (Table 3) and thus created a critical mass of private ownership in the economy. While the allocative efficiency of this give-away program may be put under question, it undoubtedly spurred the creation of entrepreneurial middle class in Bulgaria, and changed overall attitudes and perceptions to property rights. It also created a favorable business climate for foreign investors who in subsequent years flocked into the country, rapidly increasing the share of private property.

Privatizations led to many spin offs of factories and workshops, an overall fragmentation of the existing tangible assets, and establishment of new companies, often under foreign ownership.

⁵ State Gazette, 4 January 1989.

⁶ State Gazette, 12 July 1991.

⁷ State Gazette, 8 May 1992.

Green field FDI also added to the diversity of corporate structures of the economy. The period under study – particularly from the mid 1990s – saw a decline in product market concentration and a growing new entry and import penetration on the Bulgarian markets. This resulted in exponential growth of the number of firms in operation up until the early 2000’s when the market structures appeared to stabilize. Table 4⁸ demonstrates these developments: a state-dominated economy of 5,600 firms (2,300 in manufacturing) grew in just a decade to a private-dominated one of nearly 80,000 firms (12,000 in manufacturing). We can also observe that the growth of non-manufacturing firms has been much stronger.

Table 4. Number of firms 1991-2001

Year	Manufacturing	Total
1991	2,306	5,625
1992	2,451	8,748
1993	2,802	10,767
1994	2,705	10,312
1995	4,471	18,963
1996	7,053	34,434
1997	8,196	41,731
1998	8,780	49,010
1999	9,811	58,059
2000	10,850	69,518
2001	12,191	76,913

To sum up, it can be assumed that the increased fragmentation of the markets brought about more competition conducive to the creation of more intangible assets through market-related activities. As mentioned before, similar effects can be expected from the processes of privatization and introduction of new corporate governance of the firms. At the same time, the shift of economic activity from the state to the market, particularly in periods of economic hardships and financial crisis, may have resulted in less visionary spending on research & development, and a stronger focus on utilizing resources to secure survival of the firm rather than on investment into the future.

2.2. GDP growth 1990-2008

⁸ Table 4 excludes some small one-man companies using single-entry bookkeeping.

In Chapter 4 we report the share of various types of intangibles in GDP by year. To explain the growth of different nomenclatures of intangibles we first need to report the growth of GDP over the period.

Table 5. GDP growth in Bulgaria, 1990-2008

	GDP in BGN (thsnd)¹	BGL & BGN for 1 USD²	GDP in USD (mln)	GDP in euro (mln)
1990	45,390	n.a. ⁹	n.a.	n.a.
1991	135,711	19.15	7,086	n.a.
1992	200,832	23.34	8,605	n.a.
1993	298,934	27.59	10,834	n.a.
1994	525,552	54.16	9,704	n.a.
1995	880,322	67.17	13,106	n.a.
1996	1,761,172	177.88	9,901	n.a.
1997	17,432,554	1681.87	10,365	n.a.
1998	22,421,14 2	1760.36	12,737	n.a.
1999	23,790,44 0	n.a. ⁽³⁾	n.a.	n.a.
2000	26,752,83 3	2.12	12,599	n.a.
2001	29,709,21 0	2.18	13,598	15,195
2002	32,401,61 3	2.08	15,601	16,572
2003	34,627,54 5	1.73	19,986	17,711
2004	38,822,63 6	1.58	24,648	19,856
2005	42,797,40 7	1.57	27,188	21,889
2006	49,360,95 0	1.56	31,656	25,246
2007	56,519,818	1.43	39,551	28,907
2008	66,728,10 3	1.34	49,901	34,128

(1). Data in Bulgarian leva before 1999 is divided by 1000 to reflect the currency depreciation of BGN (new Bulgarian lev) with respect to BGL (old Bulgarian lev), following the financial crisis of 1996-1997.

(2). Exchange rate before 1999 is with respect to BGL, and in 2000-2008 with respect to BGN.

(3) The exchange rate is annualized from monthly data. This makes the rate for 1999 – the year of 1000-times currency depreciation – inconsistent, as the date of 1000-times currency depreciation was in mid-year and annualization would capture both the low and the high value, and produce an irrelevant number.

Source: Monthly Bulletin of the Bulgarian National Bank, average for the respective years.

Table 5 contains the figures of the GDP growth in Bulgarian currency (lev), in US dollars, and in euro for the years after 2001. It also demonstrates the rapid growth of GDP, at constant prices, after the financial crisis was overcome, and particularly after the year 2000.

⁹ No market exchange rate of the Bulgarian lev exists for 1990.

