

Concept Report

Research and Advisory Services

The Economics of Information

The Relationship Between IT Spending, Profits,
and Knowledge Capital®

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The Economics of Information

► CONCEPT REPORT

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Management Summary

This Report addresses the relationship between investment in Information technology (IT), its impact on the profitability of companies and the longer term potential of companies in creating wealth from the management of their information resources. A large number of companies are analysed in both the USA and Europe using an original set of metrics. The conclusions have wider implications than the pure management of IT and will be of special interest for company executives, financial officers, IT managers, and IT strategists.

The first part deals with the economics of information in organisations and examines the role of investments in. The conclusions are not country specific and are derived from the study of USA and UK firms with UK banks analysed in some detail as case studies. The second part addresses the related issue of Knowledge Capital® as the measurable entity that is the direct result of good, or not so good, management of the live resources of an organisation, the value of the Knowledge Capital® as the measurement of the capability of a firm to generate wealth. The performance of European firms is analysed in detail by country and by activity sectors.

Transforming IT Costs into Profits

It appears that the job of transforming IT costs into profits has suddenly become easier, because the investments necessary to keep up with the successive technology cycle, from now on, will be finally assumed where they always belonged, the IT vendors. IT executives will also not have to carry the burden of having to justify and support a costly corporate IT infrastructure – a task that they never mastered anyway. As long as networked services remain competitive and make it easy to switch from one service to another, the curse of excessively long implementation cycles could be also lifted.

If the above prospects appear to be too good to contemplate, there must surely something wrong with this vision. In fact, what's wrong are the prospects of excessive uniformity, the arresting of innovation, and the handing over of opportunities to competitors who can now imitate and retaliate faster than ever before. More importantly, the question of profits remains unanswered.

IT spending and profits are unrelated and will always remain that way.

If control of IT evolution is subordinated to vendors' profit growth expectations, what are the remaining sources of competitive advantage that would allow a firm to garner superior profits in the information age?

In summary:

- IT has not emerged as a directly measurable strategic player that can be shown to have a decisive strategic influence on corporate profitability.
- IT spending does not exhibit a comparable level of positive correlation with profits as has been found with other PIMS strategic variables such as market share, capital intensity, and relative customer quality.

This relegates IT spending to an important, but only to an enabling, catalytic role. From the standpoint of corporate strategy, IT can be then seen primarily as an attractive means that permits corporate management to re-balance its responses to rapidly changing competitive circumstances. Such a role is more than adequate as an enormous challenge for computer executives. IT managers must be involved in board-level decisions in order to link IT, in the least costly manner, to the enhancement of your firm's strategic advantages!

Knowledge Capital® in European Firms

The second part of the Report deals with the measurable result of managing the intellectual resources of an organisation. It presents a detailed analysis of the reported financial results of nearly three and an half thousand European firms (3,398 to be precise) with the dual objective of computing the Knowledge Capital®¹ accumulated by these companies, and comparing the effectiveness of different countries and industries in their ability to use this capital.

¹Knowledge Capital® is a Registered Trade Mark of Strassmann, Inc., New Canaan, Con., USA.

Knowledge Capital® – the original metrics developed by Strassmann, Inc. – is defined as Economic Profit/Cost of Capital. It is an objective measure of the capacity of a firm, or a country, to generate profits by other means than through the utilisation of financial capital. Together with the physical and financial assets of a firm, Knowledge Capital® gives a complete picture of the worth of an organisation and, in fact, it is reasonably correlated with the stock market valuation of a firm over the long run. Knowledge Capital® is assessed from the available data about European firms in order to derive comparative measurements across countries, sectors, and within sectors.

In summary:

- The average Knowledge Capital® in this study of European Firms was €542 million per firm and represents only listed firms that provided full disclosure of their financial holdings in 1999.
- The corresponding figure for US firms is \$880 million, from a study of 7,287 firms in 1999.
- The European interest rates for long-term government bonds in 1999 were comparable to the US Cost of Capital and do not account for the very large variance in the Knowledge Capital® valuations for individual countries or firms.
- One of the most telling characteristics of Knowledge Capital® is the concentration of non-financial assets, both in positive as well as in negative terms: a few firms possess a disproportionate share of Knowledge Capital® gains as well as losses. The index of Knowledge Capital® concentration is defined as the share of Knowledge Capital® attributable to the top-ranked 5 per cent firms.
- There is a high correlation between stock market valuation and Knowledge Capital for medium and large companies.

A comparison of the performance of firms country by country reveals interesting results. For instance, the UK, with approximately one third of the 3,398 firms assessed in this report, accounted for one third of the total available Knowledge

...in Germany, a very small number of firms gain in a big way and lose in a big way.

Capital®, with an average of €525m per firm. Germany displays perhaps the highest index of Knowledge Capital® concentration; in Germany, a very small number of firms gain in a big way and lose in a big way. However, there is a remarkably low proportion of net Knowledge Capital® in Germany, which averages only €92 million per firm, as compared with €2,242 million in the Netherlands or €1,485 million in Belgium.

The relatively unfavourable performance of Germany can be understood by an examination of ratios of positive and negative Knowledge Capital® contributions. In Germany there are 279 firms with positive Knowledge Capital® as compared with 246 firms with negative Knowledge Capital®, for a ratio of 1.1. In currency terms, the corresponding comparisons are €195.5 billion positive versus €147.5 negative, for one of the lowest European ratios of only 1.3.

Dutch firms show a favourable performance, accounted by the fact that 129 of its firms show positive Knowledge Capital® when compared with only 28 firms with negative Knowledge Capital®, for a ratio of 4.6 – the highest such ratio in Europe.

The average Knowledge Capital® per technology firm is not significant...this should be seen as a serious disadvantage for Europe.

Comparison of the performance of firms sector by sector also dispels a number of generally accepted views. The exaggerated role often attributed to the technology sector is largely deflated by the finding that this sector accounts for only 3 per cent of the total available Knowledge Capital®.

The average Knowledge Capital® per technology firm is not significant as compared with other sectors. From the standpoint of global competitiveness, this should be seen as a serious disadvantage for Europe.

Almost a third of the European Knowledge Capital® is in the financial sector – that demonstrates its pivotal strategic position in the economy. This concentration of economic power confirms the exceptionally favourable position held by financial institutions in steering the further development of the European economy.

Firms in the sectors that are the highest consumers of financial capital, such as the communications, energy, and utility sectors (together accounting for 28 per cent of the total Knowledge Capital®) also exhibit the highest ratios of Knowledge Capital® per firm. This finding runs counter to the generally accepted views about the sources of Knowledge Capital® formation.

The utilities sector represents by far the most attractive application of Knowledge Capital®. Only three from a total of 69 utilities show negative Knowledge Capital®. In euro currency terms, the ratio of positive to negative Knowledge Capital® far outranks all other economic sectors.

The best performing sectors in Knowledge Capital® – utilities and communications services – show the lowest levels of concentration of Knowledge Capital®, whereas some of the poorest performing sectors – basic materials, technology, and healthcare – show the highest degree of concentration. Such findings confirm the long-held views that concentration in

...concentration in economic power is damaging to a particular sector of the economy.

economic power is damaging to a particular sector of the economy. Taking the UK as a case study, the Report analyses in more detail the mechanisms behind the making of Knowledge Capital® and shows, in particular, that the characteristics of the Knowledge Capital® of a firm are unique to that firm's strategic and competitive position and not a generic property of its economical sector.

The Report justifies and expands these conclusions and gives the detailed facts and figures for Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, and the UK.

Part 1: Transforming IT Costs into Profits

1.1 – The Challenge

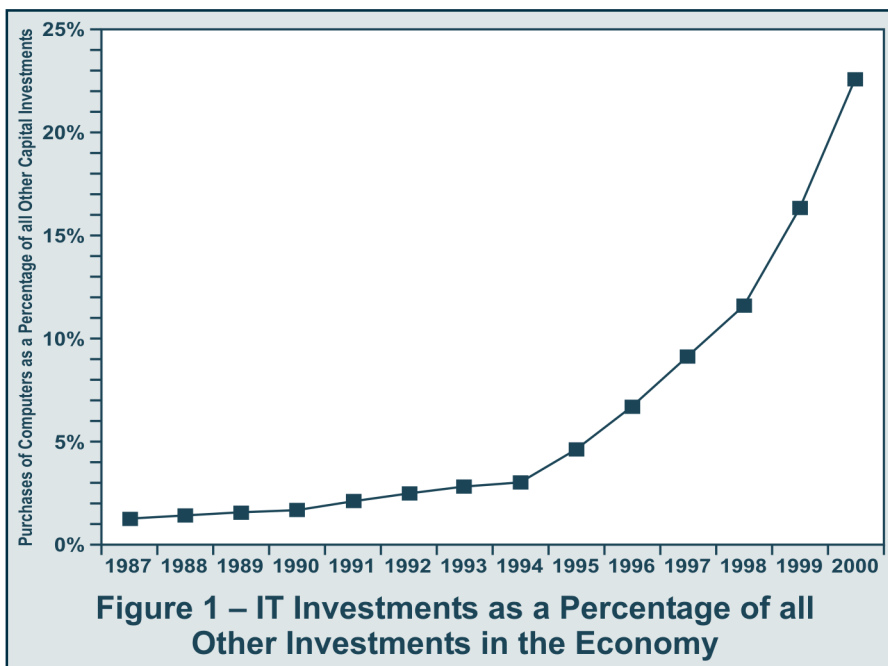
► 1.1 THE CHALLENGE

The assertions that computers improve productivity and increase profits are now generally accepted as an economic fact, as reflected in the pronouncements from government officials, industry pundits, and the business press. Computerisation has been credited as one of the principal causes of rising prosperity in the developed economies. The problem with such claims is that there is insufficient hard evidence that would conclusively support such beliefs. The admirers of computerisation rely primarily on anecdotal case studies as evidence that computers can produce astounding increases in profits. Unfortunately, such stories only rarely hold up as a verifiable proof, except as what appears to be temporary gains on the highly volatile stock markets. They are almost always authored by public relations departments and are, therefore, tainted as self-serving.

A number of academics have also generated a surprisingly small number of studies attempting to show that spending on computers was extremely profitable. The flaw with such studies is that they base their findings both on questionable government statistics as well as reliance on arcane econometric formulae, which hardly any business executive can ever apply in a real-world situation.

The Prudent Spender Rationale

At present, it is a matter of generally accepted wisdom that computers make a profitable investment. After all, what sane financial director would stand by while the board of directors is approving yet another large increase in the IT budget? How can corporate executives warmly endorse increasing IT spending at a rate that exceeds the growth in revenues and profits? What is the rationale for preferring IT spending even though there is no demonstrable relationship between computerisation and corporate profitability?



The factual evidence of an implied rationality that favours investments in computers is overwhelming. One only needs to look at the capital investment history of what is arguably the most successful global economy during the last decade – the United States – a pattern that everybody seems to wish to emulate²

The dramatic rise in the share of all investments devoted to IT would suggest that business has found an exceptionally attractive opportunity to divert funds from other pressing needs, such as energy and production equipment, to devices which are largely devoted to performing calculations.

The most often cited justification for the shift of investments to IT is the phenomenon called 'Moore's Law'. Accordingly, computing costs are

declining at a rate never encountered by any tool in the history of mankind. If the cost of tooling is dropping so precipitously, the logic states it must be profitable because giving people more tools for less money will make people more productive.³

²Bureau of Economic Analysis, US Department of Commerce, 4Q 2000.

³The fact that IT spending per capita is rising steadily at a rate that is greater than wages does not seem to deter the argument that if Moore's Law delivers annual cost reductions of over 40 per cent somehow that will generate increased profits. The chain of this logic rests on the proposition that on account of their cheapness, computers would necessarily make people productive.

Arms Race Rationale

When all other explanations for IT spending fail, the justification for increased IT spending is competitive survival. Accordingly, every firm must keep up with increased customer demand for features, services, and conveniences that depend on the installation of more sophisticated information systems. As a business model, I find the similarity between IT spending and the arms race

...the justification for increased IT spending is competitive survival.

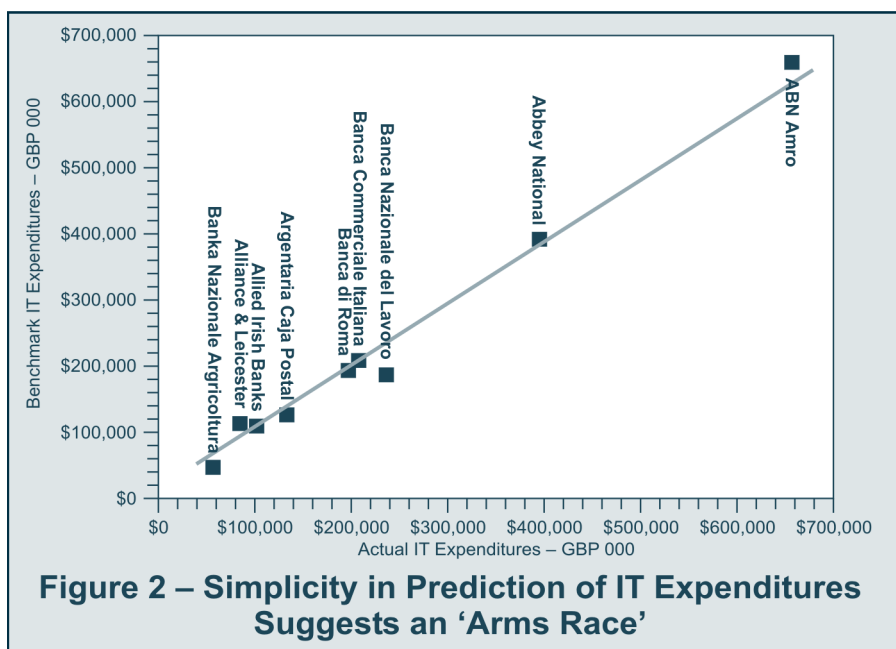
the most plausible explanation for what has been the corporate practice over the past decade.

In an arms race, the military insists that an increase in their budget is necessary for maintaining national security and for defence against real or potential adversaries. The generals will parade before legislators photographs of weapons that are in the possession of others, and which must be matched in capacity and numbers in order to maintain military parity. The focus of military budget requests is primarily on incremental funding to acquire the new weapons.

IT budget reviews follow a similar pattern of request for added funding based on little else than the need to meet (or imitate) capabilities of competitors.

In this respect, the job of the IT proponents is made much easier since vendors and an advertising-supported press will make sure that the accomplishments of the leading innovators in each industry are well described and promoted.

The most convincing way of demonstrating the arms race theory of IT budgeting is by checking the relationship between actual IT expenditures and all other variables that could be used to estimate the level of expected IT spending. In such a benchmarking process, all other causal influences, such as revenues or employment, are used as possible predictors of IT spending. The technique used to make such predictions is a statistical method called 'regression analysis' in which the 'expected'



dependent variable, e.g. IT 'benchmark expenditures' is calculated using so called 'independent' variables that define the structure of a business.⁴

For illustration purposes, we have chosen only a small random sample of European banks and compared their benchmark (expected) spending against actual spending. For all practical purposes the relationship is linear (see Figure 2).

The relationship between the 'actual' and 'benchmark' values of IT were almost entirely dependent on revenues (with R-squared of 97.5 per cent). When the employee count was added, the relationship between 'actual' and 'benchmark' IT spending showed an even tighter correlation (with R-squared of 98.6 per cent). Such comparisons demonstrate that the IT spending levels at each bank, regardless of size or geography were propelled primarily by efforts to match the IT spending patterns set by other banks. Thus, every bank was spending on IT in direct proportion to its revenues and personnel count.⁵

⁴After testing bank financial reports for every conceivable variable (e.g. Assets, Capital, Interest Income, Return on Equity, etc.), only two variables were able to predict actual expenditures for European banks.

⁵A test of a much larger sample of banking firms found the identical relationship. In this paper, the spending patterns of more firms is not shown to limit disclosure of proprietary data.

The linear relationship between IT budgets and the revenue of banks has been a persistent pattern for many decades. The only effect that changed was the percentage of revenue devoted to IT, which has increased steadily over time, thus confirming the arms race theory of spending.

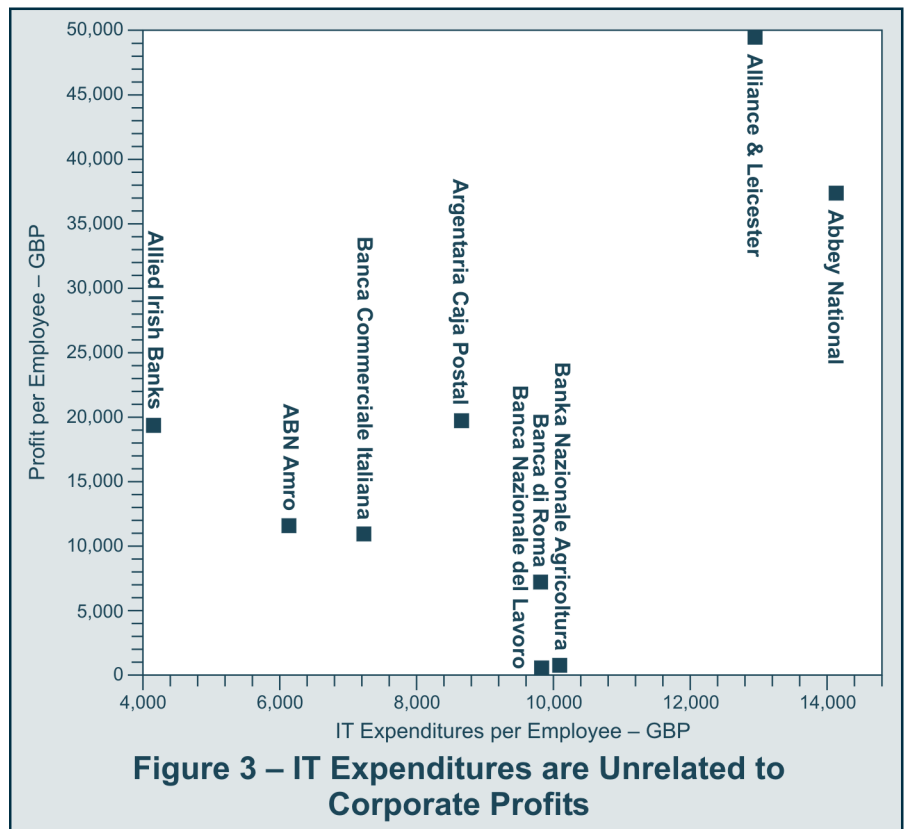
Similarly, the percentage of revenue ratios, by industry sector, has remained the favourite method for comparing and benchmarking IT spending. IT directors, consultants, and vendors always view a low IT-to-Revenue ratio as an indicator of a technological and competitive lag.

Where are the Profits?

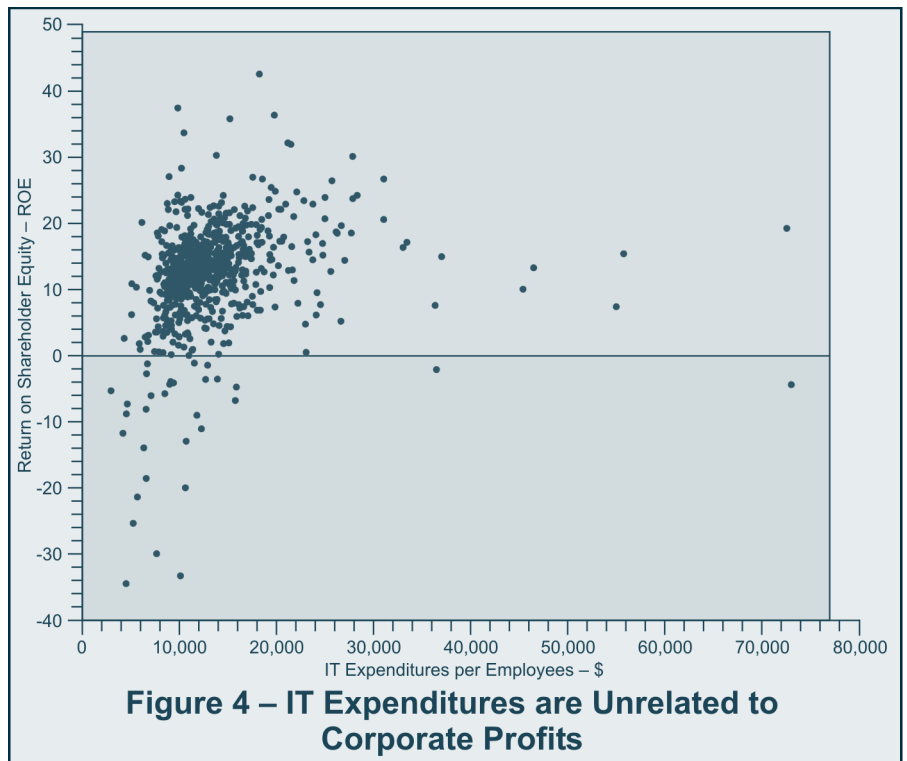
This brings us to the question about profitability. After all, the purpose of investments is to generate profits. Does increased spending on IT produce gains in profitability?

The evidence is overwhelming that there is no correlation between IT spending and profits.

The evidence is overwhelming that there is no correlation between IT spending and profits. This can be simply illustrated by taking the identical firms as plotted in Figure 3 and showing that IT spending per employee is unrelated to Profits per Employee:



To add statistical credibility to this Figure we can also show that a much larger sample of US banking firms consistently shows similar random tendencies:⁶



The random distribution of the relationship between IT spending per employee and the returns on shareholder equity is a pattern that has been reported consistently since 1985.⁷ This random pattern appears regardless what measure of computing spending one uses or whatever measure one applies to reporting profits.

The absence of a demonstrable relationship between profitability and IT spending should be seen as evidence that other effects, such as strategic advantages, competitive positioning, business dynamics, and leadership effects are likely to be more decisive than information technologies. It does not follow, however, that IT is not important. If it fails to function in an enterprise, such as a bank, would cease to function.

The above analysis confirms that the much debated ‘computer paradox’ (“...you see computers everywhere except in the economic statistics...”) has not been banished into oblivion as yet, despite claims to the contrary. None of that should be discouraging, since a number of banks in our sample deliver ROE values that are materially better than the median values, even though their IT expenditures are materially below the median for the entire sample of banks. The extent to which such superior performance can be directly attributed to computers can be understood only on a case-by-case basis. The problem then is to find ways how to tease out of the available sources of information a valid proof that IT spending makes a discernible contribution to profitability.

At this point, it will be more useful to focus on IT spending and profit patterns of individual firms. In this way, it will be possible to illustrate an assessment method for dealing with individual cases where questions arise whether IT is useful in producing superior profits.

⁶The graph reflects spending and financial returns for 718 US banks in 1999. Though similar distributions are available for other industrial sectors, we place particular emphasis on banking statistics on the presumption that financially sophisticated top management of banks can be expected to act with greater analytical prowess than other firms.

⁷See Strassmann, P.A., Information Payoff, The Free Press, New York, 1985.

IT in Banking and Profits

The lack of any correlation between the levels of IT spending and profits has now been sufficiently well documented that a further demonstration would be redundant. However, published financial statements from commercial banks offer perhaps the best data for tracking profitability of any business. Banking firms

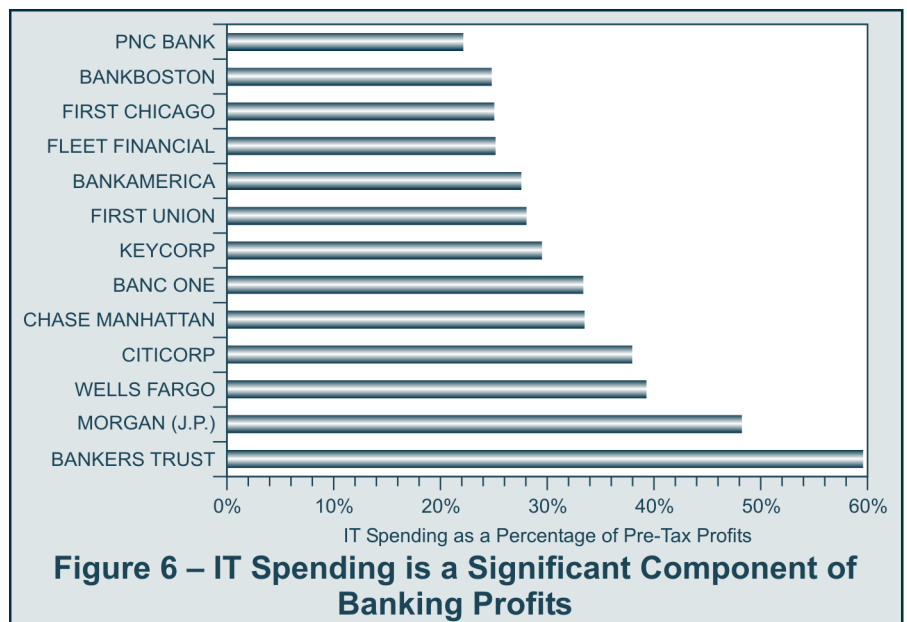
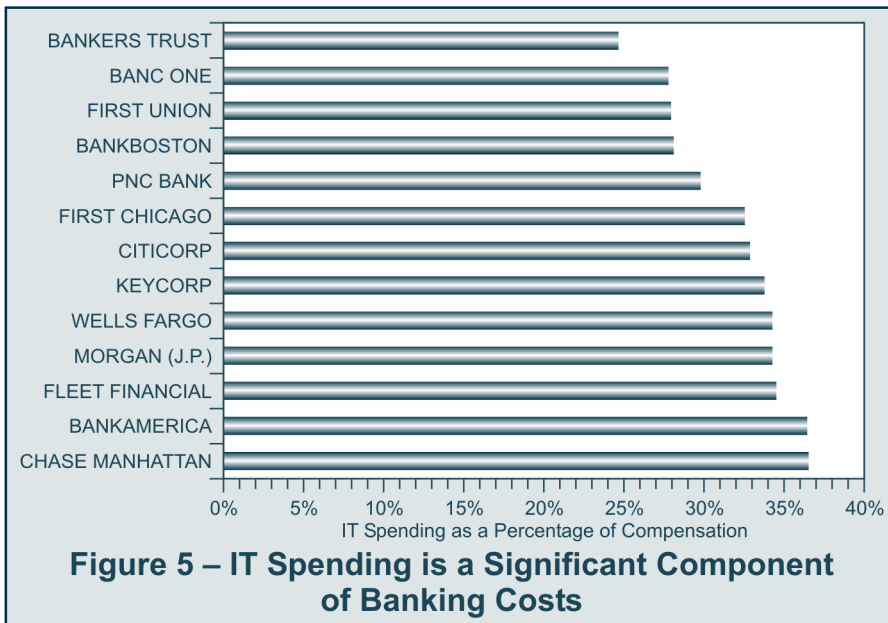
are the only ones that publish detailed data about overhead costs, payrolls, employment, and equipment purchases. Banks are also unique in that their statistics reflect their total economic value-added. Because of tight regulatory controls, their reporting practices are more uniform than one can find among industrial firms.

On a per employee basis, banks also spend more money on computers than any other business sector. Their total IT spending averages 25 to 37 per cent of total staff costs, as shown in Figure 5.

Such a high ratio ought to give computers greater leverage for delivering improved productivity results. If one could demonstrate the favourable

impact of computerisation on the productivity in banking over time, when large investments were made in IT, then this would offer a favourable indication that all may be well with IT elsewhere.

The large leverage of IT on profitability of banks becomes apparent when one compares IT spending with pre-tax profits:



With the availability of IT spending information and a large number of data for each firm, we can now consider whether the patterns of imitation (e.g. the 'arms race') in IT spending hold up under a statistical test.

As the first step in testing the conjecture whether IT does or does not contribute to improved profits, we will assemble key financial and operational data for each bank.

For a period of at least five years, the following information will be collected:

Significant Banking Variables	Significant Banking Variables
IT Budget	Employees
PreTaxIncome	Revenues
Interest Expense	Income Tax
Depreciation	Net Income before Preferred Dividends
Operating Net Cash Flow	Net Interest Expense
Investment Net Cash Flow	Staff Payroll Costs
Interest Paid on Debt	Interest Income
Total Assets	Non Interest Income
Total Liabilities	Return on Shareholder Equity

Figure 7 – Significant Variables that May Affect Banking Profitability

Using statistical analysis, it is then possible to find out whether one can construct a simple equation that would predict (e.g. perform financial modelling) actual IT spending for each individual bank with reasonable accuracy.⁸ In this case the equation was set to model pre-tax profits (e.g., the 'dependent variable'), with the IT budget, employment, assets or liabilities, staff payroll costs, and interest expense viewed as principal contributing effects to attaining profitability (e.g. so called 'dependent variables').

The results confirmed that one could model (predict) pre-tax profits with reasonable accuracy, within well-accepted limits or error:

Company	Predicted Pre-Tax Profit – with IT	Actual Pre-Tax Profits	Difference in Performance
BANC ONE	\$2,267,740	\$1,968,300	-15.21%
BANKAMERICA	\$4,757,017	\$4,796,000	0.81%
BANKBOSTON	\$1,193,045	\$1,435,000	16.86%
BANKERS TRUST	\$1,491,406	\$1,239,000	-20.37%
CHASE	\$5,910,511	\$5,910,000	-0.01%
CITICORP	\$5,627,024	\$5,722,000	1.66%
FIRST CHICAGO	\$2,228,563	\$2,266,000	1.65%
FIRST UNION	\$2,867,242	\$2,710,000	-5.80%
FLEET FINANCIAL	\$2,183,338	\$2,171,000	-0.57%
KEYCORP	\$1,376,470	\$1,345,000	-2.34%
MORGAN (J.P.)	\$2,096,595	\$2,154,000	2.67%
PNC BANK	\$1,325,375	\$1,618,000	18.09%
WELLS FARGO	\$2,059,674	\$2,049,700	-0.49%

Figure 8 – Comparison of Actual and Model Pre-Tax Profits

The positive differences between predicted and actual profits reflect better than expected results when compared with the results delivered by the banking peers. It shows, for instance, that the Bank of Boston and the PNC Bank produced better profits than could be reasonably expected under conditions when all other contributing influences were comparable. Similarly, Bankers Trust and Banc One delivered inferior performance, all other factors being equal.

⁸The technique is called 'Regression Analysis'. In this case, the testing passed every reasonable criteria, e.g. an R(squared) value of over 96% and a T value of 218.

The noteworthy aspect of this experiment is that, in each case, the equations showed that IT contributed to what was ultimately summed up as total predicted pre-tax profits. The advantage of this type of analysis is that it allows removal, one by one, of each factor that contributes to the overall results.

Company – in \$000s	Estimated Pre-Tax Profit – With IT	Estimated Pre-Tax Profit – Without IT	IT Budget	ROI on IT
BANC ONE	\$2,267,740	\$2,542,330	\$660,000	-42%
BANKAMERICA	\$4,757,017	\$4,725,015	\$1,330,000	2%
BANKBOSTON	\$1,193,045	\$1,364,485	\$360,000	-48%
BANKERS	\$1,491,406	\$1,365,783	\$740,000	17%
CHASE	\$5,910,511	\$5,661,229	\$1,990,000	13%
CITICORP	\$5,627,024	\$5,725,645	\$2,180,000	-5%
FIRST CHICAGO	\$2,228,563	\$2,259,305	\$570,000	-5%
FIRST UNION	\$2,867,242	\$3,148,083	\$760,000	-37%
FLEET	\$2,183,338	\$1,935,973	\$550,000	45%
KEYCORP	\$1,376,470	\$1,449,995	\$400,000	-18%
MORGAN (J.P.)	\$2,096,595	\$2,232,841	\$1,040,000	-13%
PNC BANK	\$1,325,375	\$1,428,256	\$360,000	-29%

Table 1 – Results of Financial Model for Evaluation of IT Return on Investment

This makes it possible to identify the relative importance of IT in the financial model. Following this reasoning, the IT budget was removed from the financial model. The estimated pre-tax profit assumes that the bank continues operating as if it was not spending any money on IT. This approach to sorting out the effects of one variable, out of a combination of many, is commonly accepted practice in the testing and simulation a wide range of phenomena.

Comparison of the differences between the two predicted pre-tax profits and using that to calculate how it relates to the IT budget, can be used as an indicator of IT profitability, as defined by a Return On Investment (ROI) ratio (see Table 1).

The results of this analysis could be surprising to the CIOs of the above banks. For instance, Banc One shows greater profit without IT (\$2,542,330) than with IT (\$2,267,740). Such a finding would lead to the conclusion that Banc One IT operations are ineffective. The CIO of Banc One could then object that the bank's data centre has the lowest cost per MIPS and the lowest cost (Total Cost of Ownership) of desktop PCs. Proving IT efficiency is always a requirement, of course, but it does not follow that operating efficiency will guarantee financial success. That arises from an interaction of much more than just IT. The purpose of the financial model was to focus on enterprise-wide issues and should not be used to explain or defend purely operating matters.

In another case, Fleet shows much greater profit with IT (\$2,183,338) than without IT (1,935,973). Fleet IT could be, therefore, judged as an effective operation. Again, that does not necessarily prove that the Fleet CIO is running a highly efficient operation. The positive indicator should be used primarily to examine whether the Fleet advantage is the result of superior uses of technology, or the consequence of effective managerial actions to keep wage rates and employment lower than competitors.

The categorisation of banks as either effective (marked blue in Table 1) or ineffective (marked white in Table 1) does not necessarily prove that the IT budget should be either cut or increased. Further examination is necessary to find out whether the favourable rating of a bank is clearly linked to IT or whether its profit is intrinsically superior because of some other strategic advantage enjoyed by the firm.

Summary

The extent to which such superior performance can be directly attributed to computers can be understood only on a case-by-case basis, and it is more useful to focus on IT spending and profit patterns of individual firms. The problem then is to find ways how to tease out of the available sources of information a valid proof that IT spending makes a discernible contribution to profitability.

The categorisation of banks, taken as an case study, as either effective or ineffective does not necessarily prove that the IT budget should be either cut or increased.

Further examination is necessary to find out whether the favourable rating of a bank is clearly linked to IT, or whether its profit is intrinsically superior because of some other strategic advantage enjoyed by the firm.

How to examine the strategic positioning of a firm shall be discussed in the next section.

Part 1: Transforming IT Costs into Profits

1.2 – The Strategic Positioning of a Firm in Relation to IT

► 1.2 THE STRATEGIC POSITIONING OF A FIRM IN RELATION TO IT

The first and foremost task for IT executives is to keep the information systems running without failure – IT must always operate without disrupting business relationships. The second priority is to keep IT costs down. Only after the first two conditions are met is it possible for IT executives to make any claims about increasing business profits.

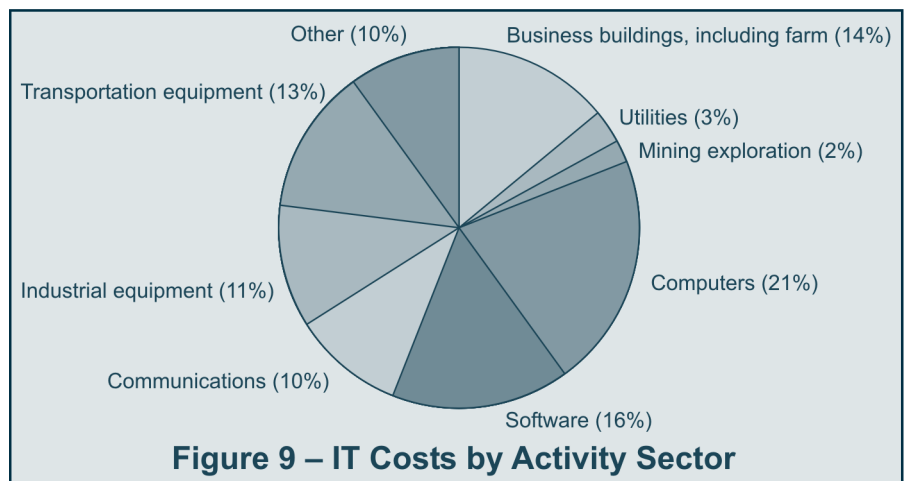
Since systems performance (not profits) and IT costs are related, I will devote this article to future directions of IT cost management as the principal lever for an IT executive to keep profits from erosion through excessive IT expenditures. I will be using US numbers for illustrative purposes only because such statistics are readily available. Though UK and most EU cost numbers are usually lower, their trends and ratios are quite comparable to the US experiences. That should not alter the observations and conclusions offered herein.

The Cost Bubble

IT executives should once and for all realise that the recent annual percent growth rates in IT budgets are not likely to be repeated ever. Just about everybody has now acknowledged that the recent IT spending increases were a spending 'bubble'. It would be useful to examine these excesses to see what one can learn from them about future directions.

...the recent annual percent growth rates in IT budgets are not likely to be repeated ever.

The best way of judging the relative importance of IT spending is by examining its share of total business investment. The latest numbers show the following allocation of Year 2000 business investment spending (expressed in 1996 prices):



This diagram shows that US businesses devoted 47 per cent of all investment funds to computer hardware, software, and communications (CIT). Capital spending for computers exceeded investments made in every other major category. Such distribution implies that IT was seen as offering greater rewards than manufacturing, transportation, energy, or natural resources. This data offers proof that the US has now evolved into an IT-based economy, a trend that is followed (and in some cases exceeded) by a number of EU countries. Nevertheless, one must realise that IT investments do not, as yet, account for the full costs of installing and maintaining IT. Each dollar of capital purchases requires at least another 2-3 dollars of labour cost. This gives us an estimated year 2000 total IT budget which equals twice the total corporate profits and more than 8 per cent of the Gross National Product.

One must now ask whether an economy that devotes almost a half of its investments and twice its profits operates on the basis of an economically viable pattern of expenditures. How much more information does an economy need to prosper while surpassing competitors in economic growth?

Forecasting Future IT Costs

It is a safe bet that the past patterns of unit cost reductions for information technologies will continue into the indefinite future. This fact alone should guarantee enormous gains in computing and communications capacity. IT budgets need not grow since Moore's Law can be expected to double processing capacity every 18 months as long as customers can manage their affairs effectively to take advantage of the inherent technological capabilities.

IT budgets need not grow as long as customers can manage their affairs effectively to take advantage of the inherent technological capabilities.

It is also possible to visualise a scenario where the sharp gains in 1999-2000 spending are seen as only an aberration. Instead of the 1999 peak annual IT cost growth rate of 25.6 per cent per annum, the hopeful proponents would be glad to settle for a rate of 13 per cent that was averaged from 1988 through 1997. The problem with such a projection is that, even at this lower rate, the relative share of IT investments, when compared to all other opportunities, would continue to rise since neither the economy nor profits can be expected to grow at that rate. As a consequence, the IT share of all business investments would keep gaining further from the present 47 per cent, thus leaving a steadily diminishing supply of funds for coping with an energy crisis, negative balance of trade, or rising competitiveness in the global economy. Such a projection will not hold up because they are unaffordable.

What is then a reasonable prognosis of the future of IT spending? One only needs to examine the historical trends of the IT share of business investment spending that have risen from 7 per cent in 1946 to 47 per cent in 2000. The growth comes in spurts reflecting repeated cycles of 'build and scrap' investment cycles.

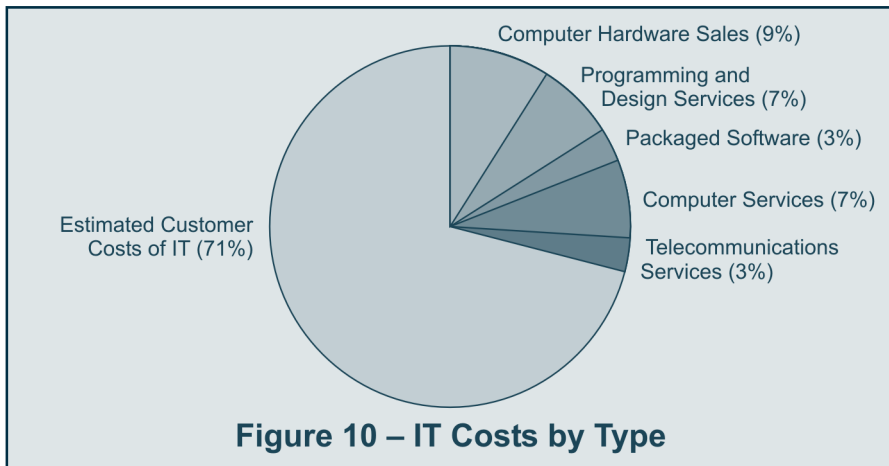
As long as each successive cycle was affordable, discarding systems whenever they reached break-even could be explained and financially justified.

As long as each successive cycle was affordable, discarding systems whenever they reached break-even could be explained and financially justified. Unfortunately, at this stage of evolution we have

finally run out of the feasibility to keep relying on practices that have propelled IT over the past 50 years to become one of the most attractive targets for cost reduction. We have reached a stage where the dismantling of client/server and enterprise systems solutions is taking place even before their installation has been completed. In the next few years, the prospects of an IT investment pace comparable to anything in the past is unlikely because the insertion of, as yet, another investment cycle (to pay for migration to Internet-based systems) cannot be funded unless enormously large and tangible new payoff opportunities become available. Thus, spending will remain stagnant until such time that IT-generated profits become more attractive than other investment opportunities.

Changing Industry Structure

The most likely future scenario is one of a dramatic overhaul in the structure of how IT business is conducted. The purpose of such a change would be to generate sufficient funds for making new investments from elimination of what is presently a costly and inefficient arrangement for developing and deploying IT. To understand where money is available can be best illustrated by an examination of current US 1999 spending patterns (see Figure 10).



The overwhelming share of IT costs remains with customers. This remains a fact, especially as IT-like activities drift from the nominal IT budget into the labour of managerial and administrative personnel who are spending an increasing amount of time coping with the complexity of computing. Therefore the greatest inefficiencies in IT can be found in the customer sector, where a do-it-yourself cottage mode of production and medieval guild mentality still prevails.

It does not take much analysis to come up with evidence that the forthcoming (and inevitable) transformation in IT, from computer-centric to network-centric architectures, can be funded only at the expense of reducing the customer's own costs. This is clearly a case of the supply of technology driving an armaments-like race, where the compulsion for spending more money on the latest technology arises from anxieties about competitive survival. As has always been the case in the past armaments races, it is the suppliers who drive demand, not vice versa. The IT

...the forthcoming (and inevitable) transformation IT, from computer-centric to network-centric architectures, can be funded only at the expense of reducing the customer's own costs.

vendors have now concluded that there is simply an insufficient money supply left in corporate coffers to keep increasing their revenues. CIT vendors have become accustomed to profits and stock market growth rates at a pace that can be satisfied only by altering their traditional roles. The following table shows revenue and profit growth rates of the leading CIT vendors that are simply unattainable if they continue doing business as usual (see Table 2).

Company	5 Year Average Revenue Growth – %	5 Year Average Profit Growth – %
MICROSOFT	33.5	46.7
ORACLE	27.8	70.2
SUN	20.1	39.4
HEWLETT-PACKARD	11.1	16.9
IBM	6.4	20.6

Table 2 – Revenue Growth of Leading CIT Vendors

The persistence of the vendors' ambitions coincides with what appears to be a diminished corporate appetite for increases in IT budgets. The track records of most company-embedded IT shops are now sufficiently blemished that management will certainly be inclined to listen to the enticing promises from increasingly revenue-hungry IT vendors, to let them take over many – if not all – IT functions and thus relieve management of responsibilities for managing information technologies. In fact, that is exactly

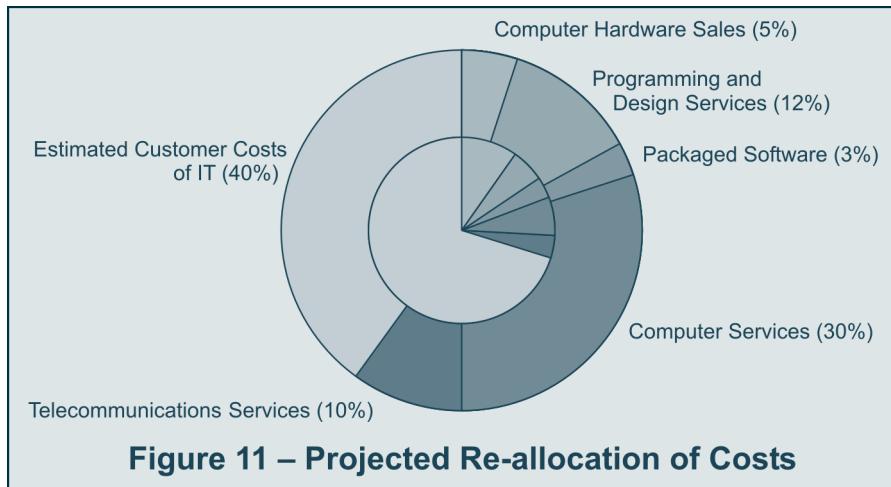
what these vendors are proposing to do. They have come forth with networked service schema such as .NET (Microsoft), Sun Open Net Environment (ONE) (Sun Microsystems), e-speak (Hewlett-Packard), Dynamic Services (Oracle), and Application Framework (IBM).

These offerings are likely to succeed since they will be delivering inter-application integration (within the walled compounds of each vendor) at levels no home-brewed IT shop has ever been able to achieve. The new service offerings will also promise an increased stability in information technology usage since each services provider will have a vested interest to keep their technologies in place as long as possible for maximum profitability.

There is absolutely no reason why the technology cycles should not lengthen again to eight to ten years, instead of the torrid recent pace of major innovations being thrust on corporate decision-makers at least every four years. This stability,

as well as clarity in what is the total IT bill, will be welcome by corporate management who are getting restive about the rapid pace of technologically induced disruptions. Management deeply resents the fact that vendors have now shortened the IT technology innovation cycles sufficiently so that positive cash flow beyond the break-even point is never realised while the vendors' profits are maximised.

The networked offerings will be the opportunity of attractive unit cost reductions, though they will always remain silent about the traumatic and costly transition burdens that will have



to be borne by each company. The most attractive feature of network services will be their claims about offering a variety of IT features and capabilities that would now become available as a variable expense and not as an ever increasing fixed investment to pay for building and maintaining a firm's own IT infrastructure.

A graphic representation of the projected changes in IT spending patterns is best illustrated by showing the likely re-allocation of the share of total cost from where it is now (the inner circle) to where it may end up in the future (sometime around 2020) (see Figure 11).

The above differences between the ratios in the inner and outer circles signify a deep and unprecedented restructuring of the IT industry. The shifts suggest an upheaval of how corporate IT organisations would function. The displacement from home-grown application to network-delivered services implies that the

The displacement from home-grown application to network-delivered services implies that the role of the IT organisation will have to take on new responsibilities.

role of the IT organisation will have to take on new responsibilities. IT will have to make the transition from building and maintaining corporate information to assuring the integration of systems from networked services, technology vendors, as well as

connections with the firm's suppliers and customers. Rising in importance will be responsibility for the conservation and safeguarding of the 'knowledge assets' with particular emphasis on information security and data-based management.

So far, the growth patterns and relationships in this industry have remained relatively stable (with the exception of recent outsourcing trends). IT vendors sold standard hardware and software configurations that were designed to fit everyone. IT people then purchased such offerings and installed them, thus assuming all of the risks and pains for making the technologies function under unique circumstances. It was an unspoken principle that vendors would never compete with customers. That would not make sense anyway because the sellers were never in a position to deliver company-specific adaptations of standard offerings in ways that were profitable and acceptable to the buyers.

The vendors were delighted with this division of labour. For 50 years the vendor profits always exceeded their customers'. Whenever a vendor succeeded to carve out a position of dominance (such as IBM in the 1970s and Microsoft in the 1990s) the vendor's profitability exceeded even what its best customers could earn.

The customer's IT people (and its hired consultants) were happy with the traditional separation between sellers and buyers because the vendor's technology push always guaranteed that more jobs and better paying opportunities would become available. As IT expanded in scope, budget, and technological sophistication, so have the IT people who have managed the growth. Many of the inefficiencies that grew during this evolution, such as poor software (as shown during the Year 2000 (Y2K) bug chase), could be covered

The replacement bill for what is now called 'legacy' applications is simply too high to be affordable. by spreading increasing amounts of money to compensate for errors. Well, all of these arrangements have finally come to an end in the current

mini-recession. Extracting an increased amount of money to fund yet another round of IT investments out of corporate treasuries is unlikely to succeed. The replacement bill for what is now called 'legacy' applications is simply too high to be affordable. Besides, the cash-rich vendors are now ready to relieve their customers' troubles by taking over the job of modernisation under conditions that are attractive to themselves because the vendors can now enjoy economies, which individual firms (with perhaps the exception of a handful giants) can never enjoy.

Summary

If control of IT evolution is subordinated to vendors' profit growth expectations, what are the remaining sources of competitive advantage that would allow a firm to garner superior profits in the information age? I will answer that question in the next and last part of the discussion.

Part 1: Transforming IT Costs into Profits

1.3 – The Competitive Advantage in the Information Age

► 1.3 THE COMPETITIVE ADVANTAGE IN THE INFORMATION AGE

In this section I shall address the question: “What are the remaining sources that would allow a firm to garner superior profits?”

Producing the proof that spending on information technologies results in improved profits has been a much-debated question for many decades. It generated a controversy that has achieved its most popularised expression in the form of the ‘computer paradox’ originally formulated by the Nobel Prize winning economist Prof. Robert Solow, who said, “...you can see computers everywhere except in economic statistics.”