The table also documents some aspects of the financial crisis of 1996-1997 discussed above, such as the spiraling currency devaluations prior to the crisis, and the depreciation of the old Bulgarian lev (BGL) in 1999 to new Bulgarian levs (BGN) by trimming three zeros from its value. In 1997, Bulgaria introduced a currency board pegging the new Bulgarian lev to equal one Deutsche Mark. (subsequently, the peg was recalculated to the euro). The peg has been in effect unchanged ever since, and consecutive governments have pledged to maintain its current value till the introduction of the euro, expected in 2013-2014.

Table 6 GDP growth in Bulgaria, 1990-2008

	Year-on-year	1997=1.00
1997	1.00	1.00
1998	1.29	1.29
1999	1.06	1.36
2000	1.12	1.53
2001	1.11	1.70
2002	1.09	1.86
2003	1.07	1.99
2004	1.12	2.23
2005	1.10	2.46
2006	1.15	2.83
2007	1.15	3.24
2008	1.18	3.83

Not adjusted for inflation.
 Source: Statistical Yearbook, respective years

The growth of GDP in US dollars clearly demonstrates the high economic and political volatility of the country prior to the financial crisis, and its stable and sound growth in the period after the crisis. In the period 2000-2006 only – the final year of our reporting on intangible assets in Chapter 4 – the economy has grown 1.85 times. If we take as a base year 1997 – the year in which the exchange rate was fixed to the DM – by 2006 the economy has grown 2.83 times (Table 6), unadjusted for inflation. This should be born in mind when comparing the shares of the various nomenclatures of intangibles in GDP over the years.

3. Sources and classifications

The computations reported in subsequent chapters are based on various sources drawn from officially published statistics, as well as surveys and interviews conducted by NGOs. There

have been two major changes of the main industry classification over the period, until in 2005 the EU NACE 3.1 was introduced to secure full compliance to EUROSTAT standards. Later in this chapter, we briefly report the micro-work to make transitions between classifications consistent.

3.1. Data sources

Business Statistics data of the National Statistics Institute

The Business Statistics data is the major source of information about intangible assets in Bulgaria. It comprises data gathered from the detailed accounts of the 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 National Statistical Institute their annual balance sheets and profit & loss accounts, including all supplements mentioned above¹⁰. 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 (Table 4).

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 7) corresponding to such intangible assets as computerized information and databases, R&D, architectural and engineering design, advertising, market research and new organizational structure.

National Accounts of the Republic of Bulgaria

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

¹⁰ 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.

National Accounts is used in the computation of capitalized expenses of the firms for vocational training in Chapter 4.3.3. Data on gross output and value added is used to compute intermediate consumption, needed to estimate the capitalized expenses for new products in finance in Chapter 4.2.3.

Structure of Earnings Survey

This 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 so far in 2002 and 2006. We use these surveys for approximating the capitalized own-account expenses on organizational structure in Chapter 4.3.5.

Vocational Training Surveys

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

3.2. Classifications and manipulations

We need to clarify the use of classifications because the time series of any economic data in Bulgaria for the period 1990-2006 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 National Statistical Institute, 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. Three different classifications have been used over the period: Classification of the Industries of the National Economy KONS (1972), NCEA (1994) and NACE (2001)¹¹. 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 and databases, 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 7, if sold on the domestic market only, would constitute the total expenditure of all other firms for the services offered by these industries.

Table 7. NACE industries producing intangible assets

7220	Software consultancy and supply
7240	Database activities
7310	R&D in natural 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

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 1990-2006. For the three IT industries we adjust the data with the available data for export and import.

4. Intangible assets by nomenclature

4.1. Computerized information

¹¹ 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.

4.1.1. 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 is taken from “Computerworld Bulgaria”. Table 7 reports the share of computer software in GDP after the adjustments made to account for exports and imports.

Table 8. Intangible assets: computer software 1991-2006
(per cent of GDP)

1991	0.02	1999	0.34
1992	0.10	2000	2.06
1993	0.07	2001	1.08
1994	0.07	2002	0.89
1995	0.23	2003	0.88
1996	0.29	2004	1.07
1997	0.34	2005	1.32
1998	0.22	2006	1.31

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.¹² 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.

Table 9 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

¹² Postal interviews of the top 30 firms currently in the industry indicate that the share of export has increased in 2007 and 2008.

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.

Table 9. Intangible assets and GDP: computer software 1998-2006
(thousands of BGN)

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Software	49,964	81,116	551,565	322,122	288,809	305,033	416,112	563,986	644,223
GDP	22,421,142	23,790,440	26,752,833	29,709,210	32,401,613	34,627,545	38,822,636	42,797,407	49,360,950
Per cent	0.2228	0.3410	2.0617	1.0771	0.8913	0.8809	1.0718	1.3178	1.3051

4.1.2. 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”¹³, also adjusted for imports and exports. Table 10 presents the results of the computations. No revenues are reported by any company prior to 1995 and, as we can observe in the table, the numbers reported up to 1999 are miniscule.

Table 10. Intangible assets: computerized databases 1991-2006
(per cent of GDP)

1995	0.004	2001	0.09
1996	0.006	2002	0.16
1997	0.009	2003	0.19
1998	0.002	2004	0.24
1999	0.043	2005	0.30
2000	0.013	2006	0.51

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 (Table 11). 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,

¹³ We assume that NACE industry 7230 “Data processing” does not contribute to intangible investment.

there are concerns that some activities may have remained unrecorded, as in the age of internet many programmers work extra hours from home. Table 11 presents the results for computer software in BGN.

Table 11. Intangible assets and GDP: computer software 1998-2006
(thousands of BGN)

	1998	1999	2000	2001	2002	2003	2004	2005	2006
Software	466.2	10,300	3,483	26,353	51,232	67,017	93,164	129,616	251,199
GDP	22,421,142	23,790,440	26,752,833	29,709,210	32,401,613	34,627,545	38,822,636	42,797,407	49,360,950
Per cent	0.0021	0.0433	0.0130	0.0887	0.1581	0.1935	0.2400	0.3029	0.5089

4.2. Innovative Property

4.2.1. Scientific research & development

The ultimate source of scientific R&D are 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, The Academy of Medical Sciences, independent research institutes, etc. They exclude, however, research expenditures of universities (classified under “Education”) and estimates for unreported research expenses of the businesses.¹⁴

The data, as presented in the National Accounts, coincides with that available in Eurostat,¹⁵ and is presented in Table 12.

Table 12. Intangible assets: research & development 1991-2006
(per cent of GDP)

1991	0.45	1999	0.57
1992	0.72	2000	0.52
1993	0.41	2001	0.47
1994	0.48	2002	0.49

¹⁴ This is due to the distinction between research in 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.

¹⁵ The source of the data available in Eurostat is the NSI of Bulgaria.

1995	0.36	2003	0.50
1996	0.36	2004	0.49
1997	0.51	2005	0.48
1998	0.57	2006	0.48

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.

4.2.2. 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 Table 13.

Table 13. Intangible assets: copyright & licenses 1992-2006
(per cent of GDP)

1991		1999	0.16
1992	0.03	2000	0.52
1993	0.18	2001	1.04
1994	0.07	2002	0.34
1995	0.13	2003	1.05
1996	0.08	2004	0.62
1997	0.11	2005	1.08
1998	0.73	2006	0.96

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

4.2.3. New product development in the financial industry

Following Manole, van Ark, and Xiaohui (2008), we assume that new product development is 20 per cent 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 presented in Table 14. They support the hypotheses - made in Section 4.1.2 – 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 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 55% of GDP in the end of the period, and a relatively stable share for the period of rapid economic growth.

Table 14. Intangible assets: new products in finance 1991-2006
(per cent of GDP)

1991	0.78	1999	0.32
1992	0.28	2000	0.32
1993	0.39	2001	0.32
1994	0.47	2002	0.34
1995	0.56	2003	0.36
1996	0.55	2004	0.51
1997	0.34	2005	0.55
1998	0.26	2006	0.54

The absolute magnitudes of this category of intangibles over the period of stable exchange rate are presented in Table 15. The table demonstrates the stable and high share of new products in finance in the last three years of the series.

Table 15. Intangible assets and GDP: new products in finance 1998-2006
(thousands of BGN)

	1998	1999	2000	2001	2002	2003	2004	2005	2006
NPFinance	290,119	378,844	428,614	477,123	552,379	639,157	983,549	1,185,388	1,334,053
GDP	22,421,142	23,790,440	26,752,833	29,709,210	32,401,613	34,627,545	38,822,636	42,797,407	49,360,950
Per cent	0.2588	0.3185	0.3204	0.3212	0.3410	0.3692	0.5067	0.5540	0.5405

4.2.4. 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 Table 16 and Table 17.