Prof. Solow, my statistics teacher at M.IT, also has the reputation for being a notable teaser and debunker of accepted dogma. His remark was not intended to be a learned observation, it was merely an amusing side remark buried in a 1987 book review in the New York Times. Nevertheless, the idea that there may be indeed a ‘computer paradox’ – a contemporary version of the Emperor’s Clothes tale – has become a topic worthy of voluminous academic papers as well as several books by government economists. Computer magazines catering to CIOs, at all times badgered for delivering proofs of IT profitability, have also joined in with weekly refutations of the ‘paradox’ on the basis of interviews with computer consultants and computer vendors.

In all of this confusion, the simple question (that may even resonate with 11th Century alchemists) still remains: “Can you demonstrate how to transform IT costs into cash in the bank?”

In this section, I will address the prevailing puzzlement about computer profitability by stating, categorically, that just spending money on IT guarantees absolutely nothing. Computers – like vitamins – are important ingredients in corporate sustenance. In the absence of a viable and adequate level of IT

...just spending money on IT guarantees absolutely nothing.

spending, the corporate body will be vulnerable to damage to its normal functioning and (only in a handful of recorded instances) actually perish

from a cause that is solely attributable to computer failure. Among all of the conceivable maladies that may cause corporate demise, which include executive incompetence, onslaught from superior competition, or even embezzlement, it is impossible to prove that a failed company perished primarily because its IT malfunctioned.

I can now answer the question whether IT and profits are inter-linked without hesitation. The failure of enterprises is preceded most often by the presence of an enormous variety of crippling influences, before an IT-induced failure kicks in and can be clearly diagnosed as the cause. Or, to put it another way, ingesting profuse quantities of the best and latest IT may be largely irrelevant (and possibly damaging) if the corporation already suffers from excess assets (too much fat), a huge administrative cost (clogged arteries) and chases ever marketing fad (schizophrenia).

All this means that there is such a thing as a ‘computer paradox’. Furthermore, I do not know how the persistence of the ‘computer paradox’ can be ever eliminated by any means as far in the future as I can see. We are stuck with the ‘paradox’ as an IT occupational hazard. Computer executives better get on with the job of helping to improve profits, by offering better means for fixing some of the most severe deficiencies that are already an existing drag on corporate performance. Offering IT-enabled remedies to improve already known adverse conditions must take precedence at all times, before betting the computer executive’s job on the profits-via-IT fiction.

What is the Relation Between IT and Profits?

The first step in understanding the 'computer paradox' is simply to examine the relationship between IT budgets and corporate profitability. To make this situation clear, I have chosen what I know about some of the major UK firms listed below. In addition to the IT budgets (denominated in GB £'s – GBP), I had access to the history of each listed firm's revenues, assets, liabilities, shareholder equity, stock market valuation, employment, profits, administrative expenses, cost of goods sold, interest payments, taxes, and costs of capital. The Standard Industrial Classification (e.g. SIC number) of each firm was also known.

Equipped with such a profusion of data, it was only a matter of laborious statistical manipulation to identify if any of the financial variables were directly related to IT budgets. No such relationships could be found, regardless of the number of calculations and plotting of the results to find a credible regression coefficient.

For the purpose of this Report, I have chosen the ratio of IT budget spending per employee as an indicator of the intensity of computerisation. This presumes that if a 'computer paradox' would not operate, somehow firms that are more computerised (e.g. equip their people with more automation tools than their competitors and thus make them more 'intelligent' than the competitors) would somehow make their people more productive and, therefore, more profitable.

RETURN ON SHAREHOLDER EQUITY – Per Cent		
INFORMATION TECHNOLOGY BUDGET – IN GBP		
COMPANY NAME		
SMITHKLINE BEECHAM PLC	1,610	86.8
DIXONS GROUP PLC	2,158	82.5
WILLIAMS PLC	1,255	62.7
CADBURY SCHWEPES PLC	2,043	57.6
LLOYDS/TSB PLC	5,717	46.4
GKN PLC	1,543	38.3
ASTRAZENECA PLC	3,712	35.9
REUTERS GROUP PLC	23,335	31.7
PRUDENTIAL CORPORATION PLC	29,219	30.4
ASSOCIATED BRITISH FOODS PLC	2,194	27.8
KINGFISHER PLC	1,078	27.3
STANDARD CHARTERED PLC	6,372	26.6
HYDER PLC	2,540	26.2
HANSON PLC	2,251	24.6
ROYAL BANK OF SCOTLAND GROUP PLC	9,368	24.4
TOMKINS PLC	1,523	24.0
SOUTHERN ELECTRIC PLC	4,506	23.9
LEGAL & GENERAL GROUP PLC	16,372	23.7
WOLSELEY PLC	3,313	22.6
JOHNSON MATTHEY PUBLIC LIMITED COMPANY	3,635	22.5
HSBC HOLDINGS PLC	6,403	22.1
ABBAY NATIONAL PLC	15,507	21.9
REXAM PLC	1,773	20.4
BP AMOCO PLC	15,132	19.3
POWERGEN PLC	45,424	19.1
ALLIED DOMECQ HOLDINGS PLC	679	18.8
ASDA GROUP PLC	1,475	18.6
MARKS & SPENCER PLC	1,934	18.3
SCHRODERS PLC	10,434	18.2
ROLLS-ROYCE PLC	2,666	17.2
NATIONAL POWER PLC	16,985	16.9
ALLIANCE & LEICESTER PLC	11,704	16.8
STOREHOUSE PLC	784	16.7
UNIGATE PLC	1,299	16.6
HALIFAX GROUP PLC	11,341	15.9
BARCLAYS PLC	6,469	15.6
BRITISH AIRWAYS PLC	5,352	15.4

Table 3 – Ranking of Major Firms (1)

RETURN ON SHAREHOLDER EQUITY – Per Cent		
INFORMATION TECHNOLOGY BUDGET – IN GBP		
COMPANY NAME		
BRITISH TELECOMMUNICATIONS PLC	4,406	15.3
ARJO WIGGINS APPLETON PLC	3,135	13.3
J SAINSBURY PLC	1,374	13.3
WHITBREAD PLC	714	13.2
PENINSULAR & ORIENTAL STEAM NAVIGATION	1,595	13.2
WOOLWICH PLC	11,234	13.2
COURTAULDS PLC	2,252	13.1
TESCO PLC	2,197	13.0
BRITISH ENERGY PLC	8,459	12.3
SCOTTISH POWER PLC	6,881	11.2
CGU PLC	33,060	11.1
RANK GROUP PLC (THE)	1,801	10.9
TATE & LYLE PLC	3,187	10.4
BRITISH AEROSPACE PLC	4,211	9.9
PEARSON PLC	3,760	9.9
UNITED BISCUITS (HOLDINGS) PLC	1,522	9.7
LEWIS (JOHN) PARTNERSHIP PLC	884	9.5
ROYAL & SUN ALLIANCE INSURANCE GROUP	11,635	9.2
ARCADIA GROUP PLC	663	9.2
NATIONAL WESTMINSTER BANK PLC	7,767	8.8
NATIONWIDE BUILDING SOCIETY	15,432	7.9
RACAL ELECTRONICS PLC	1,298	7.5
RAILTRACK GROUP PLC	3,401	7.4
IMPERIAL CHEMICAL INDUSTRIES PLC	2,834	7.2
ANGLIAN WATER PLC	16,509	7.1
BASS PLC	1,010	6.4
SMITH (W.H.) GROUP PLC	1,486	6.4
THAMES WATER PLC	2,393	5.8
SECURICOR PLC	845	5.3
BRITISH STEEL PLC	2,278	4.8
SEARS PLC	1,067	4.6
UNITED UTILITIES PLC	8,554	1.4
BG PLC	7,759	-1.6
HAMBROS PLC	3,190	-3.9
LUCAS VARIETY PLC	1,228	-19.1
PILKINGTON PLC	1,209	-21.6
CENTRICA PLC	9,716	-36.2

Table 4 – Ranking of Major Firms (2)

In the absence of the 'computer paradox', the relationship between computer spending per employee and any indicator of profitability would be a positively sloping line, with all of the data points neatly clustered around such a line. 1997 statistics were chosen because they represent a period of reasonable prosperity and do not disclose closely held recent numbers about IT spending.

As a measure of profitability, I have chosen the Shareholder Return On Equity (ROE) as the most suitable measure (and most widely accepted indicator by the stock market and executive bonuses) for comparing the profitability among diverse firms operating in different industrial sectors. I also tried the ratio that is most often popularised by the computer magazines – Return On Investment (ROI) but that produced graphs that were even more wildly scattered than the ROE measure. I also found that an attempt to correlate IT spending with stock market valuations generated the greatest amount of statistical irrelevancy (though a prominent MIT professor has been trying to make a case for such an explanation for several years).

The tables (see Tables 3 and 4), ranking major UK firms in order of their return on shareholder equity, will be used to demonstrate whether the 'computer paradox' persists or not.

An inspection of these tables will show that we will conduct an examination of widely diversified enterprises that cover the spectrum from natural resource firms to financial services enterprises. The IT budget would range from a high of

£45,424 per employee for PowerGen to a low of £663 per employee for Arcadia.

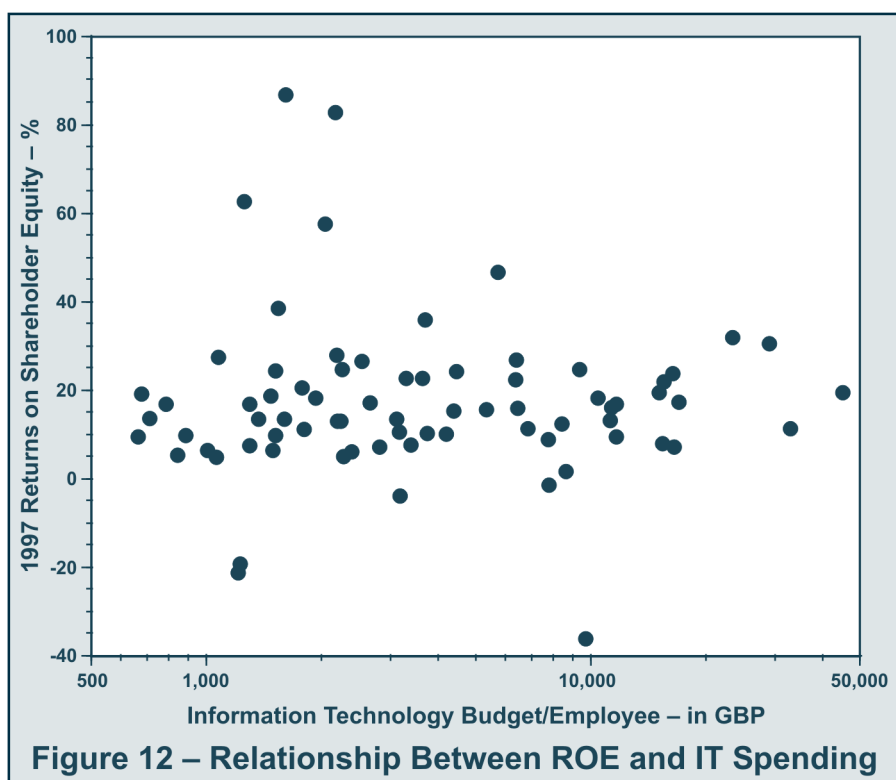
The profitability of the firms would also range widely, from the highest-ranking SmithKline Beecham with a staggering ROE of 86.8 per cent to the money losing Centrica with a negative ROE of 36.2 per cent.

What the readers may find amusing is that the most profitable, SmithKline Beecham, is budgeting only £1,610 of IT per employee whereas the least profitable, Centrica, provides a generous IT allowance of £9,715 per employee – that equates to approximately 45 per cent of its employees' salaries.

When such disparities in IT spending and corporate profitability are plotted on a scale that fits the wide range of spending into the available space in this report we obtain the following pattern (see Figure 12).

The diagram shows clearly that there is

no correlation between IT spending per employee and the ROE. Such randomness in the relationship between IT and corporate profitability should not be a surprise. I have reported similar patterns since 1985 (see *Information Payoff*, Macmillan/Free Press). As additional data became available, the identical patterns (with only more dots) were published in 1990 (*The Business Value of Computers*, The Information Economics Press), again in 1997 (*The Squandered Computer*, The Information Economics Press), and again in 1999 (*Information Productivity*, The Information Economics Press). Thus one can state with some confidence that the 'computer paradox' is neither a new phenomenon nor an exclusively USA characteristic.



Why IT Spending and Profits are Unrelated

If IT is so critically important as persistently claimed by the computer industry pundits, then why does it not show up as a closer correlation between IT spending and profitability? There must be credible way of answering that challenge because just waving the 'paradox' away as some mystical cause will simply not suffice.

It just happens that there exists a satisfactory research study, based on verifiable findings, that relates measurable corporate input factors with demonstrable profit results. It is the Profit Impact of Marketing Strategies (PIMS) research programme, originally operating from Cambridge, Massachusetts. I have served on the PIMS Board of Directors in the 1970s and early 1980s and, therefore, can comment on its validity on the basis of a full understanding how it collected and analysed the evidence. At present, PIMS Europe is actively engaged in supporting strategic studies by European firms. At this point, the PIMS findings are global and not limited in their validity to only the USA.

Dr. Sidney Schoeffler developed the original PIMS concept at the General Electric Corporation in the mid-1960s. As General Electric decentralised into over 250 Strategic Business Units (SBUs), corporate management needed tools for judging the potential profitability of its investments. Subsequently, PIMS analyses were extended to other corporations at the Management Science Institute, Harvard, in the early 1970s. The current research findings are based on studies of data obtained from over 3,000 PIMS clients by the Strategic Planning Institute and others who have collected comprehensive data describing the operations of PIMS client firms. After receipt of such data, the PIMS organisation delivered to the clients comparisons of their results with 'look-alike' firms. In this manner, the PIMS data would always be verified and validated by the paying clients who were seeking advice.

Over the years, the PIMS organisation has generated an enormous number of findings that can be summarised as follows:

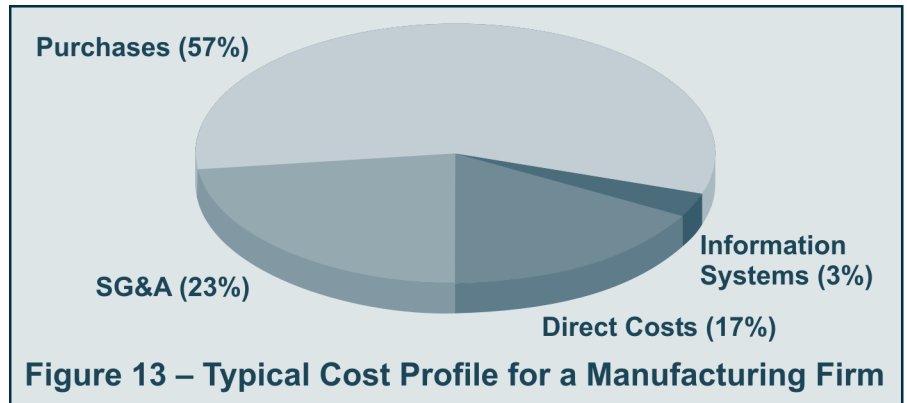
- Profits realised by a business are determined by the typical profiles of success and failure that operate under comparable business conditions.
- Profits are influenced by competitive forces and are largely out of control of the enterprise.
- The characteristics of the market and the competitors explain most of the reasons for success or failure. The operating skill or luck is important, but only secondary.
- Doing 'the right thing' is much more important than doing 'the thing right'.
- There are nine major strategic drivers of profitability, in the following order of importance: low cost production; customer preferences; relative market share; simplicity in operations; management 'style' – openness during prosperity and discipline during adversity; innovation effectiveness; customer power to extract pricing concessions – are the few or many customers; growth in the served market; and dependence on vertical integration.

Though IT can have a significant contributory role in improving every one of the above major strategic drivers, one must recognise that the power to do that decisively is limited. One must also consider that the gains in any one of the strategic drivers will not materialise without additional costs or risks incurred by some other strategic driver. Gains in one business strategy driver will always be offset by some losses from other drivers. However, well-conceived and superbly orchestrated strategies have the characteristic that on a net basis, strategic moves will reinforce each other with the result that dramatic gains in profitability can be achieved. As a rule, this only happens when a firm exploits a fundamental weakness among its competitors and acts with dispatch and well-executed surprise. Nevertheless, one must always understand that there are no large gains in profits feasible without taking corresponding large risks.

The PIMS findings have stood the test of time and are still relevant today as they were more than 25 years ago. Taking a data-driven approach, instead of the prevailing behavioural approaches, PIMS had a profound impact on business strategy thinking and has been taught in every quantitatively-oriented business school in the world.

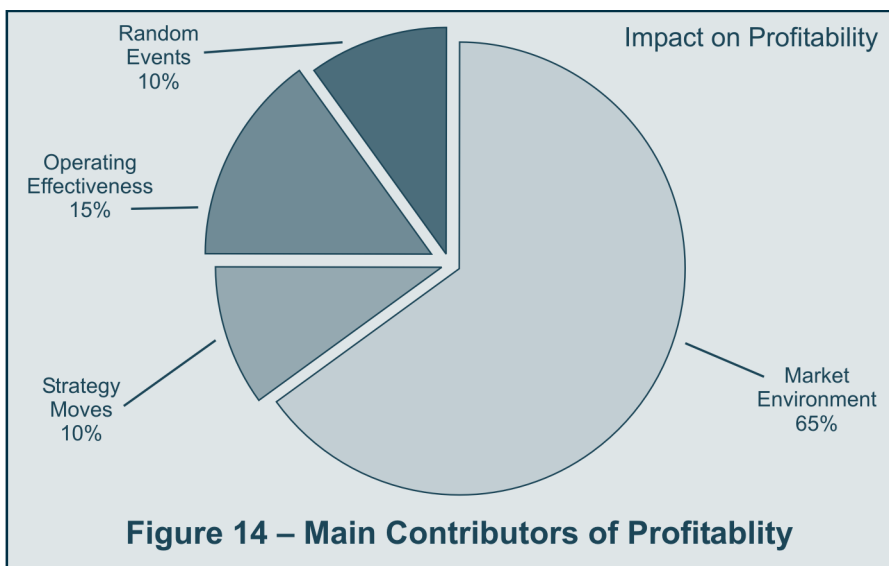
The Leverage of IT

In a typical firm, IT costs constitute only a minor factor of production costs and can influence operating efficiency only to a limited extent, as illustrated in the following cost profile of a typical major manufacturing firm:



From the standpoint of 'strategic leverage' the act of pushing too hard on any one IT mission to deliver decisive improvements in profits will be unrealistic.

The effects of even minor variability in the cost of purchases, in labour costs or in SG&A (e.g. information costs), will overwhelm the discernible effect of IT on net profits. This statement will hold true in every case (except for firms in the data services business), despite the prevailing rhetoric that CIOs should be shifting their attention from operating to strategic issues. Changing the levels of IT spending cannot possibly alter the impacts the other cost components can have on profits. Much of the critical leverage in improving a firm's competitive position is dictated by marketing, purchasing, labour relations, production, and innovation initiatives, where IT can, at best, only facilitate improvements. This lack of 'strategic



leverage' for the IT function is best illustrated by summarising the PIMS research findings as follows:

The four main factors identified from the study of a large number of firms are, in order of importance (see Figure 14):

1. Market environment: competitive situation and market share.
2. Operating effectiveness (the usual and only focus for the contribution of IT).
3. The strategic moves initiated by the business.
4. Unforeseeable or random events outside the control of the firm.

According to the above observations, up to three quarters of the potential decisive influences on profitability concern strategic choices that even very large investments in computing cannot address or solve.

The complexity of strategic interactions that ultimately need to balance conflicting strategic factors, can be illustrated by listing some (but not all) of the opposing influences that are considered by PIMS analysts in their evaluations:

Favorable Effect on Profits	Strategic Influence	Unfavorable Effect on Profits
Differentiated	Product or Service	Commodity
Segmented	Served Market	Unsegmented
High	Relative Market Share	Low
High	Relative Product Quality	Low
Low	Relative Costs	High
Good	Operating Effectiveness	Poor
Low	Investment Intensity	High
Substantial	Customer Perceived Quality	Thin
Growing	Value Added	Shrinking
Positive	Growth Rate	Flat or Negative
High	SG&A and R&D	Low
New	Age of Assets	Old

Table 5 – Factors in Strategic Influence

To perform the necessary strategic assessments, the PIMS analytic processes call for the collection of data that is mostly out of the reach of IT people. Here is a partial listing of the critical indicators that are necessary for performing a strategic assessment:

- Competitive position.
- Market environment.
- Stage of product life cycle.
- Market share.
- Marketing/sales ratio.
- New product/sales ratio.
- Market share relative to the immediate three competitors.
- Customer concentration.
- R&D/sales ratio.
- Relative quality when compared with the immediate three competitors.
- Customer purchase amount.
- Real market growth.
- Relative price when compared with the immediate three competitors.
- Industry concentration.
- Capital and operating structure.
- Investment/sales ratio.
- Receivables/investment ratio.
- Investment/value added.
- Capacity Utilisation.
- Gross book value of fixed assets/total investment ratio.
- Value added/sales ratio.
- Stock market valuation.
- Capital asset pricing.

To complete an analysis of a firm's strategic positioning also requires the analysis of the growth rates of some of the following indicators that portray the dynamics of a business when compared with its three top competitors:

Growth Rate Faster than Competitors	Strategic Influence	Growth Rate Slower than Competitors
Unfavorable	Fixed Investments	Favorable
Unfavorable	Costs of Labor	Favorable
Unfavorable	Age of Assets	Favorable
Unfavorable	SG&A/Sales	Favorable
Unfavorable	Inventories/Sales	Favorable

Table 6 – Growth Rates as Strategic Influence Factors

Summary

On the basis of the PIMS models of the response of profits to strategic moves, we can now answer the question why IT spending and profits are unrelated and will always remain that way. In summary:

- IT has not emerged as a directly measurable strategic player that can be shown to have a decisive strategic influence on corporate profitability.
- IT spending does not exhibit a comparable level of positive correlation with profits as has been found with other PIMS strategic variables, such as market share, capital intensity, and relative customer quality.

This relegates IT spending to an important, but only to an enabling catalytic role. From the standpoint of corporate strategy, IT can be then seen primarily as an attractive means that permits corporate management to re-balance its responses to rapidly changing competitive circumstances. Such a role is more than adequate as an enormous challenge for computer executives. Forget about the 'computer paradox'. Get involved in board-level decisions on how to link IT, in the least costly manner, to enhance your firm's strategic advantages!

This relegates IT spending to an important, but only to an enabling catalytic role.

Part 2: Knowledge Capital[®] in European Firms

► INTRODUCTION

Having reviewed the relationship between business performance and IT spending, I now turn my attention to the accumulated intellectual value of the organisation, what I call the Knowledge Capital® of the firm.

The purpose of measuring and comparing Knowledge Capital® is to shift attention from information technology and operational efficiency to the effectiveness of the executives to manage information in their organisations. As we have seen in the previous sections, operating efficiency in the form of low overhead costs, effective business processes, and employee awareness helps to create value – but not as much as intelligence does, and it is certainly not the decisive factor, affecting only 15 per cent of profit results. Knowledge about a company's business environment and its competitive position are the most valuable insights for executive management; 65 per cent of the profit performance of corporations can be attributed to them. The objective of knowledge management should be to increase the non-financial worth of organisations.

The valuation of Knowledge Capital® makes it possible to assess the worth of the people who possess the accumulated knowledge about an organisation. They are the individuals who leave the workplace every night (and may never return), storing in their heads the know-how acquired while receiving full pay. Their brains are repositories of knowledge accumulated over untold hours of listening and talking while not delivering any goods or services to paying customers.

The employees' minds, and the files they manage, carry a share of the company's Knowledge Capital®. This makes every employee a custodian of the most important assets a firm owns, even though these assets never show up on any financial reports. The disciplines and methods of how to account and safeguard knowledge assets are either non-existent or, at best, rudimentary.

By contrast, the custodianship of financial assets has become a well-defined discipline that depends on procedures and regulations on how to account for and report these resources. Over a period of many years, an elaborate framework involving accountants, auditors, reporting standards, and government oversight has been developed to do that.

What has changed now is the discovery that the financial assets of corporations represent only a portion of the total corporate assets. In many cases, the valuation of the financial assets is dwarfed by the implied valuation of its knowledge assets. As society evolves from an industrial model of how an economy functions to an information-based economy, knowledge assets become increasingly important.

Knowledge on the Agenda

Financial executives have shown a remarkable reluctance to put numbers on something many consider to be intangible. However, with the rising importance of non-financial assets, the time has come to place the management of knowledge on the agenda of executive managers, financial analysts, and shareholders. To that end, one must start by developing an independently verifiable quantification of the worth of knowledge assets.

Knowledge Capital® can be calculated because it reveals itself as the most important contributory influence in explaining how a firm earns its profits in excess of its cost of financial capital. The allocation of the respective contributions of Knowledge Capital® and financial capital to profits can be made if one recognises that financial capital is now a commodity – readily available at a price that reflects the interest rate that a firm pays for its borrowings, the price a shareholder can earn for an investment made at a lower risk. However, what makes a company prosper is not financial capital – which anyone can obtain for a price – but the effectiveness with which Knowledge Capital® is put to use.

Therefore, the annual returns realised on Knowledge Capital® can be isolated after paying a 'rental' for the financial capital and then subtracting that amount from profits as reported by the accountants.

What remains is what economists call an 'Economic Profit' and what some consultants call the 'Economic Value-Added'. I label that residual as the 'Knowledge Value-Added' because it accounts for those missing elements that represent everything not shown on a conventional balance sheet. By filtering out the contributions of financial capital from the reported profits, we are left with a residual that is entirely attributable to what Knowledge Capital® has actually delivered. In other words, Knowledge Value-Added is the annual yield a firm realises from its Knowledge Capital® assets.

Once you know the yield from a capital asset, calculating the value of its principal is straightforward. All you have to do is to divide the value of knowledge value-added by the costs of that capital and you get a verifiable and independently reproducible worth of a firm's Knowledge Capital®.

To provide an overview of Knowledge Capital® in Europe is a vast undertaking.⁹ Such a study would have to cover issues related to economic growth, corporate structure, the costs of capital, and the rates at which various firms have demonstrated a consistent capability of accumulating Knowledge Capital® in preference to financial assets.

This Report should be seen as a first instalment in a more comprehensive effort to map the characteristics of Knowledge Capital® formation in Europe. This study comes in two parts.

Part 2.1 – Analysis of European Firms, examines the overall characteristics of the distribution of Knowledge Capital® without dwelling on greater detail of the relationships and trends that lead to its influence of corporate profitability and long-term viability. The financial statistics are expressed in terms of euros to reflect the plans to apply similar analyses to other European countries for comparability. All information cited herein is available from public sources and reflects results of audited financial reports for public corporations, as tabulated by Standard & Poor's Global financial services databases.

Part 2.2 – Country Case – The UK Knowledge Capital®, examines some of the patterns of Knowledge Capital® of the UK economy. The corporate population covered includes detailed data about 1,152 UK firms with a total workforce of 7.1 million which represents a large share of what I term as the engines of Knowledge Capital® creation. Similar analyses will be prepared for other European countries in due course.

The Value of Knowledge Capital®

The productivity that generates Knowledge Capital® is the consequence of productive information activities. That is the Management Value-Added. In accounting terms that is defined as the Economic Profit created by a firm. By this definition:

Economic Profit is equal to:
accounting profit
(after taxes and after preferred dividends)
minus a charge for the use of the shareholders' capital
(defined as Total Assets minus Total Liabilities multiplied by the Cost of Shareholder Capital).

The creation of Economic Profit is something that defies the laws of physics. These laws state that the outputs of any system can never exceed its inputs. Delivering a positive Management Value-Added in excess of its costs must be therefore seen as an act of creativity. Such acts spring forth from something that can be measured only indirectly, as if it would originate from an otherwise hidden source.

That source is defined here as the Knowledge Capital® of a firm. It can be calculated by showing how much Economic Profit it creates. This leads to the key proposition concerning Knowledge Capital®: today's Economic Profit arises from prior accumulations of Knowledge Capital®.

Another way of looking at the same proposition is to deduce the value of Knowledge Capital® from its investment returns. If the current Economic Profit is seen as the interest earned from a bond, then the face value of such a bond can be calculated by dividing the Economic Profit by the interest one is expected to pay for such an investment. In other words:

$$\text{Knowledge Capital}^{\circledR} = \text{Economic Profit} / \text{Cost of Capital}$$

Examples of Knowledge Capital® Calculations

Pharmaceutical firms are an example of firms that have successfully kept accumulating Knowledge Capital® faster than financial capital. The earning capacity of pharmaceutical firms and their productivity is steadily gaining; not because they are hoarding what shows up as 'book value'. Their profits keep increasing because they are using the Knowledge Capital® of their employees effectively. From the standpoint of information security, here we can find many cases where increased information security vigilance would become mandatory.

To start the Knowledge Capital® valuation process, one must first calculate the Economic Profit, for example €4,365,086 million for a hypothetical pharmaceutical company.

The next step is to determine the interest rate the firm has actually paid for its capital. Whatever rate will be chosen will greatly influence the resulting Knowledge Capital®. The conventional approach for selecting an appropriate interest rate is based on picking a single fixed rate, for all firms. Often, this involves picking a single interest rate calculated as the risk-free long-term government treasury bond, plus 2 per cent for a risk premium. There are other methods that apply a wide range of formulae of increasing complexity and sophistication. Since both the market as well as the structure of the business determine its actual cost for capital, only the price actually paid for debt will be used here as a simplified indicator of the marginal cost of capital. That simple equation is:

$$\text{Average Interest Paid} = \text{Actual Interest Expense Paid} / \text{Actual Borrowed Debt}$$

The last step in the calculation is to divide the Economic Profit by the interest rate the firm has paid for its capital. In our example, with an interest of 5.35 per cent, the resulting calculation yields the following results:

$$\text{Knowledge Capital}^{\circledR} = \text{€4,365,086m} / 5.35\% = \text{€81,590,390m}$$

The Knowledge Capital® can be positive as well as negative! This happens when the accounting profit (after taxes and after preferred dividends) is less than the charge for the use of the shareholders' capital.

⁹Knowledge Capital® is a Registered Trade Mark of Strassmann, Inc. It is based on work first available in public in 1985.

Part 2: Knowledge Capital[®] in European Firms

2.1 – Analysis of European Firms

► 2.1 ANALYSIS OF EUROPEAN FIRMS

The statistical basis for analysing European Knowledge Capital® is based on 1999 published financial reports. That represents a snapshot of the current position of firms, based on the latest available full financial data.¹⁰ This Report will include firms in selected European countries, with Knowledge Capital® defined in terms of euro currency:

Country	Number of Firms	Knowledge Capital® – €m	Percentage of Knowledge Capital®	Average Knowledge Capital® per Firm – €m
Belgium	90	133,678	7.3%	1,465
Denmark	111	20,559	1.1%	185
Finland	103	73,090	4.0%	710
France	563	250,401	13.6%	445
Germany	525	48,359	2.6%	92
Ireland	52	4,969	0.3%	96
Italy	178	136,482	7.4%	767
Netherlands	157	351,954	19.1%	2,242
Norway	99	-5,454	-0.3%	-55
Portugal	39	23,294	1.3%	597
Spain	121	69,314	3.8%	573
Sweden	208	131,789	7.1%	634
United Kingdom	1,152	604,792	32.8%	525
Total Number of Firms	3,398	1,843,226	100.0%	542

Table 7 – Summary of the Scope of the Report on European Knowledge Capital®

The same statistics in graphical form are shown on Figure 15.

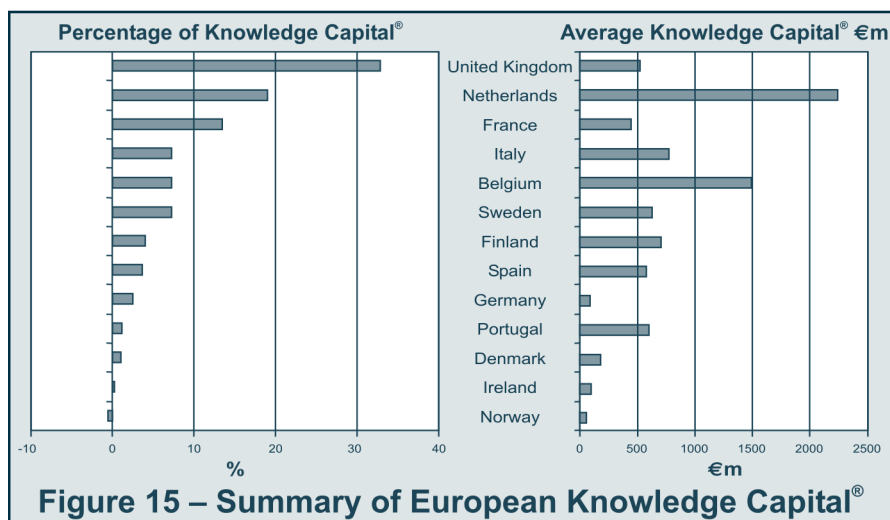


Figure 15 – Summary of European Knowledge Capital®

The following findings are noteworthy:

- The UK, with approximately one third of the firms in the sample of European firms accounted for one third of the total available Knowledge Capital. In this respect, the UK matches the profile of the average European firm with average Knowledge Capital® of €542 million.

¹⁰A more comprehensive treatment of this topic would require multi-year comparisons to discern trends in Knowledge Capital® accumulation.

- The high performers are countries with exceptional concentrations of Knowledge Capital®, such as firms in the Netherlands (with €2,242 million) and Belgium (with €1,485 million) per firm.
- At the low end of Knowledge Capital® wealth is Norway, with a total of - €5,454 million. There is a remarkably low concentration of Knowledge Capital in Germany, which averages on €92 million per firm. Such low averages are largely the reflection of the fact that a large share of firms both in Norway as well as in Germany contribute negative Knowledge Capital® to the total. This reflects their inability to earn profit returns that exceed their costs of shareholder capital.

A fuller appreciation of the economic profiles can be obtained in Appendix A, which details the names and Knowledge Capital® valuations of individual firms, their Standard Industrial Classification Code (SIC Code) as well as the respective industry grouping.

Effect of the Cost of Capital

Country	Risk-Free Cost of Capital
Belgium	4.76%
Denmark	4.94%
Finland	4.72%
France	4.62%
Germany	4.50%
Ireland	4.50%
Italy	4.75%
Netherlands	4.92%
Norway	5.55%
Portugal	4.10%
Spain	4.68%
Sweden	4.90%
United Kingdom	5.50%

Table 8 – Risk-Free Cost of Capital for European Countries

In view of the wide range of per firm Knowledge Capital® valuations, one first needs to examine whether this may be caused by the one factor that has the greatest single influence on such valuations. This factor is the ‘Cost of Capital’ which is derived by first taking the so called ‘risk-free cost of capital’ – usually defined as the long-term (e.g. 30 years) government bond yield and then adding to this number a ‘risk premium’. For the purpose of our computations, we follow established practices in such valuations by multiplying an investor risk premium of equities over bonds (in this case the premium of 3 per cent is applied to all securities), multiplied by a factor ‘Beta’ which is calculated as the difference between market averages and the fluctuations in the price of equity shares for a specific firm. The ‘Beta’ value is usually posted in stock market reports and was obtained from the Global Compustat calculations for 1999. The following is the tabulation of European ‘risk-free’ Costs of Capital for 1999 (see Table 8).

The European interest rates for long-term government bonds in 1999 were comparable and cannot explain the very large range of Knowledge Capital® per firm. However, one must also consider that the Norwegian maximum cost of capital (at 5.55 per cent) would have contributed to that country’s unfavourable ranking, whereas the unusually low cost of capital in Portugal (at 4.10 per cent) must have contributed to its relatively favourable standing.

Comparisons of Knowledge Capital® Gainers Versus Losers

The most useful insight into the structure of European Knowledge Capital® can be gained by comparing the profiles of the firms in terms of gainers and losers (see Table 9). The same statistics in diagrammatical form are shown in Figure 16.

The ratios of positive to negative firms and positive to negative Knowledge Capital® suggests where to search for explanations why the performance profiles of different European countries show a wide range of differences. For instance, the exceptionally favourable performance of Dutch firms can be readily observed by the fact that 129 of its firms show positive Knowledge Capital® when compared with only 28 firms with negative Knowledge Capital®, for a ratio of 4.6 – the highest in the group. Dutch firms also account for €385.7 billion of firms with positive contributions when compared with only €33.8 billion with negative contributions, giving an 11.4 positive to negative Knowledge Capital® ratio!

The relatively unfavourable standing of Germany can be also better understood by an examination when their ratios. In Germany, there are 279 firms with positive Knowledge Capital® as compared with 246 firms with negative Knowledge Capital®, for an almost parity ratio of 1.1. In currency, terms the corresponding comparisons are €195.5 billion positive versus €147.5 negative, giving an unimpressive ratio of only 1.3.

Country	Number of Firms with Positive Knowledge Capital®	Knowledge Capital® – €m	Number of Firms with Negative Knowledge Capital®	Knowledge Capital® – €m	Ratio of Positive/Negative Firms	Ratio of Positive/Negative Knowledge Capital®
Belgium	69	163,581	21	-29,903	3.3	5.5
Denmark	83	25,157	28	-4,598	3.0	5.5
Finland	76	78,602	27	-5,512	2.8	14.3
France	400	316,077	163	-65,676	2.5	4.8
Germany	279	195,880	246	-147,522	1.1	1.3
Ireland	35	5,669	17	-700	2.1	8.1
Italy	109	161,243	69	-24,761	1.6	6.5
Netherlands	129	385,743	28	-33,789	4.6	11.4
Norway	46	13,780	53	-19,234	0.9	0.7
Portugal	23	24,592	16	-1,299	1.4	18.9
Spain	90	75,878	31	-6,565	2.9	11.6
Sweden	133	143,778	75	-11,989	1.8	12.0
United Kingdom	667	737,732	485	-132,940	1.4	5.5
European Totals	2,139	2,327,713	1,259	-484,487	1.7	4.8

Table 9 – Profiles of Positive and Negative Contributions to Knowledge Capital®

The odds of finding a firm with positive Knowledge Capital® are THE highest in Netherlands, with the ratio of Positive/Negative firms of 4.6 in favour of the positive capital firms. The odds are the lowest in Norway, with the odds in favour of only firms with negative Knowledge Capital®.

In euro-weighted terms, the best odds for finding firms with positive Knowledge Capital® are in Portugal and Finland; the chances of incurring the lowest values of Knowledge Capital® are in Norway and Germany.

Although analysis of the above ratios offers a number of clues why some countries perform better than others, we are still dealing in each case with aggregations of firms without a better understanding of the structure and distribution of positive and negative concentrations of Knowledge Capital®.

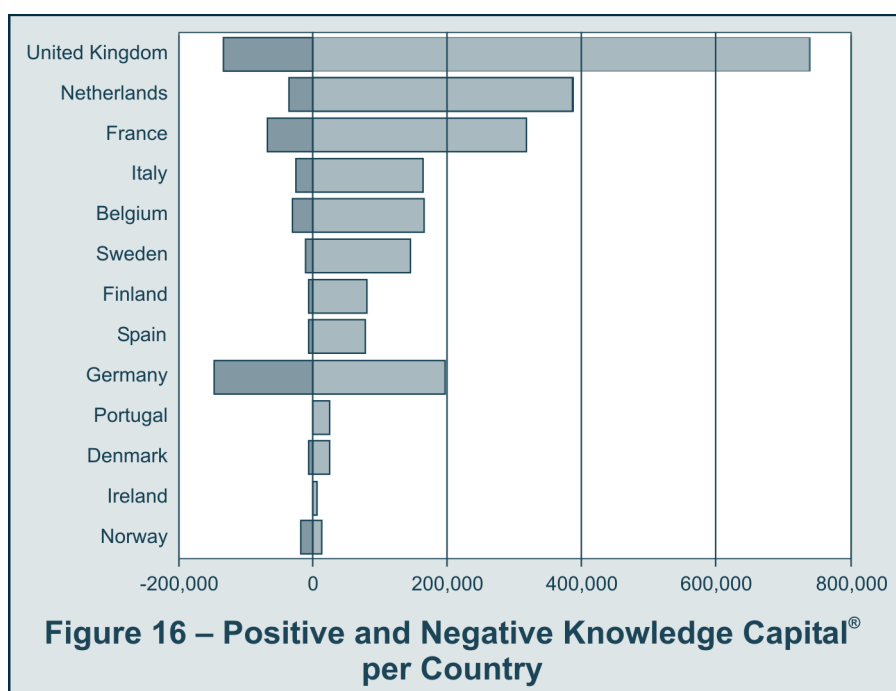


Figure 16 – Positive and Negative Knowledge Capital® per Country

Concentration of Knowledge Capital®

One of the most important characteristics of Knowledge Capital® assets is their concentration, both in positive as well as in negative terms. A few firms possess a disproportionate share of Knowledge Capital® gains or losses. This aspect influences the patterns of Knowledge Capital® ownership more than any other factor as shown in the following profiles (see Table 10).

Country	Number of Firms in the Top 5% of Knowledge Capital®	Total Knowledge Capital® – €m	Knowledge Capital® in the Top 5% of Firms – €m	Knowledge Capital® Concentration
Belgium	5	133,678	100,130	75%
Denmark	6	20,559	14,706	72%
Finland	5	73,090	58,550	80%
France	28	250,401	211,957	85%
Germany	26	48,359	133,661	276%
Ireland	3	4,969	3,857	78%
Italy	9	136,482	122,888	90%
Netherlands	8	351,954	263,322	75%
Norway	5	-5,454	8,696	-159%
Portugal	2	23,294	12,704	55%
Spain	6	69,314	41,150	59%
Sweden	10	131,789	97,633	74%
United Kingdom	58	604,792	669,238	111%
Total Number of Firms	170	1,843,226	1,738,492	94%

Table 10 – Knowledge Capital® can be Found to be Highly Concentrated

For instance, Germany displays perhaps the highest indication of Knowledge Capital® concentration, defined as the share of Knowledge Capital® that is attributable to the top-ranked 5 per cent of firms. In this case, 26 German firms (out of a total of 279 listed firms) have accumulated a total of €133,661 million of positive Knowledge Capital®. Because a disproportionate share (47 per cent) of German companies that lose Knowledge Capital®, including enormous negative contributions by firms such as Mannesmann (€-20.4 billion), Holzmann (€-17.6 billion) and Deutsche Telecom (€-17 billion), the net remaining Knowledge Capital® yields a very high concentration ratio. This is also an indication that in Germany a very small number of firms gain in big way or lose in a big way.

The Portuguese lowest concentration ratio offers an insight into the structure of its economy. Its top two firms constitute only a 55 per cent level of Knowledge Capital® concentration.

What is the economic significance of high or low levels of Knowledge Capital® concentration in an information-based economy warrants further examination and study. Nevertheless, it should be viewed as one of the indicators of the rate at which an economy can create economic surpluses that are necessary for future growth and increased prosperity.

By comparison, a study of 7,287 US Firms in 1999 by Strassmann, Inc. (“Safeguarding Knowledge Capital®: How Much is it Worth? – A Method for Valuation of Information Security Risks”) showed that the Knowledge Capital® calculated for these firms was \$6,411 billions. There were 3,287 firms with Knowledge Capital® under \$20 billion that owned 48.0 per cent of the total available Knowledge Capital® in the US.

Grouping of Firms	Number of Firms	Total Knowledge Capital® – \$ Billion	Percentage of Total Firms	Percentage of Total Knowledge Capital®
Negative Knowledge Capital	3,916	\$-1,997	53.7%	-31.1%
Positive Knowledge Capital < \$20 Billion	3,287	\$3,078	45.1%	48%
Positive Knowledge Capital > \$20 Billion	84	\$5,331	1.2%	83.1%
Total Knowledge Capital	7,287	\$6,411	100.0%	100.0%

Table 11 – The Distribution of Knowledge Capital® for US Industrial Firms

The overall US economic picture was downgraded by 3,916 firms whose Knowledge Capital® was negative. In effect, these firms detracted \$2 billion of Knowledge Capital® from the economy and accounted for a full one third of the entire population of US listed firms.

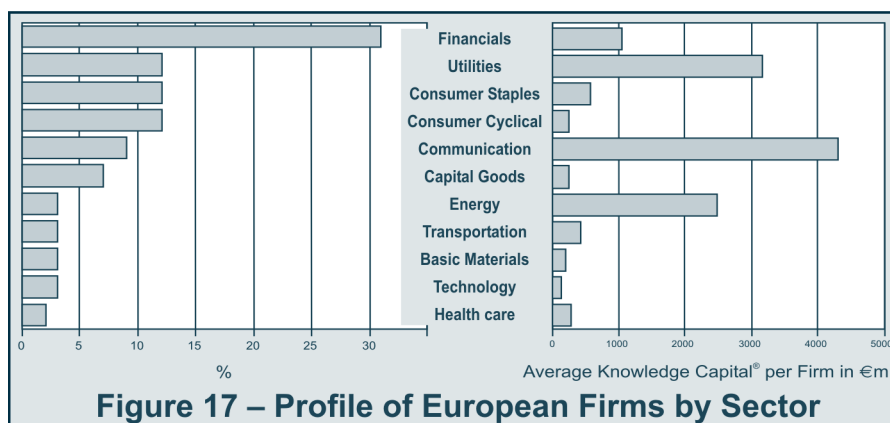
Industrial Sector Profiles

Analysing Knowledge Capital® by Economic Sector offers additional insights for understanding the structure of the European economies. For this reason, we have compiled a tabulation of Knowledge Capital®, across all of Europe, by sectors in which it is deployed:

Economic Sector	Total Number of Firms	Total Knowledge Capital® – €m	Percentage of Total Knowledge Capital®	Average Knowledge Capital®/Firm – €m
Basic Materials	265	52,762	3%	199
Capital Goods	545	133,676	7%	245
Communication	38	163,907	9%	4,313
Consumer Staples	379	218,221	12%	576
Consumer-Cyclical	871	219,431	12%	252
Energy	55	136,878	7%	2,489
Financials	541	566,213	31%	1,047
Health care	118	33,221	2%	282
Technology	394	48,337	3%	123
Transportation	123	52,062	3%	423
Utilities	69	218,517	12%	3,167
	3,398	1,843,226	100%	542

Table 12 – Profile of European Firms by Sector

The same statistics in diagrammatical form are shown in Figure 17.



The view of companies by sector offers the following noteworthy insights:

- Almost a third of the European Knowledge Capital® is in the financial sector, which demonstrates its pivotal strategic position in the economy. However, the financial sector, taken in isolation, does not create Knowledge Capital®, it only acts as an intermediary investor in other sectors of the economy. This concentration of economic power confirms the exceptionally favourable position held by financial institutions in steering the further development of the European economy. Since the financial institutions can be also seen as acting as agents of national economic policies, this strength suggests that the currency and the interest-setting powers of government remain the keys in setting future economic directions.

- The exaggerated role often attributed to the technology sector is largely deflated by the finding that it accounts for only 3 per cent of the total available Knowledge Capital®. The average Knowledge Capital® per technology firm is not significant. In fact, it is the lowest among all of the other sectors. This is not only surprising, but also counter to all of the publicity and attention that has been devoted to these firms. From the standpoint of global competitiveness, this should be seen as a serious disadvantage for Europe.
- Firms in the sectors that are the highest consumers of financial capital, such as the communication, energy, and utilities sectors (together accounting for 28 per cent of the total Knowledge Capital®) also exhibit the highest ratios of Knowledge Capital® per firm. These firms, along with the financial sector, can be all classified as ‘industrial age’ enterprises, which suggests that ‘new economy firms’ (such as in technology, healthcare and capital goods) do not, as yet, represent a significant share of the European economy.¹¹ This finding runs counter to the generally accepted views about the sources of Knowledge Capital® formation.

The relative ranking of the firms in each sector can be also better understood by an examination of the ratios of positive and negative Knowledge Capital® as follows:

Economic Sector	Number of Firms with Positive Knowledge Capital®	Firms with Positive Knowledge Capital® – €m	Number of Firms with Negative Knowledge Capital®	Firms with Negative Knowledge Capital® – €m	Ratio of Positive/Negative Firms	Ratio of Positive/Negative Knowledge Capital®
Basic Materials	160	129,791	105	-77,028	1.5	1.7
Capital Goods	371	220,542	174	-86,866	2.1	2.5
Communication	23	195,987	15	-32,080	1.5	6.1
Consumer Staples	276	244,731	103	-26,510	2.7	9.2
Consumer-Cyclical	596	315,217	275	-95,786	2.2	3.3
Energy	18	155,375	37	-18,496	0.5	8.4
Financials	289	728,039	252	-161,826	1.1	4.5
Healthcare	59	68,059	59	-34,838	1.0	2.0
Technology	206	87,213	188	-38,875	1.1	2.2
Transportation	78	77,782	45	-25,720	1.7	3.0
Utilities	66	219,387	3	-870	22.0	252.1
Totals or Averages	2,142	2,442,123	1,256	-598,897	1.7	4.1

Table 13 – Ratios of Positive and Negative Knowledge Capital® Firms by Sectors

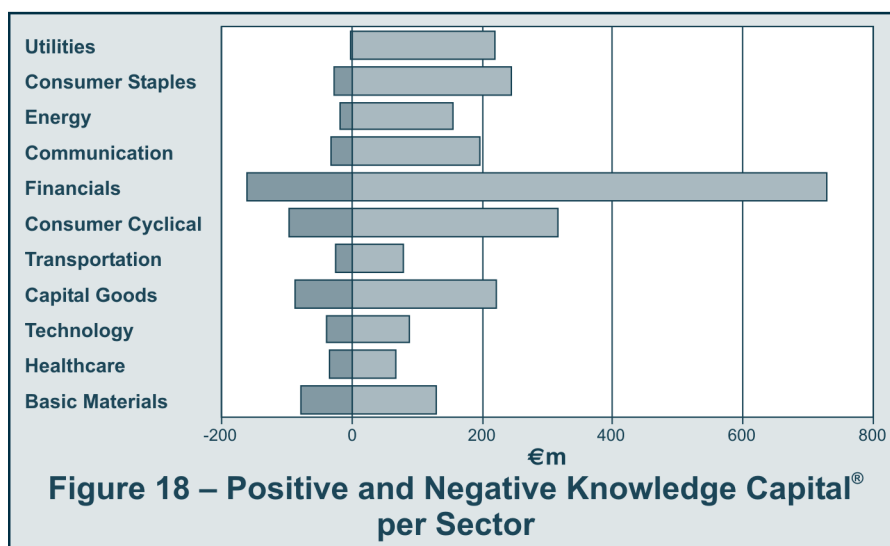
The same figures in diagrammatical form are shown on Figure 18.

The tabulation and figure (in €m, shown in order of decreasing ratio) reveals that the utilities sector represents by far the most attractive source of Knowledge Capital®. Only 3 out of a total of 69 utilities show negative Knowledge Capital®. In euro currency terms, the ratio of positive to negative Knowledge Capital® far outranks all other economic sectors.

The bottom ranking performers are basic materials firms, healthcare and technology (as measured in terms of euro-weighted ratios). A surprisingly large number of financial institutions show that their Knowledge Capital® contributions is a negative €161.8 billion – the biggest detractors of Knowledge Capital® among the rated firms.¹²

¹¹The enormous investments in new communication services are not, as yet, profitable and, therefore, do not qualify as possessors of Knowledge Capital® for the purposes of this analysis.

As previously noted, the technology sector shows up again as perhaps the weakest part of the economy with the number of winners (206 firms) not materially larger than the number of losers (188 firms). As such the positive/negative ratio confirms the fundamental weaknesses of European technology firms.



Sectoral Concentration Ratios

Concentration of economic power, as reflected in Knowledge Capital® ownership, offers another useful view of European firms. The concentration of Knowledge Capital® ownership is defined here as the ratio of the Knowledge Capital® for the top-ranked 5 per cent of firms – in a particular sector (regardless of country of origin) divided by the total Knowledge Capital® (regardless of country of origin):

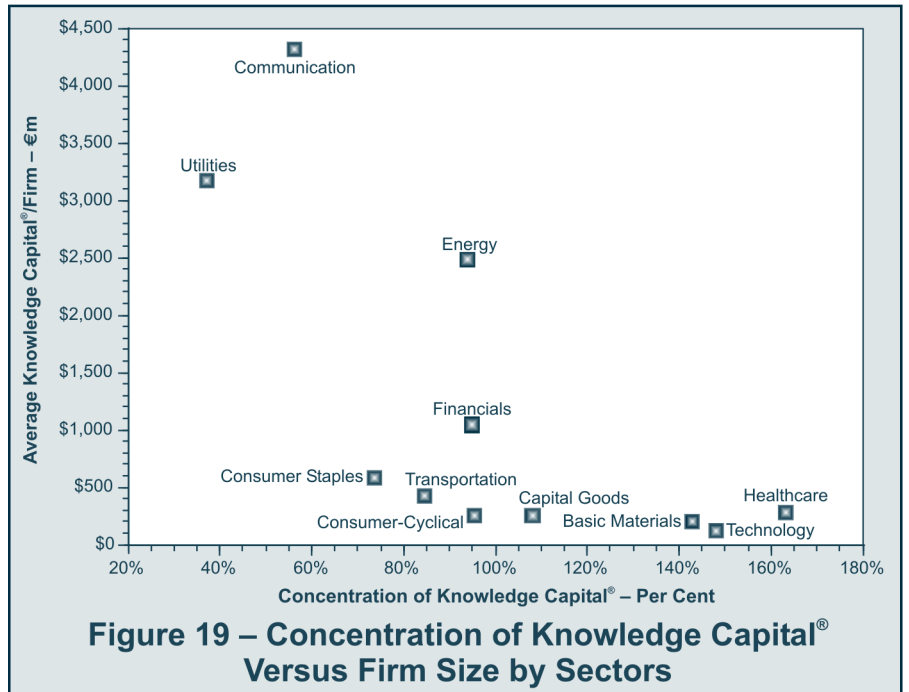
Economic Sector	Number of Firms in the Top 5% of Knowledge Capital®	Total Knowledge Capital® – €m	Knowledge Capital® in the Top 5% of Firms – €m	Knowledge Capital® Concentration
Basic Materials	13	52,762	75,387	143%
Capital Goods	27	133,676	144,474	108%
Communication Service	2	163,907	91,997	56%
Consumer Staples	19	218,221	160,859	74%
Consumer-Cyclical	44	219,431	209,631	96%
Energy	3	136,878	128,234	94%
Financials	27	566,213	536,251	95%
Health Care	6	33,221	54,265	163%
Technology	20	48,337	71,525	148%
Transportation	6	52,062	44,059	85%
Utilities	3	218,517	81,378	37%
Total Number of Firms	170	1,843,226	1,598,060	87%

Table 14 – Concentration of Knowledge Capital® by Sectors

It is noteworthy that some of the best performing sectors – utilities and communication services – show the lowest levels of concentration of Knowledge Capital®, where some of the poorest performing sectors – basic materials, technology and healthcare – show the highest degree of concentration.

¹²A similar pattern in the USA resulted in a wave of consolidation of firms and elimination of weak competitors.

The relationship between Knowledge Capital® concentration and average Knowledge Capital® per firm is shown in the diagram below. Discovery of such relationships is precisely why the use of Knowledge Capital® analyses are useful in generating new insights that otherwise would not be readily apparent using conventional methods of financial analysis.



Part 2: Knowledge Capital[®] in European Firms

2.2 – Country Case: The UK Knowledge Capital[®]

► COUNTRY CASE – THE UK KNOWLEDGE CAPITAL

Concentration of Knowledge Capital®

The dominant characteristics of all Knowledge Capital® profiles studied to date is the finding that Knowledge Capital® is highly concentrated in only a handful of firms. The following tabulation shows that out of 1,152 listed UK firms, for which sufficient data was available, the top 58 firms (or 5 per cent of the total count of firms) possessed 114 per cent of this wealth:¹³

Grouping of Firms	Knowledge Capital® – €m	Percentage of Total Knowledge Capital®	Percentage of Firms	Number of Firms
Top Ranked 5% of Companies	391,909	114%	5%	58
Other Firms with Positive Knowledge Capital	120,738	35%	51%	583
Firms with Negative Knowledge Capital	-168,633	-49%	44%	511
Total UK Knowledge Capital	344,014	100%	100%	1,152

Table 15 – Distribution of Knowledge Capital® Among UK Firms¹⁴

It is remarkable that the remaining population of UK firms, or 1,094 firms, almost nullified each other's contribution to Knowledge Capital®. The 583 UK firms with positive Knowledge Capital® assets did not compensate for the negative contributions of the 511 firms that were detracting from Knowledge Capital® by earning profits earning lower returns on the shareholder equity than the cost of capital.¹⁵

Who were then the leaders in Knowledge Capital® formulation in the period from 1998-1999? This elite showed a truly remarkable diversity in economic sectors.

To illustrate the contribution of the ranking leaders, the following is the listing of the top 29 UK firms ranked by Knowledge Capital® (see Table 16).

Distribution of Knowledge Capital® by Sectors

A sectoral view of the distribution of Knowledge Capital® may offer useful insight as to its structural characteristics. To begin with, let us examine which sectors can be considered to be 'knowledge intensive' and whether the UK corporate economy can be properly designated as a 'knowledge economy' (see Table 17).

As is apparent from the tabulation, the predominant capital in the UK economy is still financial capital defined as 'book value' shareholder equity. Only the communication, healthcare, and technology sectors show a greater dependence on Knowledge Capital® than on capital as defined by corporate accounting records.

¹³The data for this study was obtained from Standard & Poor's Global Database published March 30, 2001. Included were only currently active and listed firms with origin located in the UK. The based cost of interest was obtained from the Standard & Poor's DRI World Economic Outlook.

¹⁴For detailed listing of Knowledge Capital® for 1,152 UK listed firms see Appendix B.

¹⁵For purposes of this analysis, the cost of capital was equal to the 1998-1999 average 'risk-free' cost of interest defined as a long-term government bond yield, plus an allowance for equity risk premium multiplied by a value calculated to reflect the volatility of a firm's market price (also designated as the 'Beta' value).

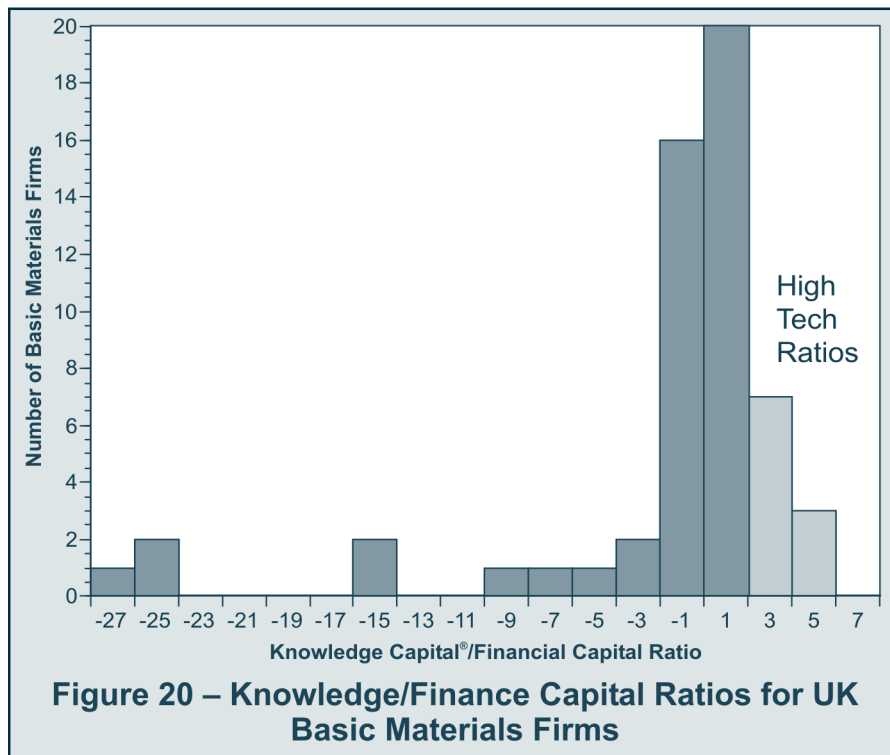
R a n k	Company Name	SIC Code	Economic Sector	Knowledge Capital® – €m
1	GLAXOSMITHKLINE PLC	2834	Healthcare	30,086
2	BRITISH TELECOMMUNICATIONS	4813	Communication	26,962
3	NATIONAL WESTMINSTER BANK	6029	Financials	25,843
4	LLOYDS TSB GROUP	6029	Financials	22,590
5	NATIONAL GRID GROUP PLC	4911	Utilities	13,224
6	ABBEY NATIONAL PLC	6029	Financials	12,945
7	BP AMOCO PLC	2911	Energy	12,930
8	UNILEVER PLC	2000	Consumer Staples	12,867
9	HALIFAX GROUP PLC	6029	Financials	12,334
10	CABLE & WIRELESS PLC	4813	Communication	9,261
11	MARCONI PLC	4810	Communication	9,073
12	BARCLAYS PLC	6029	Financials	8,907
13	PRUDENTIAL PLC	6311	Financials	8,329
14	VODAFONE GROUP PLC	4812	Communication	8,300
15	GALLAHER GROUP PLC	2100	Consumer Staples	7,665
16	HSBC HOLDINGS PLC	6029	Financials	7,567
17	GKN PLC	3714	Consumer-Cyclical	6,801
18	IMPERIAL TOBACCO GROUP PLC	2100	Consumer Staples	6,759
19	CADBURY SCHWEPPES PLC	2060	Consumer Staples	6,582
20	REUTERS GROUP PLC	7380	Consumer-Cyclical	6,101
21	ASTRAZENECA PLC	2834	Healthcare	5,904
22	SAINSBURY (J) PLC	5411	Consumer Staples	5,736
23	RENTOKIL INITIAL PLC	7340	Consumer Staples	5,688
24	PEARSON PLC	2711	Consumer-Cyclical	5,564
25	ROYAL BANK OF SCOTLAND GROUP	6029	Financials	5,558
26	HANSON PLC	3270	Consumer-Cyclical	5,496
27	KINGFISHER PLC	5399	Consumer-Cyclical	5,029
28	LEGAL & GENERAL GROUP PLC	6311	Financials	4,873

Table 16 – The Top-Ranking UK Knowledge Capital® Firms

Economic Sector	Knowledge Capital® – €m	Financial Capital – €m	Knowledge Capital®/Financial Capital Ratio
Basic Materials	2,244	31,912	7%
Capital Goods	19,322	29,847	65%
Communication	51,476	36,032	143%
Consumer Staples	47,752	54,395	88%
Consumer-Cyclical	57,610	116,578	49%
Energy	5,585	44,453	13%
Financials	64,748	235,149	28%
Healthcare	33,887	14,458	234%
Technology	6,740	6,061	111%
Transportation	14,290	24,339	59%
Utilities	39,783	43,647	91%
Total	343,438	636,870	54%

Table 17 – Knowledge/Finance Capital Ratios for Sectors of the UK Economy

Caution must be exercised in labelling any one firm as 'old economy' because it happens to be classified as belonging to an industrial sector with a very low Knowledge Capital®/Financial Capital Ratio. For instance, the lowest ranking sector in Figure 3 is the 'Basic Materials' sector. Nevertheless, it includes a number of firms with Knowledge Capital®/Financial Capital Ratios that are comparable with many of the firms classified as technology firms:



The average for the Basic Materials firms is greatly reduced by including in the data a small number of firms with substantial losses and, therefore, negative Knowledge Capital®.¹⁶ This example demonstrates conclusively that in the examination of Knowledge Capital® performance, the individual characteristics of a firm should always receive an examination since industry, sector, or geographic averages have little meaning.

Knowledge Capital® per Employee

The allocation of Knowledge Capital® to employees is one of the most important indicators in assessing the attractiveness of a variety of knowledge management programmes. The range in the values of Knowledge Capital® per employee is enormous, as attested by the following tabulation, ranked in order of Knowledge Capital® intensity per employee (see Table 18).

The exceedingly high level of Knowledge Capital® per employee for utilities is a testimonial to the unusual combination of high profitability, low costs of interest, stability in earnings (translated into a low 'Beta' value) and high automation. Nevertheless, all utilities are not comparable in their Knowledge Capital® accumulations, as attested by plotting the distribution of Knowledge Capital® ratios for 21 UK utility firms on a bar-graph histogram.

Again, it is remarkable that even the highest value sector displays a wide range in the valuation of Knowledge Capital® per employee, ranging from a high of 3.5 million euros to a low of a negative 7,734 euros. Such wide ranges, frequently encountered in all of our statistical studies, confirm that so-called industry best practices have little merit for comparative purposes.

¹⁶For supporting detail, see tabulation in Appendix B.

Economic Sector	Knowledge Capital® – €m	Employment – Thousands	Knowledge Capital®/Employee – €m
Utilities	39,783	123	324,083
Healthcare	33,887	162	209,164
Financials	64,748	764	84,709
Energy	5,585	97	57,341
Communication	51,476	1,116	46,111
Consumer-Cyclical	57,610	1,572	36,658
Transportation	14,290	422	33,873
Consumer Staples	47,752	1,440	33,158
Capital Goods	19,322	700	27,621
Technology	6,740	256	26,319
Basic Materials	2,244	417	5,384
Total	343,438	7,069	48,585

Table 18 – Knowledge Capital® per Employee for UK Industrial Sectors

Knowledge management programs for employees of a firm, such as the National Group, would most likely find more in common with a high value pharmaceutical firm than with the low value Severn-Trent utility company.

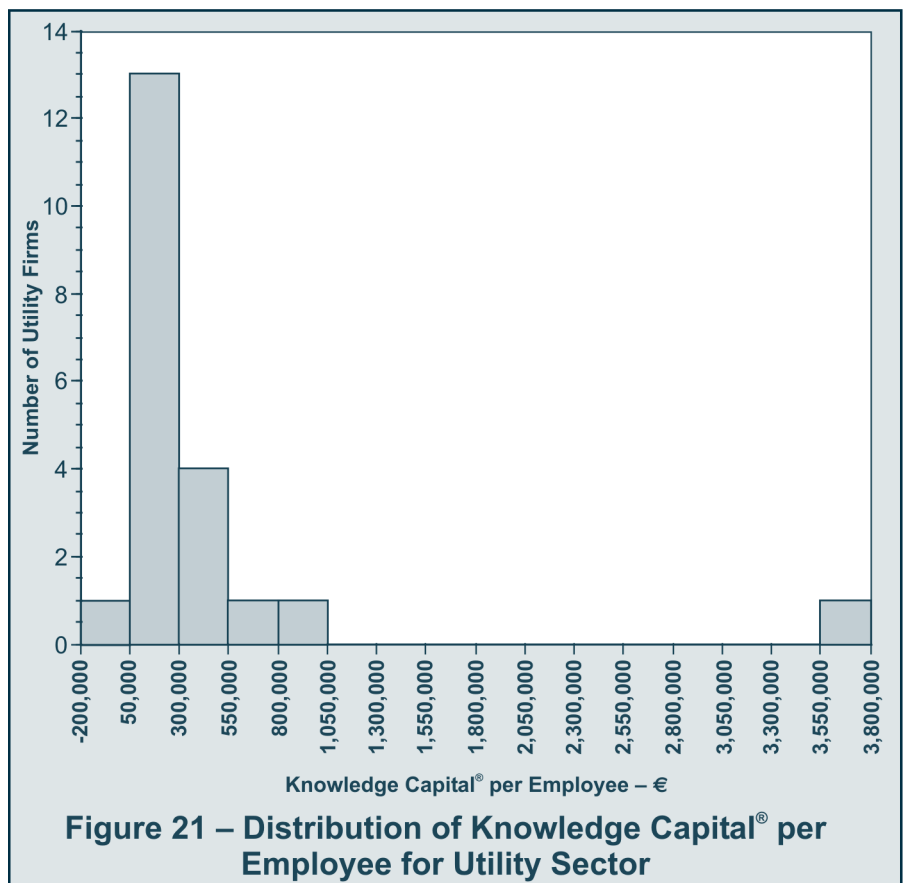


Figure 21 – Distribution of Knowledge Capital® per Employee for Utility Sector

Country	SIC Code	Knowledge Capital® – €m	Employees – 1000s	Knowledge Capital®/ Employees – €m
NATIONAL GRID GROUP	4911	13,224	3.63	3,645,054
INTERNATIONAL POWER	4911	4,174	4.45	939,037
DEE VALLEY GROUP	4941	126	0.19	681,706
EAST SURREY HOLDINGS	4941	194	0.38	505,578
POWERGEN	4911	3,697	7.88	469,457
MID KENT HOLDINGS	4941	213	0.53	401,746
BRISTOL WATER HOLDINGS	4941	191	0.58	330,068
BROCKHAMPTON HOLDINGS	4941	79	0.27	292,924
SCOTTISH & SOUTHERN	4911	2,716	9.35	290,608
SOUTH ST AFFORDSHIRE GROUP	4941	301	1.06	284,347
VIRIDIAN GROUP	4911	600	2.16	277,601
SCOTTISH POWER	4911	4,149	16.18	256,477
BOURNEMOUTH & WEST	4941	64	0.26	249,788
BG GROUP	4924	4,816	19.59	245,795
INTERNATIONAL ENERGY	4923	127	0.55	231,711
UNITED UTILITIES	4911	1,927	10.13	190,265
BRITISH ENERGY	4911	940	5.39	174,355
AWG	4941	900	5.30	169,889
KELDA GROUP	4941	383	4.21	90,974
CENTRICA	4932	1,047	19.60	53,433
SEVERN TRENT	4941	-86	11.10	-7,734

Table 19 – Knowledge Capital® per Employee for the Top Ranked Utility Sector

Market Valuation of Knowledge Capital®

Does the UK stock market place any value on a company's Knowledge Capital®? Though the stock market often reflects whims and fads, corporate executives devote an extraordinary amount of attention to the daily fluctuations in stock prices.

The following Figure compares the 1999 stock valuations of UK firms with the 'composite value' of the firm calculated as the sum of financial capital (e.g. 'book value') plus Knowledge Capital®:

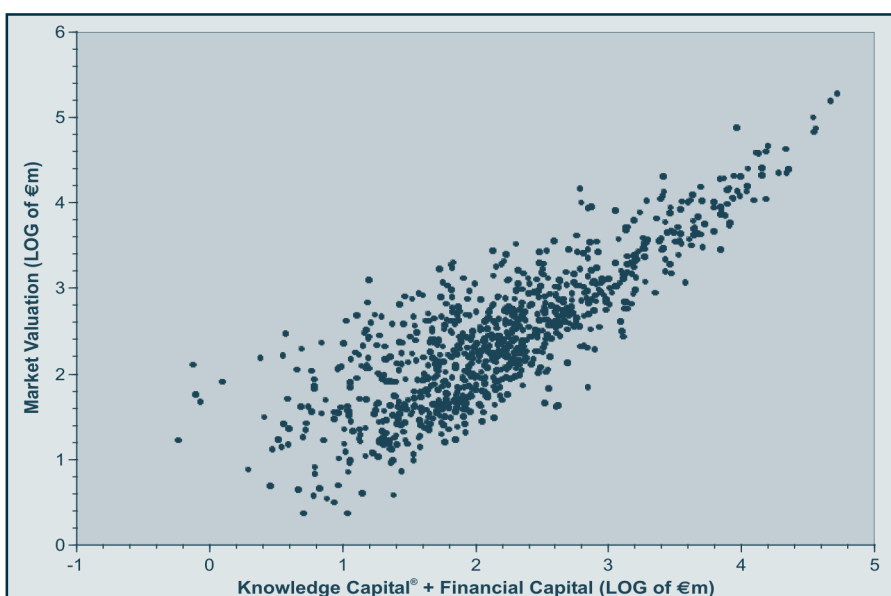
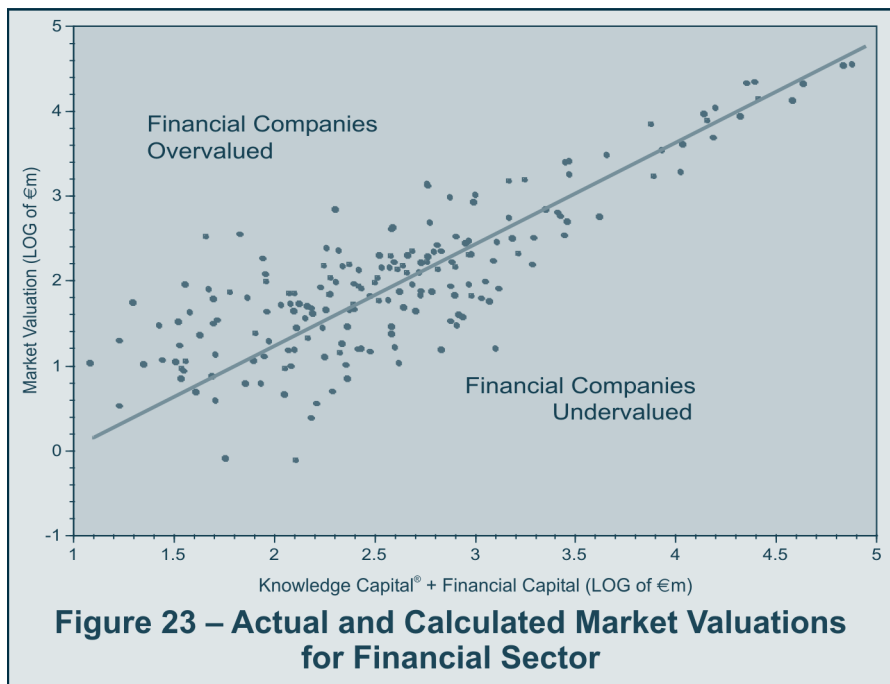


Figure 22 – Relationship Between Actual and Calculated Market Valuations

If one divides the distributions of market valuations between large capitalisation stocks (e.g. 'Large Cap', with valuations over 100 million euros – where LOG=2) and small capitalisation stocks (e.g. 'Small Cap', with valuations under 100 million euros) the importance of Knowledge Capital® can be clearly recognised.

The correlation between actual market valuations and composite valuations for Large Cap stocks has an Rsquare value of 82.8 per cent. That level of correlation offers an exceptionally high level of fit – even when it is applied to a wide range of firms in different industrials sectors – thus confirming that the stock market considers Knowledge Capital® valuations in its pricing.



If one neglects to include in the correlation equation the value of Knowledge Capital®, the Rsquare value drops to only 65.2 per cent.

For Small Cap firms the correlations between market valuations and either 'book value' or composite value do not apply. The statistical patterns are just too diverse to be predictable on the basis of a simple linear relationship.

The pattern of high correlation between actual and calculated values of companies appears to hold up in the range of valuations over one billion (with Rsquare correlations of 88.2 per cent). For lower capital valuations, the use of Knowledge Capital® for stock market comparison purposes appears to have utility only in special cases where there is a large discrepancy between market and calculated values.

Summary Findings, UK Case

1. The possession of Knowledge Capital® in the UK economy is highly concentrated. The top 5 per cent of firms (or 58 firms) account for 114 per cent of the total available Knowledge Capital®. This high concentration is largely the result of a large number of UK firms (511 firms) being detractors from Knowledge Capital® where detraction is defined as profitability that is not even sufficient to earn the Cost of Capital.
2. The concentration of Knowledge Capital® is not industry-specific. Companies with exceptionally high shares of Knowledge Capital can be found in every sector of the economy.
3. 20 per cent of UK Knowledge Capital® is concentrated in the financial sector, largely reflecting the exceptionally favourable earnings and relatively low costs of capital.
4. Only 27 per cent of the UK economy is knowledge intensive, as defined by a ratio of Knowledge Capital®/Financial Capital that is greater than 100 per cent. Using this metric, one can conclude that the UK cannot be classified, as yet, as a knowledge economy.
5. It would be a mistake to identify any one sector of the economy as knowledge-backward. For instance, even the least knowledge-intensive sector – Basic Materials – includes firms that match the knowledge profiles exceeding the average of high-technology firms.
6. From the standpoint of initiation of corporate knowledge management programs, the most interesting insights are offered by calculating the ratio of Knowledge Capital®/Employee. Sectoral analysis reveals wide-ranging disparities among different industrial groupings as well as enormous differences among comparable firms.
7. The principal conclusion of this Report is the finding that comparisons of 'best practices' in knowledge management must be made among firms with comparable levels of Knowledge Capital®/Employee, regardless of geography, revenue, or industrial classification. Knowledge Capital® characteristics of a firm are unique to that firm's strategic and competitive positioning and not a phenomenon that can be found as a generalised attribute that is industry-specific.
8. The market valuation of large capitalisation firms reflects Knowledge Capital® valuations.

Company Name	Industry Code	Knowledge Capital® – €m	Financial Capital® – €m	Knowledge/Financial Capital Ratio
CORUS GROUP	3312	-5,449	6,795	-0.80
RJB MINING	1220	-1,031	599	-1.72
ASW HOLDINGS	3300	-663	136	-4.87
ANTOFAGASTA	1000	-463	813	-0.57
YORKSHIRE GROUP	2860	-384	116	-3.31
ELEMENTIS	2800	-353	568	-0.62
DAVID S SMITH HOLDINGS	2631	-328	748	-0.44
MIDDLESEX HOLDINGS	3312	-180	19	-9.51
ADVANCED MEDICAL SOL GROUP	2820	-130	18	-7.15
CRODA INTERNATIONAL	2860	-107	240	-0.44
FIRTH HOLDINGS	3312	-93	4	-26.00
LAPORTE	2800	-85	697	-0.12
ISA INTERNATIONAL	5110	-67	42	-1.60
CAMELLIA	100	-62	241	-0.26
COMMUNISIS	2400	-61	2	-25.61
GREENWICH RESOURCES	1000	-59	17	-3.49
LOWE (ROBERT H)	2650	-59	2	-27.55
LOW & BONAR	2670	-55	156	-0.35
INVERESK	2621	-53	45	-1.19
REFLEC	2890	-42	3	-15.08
HILL & SMITH HOLDINGS	3312	-40	35	-1.15
INCH KENNETH KAJANG	100	-36	2	-15.16
FOLKES GROUP	3300	-23	86	-0.27
MACFARLANE GROUP	2670	-20	108	-0.18
BILLITON	3334	-14	4,280	-0.00
PADANG SENANG HOLDINGS	800	-2	6	-0.27
JAMES CROPPER	2621	0	43	0.00
LENDU HOLDINGS	100	2	10	0.18
ALEXANDER RUSSELL	1400	7	54	0.12
ROWE EVANS INVESTMENTS	800	11	68	0.16
APPLIED OPTICAL	2670	11	9	1.22
TREATT	2890	19	20	0.92
WILLIAM SINCLAIR HOLDINGS	2870	19	35	0.55
CHAMBERLIN & HILL	3320	28	17	1.65
LAWRENCE	2870	32	16	2.02
AMBERLEY GROUP	1400	49	36	1.37
API GROUP	2670	51	159	0.32
OSBORNE & LITTLE	2670	53	17	3.20
EUROPEAN COLOUR	2810	67	13	5.28
INTERNATIONAL GREETINGS	2670	73	24	3.03
FIRTH RIXSON	3310	94	132	0.71
CASTINGS	3320	108	64	1.69
BRITISH POLYTHENE INDS	2670	117	163	0.72
VICTREX	2821	128	39	3.27
YULE CATTO & CO	2860	178	347	0.51
ANGLIAN GROUP	2430	279	59	4.77
ASCOT	2800	327	100	3.29
WALKER GREENBANK	2670	336	68	4.93
BRITISH VITA GROUP	2821	372	498	0.75
BLUE CIRCLE INDUSTRIES	3241	417	2,335	0.18
BODYCOTE INTERNATIONAL	3390	444	479	0.93
LONMIN	1000	610	635	0.96
BOC GROUP	2810	628	2,933	0.21
BUNZL	5110	1,162	452	2.57
REXAM	2650	1,788	885	2.02
RIO TINTO GROUP (GBP)	1000	4,695	6,423	0.73

Table 20 – Example of UK Knowledge/Financial Capital Ratios

Appendix A: Valuation of Knowledge Capital®

► VALUATION OF KNOWLEDGE CAPITAL®

Measuring and Managing Knowledge Capital®

Indiscriminate discarding of knowledge assets, whether in the form of accumulated employee training or legacy software, has origins in ideas proposed over a century ago about the value of capital and labour.

These theories claim that only capital assets increased the productivity of labour. Consequently, the productivity of an enterprise is measured only in terms of the productivity of its capital, such as Return on Assets or Return on Investment. The providers of capital are then entitled to the surplus, called profit or rent. If knowledge happens to be necessary for labour to make better uses of capital, which becomes the justification for a higher wage rate for labour. By this reasoning, those performing the actual labour are not entitled to collect rent from the knowledge they have accumulated. Labour can receive only fair compensation for the time worked. The most they are allowed to claim is to be awarded premium wages and a bonus here or there.

This logic is not only misleading, but results in judging the value of employees on the basis of their wages, rather than how fast they accumulate useful knowledge. The productivity of labour is not only a matter of wages. Productivity comes from Knowledge Capital® aggregated in the employee's head in the form of useful training and company-relevant experience.

The Individual's Point of View

Let me illustrate this by an example. You hire an untrained person who meets entry-level requirements, such as literacy, a work ethic, and socially acceptable behaviour traits. His or her wage will be based on prevailing wage rates for entry-level skills. Ten years later, that person becomes a manager or expert, earning three times the entry-level wages. How does a firm justify spending three times more on the identical person?

The accumulation of company-specific knowledge explains the difference. During those ten years, the organisation invested anywhere from a year's to several years of salary in helping the employee to function more effectively. Hardly any of that expense shows up as a direct cost. Most of it is in the form of attending meetings, having phone conversations, keeping up with company gossip and making errors which, if corrected, can be charged to learning. None of that contributes to anything the customer is willing to pay for. Industrial engineers call such expense 'overhead'. I call it money spent on an accumulation of company-specific Knowledge Capital®. If organisations spend their money well, employees with ten years of accumulated knowledge will be worth more than what the company pays them. In that way, the company will be recovering the investment on its Knowledge Capital® as incremental profits.

Let us look at the same situation from the standpoint of the employee. To increase his earning capacity, the employee counts on the company to invest in developing his skills beyond whatever investments he makes on his own, such as reading books, attending courses, and involvement in professional activities. However, working for the company consumes most of the time available to do this. The best way of raising one's earning potential is to enhance what shows up on the resume as experience that is not company-specific. It would then be desirable for a person to acquire marketable knowledge that has greater value than his compensation. If that happens, employees will be able to recover their investments in knowledge by getting promoted to higher paying positions. If that does not happen, they can hope to find better paying employment elsewhere. They can then collect incremental profits on their knowledge assets in the form of the difference in the wage rate they could not get from their current employer.

If you replace the word 'software' wherever the word 'knowledge' was used above, you will find the statements to hold true except that open systems software will increase the capacity for knowledge accumulation at a faster rate, whether seen from the standpoint of the firm or the employee. If a corporation's investment in people increases the value of people faster than their salaries, everybody gains. The corporation creates employee value-added. The employee acquires Knowledge Capital® on which he can collect added income.

Tragedy occurs when none of the above works out. This takes place when the corporation practices and teaches obsolete skills. Then the employee is not marketable, except at depressed wages. The recent waves of layoffs from 're-engineering' have not increased unemployment among information workers. They find other jobs, but with lower compensation. An aerospace engineer could end up as a manager of a copy shop, working 30 per cent longer hours for 40 per cent less. It is possible to calculate the 'fair' price for the new compensation by writing off the engineer's accumulated Knowledge Capital® in aerodynamics and structural design to zero.

The cost to develop information workers, which I define as an overhead expense for acquiring company-specific knowledge, is very often much greater than the depreciation of the fixed assets and greater than profits for most corporations. The time has come for enterprises to manage Knowledge Capital® as perhaps their most significant asset.

The marketable knowledge an information worker acquires during his lifetime is the only means to increase his earnings. The potential lifetime earning capacity of a recently graduated engineer, with a starting salary of \$40,000 and real income growing at 4 per cent per annum, is \$6 million. Without the added value, from continually acquired knowledge, the lifetime earnings would be 67 per cent less. This explains why it is necessary for individual information workers to start managing their own Knowledge Capital® for maximum returns to themselves as well as to their employers.

The Corporate Point of View

The calculation of the Economic Value-Added makes it possible to count the worth of the people who possess the accumulated knowledge about a company. These are the carriers of Knowledge Capital®. They are the people who leave the workplace every night and may never return while storing in their heads knowledge acquired while receiving full pay.

They possess something for which they have spent untold hours listening and talking while delivering nothing of tangible value to paying customers. Their brains have become repositories of an accumulation of insights on how "things work here" – something that is often labelled by the vague expression 'company culture'. Their heads carry a share of the company's Knowledge Capital®, which makes them a shareholder of the most important asset a firm owns, even though it never shows up on any financial reports. Every such shareholder of knowledge assets in fact becomes a manager, because information acquisition and information utilisation is the essence of all managerial acts.

The term 'management' is used here as applicable to every information activity that is not directly engaged in the generation of revenues. I define customers as the people from whom you collect cash. When some corporate staff unit declares that it caters to other staffers as 'customers', that is just a misnomer. They are overheads and, therefore, remain a part of 'management' regardless of their claims. If a newly hired factory worker spends half a day in general orientation and indoctrination meetings, that means he partakes in a managerial activity. The work of an executive secretary can be also seen as managerial, since this job involves information gathering, storage, and dissemination tasks. Meetings, training, consultations, giving advice, accounting, administration, interviewing, or correcting quality defects, by this definition are all managerial functions because if they would be fully accounted for, they would be charged to 'overhead' and not to direct costs of sales.

In a typical company, an average employee spends at least one third of his time acquiring intra-company information that is unrelated to the delivery of goods or services. Employees in managerial and staff positions expend all of their time on tasks not directly related to the delivery of goods or services. More than 25 per cent of payroll dollars in a knowledge-intensive enterprise, and well over 50 per cent of the payroll dollars in most government agencies, are expended on information activities that should be recorded as managerial overheads.

This learning and talking and listening are expensive. They reduce corporate profits. But if that accumulation is ultimately convertible in greater productivity for the enterprise, then the expense was worth it by earning a return on the Knowledge Capital® investment.

Consider the costs of managerial knowledge accumulated by an employee over a ten-year period. With full costs of employment at about \$60,000 per annum, the decade-long exposure to managerial information would result in knowledge inputs costing about \$150,000. What would be then the measurable outputs from all of that accumulated knowledge?

Calculating Knowledge Capital®

The Economic Value-Added is the net result of all managerial activities. Economic Value-Added is the net surplus economic value created by the firm, since the suppliers, the tax authorities, all labour, and all shareholder expenses are already fully accounted for.

The creation of Economic Value-Added is something that defies the laws of conservation of energy. These laws state that output of any system in the Universe can never be greater than its input. Delivering a positive Economic Value-Added must be, therefore, an act of creativity that springs forth from something that is intangible, as if it were an artistic conception. The source of this creative energy is Knowledge Capital®. This ephemeral element can be quantified only indirectly by observing how much Economic Value-Added it yields.

Another way of looking at the same phenomenon is to infer the value of Knowledge Capital® from its periodic yield. If Economic Value-Added is the interest earned from an accumulation of knowledge residing with the firm, then the value of this principal can be calculated by dividing the Economic Value-Added by the price one pays for such capital.

Mergers and acquisitions of companies have made the pricing of all capital explicit. It is the risk-adjusted interest that an investor is willing to pay. Since investors cannot differentiate between the price of capital for financial or knowledge investments because they are intermingled, I use the identical price for all capital as a first approximation. This yields a simple equation:

$$\text{Knowledge Capital}^{\circledR} = \text{Management Value-Added/Price of Capital}$$

This relation makes it possible to prepare a revised Balance Sheet for any firm, by adding a line item Knowledge Capital® on the Asset side of the ledger, and by increasing (or decreasing) the reported valuation of Shareholder Equity by the identical amount.

Knowledge Capital® can be Positive as Well as Negative

One of the most difficult concepts to grasp when discussing Knowledge Capital® is the presence in its negative form. The easiest way to explain that is by an examination of the calculations. If a firm's Shareholder Return on Equity (ROE) is less than its Cost of Capital, then any subtraction of 'rent' for shareholder equity from profits after taxes will yield a negative number. This simply means that business operations are a liability and, if allowed to continue over an extended period of time, will result in the impoverishment of the shareholder's wealth. Since a surprisingly large number of firms exhibit negative Knowledge Capital® valuations, an investor should be especially aware of the risks whenever negative Knowledge Capital® values persist over an extended period of time.

This is why management bonuses based strictly on accounting profits cannot always be seen as evidence that management is also enhancing shareholder value.

How to Grow Knowledge Capital®

One can view Knowledge Capital® as the result of a stream of expenses that have aided an organisation to become more effective over a period of many years. Meetings are not necessarily wasted, because they may contribute to greater employee awareness. Training is useful if it is put to good use by making it possible to reach higher levels of quality and productivity. Software can become immortal if it is not discarded, but reused over and over again.

Almost everything that counts as an accumulation of knowledge is usually paid for and written-off as an overhead expense and charged against current profits. This can decrease profits, increase expenses and diminish Information Productivity unless management sets out deliberately to treat all overhead expense as a potential investment in Knowledge Capital®. Every manager should therefore monitor what portion of their Sales, General, and Administrative expense is frittered away as a one-time happening, and how much of it can be seen as an asset with a residual value.

Appendix B: Valuation of Knowledge Capital® Rankings by Country

Belgian Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	ELECTRAFINA SA	6799	Financials	€27,557.77
2	GROUP BRUXELLES LAMBERT	6799	Financials	€21,996.63
3	TRACTEBEL SA	4900	Utilities	€20,878.77
4	KBC BANKVERZEKERINGHOLDING	6029	Financials	€16,169.49
5	CIE NATL A PORTEFEUILLE	6799	Financials	€13,527.73
6	ELECTRABEL SA/NV	4931	Utilities	€13,397.08
7	SOFINA SA	6722	Financials	€10,486.35
8	ALMANIJ NV	6799	Financials	€6,338.87
9	SOLVAY SA	2810	Basic Materials	€5,607.63
10	UCB SA-NV	2821	Basic Materials	€3,570.99
11	COBEPA	6799	Financials	€3,490.36
12	DELHAIZE LE LION SA	5411	Consumer Staples	€2,478.84
13	SOLVAC SA	6799	Financials	€1,370.11
14	OBOURG (FINANCIERE D)	6799	Financials	€1,289.20
15	COLRUYT GROUP	5411	Consumer Staples	€1,246.35
16	D'IETEREN	5500	Consumer-Cyclical	€1,212.73
17	SIDRO SA/NVB	1311	Energy	€951.84
18	ACKERMANS & VAN HAAREN NV/SA	1600	Capital Goods	€904.54
19	TUBIZE (FINANCIERE DE)	6799	Financials	€891.86
20	FINANCIERE BREDERODE NV	6799	Financials	€832.45
21	TESSENDERLO CHEMIE	2800	Basic Materials	€738.57
22	BEKAERT SA/NV	3300	Basic Materials	€673.97
23	DISTRIGAZ SA	4923	Utilities	€605.43
24	BARCO NEW NV	3861	Technology	€603.70
25	AFRIFINA NV	6799	Financials	€595.80
26	KORAMIC BUILDING PRODUCTS	3250	Consumer-Cyclical	€594.51
27	UM-UNION MINIERE	3330	Capital Goods	€468.13
28	HENEX SA	6799	Financials	€410.20
29	MOSANE SA	6799	Financials	€379.58
30	COFINIMMO SA	6512	Consumer-Cyclical	€375.20
31	SAPEC SA	2870	Basic Materials	€349.84

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	SIOEN INDUSTRIES NV	2390	Consumer-Cyclical	€301.11
33	DECEUNINCK NV/SA	3089	Consumer Staples	€288.50
34	MELEXIS NV	3674	Technology	€240.88
35	IBEL-INVST EN BELEGG LACOURT	6799	Financials	€236.73
36	VAN DE VELDE SA	2340	Consumer-Cyclical	€201.58
37	CONCENTRA SA	6799	Financials	€183.69
38	BRANTANO SA	5661	Consumer-Cyclical	€179.65
39	SPADEL INTERNATIONAL GROUP	2086	Consumer Staples	€177.89
40	UNIBRA SA	2082	Consumer Staples	€164.00
41	ATENOR GROUP	6799	Financials	€161.82
42	TELINDUS GROUP NV	3576	Technology	€139.50
43	IMMOBILIERE DE BELGIQUE	1500	Capital Goods	€133.00
44	SIPEF NV	800	Basic Materials	€127.25
45	SURONGO SA	6799	Financials	€115.57
46	MOBILIER & FONC BOIS SAUVAGE	6799	Financials	€114.09
47	RECTICEL SA	2821	Basic Materials	€107.83
48	REAL SOFTWARE GROUP	7373	Technology	€89.26
49	BERGINVEST SA	3949	Consumer-Cyclical	€87.79
50	ECONOCOM GROUP BV	7377	Technology	€77.14
51	FLORIDIENNE SA/NV	2090	Consumer Staples	€76.58
52	DES GLACES MOUSTIER-SUR-SAMB	6799	Financials	€69.85
53	BMT-BAUME-MARPENT & THIRION	3220	Capital Goods	€50.08
54	SPECTOR PHOTO	7384	Consumer-Cyclical	€43.82
55	SOCFIN SA-FIN DES CAOUTCHOUC	800	Basic Materials	€34.01
56	ICOS VISION SYSTEMS CORP NV	3559	Capital Goods	€27.30
57	CIE D'ENTREPRISES CFE	1500	Capital Goods	€26.27
58	CORONA-LOTUS	2050	Consumer Staples	€24.84
59	DES GLACES DE CHARLEROI SA	6799	Financials	€19.31
60	ENGRAIS ROSIER SA	2870	Basic Materials	€18.36
61	SOC COM BRASSERIE (CO BR HA)	2082	Consumer Staples	€18.27
62	CITY HOTELS	7011	Consumer-Cyclical	€14.33

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	SCF NV/SA	5130	Consumer-Cyclical	€9.27
64	PLANTATIONS NORD-SUMATRA SA	6799	Financials	€8.16
65	COKERIES D' ANDERLUES SA	3312	Basic Materials	€7.20
66	PAPETERIES DE CATALA SA	2650	Basic Materials	€5.01
67	GLAVERBEL SA	3211	Capital Goods	€3.54
68	PROMINTER	2000	Consumer Staples	€3.25
69	AGRIDEC SA	6510	Consumer-Cyclical	€-0.14
70	DEFICOM GROUP	6799	Financials	€-2.84
71	PCB NV	5122	Consumer Staples	€-3.64
72	SABCA-SA BELGE CONSTRU AERON	3728	Capital Goods	€-5.15
73	QUICK RESTAURANTS SA	5812	Consumer Staples	€-18.38
74	CIE FINANCIERE DE NEUFCOUR	6500	Consumer-Cyclical	€-20.89
75	RESILUX NV	2821	Basic Materials	€-28.50
76	LERNOUT & HAUSPIE SPEECH PD	7372	Technology	€-37.09
77	NEUHAUS NV	2060	Consumer Staples	€-41.47
78	HAMON & CIE (INTL) SA	3440	Capital Goods	€-69.79
79	TER BEKE NV/SA	2011	Consumer Staples	€-185.29
80	BANQUE NATIONALE DE BELGIQUE	6029	Financials	€-197.95
81	AUXIMINES-CIE AUXILIAIRE MNS	6799	Financials	€-198.52
82	CMB-CIE MARITIME BELGE NV/SA	4412	Transportation	€-279.26
83	GEVAERT NV	6799	Financials	€-313.54
84	PICANOL	3550	Capital Goods	€-387.25
85	SAIT-STENTO	3661	Technology	€-418.17
86	FORTIS AG	6799	Financials	€-1,247.88
87	DEXIA SA	6799	Financials	€-1,664.45
88	GIB GROUP (GB-INNO-BM)	5411	Consumer Staples	€-1,746.70
89	STE NATIONALE CHEMINS BELGES	4011	Transportation	€-3,915.88
90	TEXAF SA	6799	Financials	€-19,120.76
Total Knowledge Capital®				€133,677.78