Table 16. Intangible assets: architectural & engineering design 1991-2006
(per cent of GDP)

1991	0.16	1999	0.37
1992	0.19	2000	0.40
1993	0.26	2001	0.44
1994	1.13	2002	0.46
1995	0.19	2003	0.51
1996	0.20	2004	0.56
1997	0.31	2005	0.57
1998	0.29	2006	0.68

Table 17. Intangible assets and GDP: architectural & engineering design 1998-2006
(thousands of BGN)

	1998	1999	2000	2001	2002	2003	2004	2005	2006
AEDesign	130,077	174,841	212,191	262,581	297,729	353,210	433,146	486,851	672,669
GDP	22,421,142	23,790,440	26,752,833	29,709,210	32,401,613	34,627,545	38,822,636	42,797,407	49,360,950
Per cent	0.2901	0.3675	0.3966	0.4419	0.4594	0.5100	0.5579	0.5688	0.6814

4.3. Economic competences

4.3.1. Brand equity, advertisement

NACE industry 7440 “Advertising”, aggregated from the Business Statistics data of the National Statistical Institute 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, as discussed in Chapter 2.1. 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 adds published in the media. The results are presented in Table 18 and Table 19.

Table 18. Intangible assets: brand equity, advertisement 1995-2006
(per cent of GDP)

1995	0.12	2001	0.31
1996	0.21	2002	0.48
1997	0.019	2003	0.55
1998	0.004	2004	0.56
1999	0.015	2005	0.69
2000	0.125	2006	0.58

Table 19. Intangible assets and GDP: brand equity, advertisement 1998-2006
(thousands of BGN)

	1998	1999	2000	2001	2002	2003	2004	2005	2006
BEAdd	2,144	7,246	67,028	184,114	312,142	382,839	435,656	587,969	572,507
GDP	22,421,142	23,790,440	26,752,833	29,709,210	32,401,613	34,627,545	38,822,636	42,797,407	49,360,950
Per cent	0.0048	0.0152	0.1253	0.3099	0.4817	0.5528	0.5611	0.6869	0.5799

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.

4.3.2. 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. Table 20 and Table 21 present the results.

Table 20. Intangible assets: brand equity, market research 1995-2006
(per cent of GDP)

1995	0.08	2001	0.19
1996	0.31	2002	0.18
1997	0.65	2003	0.17
1998	0.12	2004	0.17
1999	0.11	2005	0.15
2000	0.17	2006	0.16

Table 21. Intangible assets and GDP: brand equity, market research 1998-2006
(thousands of BGN)

	1998	1999	2000	2001	2002	2003	2004	2005	2006
BEMR	27835	28140	47168	55365	59540	60268	66355	63012	76873
GDP	22,421,142	23,790,440	26,752,833	29,709,210	32,401,613	34,627,545	38,822,636	42,797,407	49,360,950
Per cent	0.1241	0.1183	0.1763	0.1864	0.1838	0.1740	0.1709	0.1472	0.1557

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

4.3.3. 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. Table 22 reports the results for 2004 and 2006 – the years of the survey for which NSI deems results credible.

Table 22. Intangible assets: firm-specific human capital 2000-2006
(per cent of GDP)

2004	0.68
2006	0.72

4.3.4. 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. Table 22 and Table 23 report 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 FDI operating in Bulgaria through local affiliates.

Table 23. Intangible assets: organizational structure – purchased 1995-2006
(per cent of GDP)

1995	0.05	2001	0.33
1996	0.06	2002	0.38
1997	0.33	2003	0.47
1998	0.13	2004	0.51
1999	0.15	2005	0.63
2000	0.29	2006	0.56

Table 24. Intangible assets and GDP: organizational structure - purchased 1998-2006
(thousands of BGN)

	1998	1999	2000	2001	2002	2003	2004	2005	2006
OSP	30,239	37,761	76,246	98,123	123,108	163,778	200,203	268,648	278,280
GDP	22,421,142	23,790,440	26,752,833	29,709,210	32,401,613	34,627,545	38,822,636	42,797,407	49,360,950
Per cent	0.1349	0.1587	0.2850	0.3303	0.3799	0.4730	0.5157	0.6277	0.5638

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

4.3.5. 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 economy. The results for this item of intangibles are reported in Table 25.

Table 25. Intangible assets: organizational structure – own account 1995-2006
(per cent of GDP)

1995	0.05	2001	0.97
1996	0.06	2002	0.98
1997	0.33	2003	0.98
1998	0.13	2004	0.90
1999	0.86	2005	0.86
2000	1.10	2006	0.85

5. 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, as the economy became more private ownership dominated. This coincides with the growth of more market-oriented intangibles as organizational structure, brand building through advertizing=
- From the early 2000's, as the economy became more FDI dominated. This is reflected in higher rates of new product design, market research and advertising.

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