Appendix B: Valuation of Knowledge Capital® Rankings by Country

Danish Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	DANSKE BANK AS	6029	Financials	€3,741.00
2	INVTSEFGN CARNEGIE WORLD WIDE	6722	Financials	€2,825.00
3	TELE DANMARK A/S	4813	Communication	€2,553.00
4	FLS INDUSTRIES	3559	Capital Goods	€2,477.00
5	NOVO NORDISK A/S	2834	Healthcare	€1,676.00
6	POTAGUA GROUP	8711	Capital Goods	€1,435.00
7	D/S 1912 AB	4412	Transportation	€955.00
8	D/S SVENDBORG	4412	Transportation	€923.00
9	JYSKE BANK	6029	Financials	€799.00
10	H LUNDBECK A/S	2834	Healthcare	€654.00
11	CODAN GROUP LTD	6311	Financials	€628.00
12	ALM. BRAND FINANS A/S	6029	Financials	€625.00
13	CARLSBERG A/S	2082	Consumer Staples	€611.00
14	VESTAS WIND SYSTEMS A/S	3621	Capital Goods	€585.00
15	BANG & OLUFSEN HOLDING A/S	3651	Capital Goods	€553.00
16	C W OBEL A/S	1700	Capital Goods	€534.00
17	DANSKE TRAEALST A/S	5211	Consumer-Cyclical	€517.00
18	COLOPLAST A/S	3842	Healthcare	€468.00
19	DANISCO A/S	2060	Consumer Staples	€425.00
20	WILLIAM DEMANT	3842	Healthcare	€425.00
21	KOBENHAVNS LUFTHAVNE	4581	Transportation	€393.00
22	SPAR NORD BANK A/S	6029	Financials	€306.00
23	AALBORG PORTLAND HOLDING A/S	3241	Basic Materials	€269.00
24	SYDBANK AS	6029	Financials	€262.00
25	TK DEVELOPMENT A/S	1540	Capital Goods	€258.00
26	ROCKWOOL INTERNATIONAL A/S	3290	Consumer-Cyclical	€244.00
27	RADIOMETER AS	3841	Healthcare	€227.00
28	HOJGAARD HOLDING A/S	1540	Capital Goods	€227.00
29	GN STORE NORD A/S	4812	Communication	€215.00
30	DANSK KAPITALANLAEG A/S	6799	Financials	€209.00
31	VT HOLDING AS	9998	Consumer-Cyclical	€178.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	CHR HANSEN GROUP	2860	Basic Materials	€177.00
33	NESA A/S	3612	Capital Goods	€175.00
34	INWEAR GROUP A/S	2300	Consumer-Cyclical	€165.00
35	KFK KORN-OG FODERSTOF KOMP	2040	Consumer Staples	€150.00
36	DE SAMMENSLUTTEDE VOGNMAEND	4213	Transportation	€139.00
37	AURIGA INDUSTRIES A/S	2870	Basic Materials	€130.00
38	ROSKILDE BANK	6029	Financials	€128.00
39	GLUNZ & JENSEN A/S	3555	Capital Goods	€122.00
40	NORDISK SOLAR COMPAGNI	5063	Capital Goods	€121.00
41	AARHUS OLIEFABRIK A/S	2070	Consumer Staples	€119.00
42	MONBERG & THORSEN HOLDING AS	5122	Consumer Staples	€94.00
43	SONDAGSAVISEN A/S	2700	Consumer-Cyclical	€83.00
44	FORSTAEDERNES BANK	6029	Financials	€74.00
45	NAVISIONDAMGAARD AS	7371	Technology	€74.00
46	EDB GRUPPEN A/S	7373	Technology	€70.00
47	GROUP 4 FALCK A/S	7380	Consumer-Cyclical	€70.00
48	EGETAEPPEL A/S	2273	Consumer-Cyclical	€63.00
49	MIDTBANK AS	6029	Financials	€61.00
50	RINGKJOBING LANDBOBANK A/S	6029	Financials	€61.00
51	VEST-WOOD A/S	2430	Basic Materials	€58.00
52	FREDGAARD RADIO A/S	5731	Consumer-Cyclical	€56.00
53	DLH-DALHOFF LARSEN & HORNEMA	5031	Consumer-Cyclical	€48.00
54	SKAKO A/S	3531	Capital Goods	€36.00
55	BORDING (FE) A/S	2750	Consumer Staples	€36.00
56	NORDICOM A/S	6519	Consumer-Cyclical	€32.00
57	ITH A/S	2590	Consumer-Cyclical	€31.00
58	SPARBANK VEST A/S	6029	Financials	€26.00
59	JAMO A/S	3651	Capital Goods	€26.00
60	RTX TELECOM A/S	4812	Communication	€26.00
61	COLUMBUS IT PARTNER A/S	7373	Technology	€26.00
62	EJENDOMSSELSKABET NORDEN A/S	6500	Consumer-Cyclical	€23.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	SP GROUP AS	2821	Basic Materials	€22.00
64	LUXOR A/S	6799	Financials	€22.00
65	KOMPAN INTERNATIONAL A/S	3949	Consumer-Cyclical	€20.00
66	SIMCORP A/S	7373	Technology	€16.00
67	DJURSLAND BANK AS	6029	Financials	€16.00
68	DENKA HOLDING A/S	2510	Consumer-Cyclical	€14.00
69	TOTALBANKEN A/S	6029	Financials	€13.00
70	FLUGGER A/S	2851	Consumer-Cyclical	€13.00
71	NOWACO A/S	5140	Consumer Staples	€12.00
72	CARLI GRY INTL A/S	5130	Consumer-Cyclical	€11.00
73	SAS DANMARK A/S	6799	Financials	€9.00
74	BRODRENE HARTMANN A/S	2670	Basic Materials	€7.00
75	DFDS AS	4412	Transportation	€6.00
76	SANISTAL A/S	5050	Basic Materials	€5.00
77	SKAELSKOR BANK AS	6029	Financials	€4.00
78	EHUSET A/S	7373	Technology	€4.00
79	AMTSSPAREKASSN FYN AS	6029	Financials	€4.00
80	RIAS A/S	3080	Capital Goods	€3.00
81	HAANDVAERKERBANKEN	6029	Financials	€2.00
82	AMBU INTERNATIONAL A/S	3841	Healthcare	€1.00
83	HARBOES BRYGGERI A/S	2082	Consumer Staples	€1.00
84	OBTEC	3714	Consumer-Cyclical	€1.00
85	KJOBENHAVNS SOMMER-TIVOLI	7996	Consumer Staples	€-1.00
86	OVE ARKIL HOLDING A/S	1600	Capital Goods	€-2.00
87	SCANBOX ENTERTAINMENT A/S	7829	Consumer Staples	€-19.00
88	FUNKI A/S	3523	Capital Goods	€-20.00
89	ANDERSEN & MARTINI A/S	5500	Consumer-Cyclical	€-21.00
90	MIGATRONIC A/S	3540	Capital Goods	€-21.00
91	CHEMITALIC A/S	3678	Capital Goods	€-51.00
92	LAN & SPAR BANK AS	6029	Financials	€-52.00
93	TOPSIL SEMICONDUCTOR MATERLS	3679	Capital Goods	€-62.00

Danish Firms continued

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	REALDANMARK	6029	Financials	€-77.00
95	I-DATA INTERNATIONAL A/S	3661	Technology	€-82.00
96	TORSANA A/S	3845	Healthcare	€-84.00
97	EAST ASIATIC CO LTD A/S	5190	Consumer-Cyclical	€-97.00
98	TH WESSEL OG VETT	5130	Consumer-Cyclical	€-138.00
99	NTR HOLDING A/S	3580	Capital Goods	€-160.00
100	ISS A/S	7340	Consumer Staples	€-190.00
101	NEUROSEARCH A/S	8731	Healthcare	€-307.00
102	TORM D/S	4412	Transportation	€-353.00
103	INCENTIVE A/S	3580	Capital Goods	€-407.00
104	SCHOUW & CO A/S	5084	Capital Goods	€-429.00
105	SOPHUS BERENDSEN A/S	5084	Capital Goods	€-436.00
106	JUNCKERS (F) INDUSTRIER A/S	2421	Basic Materials	€-536.00
107	MOLS LINIEN A/S	4400	Transportation	€-678.00
108	OLICOM A/S	7371	Technology	€-708.00
109	TOPDANMARK AS	6321	Financials	€-802.00
110	NEG MICON A/S	3510	Capital Goods	€-1,074.00
111	NKT HOLDING A/S	3580	Capital Goods	€-1,533.00
Total Knowledge Capital®				€20,559.00

Appendix B: Valuation of Knowledge Capital® Rankings by Country

Dutch Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	ROYAL DUTCH PETROLEUM NV	2911	Energy	€70,837.00
2	ING GROEP NV	6311	Financials	€59,735.00
3	ABN-AMRO HOLDINGS NV	6029	Financials	€38,052.00
4	UNILEVER NV	2000	Consumer Staples	€33,593.00
5	AEGON NV	6311	Financials	€18,564.00
6	PHILIPS ELECTRONICS (KON) NV	3651	Capital Goods	€17,800.00
7	AKZO NOBEL NV	2800	Basic Materials	€12,638.00
8	AHOLD (KONINKLIJKE) NV	5411	Consumer Staples	€12,103.00
9	FORTIS (NL) NV	6799	Financials	€11,462.00
10	KONINKLIJKE KPN NV	4810	Communication	€8,390.00
11	HEINEKEN NV	2082	Consumer Staples	€8,332.00
12	TNT POST GROEP NV	4311	Consumer-Cyclical	€5,871.00
13	WOLTERS KLUWER NV	2731	Consumer-Cyclical	€5,815.00
14	STMICROELECTRONICS NV	3670	Capital Goods	€5,532.00
15	DSM NV	2821	Basic Materials	€5,185.00
16	HEINEKEN HOLDING NV	2082	Consumer Staples	€4,240.00
17	RANDSTAD HOLDINGS NV	7363	Consumer Staples	€3,672.00
18	HAGEMEYER NV	5130	Consumer-Cyclical	€3,645.00
19	VNU NV	2700	Consumer-Cyclical	€2,742.00
20	NUMICO (KONINKLIJKE) NV	2000	Consumer Staples	€2,729.00
21	CSM NV	2000	Consumer Staples	€2,305.00
22	GUCCI GROEP NV	2300	Consumer-Cyclical	€2,287.00
23	VOPAK (KONINKLIJKE) NV	5160	Basic Materials	€2,283.00
24	VENDEX KBB NV	5311	Consumer-Cyclical	€2,005.00
25	KLM-ROYAL DUTCH AIRLINES	4512	Transportation	€1,976.00
26	OCE NV	3861	Technology	€1,905.00
27	LAURUS NV	5411	Consumer Staples	€1,791.00
28	HUNTER DOUGLAS (NEW) NV	2590	Consumer-Cyclical	€1,761.00
29	CAP GEMINI NV	7370	Technology	€1,707.00
30	AMSTELLAND NV	1500	Capital Goods	€1,493.00
31	RODAMCO CONTINENTAL EUROPE	6512	Consumer-Cyclical	€1,468.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	VOLKER WESSELS STEVIN (KON)	1500	Capital Goods	€1,324.00
33	BUHRMANN NV	5040	Consumer-Cyclical	€1,246.00
34	UNI-INVEST NV	6512	Consumer-Cyclical	€1,246.00
35	VAN DER MOOLEN NV	6211	Financials	€1,224.00
36	INTERNATIO-MULLER NV	5122	Consumer Staples	€1,134.00
37	DRAKA HOLDING NV	3357	Basic Materials	€1,094.00
38	WESSANEN (KONINKLIJKE) NV	2000	Consumer Staples	€1,051.00
39	HOLLANDSCHE BETON GROEP	1600	Capital Goods	€1,035.00
40	IHC CALAND NV	3730	Transportation	€1,018.00
41	GETRONICS NV	7373	Technology	€963.00
42	BOSKALIS WESTMINSTER NV	1600	Capital Goods	€927.00
43	NUTRECO HOLDING NV	2040	Consumer Staples	€880.00
44	VASTNED RETAIL NV	6512	Consumer-Cyclical	€826.00
45	TELEGRAAF (DE) NV	2700	Consumer-Cyclical	€824.00
46	FUGRO NV	8700	Capital Goods	€764.00
47	VIB NV	6512	Consumer-Cyclical	€708.00
48	OPG GROEP NV	5122	Consumer Staples	€703.00
49	ISPAT INTL NV	3310	Basic Materials	€681.00
50	GAMMA HOLDING NV	2390	Consumer-Cyclical	€664.00
51	KEMPEN & CO MERCHANT BANK	6200	Financials	€657.00
52	ASM LITHOGRAPHY HOLDING NV	3861	Technology	€625.00
53	WEGENER NV	2700	Consumer-Cyclical	€596.00
54	HEIJMANS NV	1500	Capital Goods	€563.00
55	UNITED SERVICES GROUP NV	7363	Consumer Staples	€557.00
56	WERELDHAVE NV	6512	Consumer-Cyclical	€555.00
57	VAN MELLE NV	2060	Consumer Staples	€502.00
58	ORDINA NV	7370	Technology	€489.00
59	AALBERTS INDUSTRIES NV	3590	Capital Goods	€486.00
60	TWENTSCHE KABEL HOLDING NV	3357	Basic Materials	€454.00
61	ATHLON GROEP NV	7510	Consumer-Cyclical	€424.00
62	SAMAS-GROEP NV	2520	Capital Goods	€420.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	STORK NV	3500	Capital Goods	€417.00
64	SCHUIITEMA NV	5140	Consumer Staples	€409.00
65	VEDIOR NV	7363	Consumer Staples	€402.00
66	VASTNED OFFICES/ INDUSTRI NV	6512	Consumer-Cyclical	€395.00
67	GROLSCH (KONINKLIJKE) NV	2082	Consumer Staples	€356.00
68	GTI NV	1700	Capital Goods	€353.00
69	KONINKLIJKE BAM NBM NV	1500	Capital Goods	€352.00
70	NAGRON NATIONAAL GRONDBEZIT	6500	Consumer-Cyclical	€331.00
71	SCHUTTERSVELD HOLDING NV	3448	Consumer-Cyclical	€319.00
72	SMIT INTERNATIONAL NV	4400	Transportation	€313.00
73	TOOLEX INTERNATIONAL NV	3695	Technology	€298.00
74	SLIGRO BEHEER NV	5140	Consumer Staples	€287.00
75	TEN CATE (KONINKLIJKE) NV	2200	Consumer-Cyclical	€274.00
76	ARCADIS NV	8711	Capital Goods	€273.00
77	AOT NV	6211	Financials	€257.00
78	FRANS MAAS GROEP (KONINK) NV	4213	Transportation	€253.00
79	GEVEKE NV	5082	Capital Goods	€243.00
80	BETER BED HOLDING NV	2510	Consumer-Cyclical	€240.00
81	ROTO SMEETS DE BOER NV	2750	Consumer Staples	€239.00
82	KAS-ASSOCIATIE NV	6159	Financials	€228.00
83	GRONTMIJ NV	8711	Capital Goods	€187.00
84	ICT AUTOMATISERING NV	7371	Technology	€185.00
85	POLYNORM NV	3490	Capital Goods	€180.00
86	UNIT 4 NV	7370	Technology	€163.00
87	MACINTOSH NV	5900	Consumer-Cyclical	€156.00
88	QIAGEN NV	3826	Technology	€134.00
89	BRUNEL INTERNATIONAL NV	7361	Consumer Staples	€131.00
90	NEDAP NV	3822	Technology	€129.00
91	ASM INTERNATIONAL NV	3559	Capital Goods	€129.00
92	VREDESTEIN NV	3011	Consumer-Cyclical	€126.00
93	RODAMCO RETAIL NEDERLAND NV	6512	Consumer-Cyclical	€122.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	SCHRODERS EURO PROP FUND NV	6512	Consumer-Cyclical	€110.00
95	ERIKS GROUP NV	5080	Capital Goods	€107.00
96	AXA STENMAN INDUSTRIES NV	3420	Consumer-Cyclical	€85.00
97	NEDSCHROEF HOLDING NV	3452	Capital Goods	€79.00
98	FREE RECORD SHOP HOLDING NV	5735	Consumer-Cyclical	€78.00
99	NEWAYS ELECTRONICS INTERNTL	3661	Technology	€76.00
100	BATENBURG BEHEER NV	5063	Capital Goods	€70.00
101	VILENZO INTERNATIONAL NV	2300	Consumer-Cyclical	€63.00
102	REESINK NV	5030	Consumer-Cyclical	€58.00
103	SARAKREEK HOLDING NV	6512	Consumer-Cyclical	€50.00
104	COPACO NV	7370	Technology	€49.00
105	RCMA-RUBR CULTUR MIJ AMSTRDM	5190	Consumer-Cyclical	€49.00
106	ECONOSTO (KONINKLIJKE) NV	3490	Capital Goods	€49.00
107	MULTIHOUSE NV	7370	Technology	€42.00
108	KUHNE & HEITZ NV	5140	Consumer Staples	€40.00
109	DELFT INSTRUMENTS NV	3841	Healthcare	€37.00
110	HOLLAND COLOURS NV	2810	Basic Materials	€33.00
111	STERN GROEP NV	5412	Consumer Staples	€30.00
112	VAN HEEK-TWEKA NV	2250	Consumer-Cyclical	€29.00
113	PROLION HOLDING NV	3523	Capital Goods	€22.00
114	GRAPHISOFT NV	7373	Technology	€22.00
115	GOUDA VUURVAST HOLDING NV	3250	Consumer-Cyclical	€14.00
116	DE DRIE ELECTRONICS BEHEER	3600	Capital Goods	€14.00
117	HELVOET HOLDING NV	3420	Consumer-Cyclical	€14.00
118	EMIS-EUROPEAN MKTG INFO SVCS	8700	Capital Goods	€12.00
119	AFC AJAX NV	7941	Consumer Staples	€11.00
120	VAN DER HOOP EFFEKTENBANK NV	6211	Financials	€10.00
121	NEDCON GROEP NV	3440	Capital Goods	€10.00
122	PORCELEYNE FLES (NV KONINK)	3260	Consumer-Cyclical	€8.00
123	NAEFF NV	3089	Consumer Staples	€6.00
124	MANAGEMENT SHARE NV	7370	Technology	€6.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
125	VAN DORP DESPEC GROEP	5110	Basic Materials	€5.00
126	CROWN VAN GELDER PAPIERFABRI	2621	Basic Materials	€5.00
127	DOCDATA NV	3652	Capital Goods	€5.00
128	BUCO NV	3990	Capital Goods	€4.00
129	ROOD TESTHOUSE INTERNATIONAL	8731	Healthcare	€2.00
130	FORNIX BIOSCIENCES NV	2834	Healthcare	€-3.00
131	BURGMAN HEYBROEK NV	5072	Consumer-Cyclical	€-14.00
132	BLYDENSTEIN-WILLINK NV	2200	Consumer-Cyclical	€-14.00
133	ZOM FLORIDA FUND	6722	Financials	€-14.00
134	ALANHERI NV	2040	Consumer Staples	€-15.00
135	WEWELER NV	3490	Capital Goods	€-16.00
136	NYLOPLAST NV	3080	Capital Goods	€-19.00
137	DNC DE NEDERLANDEN COMPAGNIE	5180	Consumer Staples	€-28.00
138	GIM GLOBAL CONVERTIBLE FUND	6722	Financials	€-28.00
139	TULIP COMPUTERS NV	3571	Technology	€-32.00
140	AND INTL PUBLISHER NV	2711	Consumer-Cyclical	€-45.00
141	DICO INTERNATIONAL NV	2590	Consumer-Cyclical	€-75.00
142	BALLAST-NEDAM GROEP NV	1600	Capital Goods	€-80.00
143	BESI-BE SEMICONDUCTOR INDS	3559	Capital Goods	€-93.00
144	HES BEHEER NV	4400	Transportation	€-107.00
145	EUROPEAN ASSETS TRUST NV	6799	Financials	€-276.00
146	ATAG GROUP NV	3630	Consumer-Cyclical	€-296.00
147	ORANGE FUND NV	6722	Financials	€-397.00
148	INDO HIMALAYAN FUND NV	6722	Financials	€-486.00
149	SIMAC TECHNIEK NV	5045	Technology	€-830.00
150	EVC INTERNATIONAL NV	2821	Basic Materials	€-1,246.00
151	DELTA LLOYD INVESTMENT FUND	6722	Financials	€-1,504.00
152	NEDLLOYD (KONINKLIJKE) NV	4412	Transportation	€-1,665.00
153	ROLINCO NV	6799	Financials	€-2,789.00
154	DPM-DORDTSCH E PETROL-INDUSTR	6799	Financials	€-4,631.00
155	ELSEVIER NV	6799	Financials	€-4,716.00

Dutch Firms continued

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
156	BAAN CO NV	7371	Technology	€-5,529.00
157	ROBECO NV	6722	Financials	€-8,840.00
			Total Knowledge Capital®	€351,954.00

Appendix B: Valuation of Knowledge Capital[®] Rankings by Country

Finnish Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	POHJOLA GROUP	6331	Financials	€21,529.00
2	NOKIA (AB) OY	3663	Technology	€20,356.00
3	UPM-KYMMENE OYJ	2621	Basic Materials	€7,958.00
4	FORTUM OYJ	1311	Energy	€4,401.00
5	STORA ENSO OYJ	2621	Basic Materials	€4,306.00
6	SONERA OYJ	4810	Communication	€2,992.00
7	SAMPO-LEONIA INSURANCE CO	6331	Financials	€2,844.00
8	ORION-YHTYMA OY	2834	Healthcare	€1,676.00
9	METSA-SERLA OY	2621	Basic Materials	€1,296.00
10	WARTSILA OYJ ABP	3510	Capital Goods	€1,194.00
11	TIETOENATOR OYJ	7373	Technology	€621.00
12	YIT-YHTYMA OY (CORP)	1500	Capital Goods	€571.00
13	UPONOR OYJ	3080	Capital Goods	€460.00
14	STOCKMANN AB	5311	Consumer-Cyclical	€448.00
15	OY HARTWALL AB	2080	Consumer Staples	€432.00
16	SANOMA-WSOY OYJ	2700	Consumer-Cyclical	€385.00
17	VIKING LINE AB	4400	Transportation	€377.00
18	INSTRUMENTARIUM CORP	3841	Healthcare	€339.00
19	FINNLINES OY	4412	Transportation	€337.00
20	NORVESTIA OY AB	6722	Financials	€313.00
21	RAUTAKIRJA OY	5412	Consumer Staples	€300.00
22	KONE OY	3530	Capital Goods	€282.00
23	LASSILA & TIKANOJA GROUP	4950	Capital Goods	€276.00
24	PARTEK OYJ ABP	3537	Capital Goods	€271.00
25	FINNAIR OY	4512	Transportation	€254.00
26	VAISALA OYJ	3829	Technology	€251.00
27	NOKIAN RENKAAT OYJ	3011	Consumer-Cyclical	€247.00
28	AMER-YHTYMA OY	3949	Consumer-Cyclical	€246.00
29	PERLOS OYJ	3080	Capital Goods	€225.00
30	BIRKA LINE AB	4400	Transportation	€218.00
31	LEMMINKAINEN OYJ	1540	Capital Goods	€217.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	FISKARS OY	3420	Consumer-Cyclical	€216.00
33	ESPOON SAHKO OYJ	4911	Utilities	€204.00
34	SOON COMMUNICATIONS PLC	4810	Communication	€171.00
35	KCI-KONECRANES INTL	3530	Capital Goods	€147.00
36	TAMFELT CORP	2200	Consumer-Cyclical	€138.00
37	MANDATUM PANKKI OYJ	6029	Financials	€128.00
38	JOT AUTOMATION GROUP PLC	3530	Capital Goods	€124.00
39	EIMO OYJ	3089	Consumer Staples	€120.00
40	ALANDBANKEN AB	6029	Financials	€118.00
41	COMPTEL OYJ	7371	Technology	€118.00
42	ASPOCOMP GROUP PLC	3672	Capital Goods	€108.00
43	JAAKKO POYRY GROUP OYJ	8700	Capital Goods	€107.00
44	CONVENTUM OYJ	6211	Financials	€105.00
45	FORD AB/OY	5010	Consumer-Cyclical	€104.00
46	MARTELA OYJ	2520	Capital Goods	€90.00
47	SILJA OYJ ABP	4400	Transportation	€84.00
48	RAPALA VMC OYJ	3949	Consumer-Cyclical	€76.00
49	TAMRO CORP	5122	Consumer Staples	€76.00
50	PKC GROUP OYJ	3714	Consumer-Cyclical	€73.00
51	KESKO OYJ	5141	Consumer Staples	€71.00
52	KSP YHTIOT OYJ	4810	Communication	€65.00
53	TELESTE OYJ	3663	Technology	€64.00
54	ALMA MEDIA OYJ	2711	Consumer-Cyclical	€63.00
55	NOVO GROUP OYJ	7370	Technology	€44.00
56	LANNEN TEHTAAT OY	2030	Consumer Staples	€35.00
57	LIINOS ABP OYJ	7373	Technology	€34.00
58	NORDIC ALUMINIUM OY	3360	Basic Materials	€33.00
59	EXEL OYJ	3949	Consumer-Cyclical	€33.00
60	HONKARAKENNE OYJ	2452	Consumer-Cyclical	€32.00
61	TULIKIVI OYJ	3281	Consumer-Cyclical	€25.00
62	LAROX OYJ	3569	Capital Goods	€23.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	WECAN ELECTRONICS OYJ	3661	Technology	€21.00
64	ILKKA-YHTYMA OYJ	2711	Consumer-Cyclical	€21.00
65	OLVI OYJ	2080	Consumer Staples	€19.00
66	OKOBANK-OSUUSPANKKIEN KESKUS	6029	Financials	€17.00
67	KEKKILA OY	2870	Basic Materials	€14.00
68	BASWARE OYJ	7372	Technology	€14.00
69	LEO LONGLIFE LTD	6211	Financials	€12.00
70	PONSSE OYJ	3559	Capital Goods	€11.00
71	SYSOPEN OYJ	7373	Technology	€9.00
72	SAUNATEC OYJ	3634	Consumer-Cyclical	€7.00
73	TEKLA OYJ	7373	Technology	€6.00
74	SOLTEQ OYJ	7373	Technology	€2.00
75	TJ GROUP PLC	7373	Technology	€0.00
76	PLANDENT OYJ	3843	Healthcare	€0.00
77	STONESOFT OYJ	7373	Technology	€-1.00
78	PROHA OYJ	7371	Technology	€-2.00
79	HUHTAMAKI VAN LEER OYJ	7389	Consumer-Cyclical	€-4.00
80	STROMSDAL OY	2631	Basic Materials	€-8.00
81	JULIUS TALLBERG-KIINTEI	6512	Consumer-Cyclical	€-13.00
82	TALENTUM OYJ	2721	Consumer-Cyclical	€-13.00
83	EFORE OYJ	3679	Capital Goods	€-15.00
84	RAUTE OY	3550	Capital Goods	€-16.00
85	KIINTEISTOT CITYCON	6512	Consumer-Cyclical	€-17.00
86	PMJ AUTOMECH OYJ	3559	Capital Goods	€-18.00
87	VAAHTO GROUP LTD OYJ	3550	Capital Goods	€-20.00
88	KYRO OY	3559	Capital Goods	€-25.00
89	COMPONENTA OYJ	3569	Capital Goods	€-27.00
90	MENIRE OYJ	6799	Financials	€-34.00
91	SPONDA OYJ	6512	Consumer-Cyclical	€-47.00
92	ATRIA OYJ	2011	Consumer Staples	€-51.00
93	ELCOTEQ NETWORK OY	3600	Capital Goods	€-71.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	METSA TISSUE OYJ	2621	Basic Materials	€-91.00
95	POLAR KIINTEISTOT OYJ	6500	Consumer-Cyclical	€-123.00
96	F-SECURE CORP	7372	Technology	€-169.00
97	BENEFON OY	3663	Technology	€-181.00
98	OUTOKUMPU OY	3350	Capital Goods	€-237.00
99	HACKMAN OYJ ABP	3260	Consumer-Cyclical	€-278.00
100	RAISIO YHTYMA OYJ	2070	Consumer Staples	€-304.00
101	KEMIRA OY	2870	Basic Materials	€-432.00
102	RAUTARUUKKI OY	3312	Basic Materials	€-1,091.00
103	METSO OYJ	3550	Capital Goods	€-2,225.00
Total Knowledge Capital®				€73,090.00

Appendix B: Valuation of Knowledge Capital[®] Rankings by Country

French Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	CREDIT AGRICOLE	6029	Financials	€26,680.00
2	FRANCE TELECOM	4810	Communication	€23,215.00
3	ELF AQUITAINE SA	2911	Energy	€14,525.00
4	SGF-SOC GENERL DE FRANCE SA	6029	Financials	€13,137.00
5	AXA	6331	Financials	€12,531.00
6	SAINT-GOBAIN (CIE DE)	3221	Capital Goods	€9,962.00
7	SUEZ LYONNAISE DES EAUX	4941	Utilities	€9,326.00
8	AZEO	6799	Financials	€8,838.00
9	VIVENDI UNIVERSAL SA	9997	Utilities	€8,676.00
10	BNP PARIBAS	6029	Financials	€7,054.00
11	SANOFI-SYNTHELABO	2834	Healthcare	€6,494.00
12	VALEO SA	3714	Consumer-Cyclical	€6,273.00
13	PINAULT- PRINTEMPS-REDOUTE	5311	Consumer-Cyclical	€5,924.00
14	ASSURANCE GEN DE FRANCE	6331	Financials	€5,658.00
15	PATHE SA	7830	Consumer Staples	€5,236.00
16	CARREFOUR SUPERMARCHE SA	5411	Consumer Staples	€5,193.00
17	L'OREAL SA	2844	Consumer Staples	€5,140.00
18	ALCATEL	3661	Technology	€4,927.00
19	AIR LIQUIDE SA	2810	Basic Materials	€4,165.00
20	LAFARGE SA	3241	Basic Materials	€4,074.00
21	DANONE (GROUPE)	2020	Consumer Staples	€3,836.00
22	CEA INDUSTRIE SA	2810	Basic Materials	€3,393.00
23	LVMH-M HENNESY-L VUITTON	2084	Consumer Staples	€3,297.00
24	EURAFRANCE	6799	Financials	€3,108.00
25	THOMSON SA	3651	Capital Goods	€2,886.00
26	CGIP-CIE GEN D'INUST ET PART	3290	Consumer-Cyclical	€2,842.00
27	SCHNEIDER ELECTRIC SA	4911	Utilities	€2,794.00
28	ALSTOM SA	3743	Transportation	€2,775.00
29	CNP ASSURANCES SA	6311	Financials	€2,712.00
30	WORMS & CIE (NEW)	2600	Basic Materials	€2,678.00
31	SEITA SA	2100	Consumer Staples	€2,637.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	SOCIETE AIR FRANCE	4512	Transportation	€2,573.00
33	TELEVISION FRANCAISE 1	4833	Consumer Staples	€2,426.00
34	CAP GEMINI SA	7371	Technology	€2,297.00
35	GENERALI FRANCE ASSURANCES	6331	Financials	€2,007.00
36	FINAXA	6799	Financials	€1,946.00
37	ACCOR SA	7011	Consumer-Cyclical	€1,870.00
38	IMERYS	3250	Consumer-Cyclical	€1,867.00
39	TECHNIP	2911	Energy	€1,699.00
40	EXXONMOBIL CHEMICAL SA	2860	Basic Materials	€1,631.00
41	PLASTIC OMNIUM SA	2820	Basic Materials	€1,622.00
42	MARINE-WENDEL SA	2670	Basic Materials	€1,606.00
43	CASINO GUICHARD-PERRACHON SA	5411	Consumer Staples	€1,582.00
44	PEUGEOT SA	3711	Consumer-Cyclical	€1,561.00
45	PERNOD RICARD SA	2080	Consumer Staples	€1,547.00
46	CIMENTS FRANCAIS	3241	Basic Materials	€1,496.00
47	VINCI	1600	Capital Goods	€1,451.00
48	SAGEM SA	3661	Technology	€1,446.00
49	LEGRAND SA	3612	Capital Goods	€1,446.00
50	HERMES INTERNATIONAL	5600	Consumer-Cyclical	€1,398.00
51	DASSAULT AVIATION SA	3721	Capital Goods	€1,334.00
52	THOMSON MULTIMEDIA	3651	Capital Goods	€1,316.00
53	REXEL GROUP	5063	Capital Goods	€1,233.00
54	RUE IMPERIALE DE LYON SA	6510	Consumer-Cyclical	€1,221.00
55	THALES	3812	Capital Goods	€1,217.00
56	CREDIT DU NORD	6029	Financials	€1,151.00
57	GROUPE GTM	8711	Capital Goods	€1,121.00
58	CREDIT FONCIER DE FRANCE	6029	Financials	€1,118.00
59	CAMBODGE CIE DU	800	Basic Materials	€1,095.00
60	REMY COINTREAU	2084	Consumer Staples	€1,080.00
61	DASSAULT SYSTEMS SA	7373	Technology	€1,074.00
62	METROPOLE TV-(M6)	4833	Consumer Staples	€1,013.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	CREDIT AGRICOLE INDOSUEZ	6029	Financials	€980.00
64	BURELLE SA	2820	Basic Materials	€975.00
65	SIDEL (GROUPE)	3560	Capital Goods	€948.00
66	RHODIA	2800	Basic Materials	€911.00
67	LAGARDERE (GROUPE)	2700	Consumer-Cyclical	€791.00
68	PECHINEY SA	3350	Capital Goods	€779.00
69	SODEXHO SA	5812	Consumer Staples	€774.00
70	CHRISTIAN DIOR SA	2844	Consumer Staples	€739.00
71	PUBLICIS GROUPE SA	7310	Consumer-Cyclical	€683.00
72	ALTRAN TECHNOLOGIES SA	8711	Capital Goods	€661.00
73	COFLEXIP STENA OFFSHORE	3317	Basic Materials	€658.00
74	LUCIA SA	6531	Consumer-Cyclical	€656.00
75	CREDIT AGRICOLE D'ILE DE FRA	6029	Financials	€651.00
76	BIC SOCIETE	3950	Consumer-Cyclical	€640.00
77	FROMAGERIES BEL SA	2020	Consumer Staples	€637.00
78	ESSILOR INTERNATIONAL SA	3851	Healthcare	€618.00
79	BOUYGUES OFFSHORE SA	3730	Transportation	€596.00
80	CREDIT LYONNAIS SA	6029	Financials	€559.00
81	GROUPE LAPEYRE	2430	Basic Materials	€554.00
82	FINATIS SA	5140	Consumer Staples	€544.00
83	GALERIES LAFAYETTE SA	5311	Consumer-Cyclical	€520.00
84	FINANCIERE DE L'ODET SA	4400	Transportation	€512.00
85	SOMMER ALLIBERT SA	5013	Consumer-Cyclical	€510.00
86	SPS-SOC PLCMNTS SELECTIONNES	6799	Financials	€495.00
87	HAVAS ADVERTISING	7310	Consumer-Cyclical	€493.00
88	DE DIETRICH ET CIE	1600	Capital Goods	€489.00
89	CREDIT AGRICOLE PAS CALAIS	6029	Financials	€487.00
90	ATOS ORIGIN	7370	Technology	€486.00
91	FIMALAC SA	3341	Capital Goods	€482.00
92	UNION FINANCIERE FRANCE BQE	6029	Financials	€458.00
93	INITIATIVE ET FINANCE INV SA	6799	Financials	€456.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	FFP-SOC FONC FINAN ET PARTIC	6799	Financials	€454.00
95	GROUPE ANDRE SA	5661	Consumer-Cyclical	€453.00
96	MANITOU B F	3530	Capital Goods	€446.00
97	GRANDVISION SA	5040	Consumer-Cyclical	€418.00
98	ELECTRICITE DE STRASBOURG	4911	Utilities	€394.00
99	BIS SA	7361	Consumer Staples	€393.00
100	NRJ SA	4832	Consumer Staples	€380.00
101	CLARINS SA	2844	Consumer Staples	€378.00
102	DAMART SA	2300	Consumer-Cyclical	€369.00
103	ZODIAC (GROUPE)	3728	Capital Goods	€364.00
104	BAIL INVESTISSEMENT SA	6512	Consumer-Cyclical	€351.00
105	SOFRAGI	6799	Financials	€330.00
106	CREDIT AGRICOLE DE GIRONDE	6029	Financials	€330.00
107	CIE DES CAOUTCHOUCS PADANG	6799	Financials	€322.00
108	BRIOCHE PASQUIER SA	2050	Consumer Staples	€317.00
109	CREDIT AGRICOLE DE L'OISE	6029	Financials	€316.00
110	DIGIGRAM SA	3571	Technology	€313.00
111	PARTOUCHE	7011	Consumer-Cyclical	€305.00
112	TAITTINGER-COMP COMMERCIALE	5180	Consumer Staples	€303.00
113	SOAEO-OXYGENE & ACETYL EX-OR	4932	Utilities	€302.00
114	EIFFAGE	1540	Capital Goods	€294.00
115	ROYAL CANIN SA	2040	Consumer Staples	€291.00
116	BONGRAIN SA	2020	Consumer Staples	€289.00
117	NRJ GROUP	4832	Consumer Staples	€269.00
118	CREDIT AGRICOLE DU MIDI	6029	Financials	€265.00
119	INFOGRAMES ENTERTAINMENT	7372	Technology	€263.00
120	VILMORIN CLAUSE & CIE SA	100	Basic Materials	€259.00
121	GROUPE LDC	2015	Consumer Staples	€255.00
122	NEOPOST SA	7350	Consumer-Cyclical	€250.00
123	GROUPE BOURBON SA	5411	Consumer Staples	€248.00
124	TRANSICIEL SA	7373	Technology	€246.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
125	UNIBEL	2020	Consumer Staples	€246.00
126	LE GROUPE IDI	6799	Financials	€240.00
127	LA CONTINENTALE D'ENTREPRISE	1400	Basic Materials	€237.00
128	ICC-IMMOB COMPLEX COMMERC SA	6172	Financials	€236.00
129	SELECTIBAIL SA	6512	Consumer-Cyclical	€234.00
130	MONOPRIX SA	5400	Consumer Staples	€230.00
131	CREDIT AGR TOULOUSE MIDI-TOU	6029	Financials	€230.00
132	BENETEAU SA	3730	Transportation	€228.00
133	UNILOG SA	7373	Technology	€227.00
134	NORD EST SA	2650	Basic Materials	€227.00
135	LE CARBONE-LORRAINE	3620	Capital Goods	€223.00
136	SPIR COMMUNICATION SA	7310	Consumer-Cyclical	€216.00
137	LOUVRE (STE DU)	7011	Consumer-Cyclical	€214.00
138	CREDIT AGR MUTUEL CENT LOIRE	6029	Financials	€212.00
139	IPO-INSTITUT PART L'OUEST	6799	Financials	€206.00
140	ZANNIER (GROUPE)	2300	Consumer-Cyclical	€203.00
141	DIDOT-BOTTIN	2531	Capital Goods	€200.00
142	CREDIT AGRICL ILE & VILLAIN	6029	Financials	€198.00
143	CREDIT AGRICOLE HAUTE-NORMAN	6029	Financials	€192.00
144	ETAM DEVELOPPEMENT SCA	5621	Consumer-Cyclical	€189.00
145	VIEL & CIE SA	6211	Financials	€189.00
146	AVENIR TELECOM	5065	Capital Goods	€188.00
147	TRANSPORTES AZKAR SA	4210	Transportation	€187.00
148	STE SUCRIERE DE PITHIVIERS	100	Basic Materials	€182.00
149	ARBEL SA	3743	Transportation	€182.00
150	SOCIETE FINANCIERE IMMOBANQUE	6512	Consumer-Cyclical	€179.00
151	PARIS ORLEANS SA	6799	Financials	€178.00
152	PIERRE & VACANCES	7011	Consumer-Cyclical	€178.00
153	ALGECO SA	6500	Consumer-Cyclical	€171.00
154	APRIL GROUP	6411	Financials	€168.00
155	SOPRA	7373	Technology	€166.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
156	CREDIT AGR TOURAINE & POITOU	6029	Financials	€165.00
157	SAGA SA	4731	Transportation	€161.00
158	GPRI SA	3300	Basic Materials	€158.00
159	GUYENNE ET GASCOGNE SA	5400	Consumer Staples	€158.00
160	CREDIT AGRICOLE DE LA BRIE	6029	Financials	€154.00
161	EXEL INDUSTRIES	3523	Capital Goods	€153.00
162	BRICORAMA SA	5200	Consumer-Cyclical	€150.00
163	LA ROCHETTE	2670	Basic Materials	€149.00
164	BOIRON SA	2833	Healthcare	€145.00
165	LOCAFINANCIERE	6512	Consumer-Cyclical	€144.00
166	SOGEPARC (FINANCIERE)	7500	Consumer-Cyclical	€143.00
167	MANUTAN INTERNATIONAL SA	5961	Consumer-Cyclical	€138.00
168	CREDIT AGR LOIRE HAUTE LOIRE	6029	Financials	€137.00
169	LOCINDUS	6512	Consumer-Cyclical	€136.00
170	MONTUPET SA	3360	Basic Materials	€135.00
171	CNIM-CONSTRUCTIONS INDUST MED	4953	Capital Goods	€134.00
172	BRICE SA	5130	Consumer-Cyclical	€130.00
173	CEGEDIM	7374	Technology	€129.00
174	GEODIS	4513	Transportation	€128.00
175	PENAUILLIE POLYSERVICES CO	7340	Consumer Staples	€127.00
176	SIPAREX CROISSANCE	6799	Financials	€124.00
177	LECTRA SYSTEMES SA	7373	Technology	€123.00
178	ALTEN SA	8711	Capital Goods	€120.00
179	GROUPE JEAN-CLAUDE DARMON	4833	Consumer Staples	€118.00
180	HOTELS ET CASINO DEAUVILLE	7011	Consumer-Cyclical	€115.00
181	DANE-ELEC MEMORY SA	3679	Capital Goods	€115.00
182	GUYOMARCH NA	2040	Consumer Staples	€112.00
183	COFIXEL	3822	Technology	€109.00
184	SECHE ENVIRONNEMENT SA	4953	Capital Goods	€109.00
185	KLEPIERRE SA	6512	Consumer-Cyclical	€109.00
186	SAMSE	5200	Consumer-Cyclical	€104.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
187	LOUIS DREYFUS CITRUS SA	2030	Consumer Staples	€101.00
188	GFI INFORMATIQUE SA	7373	Technology	€100.00
189	FRANCAREP SA	6799	Financials	€98.00
190	COMPAGNIE DES ALPES	7990	Consumer-Cyclical	€96.00
191	NORBERT DENTRESSANGLE	4200	Transportation	€95.00
192	FALA SA	6799	Financials	€95.00
193	SERVICES ET TRANSPORTS SA	4412	Transportation	€94.00
194	DELACHAUX SA	3310	Basic Materials	€93.00
195	GROUPE FOCAL	7373	Technology	€92.00
196	INGENICO SA	3577	Technology	€90.00
197	ENTRELEC GROUP SA	3600	Capital Goods	€90.00
198	BANQUE TARNEAUD	6029	Financials	€89.00
199	SR TELEPERFORMANCE	7310	Consumer-Cyclical	€88.00
200	CEGID SA	7370	Technology	€88.00
201	DECAN GROUPE SA	8711	Capital Goods	€87.00
202	MARIONNAUD PARFUMERIES SA	5122	Consumer Staples	€86.00
203	AVIATION LATECOERE	3728	Capital Goods	€86.00
204	VIRBAC SA	8734	Consumer-Cyclical	€85.00
205	MGI COUTIER	3714	Consumer-Cyclical	€85.00
206	ARKOPHARMA LABORAT PHARMACEU	2833	Healthcare	€84.00
207	SODICE EXPANSION SA	5311	Consumer-Cyclical	€84.00
208	RADIALL SA	4812	Communication	€83.00
209	BOISSET SA	2084	Consumer Staples	€82.00
210	BOIZEL CHANOINE CHAMPAGNE SA	2084	Consumer Staples	€81.00
211	STEF-TFE SA	4213	Transportation	€81.00
212	COFITEM-COFIMUR	6512	Consumer-Cyclical	€79.00
213	ISIS SA	1311	Energy	€78.00
214	BUFFALO GRILL	5812	Consumer Staples	€78.00
215	PETIT FORESTIER	7350	Consumer-Cyclical	€77.00
216	CROMETAL SA	3440	Capital Goods	€77.00
217	MECATHERM SA	3550	Capital Goods	€76.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
218	PARIS EXPO	7990	Consumer-Cyclical	€75.00
219	CHRISTIAN DALLOZ SA	3842	Healthcare	€75.00
220	FININFO SA	7374	Technology	€75.00
221	RUBIS & CIE	5171	Capital Goods	€75.00
222	GROUPE FLO SA	5810	Consumer Staples	€74.00
223	CREDIT AGRICOLE DU MORBIHAN	6029	Financials	€74.00
224	CIE DE FIVES-LILLE SA	3500	Capital Goods	€72.00
225	SINOPIA ASSET MANAGEMENT	6799	Financials	€70.00
226	DU PAREIL AU MEME SA	5600	Consumer-Cyclical	€70.00
227	LABEYRIE SA	5400	Consumer Staples	€70.00
228	UBI SOFT ENTERTAINMENT SA	7372	Technology	€69.00
229	SADE-SOC ALSAC DEV & EXP	6029	Financials	€67.00
230	PLASTIQUES DU VAL DE LOIRE	3089	Consumer Staples	€67.00
231	TRIGANO SA	3790	Consumer-Cyclical	€66.00
232	GFI INDUSTRIES SA	3452	Capital Goods	€65.00
233	SYNERGIE SA	7361	Consumer Staples	€65.00
234	GROUPE PCAS	2833	Healthcare	€65.00
235	HYPARLO SA	5400	Consumer Staples	€63.00
236	ROBERTET SA	2080	Consumer Staples	€62.00
237	CREDIT AGR LOIRE ATLANTIQUE	6029	Financials	€62.00
238	JET MULTIMEDIA	7370	Technology	€62.00
239	RODRIGUEZ GROUP SNP HOLDING	5500	Consumer-Cyclical	€61.00
240	GEVELOT SA	3560	Capital Goods	€61.00
241	ESPACE PRODUCTION INTL SA	3990	Capital Goods	€59.00
242	AIGLE SA	3949	Consumer-Cyclical	€59.00
243	HBS TECHNOLOGIE	3080	Capital Goods	€58.00
244	GROUPE GO SPORT	5130	Consumer-Cyclical	€58.00
245	BAZAR DEL HOTEL DE VILLE	5311	Consumer-Cyclical	€58.00
246	SOLVING INTERNATIONAL SA	8742	Consumer-Cyclical	€57.00
247	PINGUELY-HAULOTTE SA	3530	Capital Goods	€56.00
248	PROSODIE SA	7370	Technology	€56.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
249	TOUAX SA	4400	Transportation	€56.00
250	SYLEA SA	3714	Consumer-Cyclical	€55.00
251	GO SPORT SA	5940	Consumer-Cyclical	€54.00
252	VRANKEN MONOPOLE SA	5180	Consumer Staples	€54.00
253	CREDIT AGRICOLE DE LA SOMME	6029	Financials	€54.00
254	GROUPE STERIA	7373	Technology	€54.00
255	BONDUELLE	2030	Consumer Staples	€52.00
256	CHANGE DE LA BOURSE SA	6799	Financials	€51.00
257	GROUPE GUILLIN	3089	Consumer Staples	€51.00
258	POCHET SA	3221	Capital Goods	€51.00
259	MERIBEL ALPINA SA	7990	Consumer-Cyclical	€51.00
260	SABATE DIOSOS	2421	Basic Materials	€50.00
261	CIE FINANCIERE SAINT-HONORE	6799	Financials	€50.00
262	DEVEAUX SA	2211	Consumer-Cyclical	€50.00
263	THERMADOR HOLDING SA	5070	Consumer-Cyclical	€48.00
264	SILIC SA	6512	Consumer-Cyclical	€48.00
265	SAFIC ALCAN & CIE	5160	Basic Materials	€47.00
266	GL TRADE SA	7372	Technology	€47.00
267	WALTER SA	3350	Capital Goods	€46.00
268	EMGP-ENTREPOTS ET MAGASINS	6512	Consumer-Cyclical	€46.00
269	EUROPEENNE DE CASINOS	7011	Consumer-Cyclical	€45.00
270	ALTAMIR & CIE	6799	Financials	€43.00
271	GROUPE ONET	7340	Consumer Staples	€43.00
272	MARC ORIAN	5944	Consumer-Cyclical	€42.00
273	SYLIS SA	7373	Technology	€42.00
274	XRG CERG SA	7372	Technology	€42.00
275	SERIBO-STE ETUDE & REAL IND	2421	Basic Materials	€41.00
276	INTER PARFUMS SA	2844	Consumer Staples	€41.00
277	GROUPE PSB INDUSTRIES	2670	Basic Materials	€41.00
278	HOTELIERE LUTETIA CONCORDE	7011	Consumer-Cyclical	€40.00
279	VM MATERIAUX SA	5030	Consumer-Cyclical	€40.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
280	TECHNOFAN SA	3728	Capital Goods	€40.00
281	BRIT AIR SA	4512	Transportation	€39.00
282	STEPHANE KELIAN	3140	Consumer-Cyclical	€38.00
283	TOUPARGEL SA	5140	Consumer Staples	€38.00
284	A NOVO SA	7600	Consumer-Cyclical	€38.00
285	ENCRES DUBUIT SA	2890	Basic Materials	€36.00
286	APEM SA	3613	Capital Goods	€36.00
287	FINANCIERE DE LA PART-DIEU	6512	Consumer-Cyclical	€35.00
288	CIE PARISIENNE DE CHAUFFAGE	4961	Utilities	€35.00
289	AUSY SA	7372	Technology	€34.00
290	PISCINES DESJOYAUX SA	1700	Capital Goods	€32.00
291	NOVATEC SA	7389	Consumer-Cyclical	€32.00
292	AFFINE	6512	Consumer-Cyclical	€32.00
293	INSTALLUX (GROUPE)	3442	Consumer-Cyclical	€31.00
294	HF COMPANY	3663	Technology	€31.00
295	FLAMMARION SA	2731	Consumer-Cyclical	€30.00
296	FINUCHEM SA	3569	Capital Goods	€30.00
297	ROUGIER SA	2400	Basic Materials	€30.00
298	MRM SA	5651	Consumer-Cyclical	€29.00
299	COPAREX INTERNATIONAL SA	1311	Energy	€29.00
300	SAIRP COMPOSITES SA	2430	Basic Materials	€29.00
301	HOLOGRAM INDUSTRIES SA	2750	Consumer Staples	€28.00
302	FPEE SA	3440	Capital Goods	€27.00
303	GUILLEMOT CORP SA	7372	Technology	€27.00
304	TEAM PARTNERS GROUP SA	7373	Technology	€27.00
305	GFSR – GARAGES SOUTERRAINS	7500	Consumer-Cyclical	€27.00
306	LEON DE BRUXELLES	5812	Consumer Staples	€25.00
307	GROUPE GASCOGNE	2670	Basic Materials	€25.00
308	MR ET ASSOCIES	8090	Healthcare	€25.00
309	DISTRIBORG	5140	Consumer Staples	€25.00
310	DELMON INDUSTRIE	3060	Capital Goods	€25.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
311	INFO REALITE	3669	Technology	€24.00
312	CIE LEBON SA	6799	Financials	€24.00
313	SOFCO	5500	Consumer-Cyclical	€23.00
314	CLUB MEDITERRANEE SA	7011	Consumer-Cyclical	€23.00
315	BACCARAT	3911	Consumer-Cyclical	€23.00
316	ASSYSTEM SA	2810	Basic Materials	€23.00
317	PARC ASTERIX SA	7996	Consumer Staples	€22.00
318	GROUPE ARES	7373	Technology	€21.00
319	PARSYS SA	7373	Technology	€21.00
320	GROUPE OPEN SA	7370	Technology	€21.00
321	SIGNAUX GIROD	3669	Technology	€21.00
322	LAFUMA SA	2253	Consumer-Cyclical	€21.00
323	JEANJEAN SA	5180	Consumer Staples	€20.00
324	PIER IMPORT EUROPE	5020	Consumer-Cyclical	€20.00
325	SCHAEFFER-DUFOUR	2200	Consumer-Cyclical	€20.00
326	PRODEF SA	7340	Consumer Staples	€20.00
327	MEDIDEP SA	8300	Consumer-Cyclical	€20.00
328	SOC DEVEL REGL DU NORD & PAS	6029	Financials	€19.00
329	OLITEC SA	3661	Technology	€18.00
330	INFOTEL SA	7371	Technology	€18.00
331	GROUPE DIFFUSION PLUS	7330	Consumer-Cyclical	€18.00
332	GEA-GRENOBL D'ELECR & D'AUTO	7373	Technology	€18.00
333	FONCIERE EURIS	5940	Consumer-Cyclical	€17.00
334	CREATIFS SA	7990	Consumer-Cyclical	€17.00
335	BRIME TECHNOLOGIES	7373	Technology	€17.00
336	SACI SA	5040	Consumer-Cyclical	€17.00
337	MB ELECTRONIQUE	3825	Technology	€17.00
338	MACC (LA)	3460	Capital Goods	€17.00
339	SOGCLAIR SA	7389	Consumer-Cyclical	€16.00
340	GENERALE LOCATION SA	7350	Consumer-Cyclical	€16.00
341	CGBI SA	7373	Technology	€16.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
342	SASA INDUSTRIE SA	3350	Capital Goods	€15.00
343	AURES ELECTRONIQUE	5045	Technology	€15.00
344	ADA SA	7510	Consumer-Cyclical	€15.00
345	OPERA CONSTRUCTION SA	1531	Consumer-Cyclical	€15.00
346	COSTIMEX	2040	Consumer Staples	€15.00
347	LVL MEDICAL GROUPE	8082	Healthcare	€15.00
348	PETIT BOY SA	2300	Consumer-Cyclical	€14.00
349	AES LABORATOIRE GROUPE SA	2835	Healthcare	€14.00
350	GUY DEGRENNE	3260	Consumer-Cyclical	€14.00
351	PROLOGUE SOFTWARE SA	7371	Technology	€14.00
352	CHARLATTE SA	3559	Capital Goods	€13.00
353	EGIDE SA	3444	Capital Goods	€13.00
354	SODERO SA	6172	Financials	€12.00
355	ESKER SA	7371	Technology	€12.00
356	CRYO	7372	Technology	€12.00
357	TEAMLOG	7371	Technology	€12.00
358	STEDIM SA	3842	Healthcare	€12.00
359	MANUFACTURE LANDAISE DE PROD	2820	Basic Materials	€12.00
360	IOLTECH	3842	Healthcare	€11.00
361	SOFIBUS SA	6512	Consumer-Cyclical	€11.00
362	RACLET SA	3790	Consumer-Cyclical	€11.00
363	COHERIS ATIX SA	7371	Technology	€11.00
364	SOCIM-SOC IMMOBIL D'INVEST	6510	Consumer-Cyclical	€11.00
365	ALAIN MANOUKIAN SA	2330	Consumer-Cyclical	€10.00
366	ALTI	7370	Technology	€10.00
367	KALISTO ENTERTAINMENT SA	7372	Technology	€10.00
368	GROUPE SILICOMP	7373	Technology	€9.00
369	NAVARRO SA	4220	Transportation	€9.00
370	DEVOTEAM SA	7373	Technology	€9.00
371	SYS-COM SA	8711	Capital Goods	€9.00
372	ANDRE TRIGANO	7000	Consumer-Cyclical	€8.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
373	POUJOLAT SA	3490	Capital Goods	€7.00
374	GRAINES VOLTZ	5190	Consumer-Cyclical	€7.00
375	INST PARTN DU BOIS&DU MEUBL	6799	Financials	€7.00
376	SYSTAR SA	7371	Technology	€7.00
377	ETOILE COMMERCIALE SA	6029	Financials	€7.00
378	SEB SA	3634	Consumer-Cyclical	€6.00
379	HENRI MAIRE SA	2084	Consumer Staples	€6.00
380	INDUS ET FINANC D'ENTREPRISE	1500	Capital Goods	€6.00
381	PICOGIGA	2860	Basic Materials	€5.00
382	FORGES STEPHANOISES SA	3420	Consumer-Cyclical	€5.00
383	BOULANGERIE EUROPE	2050	Consumer Staples	€5.00
384	FOOD PARTNER GROUPE	5140	Consumer Staples	€5.00
385	CROSS SYSTEMS CO	7371	Technology	€5.00
386	AUTOMA-TECH	8731	Healthcare	€4.00
387	STALLERGENES SA	2834	Healthcare	€4.00
388	AUBAY SA	7370	Technology	€4.00
389	MALTERIES FRANCO-BELGES	2080	Consumer Staples	€3.00
390	RIGHINI SPA	2430	Basic Materials	€3.00
391	TELECOM CITY	4812	Communication	€2.00
392	EUROFINS SCIENTIFIC	8734	Consumer-Cyclical	€2.00
393	FERRAND ET RENAUD	6799	Financials	€2.00
394	MONEYLINE SA	3578	Capital Goods	€1.00
395	PRECIA SA	3590	Capital Goods	€1.00
396	STACI SA	8742	Consumer-Cyclical	€1.00
397	IMAFFINE SA	6159	Financials	€0.00
398	IT LINK	7371	Technology	€0.00
399	SEAE	3640	Capital Goods	€0.00
400	TIVOLY (GROUPE)	3541	Capital Goods	€0.00
401	GROUPE SOCAMEL-RESCASET	2590	Consumer-Cyclical	€-1.00
402	RECIF SA	3559	Capital Goods	€-1.00
403	ALES GROUPE	2844	Consumer Staples	€-1.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
404	COURTOIS SA	6510	Consumer-Cyclical	€-2.00
405	NORDON ET CIE	3443	Capital Goods	€-2.00
406	NORTENE SA	3089	Consumer Staples	€-2.00
407	MAROCAINE (COMPAGNIE)	100	Basic Materials	€-2.00
408	CHAMPEX SA	6029	Financials	€-2.00
409	LOCAMUR-SOFIGROS SA	6172	Financials	€-3.00
410	SAVEURS DE FRANCE SA	2030	Consumer Staples	€-4.00
411	EXPAND	7812	Consumer Staples	€-4.00
412	SERF SA	3842	Healthcare	€-4.00
413	BAIL SAINT HONORE SA	6512	Consumer-Cyclical	€-4.00
414	ROCAMAT SA	3281	Consumer-Cyclical	€-5.00
415	CLAYEUX SA	5130	Consumer-Cyclical	€-5.00
416	ACCESS COMMERCE	7371	Technology	€-5.00
417	DOCKS LYONNAIS SA	6510	Consumer-Cyclical	€-5.00
418	COM 1 SA	3672	Capital Goods	€-6.00
419	EUROSIC SA	6512	Consumer-Cyclical	€-6.00
420	JACQUET INDUSTRIES SA	3440	Capital Goods	€-7.00
421	NATUREX SA	2090	Consumer Staples	€-7.00
422	MOSSLEY BADIN SA	2200	Consumer-Cyclical	€-7.00
423	MONNERET JOUETS SA	3944	Consumer-Cyclical	€-7.00
424	BOURSE DIRECT	6199	Financials	€-7.00
425	CARPINIENNE PARTICIPATIONS	6799	Financials	€-7.00
426	BISCUITS GARDEIL SA	2052	Consumer Staples	€-9.00
427	EUROPE AUTO INDUSTRIE SA	5010	Consumer-Cyclical	€-9.00
428	TIPIAK SA	2030	Consumer Staples	€-10.00
429	ARTPRICE.COM	7370	Technology	€-10.00
430	HIGH CO SA	3571	Technology	€-10.00
431	NSC GROUPE SA	3550	Capital Goods	€-11.00
432	IMMOBILIERE MARSEILLAISE	6510	Consumer-Cyclical	€-12.00
433	SOC DEV REGL DU CENTRE-EST	6159	Financials	€-12.00
434	MEDASYS	7373	Technology	€-12.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
435	JACQUES BOGART	2844	Consumer Staples	€-12.00
436	DEVERNOIS SA	2330	Consumer-Cyclical	€-12.00
437	SALVEPAR SA	6799	Financials	€-13.00
438	BL-BERGER-LEVRAULT SA	2741	Consumer-Cyclical	€-13.00
439	PERFECT TECHNOLOGIES SA	5040	Consumer-Cyclical	€-13.00
440	SOCIETE DUC LAMOTHE PART	6799	Financials	€-13.00
441	VALTECH SA	7370	Technology	€-14.00
442	CIE AGRICOLE DE LA CRAU SA	100	Basic Materials	€-14.00
443	GIFRER BARBEZAT SA	2834	Healthcare	€-16.00
444	SMOBY SA	3944	Consumer-Cyclical	€-16.00
445	CONFLANDEY SA	3300	Basic Materials	€-17.00
446	TEISSEIRE FRANCE	2080	Consumer Staples	€-18.00
447	SECURIDEV SA	3420	Consumer-Cyclical	€-19.00
448	R2I SANTE SA	7373	Technology	€-20.00
449	CHARGEURS INTERNATIONAL SA	2200	Consumer-Cyclical	€-21.00
450	DURAN DUBOI SA	7819	Consumer Staples	€-21.00
451	INTERACTIF DELTA PRODUCTION	4841	Consumer Staples	€-22.00
452	AUGROS COSMETIC PACKAGING	7389	Consumer-Cyclical	€-22.00
453	AUREA	6799	Financials	€-22.00
454	GENERIX	7372	Technology	€-23.00
455	ENTENIAL	6141	Financials	€-23.00
456	ICOM INFORMATIQUE	7371	Technology	€-23.00
457	QUANTEL SA	3842	Healthcare	€-24.00
458	IMECOM GROUP SA	7373	Technology	€-24.00
459	SUPRA SA	3433	Capital Goods	€-25.00
460	BERTHET-BONDET SA	3851	Healthcare	€-25.00
461	BOURGEOIS SA	5040	Consumer-Cyclical	€-26.00
462	TANNERIES DE FRANCE SA	1520	Consumer-Cyclical	€-27.00
463	CASCADES SA	2631	Basic Materials	€-28.00
464	SIMCO	6513	Consumer-Cyclical	€-28.00
465	EFFIK SA	8071	Healthcare	€-29.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
466	WAVECOM SA	3661	Technology	€-29.00
467	SWAN SA	7373	Technology	€-30.00
468	LACROIX	3669	Technology	€-30.00
469	CIDER SANTE SA	8742	Consumer-Cyclical	€-30.00
470	ROULEAU GUICHARD	2200	Consumer-Cyclical	€-32.00
471	TELEFLEX LIONEL-DUPONT SA	3812	Capital Goods	€-33.00
472	GLM SA	5961	Consumer-Cyclical	€-33.00
473	GAUMONT SA	7812	Consumer Staples	€-34.00
474	SABETON SA	100	Basic Materials	€-35.00
475	FAROS SA	7372	Technology	€-37.00
476	EURODIRECT MARKETING	7311	Consumer-Cyclical	€-38.00
477	LEGRIS INDUSTRIES	3530	Capital Goods	€-40.00
478	D INTERACTIVE	7310	Consumer-Cyclical	€-42.00
479	CASINO MUNICIPAL DE CANNE	7011	Consumer-Cyclical	€-43.00
480	ANF-ATELIERS CONSTR NORD FRA	6512	Consumer-Cyclical	€-45.00
481	MARIE BRIZARD & ROGER INTL	2080	Consumer Staples	€-46.00
482	MUSEE GREVIN	8400	Consumer-Cyclical	€-50.00
483	ILOG SA	7371	Technology	€-54.00
484	INTERCALL SA	4899	Communication	€-54.00
485	SIPH SOC INTERNTONALE DE PLA	800	Basic Materials	€-57.00
486	GUYANOR RESSOURCES SA	1000	Basic Materials	€-57.00
487	DEVILLE	3433	Capital Goods	€-58.00
488	LACIE GROUP SA	3572	Technology	€-59.00
489	DESQUENNE & GIRAL SA	1600	Capital Goods	€-59.00
490	NISSAN FRANCE SA	5500	Consumer-Cyclical	€-60.00
491	INFOVISTA SA	7372	Technology	€-61.00
492	TONNA ELECTRONIQUE SA	4822	Technology	€-63.00
493	GUERBET SA	2834	Healthcare	€-63.00
494	COFIDUR SA	8700	Capital Goods	€-64.00
495	FI SYSTEM SA	7370	Technology	€-64.00
496	EUROP EXTINCTEURS	3990	Capital Goods	€-64.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
497	SOC FONCIERE DES PIMONTS SA	6512	Consumer-Cyclical	€-72.00
498	CEREP SA	8731	Healthcare	€-75.00
499	GENESYS SA	4813	Communication	€-78.00
500	NICOX SA	8731	Healthcare	€-80.00
501	GUILLARD MUSIQUES	5099	Consumer-Cyclical	€-83.00
502	BOLLORE SA	4731	Transportation	€-85.00
503	CHEMUNEX SA	8071	Healthcare	€-85.00
504	MECELEC	3640	Capital Goods	€-91.00
505	ACTIELEC TECHNOLOGIES	3661	Technology	€-93.00
506	KINDY SA	2250	Consumer-Cyclical	€-94.00
507	CHAINE ET TRAME SA	2200	Consumer-Cyclical	€-96.00
508	SAUPIQUET	2090	Consumer Staples	€-99.00
509	GROUPE PANTIN SA	100	Basic Materials	€-103.00
510	TETE DANS LES NUAGES SA	7990	Consumer-Cyclical	€-104.00
511	ROCANI	6200	Financials	€-106.00
512	EXACOMPTA-CLAIREFONTAINE SA	2621	Basic Materials	€-109.00
513	ELECTRICITE & EAUX MADAGASCA	1311	Energy	€-122.00
514	INFOSOURCES	4822	Technology	€-126.00
515	VEV SA	5130	Consumer-Cyclical	€-135.00
516	CS COMMUNICATION & SYSTEMES	7373	Technology	€-137.00
517	PAUL PREDAULT SA	2011	Consumer Staples	€-140.00
518	TROUVAY & CAUVIN SA	3490	Capital Goods	€-154.00
519	ST DUPONT	3911	Consumer-Cyclical	€-158.00
520	DYNACTION SA	3600	Capital Goods	€-161.00
521	SCOR SA	6300	Financials	€-170.00
522	GECINA	6500	Consumer-Cyclical	€-171.00
523	VIA BANQUE SA	6029	Financials	€-173.00
524	SILICON ON INSULATOR TECHS	3674	Technology	€-186.00
525	METALEUROP (PENARROYA)	3341	Capital Goods	€-196.00
526	ACTIVCARD SA	7373	Technology	€-197.00
527	NAF NAF SA	5130	Consumer-Cyclical	€-199.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
528	INTEGRA SA	7370	Technology	€-218.00
529	CFF RECYCLING	3320	Basic Materials	€-225.00
530	SOC FONCIERE LYONNAISE	6512	Consumer-Cyclical	€-229.00
531	IMS-INTL METAL SERVICE SA	5051	Capital Goods	€-258.00
532	UNIBAIL	6512	Consumer-Cyclical	€-260.00
533	FAURECIA SA	2531	Capital Goods	€-262.00
534	FAIVELEY SA	3743	Transportation	€-269.00
535	CREDIT INDUSTRIEL COMMERCIAL	6029	Financials	€-276.00
536	ICBT GROUPE	1540	Capital Goods	€-298.00
537	RALLYE	5411	Consumer Staples	€-325.00
538	ETABLISSEMENTS MAUREL & PROM	1311	Energy	€-339.00
539	SKIS ROSSIGNOL SA	3949	Consumer-Cyclical	€-363.00
540	GENSET SA	8731	Healthcare	€-370.00
541	TRANSGENE	8731	Healthcare	€-395.00
542	ERAMET	1000	Basic Materials	€-462.00
543	NATEXIS BANQUES POPULAIRES	6029	Financials	€-715.00
544	EURO DISNEYLAND SCA	7996	Consumer Staples	€-744.00
545	GRANDE PAROISSE	2870	Basic Materials	€-865.00
546	MOULINEX SA	3634	Consumer-Cyclical	€-980.00
547	ESSO SAF	2911	Energy	€-1,010.00
548	CIE GENERALE DE GEOPHYSIQUE	1382	Energy	€-1,131.00
549	EUROTUNNEL SA	6799	Financials	€-1,153.00
550	EADS NV	3812	Capital Goods	€-1,213.00
551	BOUYGUES SA	1600	Capital Goods	€-1,252.00
552	RENAULT	3711	Consumer-Cyclical	€-1,383.00
553	VALLOUREC SA	3317	Basic Materials	€-1,457.00
554	CIE PARISIENNE DE REESCOMPTE	6029	Financials	€-1,461.00
555	ERIDANIA BEGHIN-SAY SA	2070	Consumer Staples	€-1,717.00
556	CIE GEN DES ETABLIS MICHELIN	3011	Consumer-Cyclical	€-1,857.00
557	DMC DOLLFUS MIEG ET CIE	2200	Consumer-Cyclical	€-1,896.00
558	TOTAL FINA ELF SA	2911	Energy	€-2,580.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
559	CANAL PLUS SA	4841	Consumer Staples	€-3,406.00
560	ALCATEL NETWORKS CORP CDA	3661	Technology	€-3,759.00
561	GROUPE BULL	7373	Technology	€-4,492.00
562	USINOR SA	3320	Basic Materials	€-6,444.00
563	AVENTIS SA	2800	Basic Materials	€-15,446.00
Total Knowledge Capital®				€250,401.00

Appendix B: Valuation of Knowledge Capital® Rankings by Country

German Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	DAIMLERCHRYSLER AG	3711	Consumer-Cyclical	€22,894.00
2	E.ON AG	9997	Transportation	€22,535.00
3	BAYER AG	2800	Basic Materials	€9,780.00
4	RWE AG	4931	Utilities	€8,581.00
5	DEUTSCHE BANK AG	6029	Financials	€6,826.00
6	AGIV-AG FUR INDUSTRIE UND VE	8711	Capital Goods	€5,183.00
7	ASEA BROWN BOVERI AG	3560	Capital Goods	€5,163.00
8	LUFTHANSA AG	4512	Transportation	€4,579.00
9	SAP AG	7371	Technology	€4,484.00
10	BERTELSMANN AG	2711	Consumer-Cyclical	€4,404.00
11	SIEMENS AG	3600	Capital Goods	€4,300.00
12	BMW-BAYER MOTOREN WERKE AG	3711	Consumer-Cyclical	€3,800.00
13	AUDI AG	3711	Consumer-Cyclical	€3,373.00
14	PILKINGTON DEUTSCHLAND AG	3211	Capital Goods	€3,095.00
15	ADIDAS-SALOMON AG	3949	Consumer-Cyclical	€2,735.00
16	KRAFTUBER-WERKE RHEINFELDEN	4911	Utilities	€2,569.00
17	HANNOVER RUCKVERSICHERUNGS	6300	Financials	€2,334.00
18	BASF AG	2800	Basic Materials	€2,226.00
19	GEHE AG	5122	Consumer Staples	€2,163.00
20	AXEL SPRINGER VERLAG AG	2711	Consumer-Cyclical	€2,115.00
21	MAN AG	3711	Consumer-Cyclical	€1,985.00
22	SUDZUCKER AG	2000	Consumer Staples	€1,957.00
23	WCM BETEILIG- & GRUNDBESITZ	6510	Consumer-Cyclical	€1,693.00
24	HENKEL KGAA	2840	Consumer Staples	€1,680.00
25	AMB-AACHENER & MUNCHENER	6311	Financials	€1,660.00
26	SCHERING AG	2834	Healthcare	€1,546.00
27	PREUSSAG AG	4700	Transportation	€1,495.00
28	PORSCHE AG	3711	Consumer-Cyclical	€1,440.00
29	KARSTADT QUELLE AG	5311	Consumer-Cyclical	€1,432.00
30	RHEINHYP-RHEINISCHE HYPOTHEK	6029	Financials	€1,370.00
31	HEIDELBERGER DRUCKMASCHINEN	2750	Consumer Staples	€1,337.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	MOBILCOM AG	4812	Communication	€1,325.00
33	DYCKERHOFF AG	3241	Basic Materials	€1,249.00
34	MERCK KGAA	2834	Healthcare	€1,230.00
35	BEIERSDORF AG	2844	Consumer Staples	€1,213.00
36	KLOCKNER WERKE AG	3089	Consumer Staples	€1,211.00
37	DEPFA BANK-DT PFAND & HYPOTH	6029	Financials	€1,191.00
38	CONTINENTAL AG	3011	Consumer-Cyclical	€1,188.00
39	BEWAG AG	4931	Utilities	€1,146.00
40	HEIDELBERGER ZEMENT AG	3241	Basic Materials	€1,087.00
41	ERGO VERSICHERUNGSGRUPPE AG	6311	Financials	€1,065.00
42	AXA COLONIA KONZERN AG	6331	Financials	€1,058.00
43	ALLIANZ LEBENSVERSICHERUNGS	6311	Financials	€1,054.00
44	BUDERUS AG	3567	Capital Goods	€1,012.00
45	ALTANA INDUSTRIE AG	2834	Healthcare	€982.00
46	KALI UND SALZ BETEILIGUNG AG	1400	Basic Materials	€977.00
47	DBV WINTERTHUR HOLDING AG	6311	Financials	€935.00
48	HSBC TRINKAUS & BURKHARDT	6029	Financials	€927.00
49	MG TECHNOLOGIES AG	2890	Basic Materials	€844.00
50	HEW-HAMBURG ELECTR WERKE AG	4911	Utilities	€839.00
51	CONCORDIA BAU UND BODEN AG	6500	Consumer-Cyclical	€763.00
52	EPCOS AG	3679	Capital Goods	€734.00
53	HUGO BOSS AG	2320	Consumer-Cyclical	€719.00
54	HOCHTIEF AG	1540	Capital Goods	€715.00
55	VOLKSFURSORGE HOLDING AG	6799	Financials	€655.00
56	DOUGLAS HOLDING AG	5311	Consumer-Cyclical	€651.00
57	THUGA AG	4911	Utilities	€644.00
58	AVA-ALLGEM HANDELSG VERBR AG	5411	Consumer Staples	€591.00
59	DEGUSSA-HUELS AG	2800	Basic Materials	€574.00
60	THURINGIA VERSICHERUNGS-AG	6321	Financials	€571.00
61	AACHENER & MUENCH LEBEN	6331	Financials	€563.00
62	PROSIEBEN MEDIA AG	4841	Consumer Staples	€554.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	BAADER WERTPAPIERHANDELSBANK	6029	Financials	€524.00
64	RHON-KLINIKUM AG	8011	Healthcare	€516.00
65	ESCHWEILER BERGWERKS-VEREIN	1540	Capital Goods	€497.00
66	AACHENER & MUNCHENER VERSICH	6331	Financials	€496.00
67	DEUTSCHE BETEILIGUNGS AG	6799	Financials	€489.00
68	WELLA AG	2844	Consumer Staples	€482.00
69	KIEKERT AG	3420	Consumer-Cyclical	€458.00
70	VEREINIGTE DEUTSCHE NICKEL-W	3910	Consumer-Cyclical	€455.00
71	EUROHYPO-EUROPAISCHE HYPOTHE	6029	Financials	€437.00
72	GOLDSCHMIDT AG	2800	Basic Materials	€406.00
73	MAN ROLAND DRUCKMASCHINEN AG	3555	Capital Goods	€399.00
74	NURNBERGER BETEILIGUNGS-AG	6300	Financials	€389.00
75	MLP-MARSCHOL LAUTENSCH & PAR	6411	Financials	€385.00
76	FRESENIUS AG	3845	Healthcare	€381.00
77	SOFTWARE AG	7371	Technology	€372.00
78	DEUT STEINZG CREMER & BREUER	3250	Consumer-Cyclical	€368.00
79	GOLD-ZACK AG	6211	Financials	€365.00
80	MAXDATA AG	5045	Technology	€361.00
81	DUEWAG AG	3743	Transportation	€358.00
82	FIELMANN AG	3851	Healthcare	€344.00
83	PASCALE (JEAN) AG	2300	Consumer-Cyclical	€340.00
84	BABCOCK BORSIG AG	8711	Capital Goods	€331.00
85	RWE-DEA AG	2911	Energy	€325.00
86	SAI AUTOMOTIVE AG	3714	Consumer-Cyclical	€320.00
87	DEUTSCHE EFFECTEN- & WECHSEL	6510	Consumer-Cyclical	€313.00
88	BUS-BERZELIUS UMWELT-SERVICE	3341	Capital Goods	€308.00
89	KOENIG & BAUER AG	3555	Capital Goods	€290.00
90	GERRESHEIMER GLAS AG	3221	Capital Goods	€289.00
91	GILDEMEISTER AG	3540	Capital Goods	€286.00
92	SCHENCK (CARL) AG	3500	Capital Goods	€269.00
93	TA TRIUMPH-ADLER AG	3571	Technology	€267.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	ST-GOBAIN OBERLAND AG	3221	Capital Goods	€262.00
95	SINGULUS TECHNOLOGIES AG	3559	Capital Goods	€261.00
96	GELSENWASSER AG	4941	Utilities	€260.00
97	MONACHIA GRUNDSTUCKS AG	6510	Consumer-Cyclical	€260.00
98	BERLIN-HANNOVERSCHE HYPOTHEK	6029	Financials	€257.00
99	HORTEN AG	6510	Consumer-Cyclical	€246.00
100	HYMER AG	3711	Consumer-Cyclical	€246.00
101	KERAMAG-KERAMISCHE WERKE AG	3430	Consumer-Cyclical	€242.00
102	UBERLANDWERK UNTERFRANKEN AG	4911	Utilities	€241.00
103	MANNHEIMER AG HLDG	6300	Financials	€240.00
104	STUTTGARTER HOFBRAU AG	2082	Consumer Staples	€230.00
105	MICHAEL WEINIG AG	3559	Capital Goods	€228.00
106	IVG AG	4220	Transportation	€222.00
107	VOLKSWAGEN AG	3711	Consumer-Cyclical	€219.00
108	PAUL HARTMANN AG	3842	Healthcare	€214.00
109	HORNBAACH HOLDING AG	5211	Consumer-Cyclical	€212.00
110	ANZAG-ANDREAE-NORIS ZAHN AG	5122	Consumer Staples	€211.00
111	FUCHS PETROLUB AG	2990	Basic Materials	€203.00
112	VTG-LEHNKERING AG	4400	Transportation	€201.00
113	IMW IMMOBILIEN AG	6512	Consumer-Cyclical	€198.00
114	PFLEIDERER BAU UND VERKEHR	2400	Basic Materials	€193.00
115	STOLLWERCK AG	2060	Consumer Staples	€189.00
116	METRO AG	5311	Consumer-Cyclical	€187.00
117	CUSTODIA HOLDING AG	6531	Consumer-Cyclical	€179.00
118	PHOENIX AG	3050	Capital Goods	€178.00
119	PIRELLI DEUTSCHLAND AG	3011	Consumer-Cyclical	€178.00
120	BIJOU BRIGITTE MOD ACCESS AG	5621	Consumer-Cyclical	€164.00
121	WERU AG	3442	Consumer-Cyclical	€160.00
122	LEONI AG	3357	Basic Materials	€159.00
123	DEUTSCHE VERKEHRS-BANK AG	6029	Financials	€156.00
124	VERSEIDAG AG	3050	Capital Goods	€153.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
125	HORNBACH-BAUMARKT AG	5211	Consumer-Cyclical	€149.00
126	STEAG HAMATECH AG	3559	Capital Goods	€148.00
127	KWS SAAT AG	700	Basic Materials	€146.00
128	VOGT ELECTRONIC AG	3651	Capital Goods	€143.00
129	ENBW-ENERGIE BADEN-WURT AG	4911	Utilities	€141.00
130	ESCADA AG	2330	Consumer-Cyclical	€139.00
131	IWKA AG	3540	Capital Goods	€138.00
132	HERMLE BERTHOLD AG	3541	Capital Goods	€137.00
133	MAIN-KRAFTWERKE AG	4911	Utilities	€136.00
134	LINDNER HOLDING KGAA	1700	Capital Goods	€135.00
135	AHLERS (ADOLF)AG	2320	Consumer-Cyclical	€135.00
136	BLAUE QUELLEN MIN-& HEILB AG	5180	Consumer Staples	€134.00
137	M-TECH TECH & BETEILIGUNGS	3669	Technology	€132.00
138	KM EUROPA METAL AG	5051	Capital Goods	€131.00
139	PFEIFFER VACUUM TECHNOLOGY	3560	Capital Goods	€130.00
140	HACH AG	5961	Consumer-Cyclical	€129.00
141	BERU AG	3690	Capital Goods	€124.00
142	HAWESKO HOLDING AG	5180	Consumer Staples	€119.00
143	APCOA PARKING AG	7500	Consumer-Cyclical	€118.00
144	LEIFHEIT AG	3460	Capital Goods	€116.00
145	LANGBEIN-PFANHAUSER WERKE AG	3350	Capital Goods	€114.00
146	WMF-WURTTENBERG METALLWAREN	3260	Consumer-Cyclical	€111.00
147	SACHSENRING AUTOMOBILTECHNIK	3711	Consumer-Cyclical	€110.00
148	CEWE COLOR HOLDING AG	7384	Consumer-Cyclical	€108.00
149	AUGUSTA TECHNOLOGIE AG	7373	Technology	€108.00
150	HAMBORNER AG	6510	Consumer-Cyclical	€107.00
151	BBS KRAFTFAHRZEUGTECHNIK AG	3714	Consumer-Cyclical	€105.00
152	BINDING-BRAUEREI AG	2082	Consumer Staples	€103.00
153	VARTA AG	3690	Capital Goods	€101.00
154	BABCOCK-BSH AG	3559	Capital Goods	€98.00
155	ALSEN AG	3241	Basic Materials	€98.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
156	KAMPA-HAUS AG	1500	Capital Goods	€97.00
157	WEBER (GERRY) INTERNATNL AG	2330	Consumer-Cyclical	€97.00
158	BOWE SYSTEC AG	3579	Capital Goods	€96.00
159	GARDENA HOLDING AG	3524	Consumer-Cyclical	€96.00
160	HARPEN AG	6510	Consumer-Cyclical	€92.00
161	KOLBENSCHMIDT-PIERBURG AG	3510	Capital Goods	€90.00
162	MUHLBAUER HOLDING AG&CO KGAA	3674	Technology	€89.00
163	DT HYPOTHBK HANNOVER/BERLIN	6029	Financials	€87.00
164	KAWAG-KRAFTWERK ALTWUERTTEMB	4911	Utilities	€87.00
165	NORDDEUTSCHE AFFINERIE AG	3330	Capital Goods	€86.00
166	STO AG	3290	Consumer-Cyclical	€86.00
167	SANACORP PHARMAHANDEL AG	5122	Consumer Staples	€86.00
168	CEAG AG	5063	Capital Goods	€85.00
169	SUDWESTDEUTSCHE SALZWERKE AG	1400	Basic Materials	€85.00
170	CONCORD EFFEKTEN AG	6211	Financials	€85.00
171	IFA HOTELS & TOURISTIK AG	7011	Consumer-Cyclical	€83.00
172	GONTARD & METALLBANK AG	6029	Financials	€78.00
173	SIMONA KUNSTSTOFFWERKE AG	2821	Basic Materials	€76.00
174	WALTER AG	3540	Capital Goods	€76.00
175	SCHAERF AG	2520	Capital Goods	€71.00
176	DIS-DEUTSCHER INDUSTRIE SERV	7361	Consumer Staples	€66.00
177	MUHL PRODUCT & SERVICE AG	5030	Consumer-Cyclical	€66.00
178	BRILLIANT AG	3640	Capital Goods	€64.00
179	INDUS HOLDING AG	3560	Capital Goods	€63.00
180	IXOS SOFTWARE AG	7370	Technology	€63.00
181	LUDWIG BECK AG	5311	Consumer-Cyclical	€62.00
182	MOBEL WALTHER AG	2510	Consumer-Cyclical	€61.00
183	ROTHENBERGER AG	4953	Capital Goods	€58.00
184	HEYDE AG	7371	Technology	€56.00
185	ALLG GOLD & SILBERSCHNEIDAN	3330	Capital Goods	€56.00
186	BALCKE-DURR AG	1600	Capital Goods	€53.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
187	UZIN UTZ AG	2891	Basic Materials	€52.00
188	BECHTLE AG	7370	Technology	€52.00
189	M&S ELEKTRONIK AG	7371	Technology	€51.00
190	VEREINS-UND WESTBANK AG	6029	Financials	€51.00
191	PROGRESS-WERK OBERKIRCH AG	3460	Capital Goods	€51.00
192	HOLSTEN-BRAUEREI AG	2082	Consumer Staples	€50.00
193	FJA AG	7370	Technology	€49.00
194	SCHOTT DESAG AG	3211	Capital Goods	€49.00
195	EUROBIKE AG	5013	Consumer-Cyclical	€49.00
196	BERTRANDT AG	8711	Capital Goods	€47.00
197	WINKLER & DUNNEBIER AG	3550	Capital Goods	€47.00
198	REFUGIUM HOLDING AG	8300	Consumer-Cyclical	€47.00
199	WESTAG & GETALIT AG	2430	Basic Materials	€45.00
200	PUMA AG RUDOLF DASSLER SPORT	3021	Consumer-Cyclical	€44.00
201	SPARTA BETEILIGUNGEN AG	6211	Financials	€44.00
202	ASCLEPION-MEDITEC AG	3845	Healthcare	€43.00
203	ALLWEILER AG	3590	Capital Goods	€43.00
204	RHENAG-RHEINISCHE ENERGIE AG	4924	Utilities	€42.00
205	EUROMICRON AG COMM & CTRL	3679	Capital Goods	€41.00
206	EFFEFF FRITZ FUSS GMBH & CO	3669	Technology	€41.00
207	ZANDERS FEINPAPIERE AG	2621	Basic Materials	€40.00
208	VOSSLOH AG	3613	Capital Goods	€40.00
209	MEDION AG	3571	Technology	€40.00
210	EX-CELL-O HOLDING AG	3540	Capital Goods	€38.00
211	WASHTEC AG	3590	Capital Goods	€37.00
212	KRONES AG	3530	Capital Goods	€37.00
213	WASAG-CHEMIE AG	2820	Basic Materials	€36.00
214	VBH HOLDING AG	2430	Basic Materials	€35.00
215	OPPERMANN VERSAND AG	5961	Consumer-Cyclical	€34.00
216	AIXTRON AG	3559	Capital Goods	€34.00
217	K&M MOBEL AG	2430	Basic Materials	€34.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
218	SENATOR ENTERTAINMENT AG	7812	Consumer Staples	€34.00
219	FRIATEC AG	3080	Capital Goods	€33.00
220	SANDER JIL AG	2300	Consumer-Cyclical	€32.00
221	ELEXIS AG	3823	Technology	€32.00
222	HIS SPORTSWEAR AG	2320	Consumer-Cyclical	€31.00
223	ALLBECON AG	7361	Consumer Staples	€30.00
224	VILLEROY & BOCH AG	3250	Consumer-Cyclical	€29.00
225	GASANSTALT KAISERSLAUTERN AG	4924	Utilities	€29.00
226	AS CREATION TAPETEN AG	2670	Basic Materials	€28.00
227	BKN INTERNATIONAL AG	7812	Consumer Staples	€26.00
228	TRANSTEC AG	3570	Technology	€25.00
229	VARETIS AG	7370	Technology	€24.00
230	SINN AG	5311	Consumer-Cyclical	€23.00
231	WET AUTOMOTIVE SYSTEMS AG	3714	Consumer-Cyclical	€23.00
232	HINDRICHS-AUFFERMANN AG	3711	Consumer-Cyclical	€22.00
233	BHS TABLETOP AG	3260	Consumer-Cyclical	€21.00
234	MUK-MARKT- & KUHLLHALLEN AG	4220	Transportation	€20.00
235	PC-WARE INFO TECHNOLOGIES AG	7371	Technology	€19.00
236	INNOTECH TSS AG	3089	Consumer Staples	€18.00
237	TECIS HOLDING AG	6799	Financials	€18.00
238	EINHELL (HANS) AG	3500	Capital Goods	€18.00
239	R STAHL AG	3530	Capital Goods	€18.00
240	OTTO STUMPF AG	5122	Consumer Staples	€18.00
241	SINNER AG	6512	Consumer-Cyclical	€17.00
242	CENIT AG SYSTEMHAUS	7373	Technology	€17.00
243	JENOPTIK AG	1540	Capital Goods	€17.00
244	SCHMALBACH-LUBECA AG	2650	Basic Materials	€16.00
245	ELMOS SEMICONDUCTOR AG	3674	Technology	€16.00
246	HEINRICH INDUS- & HANDELS-AG	3613	Capital Goods	€16.00
247	WURTTEMBERGIS HYPOTHEKENBANK	6029	Financials	€15.00
248	BIODATA INFORMATION TECH AG	7373	Technology	€15.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
249	BIEN-HAUS AG	1520	Consumer-Cyclical	€14.00
250	CENTROTEC HOCHLEISTUNGKUNST	3080	Capital Goods	€13.00
251	LOEWE AG	3651	Capital Goods	€13.00
252	NOVASOFT AG	7373	Technology	€13.00
253	GILDE BRAUEREI AG	2082	Consumer Staples	€12.00
254	OTAVI MINEN AG	3290	Consumer-Cyclical	€12.00
255	LPKF-LASER & ELECTRONICS AG	3690	Capital Goods	€11.00
256	HUNZINGER INFORMATION AG	8700	Capital Goods	€11.00
257	SCHLEICHER & CO INTERNATIONL	3579	Capital Goods	€11.00
258	VEREINTE VERSICHERUNG AG	6300	Financials	€10.00
259	STADA ARZNEIMITTEL AG	2834	Healthcare	€9.00
260	VGT AG	3559	Capital Goods	€9.00
261	BARMAG AG	3550	Capital Goods	€8.00
262	MAUSER WALDECK AG	2522	Capital Goods	€8.00
263	DATA MODUL AG	3674	Technology	€8.00
264	CEYONIQ AG	7373	Technology	€7.00
265	PC-SPEZIALIST FRANCHISE AG	7380	Consumer-Cyclical	€7.00
266	COMPUTERLINKS AG	7370	Technology	€6.00
267	DEUTSCHE HYP-DEUT HYP FR-HAM	6029	Financials	€6.00
268	IN-MOTION AG	7841	Consumer Staples	€6.00
269	SOFTLINE AG	5045	Technology	€4.00
270	TDS INFORMATIONSTECHNOLOGIE	7373	Technology	€4.00
271	TTL INFORMATION TECHNOLOGY	7373	Technology	€4.00
272	AC-SERVICE AG	7373	Technology	€4.00
273	PLAMBECK NEUE ENERGIEN AG	4911	Utilities	€4.00
274	PANDATEL AG	3357	Basic Materials	€3.00
275	CREATON AG	3250	Consumer-Cyclical	€2.00
276	VCL FILM & MEDIEN AG	7822	Consumer Staples	€2.00
277	EIFELHOHEN KLINIK AG	8060	Healthcare	€1.00
278	INTERENTAINMENT AG	7829	Consumer Staples	€1.00
279	NEMETSCHKE AG	7372	Technology	€1.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
280	ANALYTIK JENA AG	3826	Technology	€0.00
281	CE CONSUMER ELECTRONIC AG	5065	Capital Goods	€-1.00
282	ALEXANDERWERK AG	3559	Capital Goods	€-1.00
283	PIPER GENERALVERTRET DEUTSCH	3724	Capital Goods	€-1.00
284	PLENUM AG	8742	Consumer-Cyclical	€-1.00
285	MD BAU HOLDING AG	2430	Basic Materials	€-2.00
286	SARTORIUS AG	3821	Technology	€-2.00
287	HELKON MEDIA AG	7812	Consumer Staples	€-3.00
288	SYSTEMATICS AG	7370	Technology	€-3.00
289	HERZOG TELECOM AG	4812	Communication	€-3.00
290	ACTRIS AG	2082	Consumer Staples	€-3.00
291	VOGELE (JOSEPH) AG	3531	Capital Goods	€-4.00
292	ENDEMANN INTERNET AG	7311	Consumer-Cyclical	€-4.00
293	MCS SYSTEME AG	7373	Technology	€-4.00
294	ADVA AG OPTICAL NETWORKING	3674	Technology	€-5.00
295	SCHWALBCHEN MOLKEREI	2020	Consumer Staples	€-5.00
296	TUCHER BRAU AG	6510	Consumer-Cyclical	€-5.00
297	SIBRA BETEILIGUNG AG	6510	Consumer-Cyclical	€-6.00
298	DEAG-DEUTSCHE ENTERTAINMENT	7900	Consumer Staples	€-7.00
299	SCHLOTT SEBALDUS	2700	Consumer-Cyclical	€-7.00
300	EASY SOFTWARE AG	7372	Technology	€-7.00
301	MARSEILLE-KLINIKEN AG	8060	Healthcare	€-8.00
302	JETTER AG	3822	Technology	€-8.00
303	MAINZER AKTIEN BIERBRAUEREI	6512	Consumer-Cyclical	€-8.00
304	UTIMACO SAFEWARE AG	7370	Technology	€-9.00
305	AMADEUS AG SOLUTION PROVIDER	7361	Consumer Staples	€-9.00
306	DEUTSCHE INDUSTRIEBANK	6159	Financials	€-9.00
307	BIT BY BIT SOFTWARE AG	7374	Technology	€-10.00
308	MENSCH & MASCHINE SOFTWARE	5045	Technology	€-10.00
309	STELCON AG	3272	Consumer-Cyclical	€-10.00
310	CEOTRONICS AG	3669	Technology	€-10.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
311	LIPRO AG LOGISTIK & INFO	7373	Technology	€-11.00
312	RINOL AG	2821	Basic Materials	€-11.00
313	REALTECH AG	7373	Technology	€-12.00
314	DOLERIT-BASALT AG	6510	Consumer-Cyclical	€-12.00
315	TELES AG INFORMATIONSTECHNOL	3669	Technology	€-12.00
316	KUPFERBERG (CA) & CIE KGAA	2084	Consumer Staples	€-13.00
317	SIXT AG	7510	Consumer-Cyclical	€-13.00
318	ACG AG INFORMATIONSSYSTEMS	3674	Technology	€-13.00
319	CANCOM IT SYSTEME AG	7370	Technology	€-13.00
320	VK MUHLEN AG	2040	Consumer Staples	€-14.00
321	TURBON AG	3577	Technology	€-15.00
322	SHS INFORMATIONSSYSTEME AG	7371	Technology	€-17.00
323	MANAGEMENT DATA MEDIA SYSTMS	8742	Consumer-Cyclical	€-17.00
324	DIERIG HOLDING AG	6799	Financials	€-17.00
325	DORTMUNDER ACTIEN-BRAUEREI	2082	Consumer Staples	€-18.00
326	DEUTSCHE BALATON BROKER HLDG	6211	Financials	€-18.00
327	KEMPINSKI AG	7011	Consumer-Cyclical	€-18.00
328	KAP-BETEILIGUNGS-AG	2200	Consumer-Cyclical	€-18.00
329	TISCON AG INFOSYSTEMS	7373	Technology	€-18.00
330	BRAINPOOL TV AG	7812	Consumer Staples	€-18.00
331	RUTGERS AG	2821	Basic Materials	€-19.00
332	ARXES INFORMATION DESIGN AG	5734	Consumer-Cyclical	€-19.00
333	AAP IMPLANTATE AG	3842	Healthcare	€-19.00
334	ECKERT & ZIEGLER AG	2810	Basic Materials	€-20.00
335	JUMPTEC IND COMPUTERTECHNIK	3674	Technology	€-21.00
336	POPNET INTERNET AG	7373	Technology	€-21.00
337	RTV FAMILY ENTERTAINMENT AG	7822	Consumer Staples	€-21.00
338	MOKSEL (A) AG	2011	Consumer Staples	€-21.00
339	EDSCHA AG	3714	Consumer-Cyclical	€-22.00
340	TRIA SOFTWARE AG	7370	Technology	€-22.00
341	RIETER INGOLSTADT SPINNEREIM	3550	Capital Goods	€-23.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
342	PHENOMEDIA AG	7371	Technology	€-24.00
343	SIS-SILICON SENSOR INTL AG	3829	Technology	€-24.00
344	IDS SCHEER AG	7373	Technology	€-24.00
345	HAGEN BATTERIE AG	3690	Capital Goods	€-24.00
346	COR AG INSURANCE TECHNOLOGIS	7371	Technology	€-25.00
347	TELEGATE AG	7389	Consumer-Cyclical	€-25.00
348	EHLEBRACHT AG	2510	Consumer-Cyclical	€-26.00
349	BASLER (VISION TECHNOLOGIES)	3827	Technology	€-27.00
350	TFG VENTURE CAPITAL AG & CO	6799	Financials	€-27.00
351	EUROMED AG	8062	Healthcare	€-27.00
352	DUERR AG	3560	Capital Goods	€-27.00
353	WANDERER-WERKE AG	3555	Capital Goods	€-28.00
354	COMROAD AG	3812	Capital Goods	€-28.00
355	BINTEC COMMUNICATIONS AG	4899	Communication	€-29.00
356	MB SOFTWARE AG	7373	Technology	€-29.00
357	QUANTE AG	3357	Basic Materials	€-30.00
358	CINEMEDIA FILM AG GEYER-WERK	7812	Consumer Staples	€-30.00
359	SALTUS TECHNOLOGY AG	3540	Capital Goods	€-31.00
360	NET AG	5045	Technology	€-31.00
361	SCHWEIZER ELECTRONIC AG	3613	Capital Goods	€-31.00
362	SZ TESTSYSTEME AG	3825	Technology	€-31.00
363	CYBIO AG	3826	Technology	€-32.00
364	DATASAVE AG	7370	Technology	€-33.00
365	DINO ENTERTAINMENT AG	7812	Consumer Staples	€-33.00
366	MAX HOLDING AG	3433	Capital Goods	€-34.00
367	EMPRISE MGMT CONSULTING AG	7370	Technology	€-34.00
368	CTS EVENTIM AG	7990	Consumer-Cyclical	€-34.00
369	SUESS MICROTEC AG	3679	Capital Goods	€-35.00
370	CINEMAXX AG	7830	Consumer Staples	€-36.00
371	ADVANCED MEDIEN AG	7812	Consumer Staples	€-38.00
372	JACK WHITE PRODUCTIONS AG	8900	Consumer-Cyclical	€-38.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
373	BEATE UHSE AG	5900	Consumer-Cyclical	€-38.00
374	STOHR & CO AG	2200	Consumer-Cyclical	€-40.00
375	SUNBURST MERCHANDISING AG	3990	Capital Goods	€-41.00
376	PIXELPARK AG	7371	Technology	€-42.00
377	FORIS AG	8111	Consumer-Cyclical	€-43.00
378	GEDYS INTERNET PRODUCTS AG	7373	Technology	€-44.00
379	KALI-CHEMIE AG	2810	Basic Materials	€-44.00
380	SAPPI EHINGEN AG	2600	Basic Materials	€-45.00
381	IG FARBENINDUSTRIE AG	9995	Consumer-Cyclical	€-46.00
382	OAR CONSULTING AG	7370	Technology	€-47.00
383	KSB AG	3561	Capital Goods	€-47.00
384	KAUFHALLE AG	6512	Consumer-Cyclical	€-48.00
385	JUNGHEINRICH AG	3537	Capital Goods	€-49.00
386	KOGEL FAHRZEUGWERKE AG	3713	Capital Goods	€-49.00
387	ALNO AG	2430	Basic Materials	€-49.00
388	ROSENTHAL AG	3260	Consumer-Cyclical	€-54.00
389	MOSAIC SOFTWARE AG	7370	Technology	€-54.00
390	EHW-EISEN-UND HUTTENWERKE AG	6799	Financials	€-55.00
391	MASSA AG	6512	Consumer-Cyclical	€-55.00
392	BALDA AG	3089	Consumer Staples	€-55.00
393	SECUNET SECURITY NETWORKS AG	8742	Consumer-Cyclical	€-57.00
394	SER SYSTEME AG	7372	Technology	€-58.00
395	BERENTZEN-GRUPPE AG	2085	Consumer Staples	€-58.00
396	SCHUMAG AG	3540	Capital Goods	€-58.00
397	BETA SYSTEMS SOFTWARE AG	7371	Technology	€-59.00
398	HIRSCH AG	2330	Consumer-Cyclical	€-62.00
399	WINDHOFF AG	3537	Capital Goods	€-63.00
400	DAHLBUSCH VERWALTUNGS-AG	6510	Consumer-Cyclical	€-65.00
401	BUCH.DE INTERNETSTORES AG	5961	Consumer-Cyclical	€-67.00
402	METATBOX AG	3577	Technology	€-67.00
403	SCOR DEUTSCHLAND RUCKVERSICH	6300	Financials	€-67.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
404	PRAKTIKER BAU- & HEIMWERKER	5211	Consumer-Cyclical	€-68.00
405	TRIUMPH INTERNATIONAL AG	2340	Consumer-Cyclical	€-69.00
406	NORCOM INFO TECHNOLOGY AG	7371	Technology	€-70.00
407	DIDIER-WERKE AG	3250	Consumer-Cyclical	€-71.00
408	VOEST-ALPINE STAHL AG	3310	Basic Materials	€-71.00
409	PLETTAC RODER AG	3440	Capital Goods	€-72.00
410	O&K ORENSTEIN & KOPPEL AG	3531	Capital Goods	€-72.00
411	I FAO AG	4700	Transportation	€-74.00
412	MICROLOGICA AG	7389	Consumer-Cyclical	€-75.00
413	CONSORS DISCOUNT BROKER AG	6211	Financials	€-77.00
414	DATADESIGN AG	7372	Technology	€-78.00
415	MORPHOSYS AG	8731	Healthcare	€-79.00
416	TARKETT SOMMER AG	3990	Capital Goods	€-81.00
417	PARK & BELLHEIMER AG	2082	Consumer Staples	€-82.00
418	STRABAG BAU AG	1540	Capital Goods	€-83.00
419	WWL INTERNET AG	7370	Technology	€-84.00
420	BADEN-WURTTENBERGISCHE BANK	6029	Financials	€-85.00
421	RHEINBODEN HYPOTHKBK AG	6029	Financials	€-86.00
422	DRAGERWERK AG	3841	Healthcare	€-88.00
423	ARTICON INTEGRALIS AG	7370	Technology	€-89.00
424	BIOTEST AG	2834	Healthcare	€-90.00
425	TIAG-TABBERT INDUSTRIE AG	3711	Consumer-Cyclical	€-91.00
426	INFOR BUSINESS SOLUTIONS AG	7371	Technology	€-91.00
427	BRUDER MANNESMANN AG	3540	Capital Goods	€-93.00
428	INTERNETMEDIAHOUSE.COM AG	7370	Technology	€-95.00
429	SALZGITTER AG-STAHL & TECHNO	3312	Basic Materials	€-97.00
430	ELSA AG	7373	Technology	€-98.00
431	RWK-RHEIN-WESTFAL KALKWERKE	3281	Consumer-Cyclical	€-101.00
432	SAINT-GOBAIN-ISOVER	3290	Consumer-Cyclical	€-103.00
433	HOFT & WESSEL AG	7371	Technology	€-107.00
434	GAUSS INTERPRISE AG	7370	Technology	€-109.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
435	SG HOLDING AG	5500	Consumer-Cyclical	€-112.00
436	FAG KUGELFISCHER GEORG SCHAF	3562	Capital Goods	€-112.00
437	MATERNUS-KLINIKEN AG	8051	Healthcare	€-112.00
438	TOMORROW INTERNET AG	7370	Technology	€-116.00
439	BAEURER AG	7373	Technology	€-119.00
440	LEICA CAMERA AG	3861	Technology	€-119.00
441	CONSTANTIN FILM AG	7812	Consumer Staples	€-120.00
442	ELEKTRA BECKUM AG	3550	Capital Goods	€-124.00
443	FLUXX.COM AG	7370	Technology	€-127.00
444	OTTO REICHELT AG	5411	Consumer Staples	€-132.00
445	TELDAFAX AG	4813	Communication	€-133.00
446	DYCKERHOFF & WIDMAN AG	1600	Capital Goods	€-134.00
447	MANIA TECHNOLOGIE AG	3812	Capital Goods	€-136.00
448	FLENDER (A FRIEDRICH) AG	3510	Capital Goods	€-140.00
449	CPU SOFTWAREHOUSE AG	7371	Technology	€-143.00
450	SALAMANDER AG	3140	Consumer-Cyclical	€-143.00
451	ENTRIUM DIRECT BANKERS AG	6029	Financials	€-148.00
452	ARTNET.COM AG	5900	Consumer-Cyclical	€-154.00
453	BREMER WOLL-KAMMEREI AG	2211	Consumer-Cyclical	€-156.00
454	INTERGLAS TECHNOLOGIES AG	2221	Consumer-Cyclical	€-163.00
455	BRAIN INTERNATIONAL AG	7373	Technology	€-164.00
456	NETLIFE AG	7371	Technology	€-170.00
457	WEB.DE AG	7370	Technology	€-170.00
458	PSI AG	7371	Technology	€-172.00
459	KINOWELT MEDIEN AG	7822	Consumer Staples	€-183.00
460	COMPUTEC MEDIA AG	2721	Consumer-Cyclical	€-186.00
461	EVOTEC BIOSYSTEMS AG	8731	Healthcare	€-187.00
462	FREENET.DE AG	7373	Technology	€-210.00
463	DEUTSCHE SIEDLUNGS LAND	6159	Financials	€-224.00
464	DURKOPP ADLER AG	3559	Capital Goods	€-227.00
465	NSE SOFTWARE AG	7371	Technology	€-228.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
466	BHF BANK AG	6029	Financials	€-230.00
467	RHEINMETALL BERLIN AG	3460	Capital Goods	€-232.00
468	DEUTZ AG	3510	Capital Goods	€-241.00
469	NECKARWERKE STUTTGART AG	4911	Utilities	€-259.00
470	INTERSHOP COMMUNICATIONS AG	7371	Technology	€-268.00
471	HUCKE AG	2300	Consumer-Cyclical	€-269.00
472	CARGOLIFTER AG	4731	Transportation	€-271.00
473	WUNSCH AG	2300	Consumer-Cyclical	€-271.00
474	SCA HYGIENE PRODUCTS AG	2670	Basic Materials	€-277.00
475	EDEL MUSIC AG	7389	Consumer-Cyclical	€-283.00
476	UNITED INTERNET AG	7373	Technology	€-297.00
477	KULMBACHER REICHELBRAU AG	2082	Consumer Staples	€-302.00
478	DIREKT ANLAGE BANK AG	6211	Financials	€-308.00
479	GEA AG	3823	Technology	€-318.00
480	SCHNEIDER RUNDfunkWERKE AG	3651	Capital Goods	€-331.00
481	BILFINGER UND BERGER BAU AG	1500	Capital Goods	€-334.00
482	INFOMATEC INTG INFO SYSTEM	7371	Technology	€-343.00
483	JAGENBERG AG	3550	Capital Goods	€-349.00
484	BROKAT AG	7373	Technology	€-366.00
485	SCHWARZ PHARMA AG	2834	Healthcare	€-370.00
486	MOENUS TEXTILMASCHINEN AG	3550	Capital Goods	€-395.00
487	FORTUNECITY.COM INC	7370	Technology	€-413.00
488	GLUNZ AG	2430	Basic Materials	€-426.00
489	EM TV & MERCHANDISING AG	4833	Consumer Staples	€-442.00
490	LINDE AG	3537	Capital Goods	€-457.00
491	GRAMMER AG	2531	Capital Goods	€-468.00
492	BHW HOLDING AG	6029	Financials	€-523.00
493	FPB HOLDING	2621	Basic Materials	€-558.00
494	CONTIGAS-DEUTSCHE ENERGIE AG	4911	Utilities	€-594.00
495	TIPTTEL AG	3661	Technology	€-624.00
496	WUSTENROT & WURTTEMBERG AG	6029	Financials	€-642.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
497	SCHALTBAU HOLDING AG	3560	Capital Goods	€-657.00
498	ADCAPITAL AG	3669	Technology	€-716.00
499	PRIMACOM AG	4841	Consumer Staples	€-719.00
500	BRAU UND BRUNNEN AG	2082	Consumer Staples	€-739.00
501	SGL CARBON GROUP	3620	Capital Goods	€-831.00
502	HERLITZ AG	5110	Basic Materials	€-892.00
503	WALTER BAU AG	1540	Capital Goods	€-935.00
504	KOLNISCHE RUCKVERSICHERUNG	6331	Financials	€-1,025.00
505	KAMPS AG	5400	Consumer Staples	€-1,070.00
506	ALCATEL SEL-STAN ELEK LORENZ	3661	Technology	€-1,125.00
507	ALLIANZ AG	6331	Financials	€-1,311.00
508	DRESDNER BANK AG	6029	Financials	€-1,331.00
509	COMMERZBANK	6029	Financials	€-1,351.00
510	GERLING-KONZERN ALLG VERSICH	6300	Financials	€-1,643.00
511	SPAR HANDELS AG	5411	Consumer Staples	€-2,003.00
512	KAUFRING AG	5130	Consumer-Cyclical	€-2,070.00
513	PLETTAC AG	5082	Capital Goods	€-2,157.00
514	BANKGESELLSCHAFT BERLIN AG	6029	Financials	€-2,301.00
515	INFINEON TECHNOLOGIES AG	3674	Technology	€-2,842.00
516	THYSSENKRUPP AG	3300	Basic Materials	€-3,732.00
517	FORD-WERKE AG	3711	Consumer-Cyclical	€-5,095.00
518	FRESENIUS MEDICAL CARE AG	8090	Healthcare	€-5,188.00
519	MUENCHENER RUECKVERSICH	6311	Financials	€-5,508.00
520	HOECHST AG	2834	Healthcare	€-6,026.00
521	CELANESE AG	2890	Basic Materials	€-9,559.00
522	BAYERISCHE HYPO- & VEREINSBK	6029	Financials	€-9,654.00
523	DEUTSCHE TELEKOM	4810	Communication	€-16,915.00
524	PHILIPP HOLZMANN AG	1600	Capital Goods	€-17,590.00
525	MANNESMANN AG	3500	Capital Goods	€-20,440.00
Total Knowledge Capital®				€48,359.00

Appendix B: Valuation of Knowledge Capital[®] Rankings by Country

Irish Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	ALLIED IRISH BANKS	6029	Financials	€2,154.00
2	BANK OF IRELAND	6029	Financials	€1,057.00
3	IRISH LIFE & PERMANENT PLC	6311	Financials	€646.00
4	CRH PLC	3241	Basic Materials	€301.00
5	FYFFES PLC	5140	Consumer Staples	€194.00
6	ELAN CORP PLC	2834	Healthcare	€163.00
7	KERRY GROUP PLC	2090	Consumer Staples	€119.00
8	ANGLO IRISH BANK	6029	Financials	€104.00
9	ARNOTTS PLC	5311	Consumer-Cyclical	€101.00
10	INDEPENDENT NEWS & MEDIA PLC	2711	Consumer-Cyclical	€91.00
11	WATERFORD WEDGWOOD PLC	3260	Consumer-Cyclical	€74.00
12	ROBERT WISEMAN DAIRIES PLC	2020	Consumer Staples	€73.00
13	IAWS GROUP PLC	2040	Consumer Staples	€70.00
14	DCC PLC	7370	Technology	€58.00
15	GRAFTON GROUP PLC	5030	Consumer-Cyclical	€52.00
16	RYANAIR HOLDINGS PLC	4512	Transportation	€46.00
17	GREENCORE GROUP PLC	2060	Consumer Staples	€45.00
18	DUNLOE EWART PLC	1531	Consumer-Cyclical	€43.00
19	IRISH CONTINENTAL GROUP PLC	4400	Transportation	€35.00
20	KINGSPAN GROUP PLC	3448	Consumer-Cyclical	€31.00
21	ARDAGH PLC	3221	Capital Goods	€30.00
22	GOLDEN VALE PLC	2020	Consumer Staples	€29.00
23	ABBAY PLC	1531	Consumer-Cyclical	€29.00
24	OGLESBY & BUTLER GROUP PLC	3540	Capital Goods	€26.00
25	UNITED DRUG PLC	5122	Consumer Staples	€20.00
26	READYMIX PLC	3270	Consumer-Cyclical	€20.00
27	BARLO GROUP PLC	3081	Capital Goods	€16.00
28	JURYS DOYLE HOTEL GROUP PLC	7011	Consumer-Cyclical	€11.00
29	MARLBOROUGH INTERNATIONL PLC	7361	Consumer Staples	€9.00
30	HEITON HOLDINGS PLC	5030	Consumer-Cyclical	€6.00
31	NORISH PLC	4220	Transportation	€5.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	IWP INTERNATIONAL PLC	2840	Consumer Staples	€4.00
33	RYAN HOTELS PLC	7011	Consumer-Cyclical	€3.00
34	UNIDARE PLC	5084	Capital Goods	€3.00
35	REFLEX GROUP PLC	7370	Technology	€1.00
36	RAPID TECHNOLOGY GROUP PLC	3577	Technology	€-1.00
37	CELTIC RESOURCES HLDGS PLC	1000	Basic Materials	€-1.00
38	BULA RESOURCES (HLDGS) PLC	1311	Energy	€-3.00
39	MINMET PLC	1040	Basic Materials	€-3.00
40	TUSKAR RESOURCES PLC	1311	Energy	€-4.00
41	ARCON INTL RESOURCES PLC	1000	Basic Materials	€-5.00
42	AMINEX PLC	1311	Energy	€-11.00
43	JAMES CREAN PLC	2030	Consumer Staples	€-14.00
44	FBD HOLDINGS	6331	Financials	€-16.00
45	VISLINK PLC	3674	Technology	€-22.00
46	DRAGON OIL PLC	1311	Energy	€-23.00
47	KENMARE RESOURCES PLC	1400	Basic Materials	€-28.00
48	GREEN PROPERTY PLC	6512	Consumer-Cyclical	€-36.00
49	JEFFERSON SMURFIT GROUP PLC	2631	Basic Materials	€-50.00
50	TULLOW OIL PLC	1311	Energy	€-57.00
51	GLANBIA PLC	2020	Consumer Staples	€-64.00
52	GLENCAR MINING PLC	1000	Basic Materials	€-361.00
Total Knowledge Capital®				€4,970.00

Appendix B: Valuation of Knowledge Capital® Rankings by Country

Italian Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	OLIVETTI SPA	4810	Communication	€49,957.00
2	ENI-ENTE NAZIONALE IDROCAR	2911	Energy	€18,538.00
3	TIM-TELECOM ITALIA MOBILE	4812	Communication	€16,430.00
4	ENEL SPA	4911	Utilities	€12,673.00
5	UNICREDITO ITALIANO SPA	6029	Financials	€7,582.00
6	SAN PAOLO-IMI SPA	6029	Financials	€5,795.00
7	ASSICURAZIONI GENERALI SPA	6331	Financials	€4,339.00
8	ROLO BANCA 1473 SPA	6029	Financials	€4,274.00
9	TELECOM ITALIA SPA-NEW	4810	Communication	€3,301.00
10	BIPOP-CARIRE SPA	6029	Financials	€2,616.00
11	MEDIASET SPA	4833	Consumer Staples	€2,467.00
12	BANCA MONTE DEI PASCHI SIENA	6029	Financials	€2,209.00
13	ALLEANZA ASSICURAZIONI	6311	Financials	€2,202.00
14	AUTOSTRAD SPA	4700	Transportation	€1,767.00
15	BNL-BANCA NAZIONALE LAVORO	6029	Financials	€1,734.00
16	PIRELLI SPA	3357	Basic Materials	€1,318.00
17	RAS RIUNIONE ADRIATICA SICUR	6331	Financials	€1,315.00
18	SEAT PAGINE GIALLE SPA	7310	Consumer-Cyclical	€1,255.00
19	BENETTON GROUP SPA	2300	Consumer-Cyclical	€1,213.00
20	EDISON SPA	4911	Utilities	€1,206.00
21	BANCA FIDEURAM SPA	6029	Financials	€1,130.00
22	BUZZI UNICEM SPA	3241	Basic Materials	€836.00
23	BANCA LOMBARDA PIEMONTESE	6029	Financials	€815.00
24	BANCA POPOLARE DI BERGAMO	6029	Financials	€793.00
25	MEDIOLANUM SPA	6311	Financials	€737.00
26	BANCA POPOLARE DI MILANO	6029	Financials	€710.00
27	IST FIN ITALIA LANIERO	2621	Basic Materials	€680.00
28	PARMALAT FINANZIARIA SPA	2020	Consumer Staples	€610.00
29	BANCA POPOLARE EMIL ROMAGNA	6029	Financials	€599.00
30	BULGARI SPA	3910	Consumer-Cyclical	€588.00
31	CREDITO BERGAMASCO SPA	6029	Financials	€579.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	ARNOLDO MONDADORI EDITORE SP	2721	Consumer-Cyclical	€575.00
33	FALCK SPA	4911	Utilities	€565.00
34	SONDEL-SOC NORDELETTRICA	4911	Utilities	€555.00
35	BANCO DI NAPOLI	6029	Financials	€533.00
36	SAFILO SPA	3851	Healthcare	€424.00
37	ITALGAS GROUP	4932	Utilities	€412.00
38	MILANO ASSICURAZIONI	6331	Financials	€407.00
39	ASTM-AUTOSTADA TORINO-MILANO	4700	Transportation	€371.00
40	AEM SPA	4923	Utilities	€354.00
41	LOCAT SPA	6172	Financials	€345.00
42	SIMINT SPA	2300	Consumer-Cyclical	€342.00
43	GEWISS SPA	3612	Capital Goods	€290.00
44	MARZOTTO & FIGLI SPA-MANIFAT	2300	Consumer-Cyclical	€258.00
45	VIANINI LAVORI SPA	1600	Capital Goods	€258.00
46	COFIDE-CO FINANZ DE BENEDETT	2721	Consumer-Cyclical	€246.00
47	INDUSTRIE ZIGNAGO S MARGHERI	3220	Capital Goods	€234.00
48	INTERBANCA SPA	6029	Financials	€234.00
49	GRUPPO EDITORIALE L'ESPRESSO	2700	Consumer-Cyclical	€222.00
50	BANCA POPOLARE DI VERONA	6029	Financials	€208.00
51	ITTIERRE HOLDING SPA	2300	Consumer-Cyclical	€194.00
52	PIRELLI & CO	3357	Basic Materials	€191.00
53	ACEA SPA	4911	Utilities	€169.00
54	IMA-INDUSTR MACCHINE AUTOMAT	3560	Capital Goods	€162.00
55	SAIPEM SPA	8711	Capital Goods	€155.00
56	BANCA AGRICOLA MANTOVANA	6029	Financials	€145.00
57	BANCO INTESA SPA	6029	Financials	€145.00
58	POLIGRAFICI EDITORIALE SPA	2711	Consumer-Cyclical	€136.00
59	BREMBO SPA	3714	Consumer-Cyclical	€135.00
60	RENO DE MEDICI SPA	2621	Basic Materials	€134.00
61	BANCA POPOLARE DI INTRA	6029	Financials	€129.00
62	INTERPUMP GROUP SPA	3580	Capital Goods	€125.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	CEMENTIR	3241	Basic Materials	€121.00
64	SAI SOC ASSICURATRICE INDUST	6331	Financials	€120.00
65	ATTIVITA INVEST PROMOZ IMMOB	6531	Consumer-Cyclical	€118.00
66	SAIAG SPA	3050	Capital Goods	€114.00
67	CLASS EDITORI SPA	2721	Consumer-Cyclical	€112.00
68	INA-ISTITUTO NAZ ASSICURAZ	6311	Financials	€110.00
69	AUTOGRILL SPA	5812	Consumer Staples	€109.00
70	BANCA POPOLARE DI SONDRIO	6029	Financials	€91.00
71	BONAPARTE SPA	6532	Consumer-Cyclical	€88.00
72	MONRIF SPA	2711	Consumer-Cyclical	€87.00
73	BASSETTI SPA	2200	Consumer-Cyclical	€87.00
74	SAVINO DEL BENE SPA	4412	Transportation	€82.00
75	ALLIANZ SUBALPINA SPA	6331	Financials	€81.00
76	IMMOBILIARE METANOPOLI	6512	Consumer-Cyclical	€71.00
77	JOLLY HOTELS SPA	7011	Consumer-Cyclical	€71.00
78	MERLONI ELETTRODOMESTICI	3630	Consumer-Cyclical	€70.00
79	RECORDATI SPA	2834	Healthcare	€69.00
80	LA DORIA SPA	2033	Consumer Staples	€66.00
81	AZIENDA MEDITERRANEA GAS ACQ	4900	Utilities	€58.00
82	CALP-CRISTALLER ART LA PIANA	3220	Capital Goods	€54.00
83	BANCA DI ROMA	6029	Financials	€54.00
84	DANIELI SPA	3540	Capital Goods	€53.00
85	CARRARO SPA	3460	Capital Goods	€46.00
86	SIRTI SPA	1600	Capital Goods	€37.00
87	CALTAGIRONE SPA	1600	Capital Goods	€36.00
88	ZUCCHI SPA	2390	Consumer-Cyclical	€35.00
89	VITTORIA ASSICURAZIONI	6331	Financials	€29.00
90	GEN IND METALLURGICHE SPA	3350	Capital Goods	€28.00
91	BOERO BARTOLOMEO SPA	2851	Consumer-Cyclical	€24.00
92	TARGHETTI SANKEY SPA	3640	Capital Goods	€23.00
93	BANCA POPOLARE DI SPOLETO	6029	Financials	€20.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	SAES GETTERS SPA	2810	Basic Materials	€17.00
95	SMI-SOCIETA METALLURGICA	3350	Capital Goods	€15.00
96	ACQUEDOTTO FERRARI GALLIERA	4941	Utilities	€15.00
97	CREDEM-CREDITO EMILIANO SPA	6029	Financials	€14.00
98	CSP INTL INDUSTRIA CALZE SPA	2250	Consumer-Cyclical	€14.00
99	ESAOTE SPA	3845	Healthcare	€14.00
100	BONIFICA DEI TERRENI FERRARE	100	Basic Materials	€12.00
101	SOGEFI SPA	3714	Consumer-Cyclical	€12.00
102	COATS CUCIRINI SPA	2200	Consumer-Cyclical	€11.00
103	BANCO DI CHIAVARI	6029	Financials	€9.00
104	PININFARINA SPA	3711	Consumer-Cyclical	€8.00
105	ACQUEDOTTO NICOLAY SPA	4941	Utilities	€6.00
106	MITTEL SOCIETA INDUSTR SPA	6159	Financials	€6.00
107	MARANGONI SPA	3011	Consumer-Cyclical	€6.00
108	BANCA POPOLARE LUINO VARESE	6029	Financials	€1.00
109	SCHIAPPARELLI 1824 SPA	2834	Healthcare	€1.00
110	MAFFEI SPA	1400	Basic Materials	€-2.00
111	GABETTI HOLDINGS SPA	6500	Consumer-Cyclical	€-3.00
112	CREDITO VALTELLINESE	6029	Financials	€-5.00
113	CREMONINI SPA	2013	Consumer Staples	€-6.00
114	IRCE SPA	3330	Capital Goods	€-7.00
115	GILDEMEISTER ITALIANA SPA	3541	Capital Goods	€-8.00
116	TERME DEMANIALI DI ACQU	2086	Consumer Staples	€-12.00
117	NECCHI SPA	3500	Capital Goods	€-15.00
118	AEDES (LIG LOMB IMPRES)	6552	Consumer-Cyclical	€-15.00
119	BANCA POPOLARE DI CREMA	6029	Financials	€-15.00
120	DUCATI MOTOR HOLDING SPA	3751	Consumer-Cyclical	€-16.00
121	LINIFICIO CANAPIFICIO NAZION	2200	Consumer-Cyclical	€-16.00
122	GARBOLI-REP SPA	1540	Capital Goods	€-17.00
123	ACQUE POTABILI SPA	4941	Utilities	€-17.00
124	ARQUATI SPA	2390	Consumer-Cyclical	€-22.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
125	PERLIER SPA	2844	Consumer Staples	€-23.00
126	FINARTE CASA D'ASTE SPA	5990	Consumer-Cyclical	€-25.00
127	SMURFIT SISA SPA	2670	Basic Materials	€-30.00
128	PAGNOSSIN SPA	3260	Consumer-Cyclical	€-30.00
129	STAYER SPA	3540	Capital Goods	€-31.00
130	PREMAFIN FINANZIARIA SPA	6331	Financials	€-33.00
131	UNIMED – CEMENTERI MEDITERAN	3241	Basic Materials	€-34.00
132	CRESPI (GIOVANNI) SPA	2820	Basic Materials	€-37.00
133	BANCO DESIO DELLA BRIANZA	6029	Financials	€-38.00
134	BCA POPOLARE COMMERCIO IND	6029	Financials	€-40.00
135	CAM FINANZIARIA SPA	2911	Energy	€-40.00
136	CIR-COMPAGNIE INDUSTRI	2721	Consumer-Cyclical	€-45.00
137	GRUPPO CERAMICHE RICCHETTI	3250	Consumer-Cyclical	€-55.00
138	ERICSSON SPA	3663	Technology	€-64.00
139	FERROVIE NORD MILANO SPA	4011	Transportation	€-67.00
140	BANCA DI LEGNANO	6029	Financials	€-82.00
141	BANCA POPOLARE DI LODI SCARL	6029	Financials	€-84.00
142	ACQUA PIA ANTICA MARCIA	6552	Consumer-Cyclical	€-97.00
143	MANULI RUBBER INDUSTRIES SPA	3490	Capital Goods	€-114.00
144	BANCA POPOLARE DI CREMONA	6029	Financials	€-117.00
145	BASTOGI SPA	4220	Transportation	€-123.00
146	ITALIANA ASSICURAZIONI SPA	6331	Financials	€-125.00
147	SNAI SPA	7948	Consumer-Cyclical	€-127.00
148	ITALCEMENTI SPA	3241	Basic Materials	€-133.00
149	SOPAF SPA	6799	Financials	€-133.00
150	ERG SPA	2911	Energy	€-134.00
151	UNIPOL	6331	Financials	€-140.00
152	BRIOSCHI FINANZIARIA	6510	Consumer-Cyclical	€-149.00
153	BANCA POPOLARE ETRURIA LAZIO	6029	Financials	€-154.00
154	BANCA TOSCANA	6029	Financials	€-154.00
155	ITALMOBILIARE SPA	3270	Consumer-Cyclical	€-173.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
156	ANSALDO TRASPORTI SPA	3600	Capital Goods	€-189.00
157	PREMUDA SPA	4412	Transportation	€-191.00
158	BEGHELLI SPA	3640	Capital Goods	€-206.00
159	TISCALI SPA	4810	Communication	€-209.00
160	GEMINA	6799	Financials	€-220.00
161	OLCESE SPA	2200	Consumer-Cyclical	€-253.00
162	ISTITUTO FINANZIARIO INDUSTRI	3700	Capital Goods	€-283.00
163	IMPREGILO SPA	1600	Capital Goods	€-323.00
164	MONTEFIBRE	2200	Consumer-Cyclical	€-342.00
165	RINASCENTE (LA) SPA	5411	Consumer Staples	€-373.00
166	RATTI SPA	2200	Consumer-Cyclical	€-439.00
167	BANCO DI SARDEGNA	6029	Financials	€-443.00
168	BANCA CARIGE SPA GEN & IMPER	6029	Financials	€-504.00
169	SNIA SPA	2800	Basic Materials	€-536.00
170	BANCA COMMERCIALE ITALIANA	6029	Financials	€-552.00
171	DALMINE SPA	3317	Basic Materials	€-563.00
172	HPI-HOLDING PART INDUSTRIALI	2300	Consumer-Cyclical	€-766.00
173	MEDIOBANCA SPA	6029	Financials	€-994.00
174	BANCA POPOLARE DI NOVARA	6029	Financials	€-1,309.00
175	MONTEDISON SPA – NEW	100	Basic Materials	€-1,511.00
176	ALITALIA SPA	4512	Transportation	€-1,646.00
177	FINMECCANICA SPA	3721	Capital Goods	€-1,835.00
178	FIAT SPA	3711	Consumer-Cyclical	€-8,267.00
			Total Knowledge Capital®	€136,482.00

Appendix B: Valuation of Knowledge Capital[®] Rankings by Country

Norwegian Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	STOREBRAND ASA	6331	Financials	€4,575.00
2	GJENSIDIGE NOR SPAREBANK	6029	Financials	€1,698.00
3	DNB HOLDING ASA	6029	Financials	€1,226.00
4	ELKEM GROUP A/S	3300	Basic Materials	€648.00
5	HAFSLUND ASA	4911	Utilities	€548.00
6	ARENDALS FOSSEKOMPANI ASA	3612	Capital Goods	€522.00
7	NORSKE SKOGINDUSTRIER A/S	2621	Basic Materials	€504.00
8	ORKLA ASA	2030	Consumer Staples	€442.00
9	SMEDVIG A/S	1389	Energy	€272.00
10	ACTINOR SHIPPING	4400	Transportation	€259.00
11	ELTEK ASA	3620	Capital Goods	€227.00
12	TOMRA SYSTEMS A/S	3580	Capital Goods	€225.00
13	RIEBER & SON AS	2030	Consumer Staples	€223.00
14	NORLANDSBANKEN ASA	6029	Financials	€219.00
15	SOLSTAD OFFSHORE ASA	3730	Transportation	€205.00
16	SPAREBANKEN NORD NORGE	6029	Financials	€186.00
17	MERKANTILDATA AS	7370	Technology	€183.00
18	EKORNES ASA	2510	Consumer-Cyclical	€172.00
19	VEIDEKKE A/S	1500	Capital Goods	€149.00
20	KONGSBERG GRUPPEN ASA	3812	Capital Goods	€139.00
21	BOLIG-OG NAERINGSBANKEN ASA	6029	Financials	€121.00
22	NERA AS	3663	Technology	€113.00
23	RAUFOSS ASA	3490	Capital Goods	€94.00
24	PAN FISH ASA	900	Consumer Staples	€94.00
25	RICA HOTELS ASA	7011	Consumer-Cyclical	€84.00
26	NORSK VEKST ASA	6799	Financials	€75.00
27	CHOICE HOTELS SCANDINAVIA	7011	Consumer-Cyclical	€72.00
28	TGS-NOPEC GEOPHYSICAL CO ASA	8700	Capital Goods	€67.00
29	OLAV THON EIENDOMSSELSKAP	6512	Consumer-Cyclical	€60.00
30	P4 RADIO HELE NORG ASA	4832	Consumer Staples	€58.00
31	SPCS-GRUPPEN ASA	7371	Technology	€50.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	VMETRO ASA	3674	Technology	€48.00
33	WINDER ASA	2200	Consumer-Cyclical	€47.00
34	NARVESEN ASA	5331	Consumer-Cyclical	€47.00
35	OTRUM ELECTRONICS AS	3679	Capital Goods	€42.00
36	HYDRALIFT ASA	3510	Capital Goods	€34.00
37	GYLDENDAL ASA	2731	Consumer-Cyclical	€11.00
38	STAVANGER AFTENBLAD ASA	2721	Consumer-Cyclical	€9.00
39	HAG ASA	2520	Capital Goods	€8.00
40	VISMA ASA	7371	Technology	€5.00
41	ASKIA INVEST ASA	6211	Financials	€5.00
42	JOTUL ASA	3433	Capital Goods	€3.00
43	SKIENS AKTIEMOLLE ASA	6799	Financials	€3.00
44	WICOM ASA	7370	Technology	€2.00
45	NOMADIC SHIPPING ASA	4400	Transportation	€2.00
46	SOFTWARE INNOVATION ASA	7373	Technology	€2.00
47	IGROUP NO AS	7371	Technology	€-4.00
48	KRISTIANSAND DYREPARK ASA	7996	Consumer Staples	€-8.00
49	EVERCOM NETWORK ASA	3571	Technology	€-9.00
50	AWILCO ASA	1311	Energy	€-12.00
51	KENOR ASA	1040	Basic Materials	€-13.00
52	NORMAN ASA	7371	Technology	€-15.00
53	SAS NORGE ASA	6799	Financials	€-17.00
54	HARDANGER SUNNHORDLANDSKE	4400	Transportation	€-21.00
55	ADRESSEAVISEN ASA	2721	Consumer-Cyclical	€-21.00
56	WILH WILHELMSSEN ASA	4412	Transportation	€-24.00
57	MOELVEN INDUSTRIER ASA	2400	Basic Materials	€-25.00
58	FESIL ASA	3300	Basic Materials	€-26.00
59	SOLVANG ASA	4412	Transportation	€-28.00
60	TANDBERG AS	3661	Technology	€-33.00
61	FARSTAD SHIPPING ASA	4412	Transportation	€-35.00
62	BLOM A/S	8700	Capital Goods	€-36.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	INDUSTRIINVESTOR ASA	6799	Financials	€-41.00
64	EDB BUSINESS PARTNER ASA	7373	Technology	€-54.00
65	GRESVIG ASA	5940	Consumer-Cyclical	€-58.00
66	ALVERN ASA	7310	Consumer-Cyclical	€-68.00
67	DNO A/S	1311	Energy	€-79.00
68	KVERNELAND ASA	3523	Capital Goods	€-89.00
69	BELSHIPS ASA	4412	Transportation	€-91.00
70	SCANA INDUSTRIER ASA	3440	Capital Goods	€-93.00
71	STEEN & STROM ASA	6519	Consumer-Cyclical	€-98.00
72	OPTICOM ASA	8731	Healthcare	€-99.00
73	TANDBERG DATA ASA	3572	Technology	€-105.00
74	EIDSIVA REDERI ASA	4400	Transportation	€-107.00
75	AVANTOR AS	6500	Consumer-Cyclical	€-130.00
76	PROSAFE ASA	1311	Energy	€-132.00
77	GOODTECH ASA	1600	Capital Goods	€-135.00
78	SKAUGEN (IM) ASA	4412	Transportation	€-144.00
79	GANGER ROLF A/S	4412	Transportation	€-172.00
80	UNITOR A/S	3730	Transportation	€-194.00
81	NORTHERN OFFSHORE LTD	1311	Energy	€-219.00
82	SCHIBSTED ASA	2711	Consumer-Cyclical	€-228.00
83	WESTERN BULK SHIPPING ASA	4412	Transportation	€-239.00
84	DET SOND NORSKE DAMPSKIB	1382	Energy	€-239.00
85	BONHEUR A/S	4412	Transportation	€-256.00
86	LOKI ASA	4412	Transportation	€-264.00
87	AKER MARITIME ASA	3533	Energy	€-280.00
88	ENITEL ASA	4810	Communication	€-284.00
89	TANDBERG TELEVISION ASA	3669	Technology	€-284.00
90	ODFJELL ASA	4412	Transportation	€-294.00
91	TYBRING-GJEDDE	5311	Consumer-Cyclical	€-306.00
92	BERGESEN DY A/S	4412	Transportation	€-435.00
93	FRED OLSEN ENERGY ASA	3533	Energy	€-503.00

Norwegian Firms continued

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	OCEAN RIG ASA	3533	Energy	€-529.00
95	LEIF HOEGH & CO ASA	4412	Transportation	€-845.00
96	BRAATHENS ASA	4512	Transportation	€-1,046.00
97	PGS-PETROLEUM GEO-SERVICES	1382	Energy	€-1,550.00
98	NORSK HYDRO ASA	2870	Basic Materials	€-2,127.00
99	KVAERNER ASA	3730	Transportation	€-7,093.00
Total Knowledge Capital®				€-5,454.00

Appendix B: Valuation of Knowledge Capital® Rankings by Country

Portuguese Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	PORTUGAL TELECOM SGPS SA	4810	Communication	€6,484.00
2	BANCO COMERCIAL PORTUGUES SA	6029	Financials	€6,221.00
3	BANCO ESPIRITO SANTO SA	6029	Financials	€2,961.00
4	EDP-ELECTRICI DE PORTUGAL SA	4911	Utilities	€1,943.00
5	BRISA-AUTO-ESTRADAS PORTUGAL	1600	Capital Goods	€1,754.00
6	BPI-SGPS SA	6029	Financials	€1,511.00
7	CIMPOR-CIMENTOS DE PORTUGAL	3241	Basic Materials	€1,376.00
8	MODELO CONTINENTE SGPS SA	5399	Consumer-Cyclical	€618.00
9	SEMAPA-SOC DE INVEST GESTAO	3241	Basic Materials	€439.00
10	JERONIMO MARTINS & FILHO SA	5411	Consumer Staples	€398.00
11	CIN-CORP INDUSTRIAL NORTE SA	2890	Basic Materials	€147.00
12	CORTICEIRA AMORIM SGPS SA	2400	Basic Materials	€134.00
13	COMPTA	5045	Technology	€127.00
14	RAMADA (F) ACOS & INDUSTRIAS	3310	Basic Materials	€72.00
15	SONAE IMOBILIARIA SGPS SA	7389	Consumer-Cyclical	€62.00
16	IMOLEASING SA	6172	Financials	€61.00
17	BANIF-BANCO INTL FUNCHAL SA	6029	Financials	€57.00
18	ESTORIL-SOL SA	7990	Consumer-Cyclical	€55.00
19	MOTA-ENGIL SGPS SA	1600	Capital Goods	€49.00
20	IBERSOL SGPS SA	5810	Consumer Staples	€42.00
21	SUMOLIS SA	2086	Consumer Staples	€36.00
22	MUNDICENTER SGPS SA	1500	Capital Goods	€26.00
23	CIA DE CELULOSE DO CAIMA SA	2611	Basic Materials	€22.00
24	SOC TURISTICA DA PENINA SA	7011	Consumer-Cyclical	€-4.00
25	LAMEIRINHO	2200	Consumer-Cyclical	€-7.00
26	CIRES-COMP IND RESINAS SINTE	2821	Basic Materials	€-14.00
27	MOTA & COMPANHIA SA	1600	Capital Goods	€-24.00
28	INAPA	2621	Basic Materials	€-26.00
29	EFACEC-EMP FABRIL MAQUIN ELE	3600	Capital Goods	€-29.00
30	CTN-CIA DE TORRES NOVAS	2211	Consumer-Cyclical	€-32.00
31	SOPORCEL-SOC PORTUG CELULOSE	2621	Basic Materials	€-32.00

Portuguese Firms continued

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	SOMAGUE SGPS SA	1600	Capital Goods	€-35.00
33	BARBOSA & ALMEIDA SA	3221	Capital Goods	€-45.00
34	SONAE SGPS SA	5411	Consumer Staples	€-78.00
35	FISIPE-FIBRAS SINTETICAS PRT	2820	Basic Materials	€-137.00
36	SOARES DA COSTA SA	1500	Capital Goods	€-163.00
37	BANCO TOTTA & ACORES SA	6029	Financials	€-218.00
38	SONAE INDUSTRIA SGPS SA	2400	Basic Materials	€-226.00
39	PORTUCEL-EMPRESA PRODUTORA	2621	Basic Materials	€-229.00
Total Knowledge Capital®				€23,294.00

Appendix B: Valuation of Knowledge Capital® Rankings by Country

Spanish Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	BANCO SANTANDER CENTRAL HISP	6029	Financials	€9,678.00
2	TELEFONICA SA	4813	Communication	€8,160.00
3	ENDESA SA	4911	Utilities	€7,634.00
4	BCO BILBAO VIZCAYA ARGENTRIA	6029	Financials	€7,119.00
5	UNION ELECTRICA FENOSA SA	4911	Utilities	€4,644.00
6	BANCO POPULAR ESPANOL	6029	Financials	€3,914.00
7	GAS NATURAL SDG SA	4923	Utilities	€2,091.00
8	CEPSA-CIA ESPANOLA DE PETROL	2911	Energy	€2,004.00
9	BANCO ESP DE CREDITO	6029	Financials	€1,939.00
10	AMADEUS GLOBAL TRAVEL DISTR	7370	Technology	€1,773.00
11	CIA LOGISTICA HIDROCARBUROS	5171	Capital Goods	€1,588.00
12	IBERDROLA SA	4911	Utilities	€1,580.00
13	REPSOL YPF SA	2911	Energy	€1,473.00
14	ALTADIS SA	5190	Consumer-Cyclical	€1,437.00
15	FOMENTO DE CONSTRUC Y CONTRA	1600	Capital Goods	€1,148.00
16	CEMENTOS PORTLAND (GRUPO)	3241	Basic Materials	€994.00
17	CORP FINANCIERA ALBA	6512	Consumer-Cyclical	€966.00
18	CENTROS COMLS CARREFOUR SA	5411	Consumer Staples	€953.00
19	TELEFONICA PUBLICIDAD E INFO	2741	Consumer-Cyclical	€881.00
20	ZARDOYA OTIS SA	3530	Capital Goods	€789.00
21	BANKINTER	6029	Financials	€783.00
22	NH HOTELES SA	7000	Consumer-Cyclical	€683.00
23	ACCIONA SA	1600	Capital Goods	€644.00
24	ACERINOX SA	3312	Basic Materials	€584.00
25	BANCO PASTOR	6029	Financials	€581.00
26	AGUAS DE BARCELONA SA	4941	Utilities	€567.00
27	BANCO DE ANDALUCIA	6029	Financials	€556.00
28	SUPERDIPLO SA	5411	Consumer Staples	€521.00
29	FERROVIAL AGROMAN SA	1500	Capital Goods	€496.00
30	CIA DISTR INTEGRAL LOGISTA	5190	Consumer-Cyclical	€485.00
31	HIDROELECTRICA CANTABRICO SA	4911	Utilities	€472.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	GRUPO DRAGADOS SA	1600	Capital Goods	€448.00
33	ACTIVIDADES CONSTR Y SERVICI	1500	Capital Goods	€378.00
34	AUTOPISTAS CESA	4700	Transportation	€367.00
35	PORTLAND VALDERRIVAS SA	3241	Basic Materials	€351.00
36	BANCO ATLANTICO	6029	Financials	€344.00
37	CORTEFIEL SA	2300	Consumer-Cyclical	€320.00
38	ALDEASA SA	5900	Consumer-Cyclical	€310.00
39	INDRA SISTEMAS SA	7370	Technology	€272.00
40	BANCO ZARAGOZANO	6029	Financials	€270.00
41	FABRICA ESP DE PROD QUIMICOS	2834	Healthcare	€270.00
42	RED ELECTRICA DE ESPANA REDE	4911	Utilities	€268.00
43	UNILAND CEMENTERA SA	3241	Basic Materials	€265.00
44	TELE PIZZA SA	5812	Consumer Staples	€263.00
45	SAINT GOBAIN CRISTALERIA SA	3220	Capital Goods	€235.00
46	IBERPISTAS-IBERICA AUTOPISTA	4700	Transportation	€229.00
47	HEINEKEN ESPANA SA	2082	Consumer Staples	€223.00
48	ELECNOR SA	8711	Capital Goods	€222.00
49	PROSEGUR (CIA DE SEGURIDAD)	7381	Consumer-Cyclical	€213.00
50	EBRO PULEVA SA	2060	Consumer Staples	€213.00
51	MERCAPITAL SA	6799	Financials	€193.00
52	CATALANA OCCIDENTE SA	6331	Financials	€186.00
53	BANCO DE CASTILLA SA	6029	Financials	€174.00
54	BANCO GUIPUZCOANO	6029	Financials	€158.00
55	SOL MELIA SA	7011	Consumer-Cyclical	€146.00
56	URBIS-INMOBILIARIA SA	6552	Consumer-Cyclical	€140.00
57	VIDRALA SA	3221	Capital Goods	€139.00
58	AFORA-ACERIAS Y FORJAS DE AZ	3390	Basic Materials	€139.00
59	CEMENTOS LEMONA SA	3241	Basic Materials	€133.00
60	GRUPO URALITA SA	3260	Consumer-Cyclical	€128.00
61	METROVACESA SA	1531	Consumer-Cyclical	€124.00
62	ASTURIANA DE ZINC SA	1000	Basic Materials	€122.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	KOIKE SA	2070	Consumer Staples	€118.00
64	TESTA INMUEBLES EN RENTA SA	6552	Consumer-Cyclical	€113.00
65	BARON DE LEY SA	2084	Consumer Staples	€111.00
66	GRUPO EMPRES ENCE	2611	Basic Materials	€96.00
67	MIQUEL & COSTAS & MIQUEL SA	2621	Basic Materials	€92.00
68	BANSALIBER	6799	Financials	€78.00
69	CAMPOFRIO	2013	Consumer Staples	€77.00
70	AZKOYEN SA	3580	Capital Goods	€75.00
71	BODEGAS & BEBIDAS SA	2084	Consumer Staples	€73.00
72	VINICOLA DEL NORTE DE ESPANA	2084	Consumer Staples	€71.00
73	ABENGOA SA	8711	Capital Goods	€71.00
74	ENACO SA	5411	Consumer Staples	€58.00
75	DOGI SA	2200	Consumer-Cyclical	€58.00
76	ZELTIA SA	2833	Healthcare	€56.00
77	ADOLFO DOMINGUEZ SA	5600	Consumer-Cyclical	€55.00
78	UNION EUROPEA DE INVERSIONES	6799	Financials	€48.00
79	CORREA (NICOLAS) SA	3540	Capital Goods	€45.00
80	OMSA ALIMENTACION SA	2011	Consumer Staples	€44.00
81	LINGOTES ESPECIALES SA	3312	Basic Materials	€38.00
82	BODEGAS RIOJANAS	2084	Consumer Staples	€32.00
83	PESCANOVA SA	900	Consumer Staples	€20.00
84	FASTIBEX SA	6799	Financials	€19.00
85	TUBACEX SA-D E DE TUBOS POR	3317	Basic Materials	€18.00
86	COTOSA-HULLAS DEL COTO CORTE	1220	Basic Materials	€16.00
87	CONSTRUCCIONES Y AUXIL FERRO	3743	Transportation	€12.00
88	VISCOFAN SA	3089	Consumer Staples	€4.00
89	INBESOS SA	6552	Consumer-Cyclical	€0.00
90	VALLEHERMOSO SA	1520	Consumer-Cyclical	€0.00
91	ESPANOLA DEL ZINC SA	3350	Capital Goods	€-4.00
92	PASCUAL HERMANOS SA	100	Basic Materials	€-4.00
93	AHORRO FAMILIAR SA	6531	Consumer-Cyclical	€-5.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	SOTOGRADE SA	6531	Consumer-Cyclical	€-7.00
95	BAMI SA	6552	Consumer-Cyclical	€-8.00
96	GRUPO DURO-FELGUERA SA	8711	Capital Goods	€-9.00
97	TAVEX ALGODONERA SA	2211	Consumer-Cyclical	€-14.00
98	ENERGIA E INDUSTRI ARAGONESAS	2800	Basic Materials	€-18.00
99	PAPELES & CARTONES EUROPA SA	2611	Basic Materials	€-24.00
100	NUEVA MONTANA QUIJANO SA	4213	Transportation	€-38.00
101	FILO SA	1531	Consumer-Cyclical	€-41.00
102	RADIOTRONICA SA	1731	Capital Goods	€-49.00
103	LA SEDA DE BARCELONA SA	2800	Basic Materials	€-56.00
104	UNIPAPEL SA	2670	Basic Materials	€-64.00
105	OBRASCON HUARTE LAIN SA	1600	Capital Goods	€-70.00
106	IBERPAPPEL GESTION SA	2621	Basic Materials	€-78.00
107	ACUMULADOR TUDOR	3690	Capital Goods	€-79.00
108	AUREA CONCESIONES INFRASTRUC	4100	Transportation	€-91.00
109	CORPORACION MAPFRE	6311	Financials	€-93.00
110	AMPER SA	3661	Technology	€-99.00
111	SNIACE SA	2621	Basic Materials	€-99.00
112	ERCROS SA	2810	Basic Materials	€-117.00
113	GRUPO PICKING PACK SA	7389	Consumer-Cyclical	€-129.00
114	INDO INTERNACIONAL SA	3851	Healthcare	€-257.00
115	META4 NV	7371	Technology	€-379.00
116	EUROPISTAS CONC ESPANOLA SA	4700	Transportation	€-383.00
117	SOGECABLE SA	4833	Consumer Staples	€-544.00
118	TAFISA-TABLEROS DE FIBRAS SA	2400	Basic Materials	€-741.00
119	ACERALIA CORPOR SIDERURGICA	3312	Basic Materials	€-823.00
120	TERRA NETWORKS SA	7370	Technology	€-2,244.00
Total Knowledge Capital®				€69,314.00

Appendix B: Valuation of Knowledge Capital® Rankings by Country

Swedish Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	VOLVO AB	3713	Capital Goods	€42,138.00
2	SWEDISH MATCH AB	2100	Consumer Staples	€9,868.00
3	INVESTOR AB	6799	Financials	€8,345.00
4	SVENSKA HANDELSBANKEN	6029	Financials	€7,675.00
5	ERICSSON (LM) TEL	3661	Technology	€6,257.00
6	SKANSKA AB	1500	Capital Goods	€5,469.00
7	INDUSTRIVARDEN AB	8711	Capital Goods	€4,898.00
8	TELE2 AB	4813	Communication	€4,795.00
9	FORENINGSSPARBANK (SWEDBANK)	6029	Financials	€4,098.00
10	H & M HENNES & MAURITZ AB	5651	Consumer-Cyclical	€4,090.00
11	ELECTROLUX AB	3630	Consumer-Cyclical	€3,867.00
12	SANDVIK AB	3541	Capital Goods	€3,670.00
13	SCANIA AB	3711	Consumer-Cyclical	€3,011.00
14	SKANDIA FORSAEKRING AB	6331	Financials	€2,821.00
15	TELIA AB	4810	Communication	€2,559.00
16	SKAND ENSKILDA BANKEN	6029	Financials	€2,492.00
17	RATOS AB	6799	Financials	€2,266.00
18	SYDKRAFT AB	4911	Utilities	€1,864.00
19	LUNDBERGFÖRETAGEN (L E) AB	6513	Consumer-Cyclical	€1,754.00
20	SCA-SVENSKA CELLULOSA AB	2621	Basic Materials	€1,743.00
21	ATLAS COPCO AB	3560	Capital Goods	€1,381.00
22	WM-DATA AB	7373	Technology	€754.00
23	CUSTOS AB	6799	Financials	€745.00
24	ATLE AB	6799	Financials	€725.00
25	GETINGE INDUSTRIER AB	3842	Healthcare	€721.00
26	HOLMEN AB	2621	Basic Materials	€695.00
27	JM AB	1500	Capital Goods	€609.00
28	ASSA ABLOY AB	3420	Consumer-Cyclical	€581.00
29	HUFVUDSTADEN AB	6512	Consumer-Cyclical	€566.00
30	SECO TOOLS AB	3540	Capital Goods	€514.00
31	CARDO AB	3442	Consumer-Cyclical	€508.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	HOGANAS AB	3390	Basic Materials	€465.00
33	TRELLEBORG AB	3060	Capital Goods	€457.00
34	LATOUR INVESTMENT AB	3540	Capital Goods	€444.00
35	SAPA AB	3334	Basic Materials	€440.00
36	DROTT AB	6510	Consumer-Cyclical	€438.00
37	SECURITAS AB	7381	Consumer-Cyclical	€429.00
38	SVEDALA INDUSTRI AB	3532	Capital Goods	€396.00
39	SCANDIC HOTELS AB	7011	Consumer-Cyclical	€393.00
40	NCC AB	1500	Capital Goods	€381.00
41	CASTELLUM AB	6510	Consumer-Cyclical	€354.00
42	GRANINGE AB	4911	Utilities	€348.00
43	FINNVEDEN AB	3714	Consumer-Cyclical	€321.00
44	GAMBRO AB	8090	Healthcare	€321.00
45	OM GRUPPEN	6200	Financials	€301.00
46	PEAB AB	1500	Capital Goods	€290.00
47	SKF AB	3562	Capital Goods	€288.00
48	MANDAMUS FASTIGHETER AB	6510	Consumer-Cyclical	€263.00
49	LINDEX AB	5600	Consumer-Cyclical	€261.00
50	HQ.SE HOLDING AB	6211	Financials	€245.00
51	BERGMAN & BEVING	5080	Capital Goods	€234.00
52	SAS SVERIGE AB	6799	Financials	€231.00
53	LINDAB AB	3444	Capital Goods	€228.00
54	WALLENSTAM BYGGNADS AB	6513	Consumer-Cyclical	€217.00
55	GUNNEBO AB	3490	Capital Goods	€202.00
56	NOLATO AB	2821	Basic Materials	€172.00
57	AXFOOD AB	5411	Consumer Staples	€169.00
58	WIHLBORGS FASTIGHE AB	6513	Consumer-Cyclical	€164.00
59	ELANDERS AB	2700	Consumer-Cyclical	€150.00
60	MUNTERS AB	3823	Technology	€150.00
61	TV4 AB	4833	Consumer Staples	€139.00
62	KINNEVIK INDUSTRIFORVLTNINGS	2631	Basic Materials	€130.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	HALDEX AB	3714	Consumer-Cyclical	€123.00
64	FAGERHULT AB	3640	Capital Goods	€118.00
65	KARLSHAMNS AB	2070	Consumer Staples	€116.00
66	COLUMNNA FASTIGHETER AB	6510	Consumer-Cyclical	€114.00
67	JACOBSON & WIDMARK AB	8700	Capital Goods	€112.00
68	SCANDIACONSULT AB	8900	Consumer-Cyclical	€100.00
69	HAVSFRUN AB	6799	Financials	€96.00
70	PANDOX AB	6500	Consumer-Cyclical	€95.00
71	NOBEL BIOCARE AB	3843	Healthcare	€94.00
72	GEVEKO AB	2851	Consumer-Cyclical	€94.00
73	OEM-INTERNATIONAL AB	3670	Capital Goods	€94.00
74	KAROLIN MACHINE TOOL AB	3444	Capital Goods	€93.00
75	EXPANDA AB	2520	Capital Goods	€79.00
76	SARDUS AB	2013	Consumer Staples	€73.00
77	MTG-MODERN TIMES GROUP AB	4833	Consumer Staples	€69.00
78	HEBA FASTIGHETS AB	6513	Consumer-Cyclical	€67.00
79	NAERKES ELEKTRISKA AB	4911	Utilities	€66.00
80	CLAS OHLSON AB	5399	Consumer-Cyclical	€65.00
81	ITAB INDUSTRI AB	2590	Consumer-Cyclical	€64.00
82	VBG AB	3714	Consumer-Cyclical	€64.00
83	HEXAGON AB	3580	Capital Goods	€62.00
84	SEMCON AB	8711	Capital Goods	€60.00
85	LGP TELECOM HOLDING AB	3440	Capital Goods	€60.00
86	NIBE INDUSTRIER AB	3430	Consumer-Cyclical	€59.00
87	IBS AB	7370	Technology	€56.00
88	DORO AB	3663	Technology	€55.00
89	BEIJER ALMA AB	3490	Capital Goods	€54.00
90	OBSERVER AB	7380	Consumer-Cyclical	€49.00
91	TRACTION HOLDING AB	6799	Financials	€49.00
92	SPENDRUPS BRYGGERI AB	2080	Consumer Staples	€45.00
93	BONG LJUNGDAHL AB	2670	Basic Materials	€44.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	CLOETTA FAZER AB	2060	Consumer Staples	€44.00
95	FRONTEC AB	7373	Technology	€43.00
96	PARTNERTECH AB	3679	Capital Goods	€41.00
97	MODUL 1 DATA AB	7373	Technology	€41.00
98	BIACORE INTL AB	2834	Healthcare	€40.00
99	G & L BEIJER AB	3585	Capital Goods	€40.00
100	SVEDBERGS I DALSTORP AB	2510	Consumer-Cyclical	€39.00
101	MUNKSJO AB	2600	Basic Materials	€39.00
102	CAPONA AB	6512	Consumer-Cyclical	€38.00
103	SOFTRONIC AB	7373	Technology	€38.00
104	NH NORDISKA HOLDING AB	6200	Financials	€35.00
105	HL DISPLAY AB	2540	Consumer-Cyclical	€34.00
106	ALLGON AB	3661	Technology	€31.00
107	HIQ INTERNATIONAL AB	7370	Technology	€30.00
108	BOSS MEDIA AB	7371	Technology	€29.00
109	FJALLRAVEN AB	2390	Consumer-Cyclical	€28.00
110	GORTHON LINES AB	4412	Transportation	€28.00
111	POOLIA AB	7363	Consumer Staples	€26.00
112	SALENSTJARNAN AB	7990	Consumer-Cyclical	€24.00
113	SIGMA AB	7373	Technology	€23.00
114	BORAS WAFVERI AB	2200	Consumer-Cyclical	€20.00
115	PERSTORP AB	2800	Basic Materials	€20.00
116	ANGPANNEFORENINGEN AB	8711	Capital Goods	€19.00
117	PROFFICE AB	7363	Consumer Staples	€19.00
118	NOVOTEK AB	7373	Technology	€17.00
119	SECTRA AB	3845	Healthcare	€16.00
120	LJUNGBERGGRUPPEN AB	1500	Capital Goods	€15.00
121	CELL NETWORK AB	7373	Technology	€14.00
122	ELEKTRONIKGRUPPEN BK AB	3679	Capital Goods	€13.00
123	STRALFORS AB	2750	Consumer Staples	€9.00
124	ENEA DATA AB	7373	Technology	€8.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
125	NEFAB AB	2400	Basic Materials	€6.00
126	MEDIVIR AB	8731	Healthcare	€6.00
127	CYBER COM CONSULTING GROUP	7370	Technology	€4.00
128	BRIO AB	5090	Consumer-Cyclical	€2.00
129	FRANGO AB	7371	Technology	€2.00
130	IMS DATA AB	7373	Technology	€1.00
131	FB INDUSTRI HOLDING AB	3714	Consumer-Cyclical	€0.00
132	MTV PRODUKTION AB	7812	Consumer Staples	€0.00
133	TIVOX AB	3540	Capital Goods	€0.00
134	EXTENDED CAPITAL GROUP	5734	Consumer-Cyclical	€-2.00
135	WILH. SONESSON AB (NEW)	2531	Capital Goods	€-4.00
136	TURNIT AB	7370	Technology	€-4.00
137	MIDWAY HOLDING AB	1531	Consumer-Cyclical	€-6.00
138	PREVAS AB	7373	Technology	€-6.00
139	LEDSTIERNAN AB	3444	Capital Goods	€-8.00
140	TICKET TRAVEL GROUP AB	4700	Transportation	€-9.00
141	NOCOM AB	7371	Technology	€-11.00
142	TELELOGIC AB	7372	Technology	€-13.00
143	ROTTNEROS AB	2611	Basic Materials	€-14.00
144	C F BERG & CO AB	2421	Basic Materials	€-15.00
145	DIGITAL VISION DV-SWEDEN AB	3663	Technology	€-15.00
146	NEXUS TECHNOLOGIES AB	7373	Technology	€-17.00
147	DUROC AB	3470	Capital Goods	€-19.00
148	SWECO AB (NEW)	1500	Capital Goods	€-20.00
149	PROTECT DATA AB	7371	Technology	€-21.00
150	OPCON AB	3714	Consumer-Cyclical	€-21.00
151	REDERI AB GOTLAND	4400	Transportation	€-22.00
152	BILIA AB	5500	Consumer-Cyclical	€-22.00
153	CTT SYSTEMS AB	3728	Capital Goods	€-22.00
154	PERBIO SCIENCE AB	8731	Healthcare	€-22.00
155	RORVIK TIMBER AB	2421	Basic Materials	€-23.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
156	C TECHNOLOGIES AB	3690	Capital Goods	€-25.00
157	RESCO AB	7373	Technology	€-25.00
158	SCANMINING AB	1000	Basic Materials	€-26.00
159	SVOLDER AB	6799	Financials	€-26.00
160	SCRIBONA AB	5045	Technology	€-26.00
161	GANDALF AB	5045	Technology	€-28.00
162	ADCORE AB	7370	Technology	€-29.00
163	ORTIVUS AB	7373	Technology	€-30.00
164	M2S-MULTIMEDIA SFTWR SCANDIN	7371	Technology	€-32.00
165	READSOFT AB	7372	Technology	€-34.00
166	TRICORONA MINERAL AB	1090	Basic Materials	€-36.00
167	CONNOVA GROUP AB	7372	Technology	€-37.00
168	PLATZER FASTIGHETER AB	6510	Consumer-Cyclical	€-38.00
169	ARTIMPLANT AB	3842	Healthcare	€-38.00
170	FRAMFAB-FRAMTIDSFABRIKEN AB	8742	Consumer-Cyclical	€-42.00
171	CELTICA FASTIGHETS AB	6799	Financials	€-43.00
172	ASPIRO INFORMATION AB	7370	Technology	€-48.00
173	TELIGENT AB	4822	Technology	€-55.00
174	WESTERGYLLEN AB	1520	Consumer-Cyclical	€-59.00
175	SALUS ANSVAR AB	6029	Financials	€-60.00
176	NORDIFAGRUPPEN AB	3564	Capital Goods	€-62.00
177	SKANDITEK INDUSTRIFORVALT AB	7373	Technology	€-63.00
178	CONSILIUM AB	3679	Capital Goods	€-64.00
179	KLIPPANS FINPAPPERSBRUK	2621	Basic Materials	€-66.00
180	GRAPHIUM AB	2750	Consumer Staples	€-66.00
181	KARO BIO AB	8731	Healthcare	€-78.00
182	BURE EQUITY AB	6799	Financials	€-80.00
183	SINTERCAST AB	3823	Technology	€-87.00
184	MATTEUS AB	6211	Financials	€-93.00
185	MICRONIC LASER SYSTEMS AB	3674	Technology	€-97.00
186	ARRAY AB	6794	Consumer-Cyclical	€-103.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
187	FAST PARTNER AB	6512	Consumer-Cyclical	€-112.00
188	EFFNET GROUP AB	3576	Technology	€-118.00
189	B&N GROUP	4412	Transportation	€-128.00
190	BROSTROM AB	4412	Transportation	€-145.00
191	LUNDIN OIL AB	1311	Energy	€-148.00
192	BIORA AB	2834	Healthcare	€-182.00
193	NET INSIGHT AB	3576	Technology	€-186.00
194	CONCORDIA MARITIME AB	4412	Transportation	€-186.00
195	ACTIVE BIOTECH AB	2834	Healthcare	€-212.00
196	UTFORS AB	7370	Technology	€-228.00
197	SVENSKA ORIENT LINIEN AB	4412	Transportation	€-262.00
198	ELEKTA AB	3845	Healthcare	€-299.00
199	PRICER AB	3669	Technology	€-310.00
200	INDUSTRIAL & FINL SYSTEMS AB	7372	Technology	€-333.00
201	ORESUNDS INVESTMENT	6799	Financials	€-520.00
202	NORDEA AB	6799	Financials	€-531.00
203	TELE1 EUROPE HOLDING	4810	Communication	€-588.00
204	INTENTIA INTERNATIONAL AB	7371	Technology	€-603.00
205	ICON MEDIALAB INTERNATIONAL	7371	Technology	€-613.00
206	ESSELTE AB	5110	Basic Materials	€-685.00
207	SSAB SVENSKT STAL AB	3312	Basic Materials	€-710.00
208	ASSIDOMAN AB	2631	Basic Materials	€-2,982.00
			Total Knowledge Capital®	€131,789.00

Appendix B: Valuation of Knowledge Capital[®] Rankings by Country

UK Firms

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1	GLAXOSMITHKLINE	2834	Healthcare	€30,086.00
2	BRITISH TELECOMMUNICATIONS	4813	Communication	€26,962.00
3	NATL WESTMINSTER BANK	6029	Financials	€25,843.00
4	LLOYDS TSB GROUP	6029	Financials	€22,590.00
5	NATIONAL GRID GROUP	4911	Utilities	€13,224.00
6	ABBEY NATIONAL	6029	Financials	€12,945.00
7	BP AMOCO	2911	Energy	€12,930.00
8	UNILEVER	2000	Consumer Staples	€12,867.00
9	HALIFAX GROUP	6029	Financials	€12,334.00
10	CABLE & WIRELESS	4813	Communication	€9,261.00
11	MARCONI	4810	Communication	€9,073.00
12	BARCLAYS	6029	Financials	€8,907.00
13	PRUDENTIAL	6311	Financials	€8,329.00
14	VODAFONE GROUP	4812	Communication	€8,300.00
15	GALLAHER GROUP	2100	Consumer Staples	€7,665.00
16	HSBC HLDGS	6029	Financials	€7,567.00
17	GKN	3714	Consumer-Cyclical	€6,801.00
18	IMPERIAL TOBACCO GROUP	2100	Consumer Staples	€6,759.00
19	CADBURY SCHWEPPE	2060	Consumer Staples	€6,582.00
20	REUTERS GROUP	7380	Consumer-Cyclical	€6,101.00
21	ASTRAZENECA	2834	Healthcare	€5,904.00
22	SAINSBURY (J)	5411	Consumer Staples	€5,736.00
23	RENTOKIL INITIAL	7340	Consumer Staples	€5,688.00
24	PEARSON	2711	Consumer-Cyclical	€5,564.00
25	ROYAL BANK OF SCOTLAND GROUP	6029	Financials	€5,558.00
26	HANSON	3270	Consumer-Cyclical	€5,496.00
27	KINGFISHER	5399	Consumer-Cyclical	€5,029.00
28	LEGAL & GEN GROUP	6311	Financials	€4,873.00
29	BG GROUP	4924	Utilities	€4,816.00
30	RIO TINTO GROUP (GBP)	1000	Basic Materials	€4,695.00
31	GREAT UNIVERSAL STORES	5961	Consumer-Cyclical	€4,537.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
32	ALLIANCE & LEICESTER	6029	Financials	€4,349.00
33	INTERNATIONAL POWER	4911	Utilities	€4,174.00
34	CHUBB	7380	Consumer-Cyclical	€4,167.00
35	SCOTTISH POWER	4911	Utilities	€4,149.00
36	EMI GROUP	7389	Consumer-Cyclical	€3,994.00
37	TOMKINS	2000	Capital Goods	€3,882.00
38	POWERGEN	4911	Utilities	€3,697.00
39	BANK OF SCOTLAND	6029	Financials	€3,642.00
40	TESCO	5411	Consumer Staples	€3,472.00
41	MARKS & SPENCER	5311	Consumer-Cyclical	€3,342.00
42	BASS	7011	Consumer-Cyclical	€3,312.00
43	DEBENHAMS	5311	Consumer-Cyclical	€2,953.00
44	DIXONS GROUP	5731	Consumer-Cyclical	€2,881.00
45	SCOTTISH & SOUTHERN ENERGY	4911	Utilities	€2,716.00
46	SMITHS GROUP	3812	Capital Goods	€2,508.00
47	RAILTRACK GROUP	6510	Consumer-Cyclical	€2,428.00
48	STAGECOACH HOLDINGS	4100	Transportation	€2,394.00
49	IMI	3350	Capital Goods	€2,339.00
50	BAT-BRITISH AMER TOBACCO	2100	Consumer Staples	€2,278.00
51	HAYS	4200	Transportation	€2,218.00
52	WPP GROUP	7311	Consumer-Cyclical	€2,153.00
53	SMITH (WH) GROUP	5940	Consumer-Cyclical	€2,092.00
54	DAILY MAIL & GENERAL TRUST	2711	Consumer-Cyclical	€2,079.00
55	WOLSELEY	5070	Consumer-Cyclical	€1,942.00
56	UNITED UTILITIES	4911	Utilities	€1,927.00
57	CARLTON COMMUNICATIONS	7819	Consumer Staples	€1,917.00
58	REED INTERNATIONAL	6799	Financials	€1,880.00
59	REXAM	2650	Basic Materials	€1,788.00
60	ARRIVA	4100	Transportation	€1,632.00
61	NEXT	5651	Consumer-Cyclical	€1,621.00
62	ROLLS-ROYCE	3724	Capital Goods	€1,615.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
63	AVIS EUROPE	7510	Consumer-Cyclical	€1,600.00
64	AIRTOURS	4700	Transportation	€1,575.00
65	SCOTTISH & NEWCASTLE	2082	Consumer Staples	€1,427.00
66	PROVIDENT FINL GROUP	6141	Financials	€1,412.00
67	NYCOMED AMERSHAM	2835	Healthcare	€1,398.00
68	CHARTER	3540	Capital Goods	€1,322.00
69	FIRSTGROUP	4100	Transportation	€1,292.00
70	NORTHERN ROCK	6036	Financials	€1,262.00
71	NATIONAL EXPRESS GROUP	4100	Transportation	€1,247.00
72	BAE SYSTEMS	3721	Capital Goods	€1,216.00
73	BUNZL	5110	Basic Materials	€1,162.00
74	FKI	3530	Capital Goods	€1,160.00
75	SMITH & NEPHEW	3842	Healthcare	€1,154.00
76	SCHRODERS (NEW)	6029	Financials	€1,145.00
77	AMVESCAP	6282	Financials	€1,133.00
78	MISYS	7373	Technology	€1,132.00
79	NORTHERN FOODS	2000	Consumer Staples	€1,131.00
80	BBA GROUP	2200	Consumer-Cyclical	€1,085.00
81	PREMIER FARNELL	5961	Consumer-Cyclical	€1,069.00
82	CENTRICA	4932	Utilities	€1,047.00
83	MAN GROUP	6211	Financials	€1,027.00
84	GUINNESS PEAT GROUP	6799	Financials	€967.00
85	UNIQ	5140	Consumer Staples	€963.00
86	ST JAMES PLACE CAPITAL	6311	Financials	€958.00
87	BRITISH ENERGY	4911	Utilities	€940.00
88	SECURICOR	4731	Transportation	€924.00
89	SAFEWAY	5411	Consumer Staples	€911.00
90	LONDON PACIFIC GROUP LTD	6311	Financials	€907.00
91	AWG	4941	Utilities	€900.00
92	JARDINE LLOYD THOMPSON GROUP	6411	Financials	€880.00
93	BAA	4581	Transportation	€867.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
94	ENODIS	3550	Capital Goods	€863.00
95	ELECTROCOMPONENTS	5065	Capital Goods	€836.00
96	RMC GROUP	3270	Consumer-Cyclical	€813.00
97	COUNTRYWIDE ASSURED GRP	6531	Consumer-Cyclical	€805.00
98	SEMA	7373	Technology	€796.00
99	PIC INTERNATIONAL GROUP	200	Consumer Staples	€765.00
100	ALLIANCE UNICHEM	5122	Consumer Staples	€760.00
101	JOHNSON MATTHEY	3341	Capital Goods	€756.00
102	LEX SERVICE	5500	Consumer-Cyclical	€734.00
103	BRITAX INTERNATIONAL	3231	Capital Goods	€731.00
104	MORRISON (WM) SUPERMARKETS	5411	Consumer Staples	€715.00
105	EUROTUNNEL	4011	Transportation	€698.00
106	AEGIS GROUP	7310	Consumer-Cyclical	€695.00
107	FAIREY GROUP	3577	Technology	€662.00
108	WIMPEY (GEORGE)	1520	Consumer-Cyclical	€654.00
109	ASTON VILLA	7941	Consumer Staples	€643.00
110	HEYWOOD WILLIAMS GROUP	3211	Capital Goods	€632.00
111	BOC GROUP	2810	Basic Materials	€628.00
112	LONMIN	1000	Basic Materials	€610.00
113	SAGE GROUP	7371	Technology	€604.00
114	VIRIDIAN GROUP	4911	Utilities	€600.00
115	ALVIS	3711	Consumer-Cyclical	€598.00
116	HEPWORTH	3433	Capital Goods	€595.00
117	CMG	7373	Technology	€587.00
118	INDEPENDENT INSURANCE GROUP	6331	Financials	€580.00
119	WILSON BOWDEN	1520	Consumer-Cyclical	€577.00
120	AMEC	1600	Capital Goods	€570.00
121	BPB	3270	Consumer-Cyclical	€527.00
122	DAVIS SERVICE GROUP	7200	Consumer-Cyclical	€510.00
123	WHITBREAD	5810	Consumer Staples	€510.00
124	NEW LOOK GROUP	5621	Consumer-Cyclical	€504.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
125	QUEENS MOAT HOUSES	7011	Consumer-Cyclical	€494.00
126	BEAZER GROUP	1520	Consumer-Cyclical	€491.00
127	SPIRENT	3570	Technology	€489.00
128	RUTLAND TRUST	6799	Financials	€480.00
129	COMPUTACENTER	7373	Technology	€479.00
130	VITEC GROUP	3679	Capital Goods	€478.00
131	BARRATT DEVELOPMENTS	1520	Consumer-Cyclical	€470.00
132	SMG	4833	Consumer Staples	€469.00
133	COBHAM	3728	Capital Goods	€463.00
134	GO-AHEAD GROUP	4100	Transportation	€460.00
135	ARCADIA GROUP	5600	Consumer-Cyclical	€457.00
136	EMAP	2721	Consumer-Cyclical	€455.00
137	TAYLOR WOODROW	1540	Capital Goods	€449.00
138	BRITANNIC	6311	Financials	€446.00
139	BODYCOTE INTERNATIONAL	3390	Basic Materials	€444.00
140	PERSIMMON	1520	Consumer-Cyclical	€432.00
141	EUROMONEY INSTITUTION INVEST	2700	Consumer-Cyclical	€424.00
142	BULLOUGH	3585	Capital Goods	€420.00
143	WEIR GROUP	3561	Capital Goods	€420.00
144	WETHERSPOON (JD)	5810	Consumer Staples	€418.00
145	BLUE CIRCLE INDUSTRIES	3241	Basic Materials	€417.00
146	UNITED BUSINESS MEDIA	2721	Consumer-Cyclical	€415.00
147	BERKELEY GROUP	1520	Consumer-Cyclical	€404.00
148	TRAVIS PERKINS	5211	Consumer-Cyclical	€403.00
149	CORDIANT COMMUNICATIONS GRP	7310	Consumer-Cyclical	€396.00
150	ATKINS (WS)	8742	Consumer-Cyclical	€389.00
151	ASSOCIATED BRITISH FOODS	2000	Consumer Staples	€386.00
152	ST IVES	2750	Consumer Staples	€386.00
153	KELDA GROUP	4941	Utilities	€383.00
154	TT GROUP	3600	Capital Goods	€382.00
155	BRITISH VITA GROUP	2821	Basic Materials	€372.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
156	DAIRY CREST GROUP	2020	Consumer Staples	€369.00
157	CATTLES	6141	Financials	€365.00
158	BELLWAY	1520	Consumer-Cyclical	€365.00
159	DFS FURNITURE CO	5712	Consumer-Cyclical	€354.00
160	ENTERPRISE OIL	1311	Energy	€350.00
161	MOTHERCARE	5600	Consumer-Cyclical	€341.00
162	AGGREKO	7359	Consumer-Cyclical	€340.00
163	CLOSE BROTHERS GROUP	6172	Financials	€337.00
164	WALKER GREENBANK	2670	Basic Materials	€336.00
165	T & S STORES	5411	Consumer Staples	€328.00
166	ASCOT	2800	Basic Materials	€327.00
167	LOGICA	7371	Technology	€327.00
168	SOMERFIELD HOLDINGS LTD	5411	Consumer Staples	€323.00
169	PIZZAEXPRESS	5812	Consumer Staples	€322.00
170	SHANKS GROUP	4953	Capital Goods	€319.00
171	GEEST	2000	Consumer Staples	€319.00
172	REDROW	1520	Consumer-Cyclical	€313.00
173	BOOTS CO	5912	Consumer Staples	€313.00
174	SALVESEN CHRISTIAN	8742	Consumer-Cyclical	€311.00
175	SPIRAX-SARCO ENGINEERING	3500	Capital Goods	€309.00
176	TAYLOR NELSON SOFRES	8700	Capital Goods	€306.00
177	FIRST CHOICE HOLIDAYS	4700	Transportation	€305.00
178	SOUTH STAFFORDSHIRE GRP	4941	Utilities	€301.00
179	HALMA	3690	Capital Goods	€296.00
180	BRYANT GROUP	1520	Consumer-Cyclical	€292.00
181	SIG	5030	Consumer-Cyclical	€288.00
182	BRITISH SKY BROADCASTING	4833	Consumer Staples	€287.00
183	ANGLIAN GROUP	2430	Basic Materials	€279.00
184	CARPETRIGHT	5700	Consumer-Cyclical	€278.00
185	ULTRA ELECTRONICS HLDGS	3728	Capital Goods	€275.00
186	BPP HOLDINGS	8200	Consumer-Cyclical	€273.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
187	MCBRIDE	2840	Consumer Staples	€272.00
188	INTERMEDIATE CAPITAL GROUP	6159	Financials	€271.00
189	EXEL – NEW	4731	Transportation	€271.00
190	CAPITA GROUP	8742	Consumer-Cyclical	€269.00
191	AEA TECHNOLOGY	8711	Capital Goods	€268.00
192	PARAGON GROUP OF COS	6141	Financials	€268.00
193	ROTORK	3590	Capital Goods	€262.00
194	GWR GROUP	4832	Consumer Staples	€262.00
195	LAING (JOHN)	1500	Capital Goods	€262.00
196	BRAKE BROS	5140	Consumer Staples	€261.00
197	SIGNET GROUP	5944	Consumer-Cyclical	€260.00
198	MERSEY DOCKS & HARBOUR CO	4400	Transportation	€260.00
199	INFORMA GROUP	2721	Consumer-Cyclical	€260.00
200	MANCHESTER UNITED	7941	Consumer Staples	€259.00
201	GREGGS	5400	Consumer Staples	€258.00
202	JARVIS	6519	Consumer-Cyclical	€255.00
203	PARITY GROUP	7370	Technology	€252.00
204	RENISHAW	3829	Technology	€250.00
205	WILSON CONNOLLY HLDGS	1520	Consumer-Cyclical	€249.00
206	BULMER (HP) HOLDINGS	2080	Consumer Staples	€249.00
207	ASHTEAD GROUP	7359	Consumer-Cyclical	€248.00
208	JOHNSTON PRESS	2711	Consumer-Cyclical	€246.00
209	VOSPER THORNYCROFT HLDGS	3730	Transportation	€241.00
210	MEGGITT	3670	Capital Goods	€240.00
211	FORTH PORTS	4400	Transportation	€238.00
212	AGGREGATE INDUSTRIES	3272	Consumer-Cyclical	€237.00
213	HUNTLEIGH TECHNOLOGY	3842	Healthcare	€236.00
214	ALEXON GROUP	2300	Consumer-Cyclical	€225.00
215	INVENSYS	3822	Technology	€221.00
216	ICELAND GROUP	5411	Consumer Staples	€219.00
217	RENOLD	3560	Capital Goods	€218.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
218	BROWN & JACKSON	5600	Consumer-Cyclical	€218.00
219	MID KENT HLDGS	4941	Utilities	€213.00
220	LMS-LONDON MERCHANT SECURIT	6512	Consumer-Cyclical	€213.00
221	SCAPA GROUP	3550	Capital Goods	€212.00
222	DE LA RUE	3578	Capital Goods	€209.00
223	SSL INTERNATIONAL	2834	Healthcare	€205.00
224	BPT	6532	Consumer-Cyclical	€198.00
225	MARSHALLS	3250	Consumer-Cyclical	€197.00
226	EAST SURREY HOLDGS	4941	Utilities	€194.00
227	GREENE KING	2082	Consumer Staples	€194.00
228	BRISTOL WATER HOLDINGS	4941	Utilities	€191.00
229	AVON RUBBER	3050	Capital Goods	€189.00
230	STANDARD CHARTERED BANK	6029	Financials	€188.00
231	JJB SPORTS	5940	Consumer-Cyclical	€183.00
232	BRAMMER	5080	Capital Goods	€178.00
233	YULE CATTO & CO	2860	Basic Materials	€178.00
234	SERCO CROUP	8744	Consumer Staples	€177.00
235	HOLIDAYBREAK	7000	Consumer-Cyclical	€176.00
236	INTERSERVE	1540	Capital Goods	€176.00
237	ULSTER TELEVISION	3663	Technology	€176.00
238	DAWSON HOLDINGS	5190	Consumer-Cyclical	€176.00
239	ELECTRONICS BOUTIQUE	5734	Consumer-Cyclical	€172.00
240	MCCARTHY & STONE	1520	Consumer-Cyclical	€171.00
241	TIBBETT & BRITTEN GROUP	4731	Transportation	€168.00
242	VARDY (REG)	5010	Consumer-Cyclical	€168.00
243	HEADLAM GROUP	5020	Consumer-Cyclical	€164.00
244	REED EXECUTIVE	7361	Consumer Staples	€162.00
245	EXPRO INTERNATIONAL GRP	1389	Energy	€161.00
246	HAMPSON INDUSTRIES	3720	Capital Goods	€159.00
247	ROXBORO GROUP	3823	Technology	€159.00
248	VOLEX GROUP	3600	Capital Goods	€158.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
249	HENLYS GROUP	3713	Capital Goods	€158.00
250	DEVELOPMENT SECURITIES	6512	Consumer-Cyclical	€158.00
251	ANITE GROUP	7370	Technology	€155.00
252	HARVEY NICHOLS GROUP	5651	Consumer-Cyclical	€154.00
253	WESTBURY	1520	Consumer-Cyclical	€153.00
254	RATHBONE BROTHERS	6282	Financials	€153.00
255	BESPAK	3829	Technology	€153.00
256	RPC GROUP	3080	Capital Goods	€153.00
257	GRAMPIAN HOLDINGS	5940	Consumer-Cyclical	€151.00
258	PRESSAC HOLDINGS	3600	Capital Goods	€151.00
259	ALPHA AIRPORTS GROUP	5940	Consumer-Cyclical	€151.00
260	CLYDEPORT	4400	Transportation	€150.00
261	PSD GROUP	8742	Consumer-Cyclical	€149.00
262	KLEENEZE	5961	Consumer-Cyclical	€147.00
263	ULTRAFRAME	8700	Capital Goods	€147.00
264	EIDOS	7372	Technology	€146.00
265	SINGER & FRIEDLANDER GROUP	6029	Financials	€145.00
266	EDINBURGH FUND MANAGERS	6282	Financials	€145.00
267	FI GROUP	7370	Technology	€144.00
268	ALBA	3600	Capital Goods	€143.00
269	PHOTOBITION GROUP	7330	Consumer-Cyclical	€143.00
270	FRIENDS IVORY & SIME	6282	Financials	€142.00
271	AGA FOODSERVICE GROUP	3080	Capital Goods	€140.00
272	BRIGHT STATION	7370	Technology	€139.00
273	BUSINESS POST LTD	4513	Transportation	€138.00
274	MACRO 4	7373	Technology	€137.00
275	BOVIS HOMES GROUP	1520	Consumer-Cyclical	€137.00
276	NORTHGATE	7510	Consumer-Cyclical	€137.00
277	METALRAX GROUP	3540	Capital Goods	€135.00
278	CELLTECH GROUP	2834	Healthcare	€133.00
279	SANDERSON BRAMALL MOTOR GRP	5500	Consumer-Cyclical	€133.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
280	P&O-PENIN & ORIENT STEAM NAV	4400	Transportation	€132.00
281	DOMESTIC & GENERAL GROUP	6399	Financials	€130.00
282	BLACKS LEISURE GROUP	5600	Consumer-Cyclical	€128.00
283	GALEN HOLDINGS	2834	Healthcare	€128.00
284	VICTREX	2821	Basic Materials	€128.00
285	RM	7373	Technology	€127.00
286	INTERNATIONAL ENERGY GROUP	4923	Utilities	€127.00
287	DRUCK HOLDINGS	3823	Technology	€127.00
288	JARVIS HOTEL	7011	Consumer-Cyclical	€127.00
289	KIER GROUP	1540	Capital Goods	€126.00
290	DEE VALLEY GROUP	4941	Utilities	€126.00
291	BAYNES (CHARLES)	5084	Capital Goods	€126.00
292	ALLEN	1520	Consumer-Cyclical	€125.00
293	MOSS BROS GROUP	5600	Consumer-Cyclical	€124.00
294	LYNX GROUP	7370	Technology	€124.00
295	GAMES WORKSHOP GROUP	3944	Consumer-Cyclical	€124.00
296	KELLER GROUP	8711	Capital Goods	€120.00
297	DEWHIRST GROUP	2300	Consumer-Cyclical	€118.00
298	BRITISH POLYTHENE INDS	2670	Basic Materials	€117.00
299	BARR (AG)	2086	Consumer Staples	€117.00
300	DOMINO PRINTING SCIENCES	3555	Capital Goods	€115.00
301	WHATMAN	3569	Capital Goods	€115.00
302	OASIS STORES	2330	Consumer-Cyclical	€115.00
303	CREST NICHOLSON	1520	Consumer-Cyclical	€115.00
304	MOWLEM (JOHN) & CO	1540	Capital Goods	€113.00
305	WILSHAW	3490	Capital Goods	€112.00
306	BROWN (N) GROUP	5961	Consumer-Cyclical	€111.00
307	WYNDEHAM PRESS GROUP	2750	Consumer Staples	€111.00
308	SILENTNIGHT HOLDINGS	2510	Consumer-Cyclical	€111.00
309	SHL GROUP	8742	Consumer-Cyclical	€110.00
310	BSS GROUP	5070	Consumer-Cyclical	€109.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
311	SCOTTISH RADIO HOLDINGS	4832	Consumer Staples	€108.00
312	CASTINGS	3320	Basic Materials	€108.00
313	MORGAN SINDALL	1540	Capital Goods	€108.00
314	CHIME COMMUNICATIONS	8700	Capital Goods	€105.00
315	DIPLOMA	5065	Capital Goods	€103.00
316	COMPEL GROUP	7373	Technology	€102.00
317	NESTOR-BNA	8082	Healthcare	€102.00
318	ABBOT GROUP	1381	Energy	€101.00
319	JOHN DAVID SPORTS	5600	Consumer-Cyclical	€101.00
320	PROWTING	1531	Consumer-Cyclical	€100.00
321	HUNTING	2911	Energy	€98.00
322	MITIE GROUP	7340	Consumer Staples	€98.00
323	MONSOON	5621	Consumer-Cyclical	€96.00
324	ACAL	5065	Capital Goods	€95.00
325	THORNTONS	2060	Consumer Staples	€95.00
326	MCLEOD RUSSELL HLDGS	3564	Capital Goods	€94.00
327	FIRTH RIXSON	3310	Basic Materials	€94.00
328	EXPAMET INTERNATIONAL	3448	Consumer-Cyclical	€94.00
329	FIRST TECHNOLOGY	3714	Consumer-Cyclical	€94.00
330	CLINTON CARDS	5940	Consumer-Cyclical	€94.00
331	RYLAND GROUP	5500	Consumer-Cyclical	€93.00
332	TEMPUS GROUP	7311	Consumer-Cyclical	€93.00
333	ANDREWS SYKES GROUP	1700	Capital Goods	€93.00
334	CHARACTER GROUP	5090	Consumer-Cyclical	€92.00
335	LONDON SCOTTISH BANK	6029	Financials	€92.00
336	MENTMORE ABBEY	6519	Consumer-Cyclical	€92.00
337	KBC ADVANCED TECHNOLOGIES	1389	Energy	€90.00
338	BREWIN DOLPHIN HLDGS	6211	Financials	€88.00
339	MMT COMPUTING	7370	Technology	€88.00
340	TRIFAST	3600	Capital Goods	€88.00
341	MOUNTVIEW ESTATES	6500	Consumer-Cyclical	€87.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
342	SECURE TRUST BANKING GRP	6029	Financials	€87.00
343	ANN STREET GROUP LTD	2080	Consumer Staples	€85.00
344	CHLORIDE GROUP	3612	Capital Goods	€84.00
345	AUTOLOGIC HOLDINGS	5010	Consumer-Cyclical	€83.00
346	FISHER (JAMES) AND SONS	4412	Transportation	€83.00
347	BEATTIE (JAMES)	5311	Consumer-Cyclical	€82.00
348	COUNTRYSIDE PROPERTIES	6552	Consumer-Cyclical	€82.00
349	NOVARA	5040	Consumer-Cyclical	€79.00
350	BROCKHAMPTON HOLDINGS	4941	Utilities	€79.00
351	FILTRONIC	3663	Technology	€79.00
352	LAMBERT HOWARTH GROUP	3140	Consumer-Cyclical	€78.00
353	DOMNICK HUNTER GRP	3560	Capital Goods	€78.00
354	REGENT INNS	5810	Consumer Staples	€78.00
355	SPRING GROUP	7361	Consumer Staples	€77.00
356	HAMLEYS	5945	Consumer-Cyclical	€77.00
357	UMECO	5080	Capital Goods	€76.00
358	SVB HOLDINGS	6331	Financials	€76.00
359	GRAINGER TRUST	6500	Consumer-Cyclical	€76.00
360	FRENCH CONNECTION GROUP	5600	Consumer-Cyclical	€76.00
361	CAPITAL RADIO	4832	Consumer Staples	€75.00
362	AQUARIUS GROUP	2510	Consumer-Cyclical	€73.00
363	TRIAD GROUP	7370	Technology	€73.00
364	INTERNATIONAL GREETINGS	2670	Basic Materials	€73.00
365	MCALPINE (ALFRED)	1531	Consumer-Cyclical	€72.00
366	RELIANCE SECURITY GROUP	7381	Consumer-Cyclical	€72.00
367	METAL BULLETIN	2741	Consumer-Cyclical	€71.00
368	AMEY	1600	Capital Goods	€71.00
369	BLICK	7380	Consumer-Cyclical	€71.00
370	SKILLSGROUP	8200	Consumer-Cyclical	€70.00
371	STIRLING GROUP	2300	Consumer-Cyclical	€70.00
372	DTZ HOLDINGS	6531	Consumer-Cyclical	€70.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
373	SHERWOOD INTERNATIONAL LTD	7373	Technology	€70.00
374	NICHOLS	2086	Consumer Staples	€69.00
375	BETT BROTHERS	1531	Consumer-Cyclical	€69.00
376	BURNDENE INVESTMENTS	3790	Consumer-Cyclical	€68.00
377	PATERSON ZOCHONIS	2840	Consumer Staples	€68.00
378	EUROPEAN COLOUR	2810	Basic Materials	€67.00
379	CARE UK	8050	Healthcare	€66.00
380	ABACUS POLAR	5731	Consumer-Cyclical	€65.00
381	BOURNEMOUTH & WEST HAMPSHIRE	4941	Utilities	€64.00
382	RICARDO	8711	Capital Goods	€64.00
383	SAVILLS	7389	Consumer-Cyclical	€64.00
384	CRANSWICK	2011	Consumer Staples	€64.00
385	MSB INTERNATIONAL	7361	Consumer Staples	€63.00
386	COMMUNITY HOSPITALS GRP	8060	Healthcare	€62.00
387	LITHO SUPPLIES	5084	Capital Goods	€62.00
388	MACDONALD HOTELS	7011	Consumer-Cyclical	€61.00
389	WAGON	3460	Capital Goods	€61.00
390	ALLIED DOMECCQ	2084	Consumer Staples	€61.00
391	CARCLO	3714	Consumer-Cyclical	€60.00
392	HARVEY NASH GROUP	7361	Consumer Staples	€60.00
393	DIAGONAL	7370	Technology	€60.00
394	ST MODWEN PROPERTIES	6512	Consumer-Cyclical	€59.00
395	GUARDIAN IT	7380	Consumer-Cyclical	€59.00
396	LINCAT GROUP	3630	Consumer-Cyclical	€58.00
397	YATES GROUP	5810	Consumer Staples	€58.00
398	TBI	4581	Transportation	€58.00
399	WYEVALE GARDEN CENTERS	5200	Consumer-Cyclical	€57.00
400	OTTAKAR'S	5940	Consumer-Cyclical	€57.00
401	ITE GROUP	7389	Consumer-Cyclical	€56.00
402	SYLTONE	3711	Consumer-Cyclical	€55.00
403	BUDGENS	5411	Consumer Staples	€55.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
404	DART GROUP	4731	Transportation	€55.00
405	COURTS	5700	Consumer-Cyclical	€55.00
406	RELYON GROUP	2510	Consumer-Cyclical	€54.00
407	WHITEHEAD MANN GROUP	7361	Consumer Staples	€54.00
408	OSBORNE & LITTLE	2670	Basic Materials	€53.00
409	MORGAN CRUCIBLE CO	3290	Consumer-Cyclical	€53.00
410	MAYFLOWER CORP	3711	Consumer-Cyclical	€53.00
411	TIME PRODUCTS	5094	Consumer-Cyclical	€53.00
412	HELICAL BAR	6552	Consumer-Cyclical	€52.00
413	WIGGINS GROUP	6552	Consumer-Cyclical	€52.00
414	COSALT	3711	Consumer-Cyclical	€52.00
415	PENDRAGON	5500	Consumer-Cyclical	€51.00
416	VEGA GROUP	7373	Technology	€51.00
417	API GROUP	2670	Basic Materials	€51.00
418	ZOTEFOAMS	3086	Consumer Staples	€51.00
419	WSP GROUP	8711	Capital Goods	€51.00
420	GUITON GROUP LTD	5190	Consumer-Cyclical	€50.00
421	AIRFLOW STREAMLINES	3713	Capital Goods	€50.00
422	ISOTRON	8071	Healthcare	€50.00
423	PSION	7374	Technology	€50.00
424	MALLETT	5990	Consumer-Cyclical	€50.00
425	STANLEY LEISURE	7990	Consumer-Cyclical	€50.00
426	ACTION COMPUTER SUPP HLDGS	5045	Technology	€50.00
427	AMBERLEY GROUP	1400	Basic Materials	€49.00
428	WEMBLEY	7948	Consumer-Cyclical	€49.00
429	INCEPTA GROUP	7310	Consumer-Cyclical	€49.00
430	SEVERFIELD-ROWEN	3440	Capital Goods	€48.00
431	BWD SECURITIES	6282	Financials	€47.00
432	EUROPEAN MOTOR HLDGS	5500	Consumer-Cyclical	€47.00
433	TRACE COMPUTERS	7371	Technology	€47.00
434	GLOBAL GROUP	5140	Consumer Staples	€46.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
435	DCS GROUP	7373	Technology	€46.00
436	JOHNSTON GROUP	3711	Consumer-Cyclical	€45.00
437	F W THORPE	3640	Capital Goods	€45.00
438	CAMMELL LAIRD HOLDINGS	3730	Transportation	€45.00
439	EMESS	3640	Capital Goods	€45.00
440	RPS GROUP	8700	Capital Goods	€45.00
441	ALEXANDRA	2300	Consumer-Cyclical	€45.00
442	SNACKHOUSE	2090	Consumer Staples	€45.00
443	AUSTIN REED GROUP	5600	Consumer-Cyclical	€44.00
444	EXPLORATION CO (THE)	6799	Financials	€44.00
445	CITY CENTRE RESTAURANTS	5812	Consumer Staples	€43.00
446	SIRDAR	2273	Consumer-Cyclical	€43.00
447	DYSON GROUP	3250	Consumer-Cyclical	€43.00
448	DIXON MOTORS	5500	Consumer-Cyclical	€43.00
449	NORTHAMBER	5045	Technology	€43.00
450	DOWDING & MILLS PL	7600	Consumer-Cyclical	€43.00
451	ENTERPRISE INNS	5810	Consumer Staples	€42.00
452	LAVENDON GROUP	7359	Consumer-Cyclical	€42.00
453	BELHAVEN BREWERY GROUP	2082	Consumer Staples	€42.00
454	ASK CENTRAL	5812	Consumer Staples	€41.00
455	TOPPS TILES	5030	Consumer-Cyclical	€41.00
456	SIMON GROUP	4400	Transportation	€41.00
457	INTERX	5045	Technology	€41.00
458	TED BAKER	2300	Consumer-Cyclical	€40.00
459	S & U	6141	Financials	€40.00
460	ACCESS PLUS	7389	Consumer-Cyclical	€40.00
461	KEWILL SYSTEMS	7373	Technology	€40.00
462	GLENMORANGIE	2085	Consumer Staples	€39.00
463	HERCULES PROPERTY SERVICES	6331	Financials	€39.00
464	WILMINGTON GROUP	2721	Consumer-Cyclical	€39.00
465	FENNER	3560	Capital Goods	€39.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
466	LINX PRINTING TECHNOLOGIES	3577	Technology	€38.00
467	L GARDNER GROUP	3700	Capital Goods	€38.00
468	BOOT (HENRY)	1540	Capital Goods	€38.00
469	YOUNG (H) HOLDINGS	5000	Capital Goods	€38.00
470	CHARLES STANLEY GROUP	6200	Financials	€38.00
471	HIGHBURY HOUSE COMMUNICATION	2721	Consumer-Cyclical	€38.00
472	OXFORD INSTRUMENTS	3826	Technology	€36.00
473	CHRISTIE GROUP	8742	Consumer-Cyclical	€36.00
474	EL ORO MINING & EXPLORATION	6799	Financials	€36.00
475	ROYALBLUE GROUP	7372	Technology	€36.00
476	ABBEYCREST	3911	Consumer-Cyclical	€35.00
477	HAYNES PUBLISHING GROUP	2731	Consumer-Cyclical	€35.00
478	SFI GROUP	5810	Consumer Staples	€35.00
479	CAPE	1700	Capital Goods	€35.00
480	SANCTUARY GROUP	7389	Consumer-Cyclical	€35.00
481	SCS UPHOLSTERY	5712	Consumer-Cyclical	€35.00
482	CEDAR GROUP	5045	Technology	€35.00
483	INTERIOR SERVICES GROUP	8744	Consumer Staples	€35.00
484	BEALE	5311	Consumer-Cyclical	€34.00
485	WELLINGTON UNDERWRITING	6331	Financials	€34.00
486	HEAL'S	5712	Consumer-Cyclical	€33.00
487	FULMAR	2750	Consumer Staples	€33.00
488	MAJESTIC WINE	5900	Consumer-Cyclical	€32.00
489	LAWRENCE	2870	Basic Materials	€32.00
490	PETERHOUSE GROUP	1540	Capital Goods	€32.00
491	RUGBY ESTATES	6531	Consumer-Cyclical	€32.00
492	HOLMES PLACE	7990	Consumer-Cyclical	€32.00
493	STADIUM GROUP	3089	Consumer Staples	€31.00
494	DBS MANAGEMENT	6411	Financials	€31.00
495	PIFCO HOLDINGS	3634	Consumer-Cyclical	€31.00
496	MAIDEN GROUP	7310	Consumer-Cyclical	€31.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
497	TELEVISION CORPORATION	7819	Consumer Staples	€30.00
498	TOREX	7373	Technology	€30.00
499	AIR PARTNER	4522	Transportation	€30.00
500	CROWN SPORTS	7997	Consumer-Cyclical	€29.00
501	ACTIONLEISURE	5500	Consumer-Cyclical	€29.00
502	LINTON PARK	5140	Consumer Staples	€29.00
503	CHARLES TAYLOR CONSULTING	6411	Financials	€28.00
504	CHAMBERLIN & HILL	3320	Basic Materials	€28.00
505	LUMINAR	5810	Consumer Staples	€28.00
506	LOCKER GROUP	3490	Capital Goods	€27.00
507	BLACK ARROW GROUP	2520	Capital Goods	€27.00
508	LE RICHE GROUP LTD	5411	Consumer Staples	€27.00
509	WESCOL GROUP	1700	Capital Goods	€27.00
510	GALLIFORD	1500	Capital Goods	€26.00
511	4IMPRINT GROUP	2750	Consumer Staples	€26.00
512	ASHTENNE HLDGS	6512	Consumer-Cyclical	€26.00
513	MTL INSTRUMENTS	3829	Technology	€26.00
514	QSP GROUP	7372	Technology	€26.00
515	JARVIS PORTER	2750	Consumer Staples	€25.00
516	OLD ENGLISH INNS	7011	Consumer-Cyclical	€25.00
517	BNB RESOURCES	7361	Consumer Staples	€25.00
518	HR OWEN	5500	Consumer-Cyclical	€25.00
519	PRECOAT INTERNATIONAL	3470	Capital Goods	€24.00
520	GROUPE CHEZ GERARD	5812	Consumer Staples	€23.00
521	SPORTECH	6794	Consumer-Cyclical	€23.00
522	WILLIAM JACKS	5500	Consumer-Cyclical	€23.00
523	ALLDERS	5311	Consumer-Cyclical	€22.00
524	DELTRON ELECTRONICS	3679	Capital Goods	€22.00
525	JAMES HALSTEAD	3089	Consumer Staples	€22.00
526	LOOKERS	5500	Consumer-Cyclical	€22.00
527	CELTIC	7941	Consumer Staples	€22.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
528	FERRARIS GROUP	3841	Healthcare	€22.00
529	ELIZA TINSLEY GROUP	3523	Capital Goods	€22.00
530	COMINO GROUP	7372	Technology	€22.00
531	GULLANE ENTERTAINMENT	6794	Consumer-Cyclical	€21.00
532	TJ HUGHES	5311	Consumer-Cyclical	€21.00
533	SEMPLE COCHRANE	8700	Capital Goods	€21.00
534	HELPHIRE GROUP	7510	Consumer-Cyclical	€21.00
535	MICE GROUP	7389	Consumer-Cyclical	€21.00
536	YJL	1520	Consumer-Cyclical	€21.00
537	ICM COMPUTER GROUP	7373	Technology	€21.00
538	LATCHWAYS	3531	Capital Goods	€21.00
539	HEADWAY	2510	Consumer-Cyclical	€20.00
540	NORTHERN RECRUITMENT GROUP	7361	Consumer Staples	€20.00
541	BENTALLS	5311	Consumer-Cyclical	€20.00
542	RAGE SOFTWARE	7990	Consumer-Cyclical	€20.00
543	ENSOR HOLDINGS	3270	Consumer-Cyclical	€20.00
544	WILLIAM SINCLAIR HLDGS	2870	Basic Materials	€19.00
545	NUMIS CORP	6211	Financials	€19.00
546	JOHN LUSTY GROUP	5140	Consumer Staples	€19.00
547	IMS GROUP	4810	Communication	€19.00
548	EXETER INVESTMENT GROUP	6282	Financials	€19.00
549	TREATT	2890	Basic Materials	€19.00
550	MERIVALE MOORE	6552	Consumer-Cyclical	€18.00
551	WT FOODS	2030	Consumer Staples	€18.00
552	CADCENTRE GROUP	7371	Technology	€17.00
553	SEACON HOLDINGS	4412	Transportation	€17.00
554	GLEESON (MJ) GROUP	1500	Capital Goods	€17.00
555	TOAD	3714	Consumer-Cyclical	€17.00
556	ABERDEEN ASSET MANAGEMENT	6799	Financials	€17.00
557	ROXSPUR	3823	Technology	€17.00
558	MANAGEMENT CONSULTING GROUP	8742	Consumer-Cyclical	€17.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
559	WENSUM CO	2300	Consumer-Cyclical	€16.00
560	ALBEMARLE & BOND HLDGS	5900	Consumer-Cyclical	€15.00
561	FAYREWOOD	5045	Technology	€15.00
562	AVINGTRANS	2330	Consumer-Cyclical	€14.00
563	WHITE YOUNG GREEN	8711	Capital Goods	€14.00
564	ALBION	2320	Consumer-Cyclical	€14.00
565	NORMAN HAY	3470	Capital Goods	€14.00
566	GASKELL	3990	Capital Goods	€14.00
567	COLEFAX GROUP	2211	Consumer-Cyclical	€14.00
568	HAWTIN	3949	Consumer-Cyclical	€13.00
569	SHOPRITE GROUP	5411	Consumer Staples	€13.00
570	AMSTRAD	3661	Technology	€13.00
571	HEAVITREE BREWERY	5810	Consumer Staples	€13.00
572	BAGGERIDGE BRICK	3250	Consumer-Cyclical	€13.00
573	MARYLEBONE WARWICK BALFOUR	6500	Consumer-Cyclical	€13.00
574	LPA GROUP	3640	Capital Goods	€13.00
575	BODY SHOP INTERNATIONAL	2844	Consumer Staples	€12.00
576	WINTRUST	6029	Financials	€12.00
577	DONATANTONIO	5141	Consumer Staples	€12.00
578	I-SPIRE	5020	Consumer-Cyclical	€12.00
579	TITON HOLDINGS	3634	Consumer-Cyclical	€12.00
580	ENTERPRISE	8742	Consumer-Cyclical	€12.00
581	APPLIED OPTICAL TECHNOLOGIES	2670	Basic Materials	€11.00
582	GIEVES & HAWKES	5600	Consumer-Cyclical	€11.00
583	CITY OF LONDON GROUP	8700	Capital Goods	€11.00
584	ROWE EVANS INVESTMENTS	800	Basic Materials	€11.00
585	MAISHA	5122	Consumer Staples	€10.00
586	NEWCASTLE UNITED	7941	Consumer Staples	€10.00
587	MERCHANT RETAIL GROUP	5311	Consumer-Cyclical	€10.00
588	SOUTHERN VECTIS	4100	Transportation	€10.00
589	WHITTARD OF CHELSEA	5810	Consumer Staples	€10.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
590	KINGFISHER LEISURE	5810	Consumer Staples	€9.00
591	MOORFIELD GROUP	6510	Consumer-Cyclical	€9.00
592	BLOOMSBURY PUBLISHING	2731	Consumer-Cyclical	€9.00
593	HORNBY GROUP	3944	Consumer-Cyclical	€9.00
594	AUKETT GROUP	8700	Capital Goods	€9.00
595	SHILOH	2200	Consumer-Cyclical	€8.00
596	AIT GROUP	7370	Technology	€8.00
597	EUROCOPY	5040	Consumer-Cyclical	€8.00
598	EUROPEAN TELECOM	5065	Capital Goods	€7.00
599	BIRSE GROUP	1540	Capital Goods	€7.00
600	LONDON CLUBS INTL	7990	Consumer-Cyclical	€7.00
601	HIGHAMS SYSTEMS SVCS GRP	8700	Capital Goods	€7.00
602	DARTMOOR INVESTMENT TRUST	6799	Financials	€7.00
603	DURLACHER CORP	6211	Financials	€7.00
604	ALEXANDER RUSSELL	1400	Basic Materials	€7.00
605	HORACE CLARKSON	4412	Transportation	€6.00
606	LONDON BRIDGE SOFTWARE HLDGS	7371	Technology	€6.00
607	VHE HOLDINGS	1600	Capital Goods	€6.00
608	HAY & ROBERTSON	2300	Consumer-Cyclical	€6.00
609	COMPUTERLAND UK	7370	Technology	€6.00
610	GIBBS AND DANDY	5211	Consumer-Cyclical	€5.00
611	HOLDERS TECHNOLOGY	5084	Capital Goods	€5.00
612	ADVANCED POWER COMPONENTS	3679	Capital Goods	€5.00
613	ESTATES & GENERAL	6500	Consumer-Cyclical	€4.00
614	ELECO	1700	Capital Goods	€4.00
615	CAPITAL BARS	5810	Consumer Staples	€4.00
616	DENSITRON TECHNOLOGIES	3670	Capital Goods	€4.00
617	CAFFYNS	5500	Consumer-Cyclical	€4.00
618	CAKEBREAD ROBEY & CO	5030	Consumer-Cyclical	€4.00
619	BILSTON & BATTERSEA ENAMELS	3260	Consumer-Cyclical	€4.00
620	CLUBHAUS	7997	Consumer-Cyclical	€4.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
621	RICHMOND FOODS	5140	Consumer Staples	€3.00
622	JACOBS HOLDINGS	4200	Transportation	€3.00
623	HUNTSWORTH	8742	Consumer-Cyclical	€3.00
624	OEM	6500	Consumer-Cyclical	€3.00
625	BOOTH INDUSTRIES	3442	Consumer-Cyclical	€3.00
626	BIRCHIN INTERNATIONAL	8200	Consumer-Cyclical	€3.00
627	CRITERION PROPERTIES	6512	Consumer-Cyclical	€2.00
628	PERRY GROUP	5500	Consumer-Cyclical	€2.00
629	SPRINGWOOD	5810	Consumer Staples	€2.00
630	STRATAGEM GROUP	3585	Capital Goods	€2.00
631	LENDU HOLDINGS	100	Basic Materials	€2.00
632	HAVELOCK EUROPA	3990	Capital Goods	€2.00
633	MANGANESE BRONZE HLDGS	3711	Consumer-Cyclical	€1.00
634	UNIVERSAL SALVAGE	5500	Consumer-Cyclical	€1.00
635	CARDIFF PROPERTY	6512	Consumer-Cyclical	€1.00
636	MARTIN SHELTON GROUP	2780	Consumer-Cyclical	€1.00
637	SOUNDTRACS	3651	Capital Goods	€0.00
638	CHESTERTON INTL	6531	Consumer-Cyclical	€0.00
639	TEATHER & GREENWOOD HLDGS	6726	Financials	€0.00
640	JAMES CROPPER	2621	Basic Materials	€0.00
641	BELGO GROUP	5810	Consumer Staples	€0.00
642	PREMISYS TECHNOLOGIES	1540	Capital Goods	€0.00
643	FEEDBACK	7371	Technology	€-1.00
644	ARCOELECTRIC HOLDINGS	3679	Capital Goods	€-1.00
645	CML MICROSYSTEMS	3669	Technology	€-1.00
646	GRESHAM COMPUTING	7373	Technology	€-1.00
647	BOGOD GROUP	5064	Capital Goods	€-1.00
648	LAIRD GROUP	3570	Technology	€-2.00
649	PADANG SENANG HOLDINGS	800	Basic Materials	€-2.00
650	PILKINGTON'S TILES GROUP	3250	Consumer-Cyclical	€-2.00
651	EUROPOWER	3060	Capital Goods	€-2.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
652	ASSOCIATED BRITISH ENGR	5040	Consumer-Cyclical	€-2.00
653	UNITED INDUSTRIES	3089	Consumer Staples	€-2.00
654	ELECTRONIC DATA PROCESSING	7370	Technology	€-3.00
655	HUNTERS LEISURE	2520	Capital Goods	€-3.00
656	DANIELS (S)	2000	Consumer Staples	€-3.00
657	GOWRINGS	5500	Consumer-Cyclical	€-3.00
658	OCKHAM HOLDINGS	6300	Financials	€-3.00
659	DICOM GROUP	7370	Technology	€-3.00
660	EVOLUTION GROUP	6799	Financials	€-3.00
661	DEEP-SEA LEISURE	8400	Consumer-Cyclical	€-4.00
662	BULGIN (AF) & CO	3679	Capital Goods	€-4.00
663	BEN BAILEY CONSTRUCTION	1520	Consumer-Cyclical	€-4.00
664	TORDAY & CARLISLE	3510	Capital Goods	€-4.00
665	EURODIS ELECTRON	5045	Technology	€-5.00
666	NORD ANGLIA EDUCATION	8200	Consumer-Cyclical	€-5.00
667	VICTORIA CARPET HOLDINGS	2273	Consumer-Cyclical	€-5.00
668	AVESCO	3663	Technology	€-5.00
669	QUARTO GROUP INC (THE)	2731	Consumer-Cyclical	€-6.00
670	CHEMRING GROUP	3812	Capital Goods	€-6.00
671	PHP-PRIMARY HEALTH PPTYS	6512	Consumer-Cyclical	€-6.00
672	EDINBURGH JAVA TRUST	6726	Financials	€-6.00
673	VTR	7812	Consumer Staples	€-7.00
674	SOUTHAMPTON LEISURE HLDGS	7941	Consumer Staples	€-7.00
675	GOSHAWK INSURANCE HLDGS	6300	Financials	€-7.00
676	JENNINGS BROTHERS	2082	Consumer Staples	€-7.00
677	MS INTERNATIONAL	8711	Capital Goods	€-7.00
678	INGENTA	1520	Consumer-Cyclical	€-7.00
679	CASSIDY BROTHERS	3944	Consumer-Cyclical	€-7.00
680	THOMAS WALKER	3960	Consumer-Cyclical	€-7.00
681	DINKIE HEEL	3060	Capital Goods	€-8.00
682	GAMING INTERNET	7812	Consumer Staples	€-8.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
683	JOSEPH (LEOPOLD) HOLDINGS	6029	Financials	€-8.00
684	I2S	2200	Consumer-Cyclical	€-8.00
685	PNC TELE.COM	4899	Communication	€-9.00
686	SCI ENTERTAINMENT	7372	Technology	€-9.00
687	COSTAIN GROUP	1600	Capital Goods	€-9.00
688	EURO SALES FINANCE	6153	Financials	€-9.00
689	ANGLO-EASTERN PLANTATIONS	2070	Consumer Staples	€-9.00
690	FORESIGHT TECHNOLOGY VCT	6799	Financials	€-9.00
691	DANAE INVESTMENT TRUST	6726	Financials	€-10.00
692	ARENA LEISURE	7948	Consumer-Cyclical	€-10.00
693	IAF GROUP	6172	Financials	€-10.00
694	BERRY BIRCH & NOBLE	6799	Financials	€-10.00
695	ABERDEEN NEW THAI INVST TRST	6726	Financials	€-10.00
696	ILLUMINATOR	7371	Technology	€-10.00
697	STAFFWARE	7372	Technology	€-11.00
698	PORTMEIRION GROUP	3260	Consumer-Cyclical	€-11.00
699	CULVER HOLDINGS	6799	Financials	€-11.00
700	ELBIEF	3990	Capital Goods	€-11.00
701	ROLFE & NOLAN	7372	Technology	€-11.00
702	DIGITAL ANIMATIONS GROUP	7372	Technology	€-11.00
703	GEARHOUSE GROUP	7359	Consumer-Cyclical	€-11.00
704	FORTNUM & MASON	5400	Consumer Staples	€-12.00
705	CALDWELL INVESTMENTS	5130	Consumer-Cyclical	€-12.00
706	PARTRIDGE FINE ARTS	5990	Consumer-Cyclical	€-12.00
707	VOCALIS GROUP	3669	Technology	€-12.00
708	KUNICK	7996	Consumer Staples	€-12.00
709	LORIEN	8742	Consumer-Cyclical	€-13.00
710	HANOVER INTL	7011	Consumer-Cyclical	€-13.00
711	LEEDS SPORTING	7941	Consumer Staples	€-13.00
712	SMART (J) & CO CONTRACTORS	1500	Capital Goods	€-13.00
713	HARDY UNDERWRITING GROUP	6331	Financials	€-14.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
714	FULLER SMITH & TURNER	2082	Consumer Staples	€-14.00
715	BILLITON	3334	Basic Materials	€-14.00
716	FUTURE INTEGRATED TELEPHONY	4810	Communication	€-15.00
717	BABCOCK INTERNATIONAL GROUP	8711	Capital Goods	€-15.00
718	HIT ENTERTAINMENT	6794	Consumer-Cyclical	€-15.00
719	SUTTON HARBOUR HLDGS	4400	Transportation	€-15.00
720	DREW SCIENTIFIC GROUP	3826	Technology	€-16.00
721	UCM GROUP	3250	Consumer-Cyclical	€-16.00
722	QUICKS GROUP	5500	Consumer-Cyclical	€-16.00
723	ARTHUR SHAW & CO	3442	Consumer-Cyclical	€-16.00
724	TGI	3651	Capital Goods	€-16.00
725	NETCALL	7373	Technology	€-16.00
726	SUNDERLAND	7941	Consumer Staples	€-16.00
727	SPORTSWORLD MEDIA GROUP	7812	Consumer Staples	€-16.00
728	PARK GROUP	5961	Consumer-Cyclical	€-16.00
729	SURGICAL INNOVATIONS GRP	3841	Healthcare	€-17.00
730	IDS GROUP	7371	Technology	€-17.00
731	GLASGOW INCOME TRUST	6726	Financials	€-17.00
732	PANTHER SECURITIES	6512	Consumer-Cyclical	€-17.00
733	PITTARDS	3100	Consumer-Cyclical	€-17.00
734	HARDYS & HANSONS	2082	Consumer Staples	€-17.00
735	FRENCH	2390	Consumer-Cyclical	€-18.00
736	FITNESS FIRST	7990	Consumer-Cyclical	€-18.00
737	INVESCO CITY & COMMERCIAL TR	6726	Financials	€-18.00
738	EASYNET GROUP	7373	Technology	€-19.00
739	10 GROUP	7310	Consumer-Cyclical	€-19.00
740	AIM DISTRIBUTION TRUST	6726	Financials	€-19.00
741	GARTON ENGINEERING	3540	Capital Goods	€-19.00
742	MACFARLANE GROUP	2670	Basic Materials	€-20.00
743	ORBIS	7380	Consumer-Cyclical	€-20.00
744	MID-STATES	5013	Consumer-Cyclical	€-20.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
745	IMAGINATION TECHNOLOGIES GRP	3674	Technology	€-20.00
746	ANGLO SIBERIAN OIL CO	1311	Energy	€-20.00
747	COMPCO HOLDINGS	6512	Consumer-Cyclical	€-20.00
748	MAYBORN GROUP	3060	Capital Goods	€-20.00
749	ENNSTONE	3270	Consumer-Cyclical	€-21.00
750	AFRICAN LAKES CORP	5010	Consumer-Cyclical	€-21.00
751	CH BAILEY	3730	Transportation	€-22.00
752	REA HOLDINGS	5190	Consumer-Cyclical	€-22.00
753	MECONIC	2834	Healthcare	€-22.00
754	AFA SYSTEMS	7371	Technology	€-22.00
755	FOLKES GROUP	3300	Basic Materials	€-23.00
756	PROTEOME SCIENCES	8731	Healthcare	€-24.00
757	UNIVERSE GROUP	7389	Consumer-Cyclical	€-24.00
758	ARM HOLDINGS	3674	Technology	€-25.00
759	MICROGEN	7370	Technology	€-25.00
760	JAMES SMITH ESTATES	6512	Consumer-Cyclical	€-25.00
761	CELSIS INTERNATIONAL	3823	Technology	€-25.00
762	ARMOUR TRUST	5900	Consumer-Cyclical	€-26.00
763	AIRSPRUNG FURNITURE GROUP	2510	Consumer-Cyclical	€-26.00
764	EDINBURGH OIL & GAS	1311	Energy	€-26.00
765	ALBANY INVESTMENT TRUST	6726	Financials	€-26.00
766	BARLOWS	6512	Consumer-Cyclical	€-27.00
767	KS BIOMEDIX HOLDINGS	2834	Healthcare	€-27.00
768	AIM GROUP	8711	Capital Goods	€-28.00
769	SOPHEON	7372	Technology	€-28.00
770	SWP GROUP	2452	Consumer-Cyclical	€-29.00
771	600 GROUP (THE)	3540	Capital Goods	€-29.00
772	NORTHERN INVESTORS CO	6722	Financials	€-29.00
773	QS GROUP	5651	Consumer-Cyclical	€-29.00
774	TRINITY MIRROR	2711	Consumer-Cyclical	€-29.00
775	HENDERSON FAR EAST INCOME TR	6726	Financials	€-29.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
776	TARSUS GROUP	7330	Consumer-Cyclical	€-30.00
777	WORKSPACE GROUP	6512	Consumer-Cyclical	€-30.00
778	AUSTRALIAN OPPORTUN INV TR	6726	Financials	€-30.00
779	GLADSTONE	7370	Technology	€-31.00
780	NINTH FLOOR	5013	Consumer-Cyclical	€-32.00
781	RECOGNITION SYSTEMS GROUP	7371	Technology	€-33.00
782	ADVENT VCT	6726	Financials	€-33.00
783	CREIGHTON'S NATURALLY	2840	Consumer Staples	€-34.00
784	CHARLTON ATHLETIC	7941	Consumer Staples	€-34.00
785	PLANIT HOLDINGS	7372	Technology	€-35.00
786	VIBROPLANT	7359	Consumer-Cyclical	€-35.00
787	DRESDNER RCM SMLR COS INV TR	6726	Financials	€-35.00
788	ULTIMA NETWORKS	3577	Technology	€-35.00
789	BERTAM HOLDINGS	3060	Capital Goods	€-35.00
790	SWALLOWFIELD	3990	Capital Goods	€-35.00
791	PACIFIC MEDIA	7812	Consumer Staples	€-36.00
792	FREDERICK COOPER	3470	Capital Goods	€-36.00
793	DAEJAN HOLDINGS	6500	Consumer-Cyclical	€-36.00
794	INCH KENNETH KAJANG RUBBER	100	Basic Materials	€-36.00
795	FINSBURY LIFE SCIENCES INVT	6726	Financials	€-37.00
796	TADPOLE TECHNOLOGY	7370	Technology	€-38.00
797	MEDICAL SOLUTIONS	3841	Healthcare	€-38.00
798	BRANDON HIRE	7350	Consumer-Cyclical	€-38.00
799	DARBY GROUP	3220	Capital Goods	€-39.00
800	STERLING PUBLISHING GRP	2731	Consumer-Cyclical	€-39.00
801	BAILLIE GIFFORD SHIN NIPPON	6726	Financials	€-39.00
802	TRAFFICMASTER	2741	Consumer-Cyclical	€-39.00
803	MEDISYS	3826	Technology	€-39.00
804	LEGGMASON INVESTORS ENTR	6799	Financials	€-40.00
805	RONSON	5190	Consumer-Cyclical	€-40.00
806	HILL & SMITH HOLDINGS	3312	Basic Materials	€-40.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
807	MEGALOMEDIA	7819	Consumer Staples	€-40.00
808	MID WYND INTL INVSTMT TR	6726	Financials	€-41.00
809	ENERGY CAPITAL INVESTMENT CO	6799	Financials	€-41.00
810	SR PHARMA	8731	Healthcare	€-41.00
811	DRUMMOND GROUP	2200	Consumer-Cyclical	€-41.00
812	MARTIN INTERNATIONAL HLDGS	2300	Consumer-Cyclical	€-42.00
813	REFLEC	2890	Basic Materials	€-42.00
814	MCKAY SECURITIES	6512	Consumer-Cyclical	€-42.00
815	XAAR	3555	Capital Goods	€-42.00
816	TELEMETRIX	3576	Technology	€-43.00
817	BILLAM	8711	Capital Goods	€-44.00
818	FINDEL	5961	Consumer-Cyclical	€-44.00
819	TELSPEC	3661	Technology	€-45.00
820	BRITISH & AMERICAN INVEST TR	6726	Financials	€-45.00
821	ULTRASIS	8711	Capital Goods	€-45.00
822	FORTRESS HOLDINGS	3600	Capital Goods	€-45.00
823	JOS HOLDINGS	6726	Financials	€-46.00
824	MUCKLOW (A&J) GROUP	6500	Consumer-Cyclical	€-48.00
825	PORVAIR	3290	Consumer-Cyclical	€-48.00
826	INTELEK	3679	Capital Goods	€-48.00
827	LIFE OFFICES OPPORTUNITIES	6726	Financials	€-49.00
828	PHOTO-ME INTERNATIONAL	7200	Consumer-Cyclical	€-49.00
829	INTELLIGENT ENVIRONMENTS	7370	Technology	€-50.00
830	ELDRIDGE POPE & CO	5810	Consumer Staples	€-52.00
831	INVERESK	2621	Basic Materials	€-53.00
832	SUPERSCAPE VR	7371	Technology	€-54.00
833	JUPITER PRIMADONA GROWTH TR	6726	Financials	€-54.00
834	LOW & BONAR	2670	Basic Materials	€-55.00
835	EMERALD ENERGY	1311	Energy	€-55.00
836	BOUSTEAD	1500	Capital Goods	€-56.00
837	I&S UK SMALLER COS TRUST	6726	Financials	€-56.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
838	BURTONWOOD BREWERY	5810	Consumer Staples	€-58.00
839	WEB-ANGEL	1311	Energy	€-59.00
840	LOWE (ROBERT H)	2650	Basic Materials	€-59.00
841	AIM TRUST	6726	Financials	€-59.00
842	GREENWICH RESOURCES	1000	Basic Materials	€-59.00
843	KALAMAZOO	7370	Technology	€-60.00
844	JOURDAN	3580	Capital Goods	€-60.00
845	WORTHINGTON GROUP	2200	Consumer-Cyclical	€-61.00
846	WELLINGTON HLDGS	3060	Capital Goods	€-61.00
847	COMMUNISIS	2400	Basic Materials	€-61.00
848	REGALIAN PROPERTIES	6552	Consumer-Cyclical	€-62.00
849	PLANTATION & GENL INVT	3523	Capital Goods	€-62.00
850	FII GROUP	3021	Consumer-Cyclical	€-62.00
851	MERRYDOWN	2080	Consumer Staples	€-62.00
852	CAMELLIA	100	Basic Materials	€-62.00
853	GOVETT EURO TECH & INC TST	6726	Financials	€-62.00
854	FIBERNET GROUP	7373	Technology	€-63.00
855	OXFORD BIOMEDICA LTD	8731	Healthcare	€-64.00
856	MARTIN CURRIE PACIFIC TR	6726	Financials	€-64.00
857	KINTA KELLAS	8711	Capital Goods	€-64.00
858	PROTHERICS	7373	Technology	€-65.00
859	SWAN HILL GROUP	1540	Capital Goods	€-65.00
860	FLYING BRANDS LTD	5990	Consumer-Cyclical	€-65.00
861	NHP	6512	Consumer-Cyclical	€-65.00
862	HOUSE OF FRASER	5311	Consumer-Cyclical	€-65.00
863	ENERGY TECHNIQUE	3585	Capital Goods	€-66.00
864	DESIRE PETROLEUM	1311	Energy	€-66.00
865	ISA INTERNATIONAL	5110	Basic Materials	€-67.00
866	GYRUS GROUP	3845	Healthcare	€-67.00
867	DATRONTECH GROUP	5045	Technology	€-67.00
868	DUNEDIN SMALLER COS INVST TR	6726	Financials	€-68.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
869	JACQUES VERT	2330	Consumer-Cyclical	€-68.00
870	LONDON & ST LAWRENCE INVT CO	6726	Financials	€-68.00
871	JERMYN INVESTMENT PROPERTIES	6512	Consumer-Cyclical	€-69.00
872	BRADSTOCK GROUP	6411	Financials	€-69.00
873	HENDERSON HIGH INCOME TRUST	6726	Financials	€-70.00
874	SCOTTISH VALUE TR	6726	Financials	€-71.00
875	WARNER ESTATE HOLDINGS	6512	Consumer-Cyclical	€-72.00
876	INVESCO INCOME GROWTH TRUST	6726	Financials	€-72.00
877	LEEDS GROUP	2200	Consumer-Cyclical	€-73.00
878	VALUE AND INCOME TRUST	6726	Financials	€-73.00
879	BRIT INSURANCE HOLDINGS	6331	Financials	€-74.00
880	TELME.COM	2741	Consumer-Cyclical	€-74.00
881	PHYTOPHARM	2833	Healthcare	€-74.00
882	DELANCEY ESTATES	6500	Consumer-Cyclical	€-75.00
883	STODDARD INTERNATIONAL	2273	Consumer-Cyclical	€-75.00
884	BIRMINGHAM CITY	7941	Consumer Staples	€-75.00
885	ESPORTA	7997	Consumer-Cyclical	€-75.00
886	PENNON GROUP	4950	Capital Goods	€-76.00
887	UNITED OVERSEAS GROUP	5090	Consumer-Cyclical	€-78.00
888	LEGAL & GEN UK SELECT INVT	6799	Financials	€-78.00
889	DEUTSCHE EQUITY INCOME TR	6726	Financials	€-79.00
890	PALADIN RESOURCES	1311	Energy	€-79.00
891	HEMSCOTT.NET GROUP	6199	Financials	€-82.00
892	CHRYSLIS GROUP	3652	Capital Goods	€-82.00
893	PACE MICRO TECHNOLOGY	3663	Technology	€-83.00
894	FINSBURY TRUST	6726	Financials	€-85.00
895	LAPORTE	2800	Basic Materials	€-85.00
896	SEVERN TRENT	4941	Utilities	€-86.00
897	BRUNEL HOLDINGS	8711	Capital Goods	€-86.00
898	CHELSEA VILLAGE	7941	Consumer Staples	€-86.00
899	WARNFORD INVESTMENTS	6510	Consumer-Cyclical	€-87.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
900	EADIE HOLDINGS	3530	Capital Goods	€-87.00
901	SAVE GROUP	5500	Consumer-Cyclical	€-89.00
902	LOWLAND INVESTMENT CO	6722	Financials	€-89.00
903	D C COOK HLDGS	5500	Consumer-Cyclical	€-90.00
904	NMT GROUP	3841	Healthcare	€-91.00
905	SOCO INTERNATIONAL	1311	Energy	€-92.00
906	FIRTH HOLDINGS	3312	Basic Materials	€-93.00
907	COX INSURANCE HOLDINGS	6311	Financials	€-93.00
908	TOTTENHAM HOTSPUR	7941	Consumer Staples	€-94.00
909	SMALLER COS INVT TR	6726	Financials	€-95.00
910	FLEMING US DISCOVERY INV TR	6726	Financials	€-95.00
911	INVESCO ASIA TRUST	6726	Financials	€-95.00
912	UNION	6200	Financials	€-96.00
913	PLASMON	7373	Technology	€-96.00
914	ALUMASC GROUP	3540	Capital Goods	€-97.00
915	SAVILLE GORDON ESTATES	6512	Consumer-Cyclical	€-99.00
916	PACIFIC ASSETS TRUST	6726	Financials	€-100.00
917	FOREIGN & COLON PEP & ISA	6726	Financials	€-100.00
918	ERA GROUP	5090	Consumer-Cyclical	€-101.00
919	TOWN CENTRE SECURITIES	6512	Consumer-Cyclical	€-103.00
920	FIDELITY ASIAN VALUES	6722	Financials	€-103.00
921	RAMCO ENERGY	1381	Energy	€-106.00
922	FINSBURY GROWTH TRUST	6799	Financials	€-106.00
923	CLS HOLDINGS	6512	Consumer-Cyclical	€-106.00
924	CRODA INTERNATIONAL	2860	Basic Materials	€-107.00
925	HISCOX	6331	Financials	€-108.00
926	INTL BIOTECHNOLOGY TRUST	6726	Financials	€-108.00
927	QUINTAIN ESTATES & DEVELOP	6512	Consumer-Cyclical	€-108.00
928	SCHRODER INCOME GROWTH FUND	6722	Financials	€-109.00
929	HONEYSUCKLE GROUP	2330	Consumer-Cyclical	€-109.00
930	AZLAN GROUP	5045	Technology	€-110.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
931	ABERFORTH SPLIT LEVEL TRUST	6726	Financials	€-110.00
932	SHIRES INCOME	6726	Financials	€-110.00
933	FINSBURY TECHNOLOGY TR	6799	Financials	€-111.00
934	SCHRODER EMRG COUNTRIES FUND	6722	Financials	€-111.00
935	CARBO	3290	Consumer-Cyclical	€-113.00
936	YOUNG & CO'S BREWERY	2082	Consumer Staples	€-113.00
937	BRITANNIA SMALLER COS TR	6726	Financials	€-113.00
938	BETA GLOBAL EMERG MKTS INV	6726	Financials	€-118.00
939	INFOBANK INTL HLDGS	5734	Consumer-Cyclical	€-118.00
940	SCHRODER ASIA PACIFIC FUND	6722	Financials	€-119.00
941	ENIC	6799	Financials	€-123.00
942	CANNONS GROUP	7990	Consumer-Cyclical	€-123.00
943	FINSBURY WORLDWIDE PHARM TR	6726	Financials	€-123.00
944	AXIS-SHIELD	2835	Healthcare	€-123.00
945	FRAMLINGTON INNOVATVE GTH TR	6726	Financials	€-125.00
946	ADVANCED MEDICAL SOL GRP	2820	Basic Materials	€-130.00
947	FREEPORT LEISURE	1540	Capital Goods	€-132.00
948	3I SMALLER QUOTED COS TRUST	6726	Financials	€-133.00
949	DERBY TRUST	6726	Financials	€-136.00
950	ASDA PROPERTY HOLDINGS	6510	Consumer-Cyclical	€-142.00
951	EDINBURGH SMALL COMPANIES TR	6726	Financials	€-145.00
952	GTL RESOURCES	1311	Energy	€-146.00
953	ATLANTIS JAPAN GROWTH FUND	6799	Financials	€-148.00
954	FLEMING ASIAN INVT TR	6726	Financials	€-149.00
955	BAILLIE GIFFORD JAPAN TR	6726	Financials	€-152.00
956	NXT	3651	Capital Goods	€-153.00
957	ML LABORATORIES	3841	Healthcare	€-154.00
958	MERRILL LYNCH UK INVT TR	6726	Financials	€-154.00
959	CANDOVER INVESTMENTS	6799	Financials	€-155.00
960	HAMPTON TRUST	6512	Consumer-Cyclical	€-157.00
961	CAMBRIDGE ANTIBODY TECH GRP	8731	Healthcare	€-157.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
962	TDG	4213	Transportation	€-162.00
963	SCHRODER JAPAN GROWTH FUND	6722	Financials	€-163.00
964	EDINBURGH UK TRACKER TRUST	6726	Financials	€-164.00
965	KENWOOD APPLIANCES	3630	Consumer-Cyclical	€-166.00
966	BURNDEN LEISURE	7941	Consumer Staples	€-167.00
967	HENDERSON STRATA INVESTMENTS	6726	Financials	€-168.00
968	SHEFFIELD UNITED	7941	Consumer Staples	€-169.00
969	FOREIGN & COLON US SMLLR COS	6726	Financials	€-172.00
970	TOPS ESTATE	6512	Consumer-Cyclical	€-172.00
971	WASTE RECYCLING GROUP	4953	Capital Goods	€-173.00
972	ACAMBIS	2834	Healthcare	€-173.00
973	SEP INDUSTRIAL HLDGS	3452	Capital Goods	€-174.00
974	THEMIS FTSE ALL-SMALL INDEX	6726	Financials	€-175.00
975	POWDERJECT PHARMACEUTICALS	2834	Healthcare	€-175.00
976	BEAUFORD	3290	Consumer-Cyclical	€-176.00
977	MIDDLESEX HLDGS	3312	Basic Materials	€-180.00
978	MOLINS	3559	Capital Goods	€-181.00
979	CHORION	7900	Consumer Staples	€-181.00
980	ANTONOV	6794	Consumer-Cyclical	€-181.00
981	BTG-BRITISH TECHNOLOGY GROUP	6794	Consumer-Cyclical	€-181.00
982	SENIOR	3490	Capital Goods	€-183.00
983	TAY HOMES	6552	Consumer-Cyclical	€-183.00
984	FOREIGN & COL EMR MKT INV TR	6726	Financials	€-183.00
985	LAMONT HOLDINGS	2200	Consumer-Cyclical	€-185.00
986	FLEMING EUROPEAN FLED INV TR	6726	Financials	€-187.00
987	UNDERVALUED ASSETS TRUST	6726	Financials	€-187.00
988	F&C LATIN AMERICAN INVEST TR	6726	Financials	€-188.00
989	FRIENDLY HOTELS	7011	Consumer-Cyclical	€-189.00
990	PURA	2070	Consumer Staples	€-189.00
991	JOHNSON SERVICE GROUP	7200	Consumer-Cyclical	€-194.00
992	XENOVA GROUP	2834	Healthcare	€-197.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
993	PANTHEON INTL & PARTICIP	6799	Financials	€-197.00
994	FLEMING MID CAP INVESTMNT TR	6726	Financials	€-199.00
995	THOMPSON CLIVE INVESTMENTS	6722	Financials	€-200.00
996	FIDELITY JAPANESE VALUES	6722	Financials	€-202.00
997	DEVRO INTERNATIONAL	2013	Consumer Staples	€-203.00
998	ABERFORTH SMALLER CO TRUST	6726	Financials	€-203.00
999	CANTAB PHARMACEUTICALS	2836	Healthcare	€-205.00
1000	FLEMING EMERG MARKETS INV TR	6726	Financials	€-211.00
1001	INFAST GROUP	1700	Capital Goods	€-213.00
1002	GARTMORE EUROPEAN INVSTMT TR	6726	Financials	€-214.00
1003	MAJEDIE INVESTMENTS	6726	Financials	€-214.00
1004	GT JAPAN INVESTMNT TRUST	6726	Financials	€-214.00
1005	CENES PHARMACEUTICALS	2834	Healthcare	€-217.00
1006	SHAFTESBURY	6512	Consumer-Cyclical	€-220.00
1007	BENCHMARK GROUP	6510	Consumer-Cyclical	€-222.00
1008	JUPITER SPLIT TRUST	6799	Financials	€-226.00
1009	INVESCO ENGLISH & INTL TRUST	6726	Financials	€-231.00
1010	ATLANTIC TELECOM GROUP	4810	Communication	€-237.00
1011	SHIRE PHARMACEUTICALS GROUP	2834	Healthcare	€-239.00
1012	EDINBURGH DRAGON TRUST	6726	Financials	€-242.00
1013	TR PROPERTY INVESTMENT TRUST	6726	Financials	€-243.00
1014	DELTA	3600	Capital Goods	€-246.00
1015	RECKITT BENCKISER	2842	Consumer Staples	€-260.00
1016	LAW DEBENTURE CORP	6726	Financials	€-260.00
1017	STYLO	5661	Consumer-Cyclical	€-266.00
1018	FLEMING INCOME & CAPITAL INV	6726	Financials	€-267.00
1019	MERANT	7371	Technology	€-269.00
1020	MERRILL LYNCH WORLD MNG TR	6726	Financials	€-270.00
1021	VICTORY CORP	5600	Consumer-Cyclical	€-271.00
1022	FORTUNE OIL	5171	Capital Goods	€-272.00
1023	HENDERSON TR PACIFIC INV TR	6726	Financials	€-274.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1024	DANA PETROLEUM	1311	Energy	€-278.00
1025	BARING EMERGING EUROPE TRUST	6799	Financials	€-279.00
1026	HUNTINGDON LIFE SCIENCE	8731	Healthcare	€-282.00
1027	PPL THERAPEUTICS	2834	Healthcare	€-291.00
1028	CHAPELTHORPE	2200	Consumer-Cyclical	€-292.00
1029	PERPETUAL INC & GROWTH INVT	6726	Financials	€-294.00
1030	M & G INCOME INVESTMENT TR	6726	Financials	€-295.00
1031	THROGMORTON TRUST	6726	Financials	€-307.00
1032	DERWENT VALLEY HOLDINGS	6512	Consumer-Cyclical	€-308.00
1033	BRIXTON ESTATE	6512	Consumer-Cyclical	€-312.00
1034	MURRAY GLOBAL RETURN TR	6726	Financials	€-318.00
1035	SCOOT.COM	7370	Technology	€-322.00
1036	BRITISH AIRWAYS	4512	Transportation	€-323.00
1037	FOREIGN & COLON SMALLER COS	6726	Financials	€-326.00
1038	DAVID S SMITH HOLDINGS	2631	Basic Materials	€-328.00
1039	FOREIGN & COLON ENTERPRS TR	6726	Financials	€-331.00
1040	CAPITAL & REGIONAL PPTYS	6512	Consumer-Cyclical	€-337.00
1041	TEMPLE BAR INVESTMENT TR	6726	Financials	€-343.00
1042	ANGLO AMERICAN	6799	Financials	€-344.00
1043	BRITISH EMPIRE SECS & GEN TR	6726	Financials	€-348.00
1044	CATHAY INTL HLDGS	7011	Consumer-Cyclical	€-349.00
1045	ELEMENTIS	2800	Basic Materials	€-353.00
1046	GENESIS EMERGING MKTS FUND	6722	Financials	€-355.00
1047	CALEDONIA INVESTMENTS	6722	Financials	€-359.00
1048	SCHRODER VENTURES INT INV TR	6726	Financials	€-372.00
1049	DUNEDIN INCOME GROWTH INV TR	6726	Financials	€-375.00
1050	FIDELITY EUROPEAN VALUES	6722	Financials	€-378.00
1051	PILLAR PROPERTY INVESTMENTS	6512	Consumer-Cyclical	€-381.00
1052	MERCHANTS TRUST	6726	Financials	€-381.00
1053	VERNALIS GROUP	8731	Healthcare	€-382.00
1054	YORKSHIRE GROUP	2860	Basic Materials	€-384.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1055	SCOTIA HOLDINGS	2834	Healthcare	€-385.00
1056	SKYEPHARMA	2834	Healthcare	€-386.00
1057	BRUNNER INVESTMENT TRUST	6726	Financials	€-388.00
1058	ENGLISH & SCOTTISH INVESTORS	6726	Financials	€-388.00
1059	FLEMING CLAVERHOUSE INVST TR	6726	Financials	€-388.00
1060	FOREIGN & COLON PAC INVST TR	6726	Financials	€-391.00
1061	MINERVA	6512	Consumer-Cyclical	€-406.00
1062	HENDERSON TECHNOLOGY TRUST	6726	Financials	€-407.00
1063	WOLVERHAMPTON & DUDLEY BREW	2082	Consumer Staples	€-410.00
1064	JKX OIL & GAS	1311	Energy	€-422.00
1065	MENZIES (JOHN)	5190	Consumer-Cyclical	€-433.00
1066	HERALD INVESTMENT TRUST	6726	Financials	€-452.00
1067	SCHRODER UK GROWTH FUND	6722	Financials	€-459.00
1068	TRIBUNE TRUST	6726	Financials	€-460.00
1069	ANTOFAGASTA	1000	Basic Materials	€-463.00
1070	SHERWOOD GROUP	2250	Consumer-Cyclical	€-464.00
1071	HENDERSON ELE & GEN INV TRST	6726	Financials	€-465.00
1072	GRANTCHESTER HLDGS	6512	Consumer-Cyclical	€-477.00
1073	SECURITIES TRUST OF SCOTLAND	6726	Financials	€-478.00
1074	HILTON GROUP	7990	Consumer-Cyclical	€-489.00
1075	INVESTORS CAPITAL TRUST	6726	Financials	€-495.00
1076	MURRAY INCOME TRUST	6726	Financials	€-497.00
1077	FOREIGN & COLON EUROTR	6726	Financials	€-503.00
1078	BRITISH ASSETS TRUST	6726	Financials	€-504.00
1079	BANKERS INVESTMENT TRUST	6726	Financials	€-526.00
1080	GOVETT STRATEGIC INVT TR	6726	Financials	€-550.00
1081	TR EUROPEAN GROWTH TRUST	6726	Financials	€-558.00
1082	HARTSTONE GRP (THE)	3100	Consumer-Cyclical	€-568.00
1083	BOOSEY & HAWKES	3931	Consumer-Cyclical	€-583.00
1084	CITY OF LONDON INVESTMENT TR	6726	Financials	€-586.00
1085	FLEMING CONTL EUROP INVST TR	6726	Financials	€-605.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1086	SCOTTISH AMERICAN INVEST TR	6726	Financials	€-642.00
1087	CHARTER EUROPEAN TRUST	6726	Financials	€-642.00
1088	FLEMING MERCANTILE INVEST	6799	Financials	€-643.00
1089	EDINBURGH US TRACKER TRUST	6726	Financials	€-649.00
1090	MILLENNIUM& COPTHORNE HOTELS	7011	Consumer-Cyclical	€-653.00
1091	BAIRD (WILLIAM)	2300	Consumer-Cyclical	€-659.00
1092	CORPORATE SERVICES GROUP	7361	Consumer Staples	€-660.00
1093	ASW HOLDINGS	3300	Basic Materials	€-663.00
1094	MURRAY INTERNATIONAL TRUST	6726	Financials	€-677.00
1095	SECOND ALLIANCE TRUST	6722	Financials	€-697.00
1096	COOKSON GROUP	3672	Capital Goods	€-713.00
1097	BIOCOMPATIBLES INTL	3851	Healthcare	€-721.00
1098	ROYAL DOULTON	3260	Consumer-Cyclical	€-737.00
1099	ASSOC BRITISH PORTS HLDG	4400	Transportation	€-747.00
1100	FLEMING JAPANESE INV TR	6726	Financials	€-754.00
1101	LONDON FORFAITING CO	6799	Financials	€-763.00
1102	CHELSEFIELD	6512	Consumer-Cyclical	€-765.00
1103	FLEMING AMERICAN INVEST TR	6726	Financials	€-788.00
1104	HENDERSON SMALLER COS INV TR	6726	Financials	€-804.00
1105	GREAT PORTLAND ESTATES	6510	Consumer-Cyclical	€-805.00
1106	ANGLO & OVERSEAS TRUST	6726	Financials	€-822.00
1107	CAIRN ENERGY	1311	Energy	€-843.00
1108	LONRHO AFRICA	5010	Consumer-Cyclical	€-847.00
1109	DAWSON INTERNATIONAL	2250	Consumer-Cyclical	€-876.00
1110	HAMMERSON	6512	Consumer-Cyclical	€-890.00
1111	FLEMING OVERSEAS INVT TR	6726	Financials	€-903.00
1112	PEEL HOLDINGS	6500	Consumer-Cyclical	€-915.00
1113	THISTLE HOTELS	7011	Consumer-Cyclical	€-935.00
1114	LAURA ASHLEY HOLDINGS	5621	Consumer-Cyclical	€-936.00
1115	ALLDAYS	5412	Consumer Staples	€-939.00
1116	MONKS INVESTMENT TRUST	6726	Financials	€-965.00

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1117	TEMPLETON EMRG MKT INVT	6726	Financials	€-972.00
1118	COATS VIYELLA	2200	Consumer-Cyclical	€-993.00
1119	ENERGIS	4810	Communication	€-1,020.00
1120	RJB MINING	1220	Basic Materials	€-1,031.00
1121	RIT CAPITAL PARTNERS	6211	Financials	€-1,066.00
1122	ENTERTAINMENT RIGHTS	7812	Consumer Staples	€-1,099.00
1123	SLOUGH ESTATES	6512	Consumer-Cyclical	€-1,119.00
1124	MERRILL LYNCH EURO INVT TR	6726	Financials	€-1,121.00
1125	BRITISH BIOTECH	2834	Healthcare	€-1,313.00
1126	FISHER (ALBERT) GROUP	2090	Consumer Staples	€-1,361.00
1127	ELECTRA INVESTMENT TRUST	6726	Financials	€-1,403.00
1128	SHELL TRANSPORT AND TRADING	2911	Energy	€-1,428.00
1129	INCHCAPE	5010	Consumer-Cyclical	€-1,476.00
1130	SCOTTISH INVESTMENT TR	6726	Financials	€-1,498.00
1131	LIBERTY INTERNATIONAL	6500	Consumer-Cyclical	€-1,847.00
1132	EDINBURGH INVESTMENT TRUST	6726	Financials	€-1,859.00
1133	PREMIER OIL	1311	Energy	€-1,872.00
1134	ALLIANCE TRUST	6726	Financials	€-1,924.00
1135	PILKINGTON	3211	Capital Goods	€-2,105.00
1136	SCOTTISH MORTGAGE & TRUS	6726	Financials	€-2,106.00
1137	RANK GROUP	7819	Consumer Staples	€-2,230.00
1138	COLT TELECOM GROUP	4813	Communication	€-2,272.00
1139	WITAN INVESTMENT TRUST	6726	Financials	€-2,310.00
1140	DANKA BUSINESS SYSTEMS	5040	Consumer-Cyclical	€-2,344.00
1141	NOVAR	3430	Consumer-Cyclical	€-2,370.00
1142	BRITISH LAND CO	6531	Consumer-Cyclical	€-2,718.00
1143	DE VERE GROUP	7011	Consumer-Cyclical	€-2,833.00
1144	3I GROUP	6799	Financials	€-3,449.00
1145	FOREIGN & COLONIAL INVEST TR	6726	Financials	€-3,565.00
1146	LAND SECURITIES	6512	Consumer-Cyclical	€-3,632.00
1147	LASMO	1311	Energy	€-4,080.00

UK Firms continued

Rank	Company Name	SIC Code	Economic Sector	Knowledge Capital® – Millions
1148	BALFOUR BEATTY	8711	Capital Goods	€-4,284.00
1149	CGNU	6331	Financials	€-5,401.00
1150	CORUS GROUP	3312	Basic Materials	€-5,449.00
1151	ROYAL & SUN ALLIANCE INS	6331	Financials	€-6,288.00
1152	TELEWEST COMMUNICATIONS	4813	Communication	€-9,245.00
Total UK Knowledge Capital®				€344,014.00

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