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**GOVERNANCE AND REGULATION OF NEW ECONOMY
COMPANIES: THE ROLE OF HUMAN CAPITAL**

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GOVERNANCE AND REGULATION OF NEW ECONOMY COMPANIES: THE ROLE OF HUMAN CAPITAL

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ABSTRACT

There has been much publicity surrounding “new economy” companies, a term embracing “dot.com”, “high-tech” and “innovative high growth” companies, amongst others. Whilst such generic terminology serves to obscure the very real differences between such companies, they are generally thought to be an important factor in economic growth despite fears as to their volatility. In economic terms such companies potentially present a number of difficulties relating to judgement problems, information asymmetry, asset specificity, imperfectly competitive markets and measurement. Such distinguishing features give rise to a high probability of market failure and may be argued to have played a significant role in the “dot.com crash”. In particular, it is thought that the role played by human capital and the associated problem of human asset specificity, poses special problems. Such difficulties may provide a justification for state intervention to regulate such companies and, in particular, their governance. This paper evaluates the the legal and regulatory framework for the governance of human capital in new economy companies by reference to the competing or complementary regulatory goals of efficiency, good governance, innovation and human capital. It further illustrates the practical effect of this framework by means of a survey of prospectuses of a sample of 50 companies listed on the Techmark index selected from three relevant groupings of sectors, which included health related, computer hardware, telecommunications and computing services companies, and related annual reports and accounts. It concludes by identifying examples of inappropriate regulation and making proposals for reform.

INTRODUCTION

The importance of an analysis of “new economy” companies

Michael Jensen, then President of the American Finance Association, spoke prophetically of what he later termed a “Third Industrial Revolution” in 1993 in giving its Presidential Address[2]:

“Since 1973 technological, political, regulatory, and economic forces have been changing the worldwide economy in a fashion comparable to the changes experienced during the nineteenth century Industrial Revolution. As in the nineteenth century, we are experiencing declining costs, increasing average (but decreasing marginal) productivity of labor, reduced growth rates of labor income, excess capacity, and the requirement for downsizing and exit. The last two decades indicate corporate internal control systems have failed to deal effectively with these changes, especially slow growth and the requirement for exit. The next several decades pose a major challenge for Western firms and political systems as these forces continue to work their way through the worldwide economy.”

The growth of what have been termed “new economy” companies has been an important factor in shaping the character of this “Third Industrial Revolution”. “New economy” companies are associated with the most innovative sectors of the global economy, encompassing fields as diverse as information technology, biotechnology and pharmaceuticals, to list but a few. The OECD has recently challenged talk of:

“... the death of the “new economy ...”,

claiming, in contrast, that the[3]:

“ ... knowledge intensity of OECD countries has continued to increase in recent years”.

Gottinger has argued that the “racing behaviour” in leading high-technology industries creates cluster and network externalities, which pipeline through other sectors of the economy and creating competitive advantages elsewhere, endogenising growth in these economies[4]. Youndt, Subramaniam and Snell have observed that “ ... the notion that knowledge and brainpower supercede physical assets as the primary source of competitive advantage is now commonly accepted in the management literature ...”[5].

Accordingly, investment in knowledge, taken by the OECD as meaning the sum of investment in R & D, software and higher education, amounted to 7% of GDP in the United States against an OECD average of 4.8% of GDP[6]. Trade in high-technology goods such as aircraft, computers, pharmaceuticals and scientific instruments can be demonstrated to have increased from less than 20% in the early 1990s to over 25% of total trade in 2000 and 2001[7]. Similarly, there has been a 32% increase between 1991 and 1998 in the growth of patent families in the OECD area[8]. In the United Kingdom, the market capitalisation of the 177 companies grouped on the TechMARK index of the London Stock Exchange amounted to £282,606 million as at March 2004, of which 40 companies were included in the TechMARK Mediscience index with a market capitalisation of £128,990 million[9]. Disappointingly, perhaps, in the light of this, BusinessWeek identified only 1 UK company, Vodaphone Group plc, as falling within its Info Tech 100[10]. Whilst “new economy companies” are undoubtedly important, they also present potential difficulties. The volatility of such companies and, in particular, their share price is well-known on account of the publicity surrounding the “dot.com bubble”. PriceWaterhouse found in 2001 that expectations of European dotcom companies included turnover growth in excess of 800% over the following 12 months[11]. Some such companies have failed, including Boo.Com and Clickmango[12]. Others have suffered a severe reduction in market value, including Thus, which entered the FTSE-100 with a valuation of £3 billion and fell to £424 million, with even long-established companies such as British Telecom, suffering a fall in the value of its shares of two-thirds of their value[13]. Trading in TechMARK shares remains active: the London Stock Exchange statistics for the “most active UK securities” for March 2004 includes 17 TechMARK companies in its total of 50[14].

The importance of “new economy” companies globally has made them a major priority for policy-makers. The 1997 Labour Party manifesto argued that[15]:

“ ... the United Kingdom must be positively committed to the global pursuit of new knowledge, with a strong science base ... leading the world ... We support a collaborative

approach between researchers and business, spreading the use of new technology and good design, and exploiting our own inventions to boost business in the UK”.

Subsequently, the Department of Trade and Industry issued the wide-ranging White Paper, “The Knowledge Economy”[16]. The White Paper acknowledged the importance of knowledge not only for high-tech industries, such as pharmaceuticals, but also for its transformative effect on other sectors, such as the car industry[17]. The importance of “knowledge assets” such as the knowledge embodied in patents and staff was also noted[18]. The impact for the policymaker was stated to be[19]:

“ ... to create a framework which supports continued development of scientific and technological excellence, greater competition and a culture of enterprise and innovation, and which ensures effective protection of the environment. Enterprise is more likely to thrive where there is a stable financial and economic backdrop; a supportive business and social environment; good access to markets, technology and finance; and a flexible, highly educated and skilled labour force. Helping those adversely affected by the adjustment to the knowledge driven economy is another role for government”.

The White Paper distinguished the role of the regulator, however, arguing[20]:

“Regulators need to weigh up the costs with the benefits in terms of incentivising and facilitating innovation. Regulation also becomes harder where output is knowledge driven and the regulated body increasingly has more information than the regulator. This makes it more difficult for the regulator to assess accurately the position of the regulated and therefore make policy that is economically efficient.”

The Company Law Review Steering Group adopted a very similar approach in identifying key trends which should influence the Modern Company Law Review. It argued that[21]:

“The pattern of productive activity, in many sectors of the economy, is shifting to become increasingly human resource – and knowledge – based. This is of particular importance for the UK, which has no future as a low wage, low productivity economy, producing low value added products. The traditional model of the company ... derives from the railway age, of a high fixed asset enterprise, run by managers on behalf of a wide body of investors and dependent on a largely undifferentiated ‘commodity’ labour force ... Assets structures are changing, and becoming increasingly ‘soft’, in the sense that a significant proportion of the value, or capacity, of a business is to be found in intangibles ... But British law fails satisfactorily to capture such assets, to enable assessment by investors and others, or to secure accountability of management for stewardship. Traditional reporting requirements focus on historic experience and tangible assets and not prospective opportunities and risks and human and intellectual investment.”

The Higgs Committee, which reported in January 2003, did much to identify and make recommendations in respect of what were, in effect, the human capital aspects of corporate governance[22]. Particularly significant findings made by it related to the age, gender, number of other posts held, average time in post and use of nomination committees[23]. It included

consideration of the behaviours and personal attributes required of the non-executive director[24], the nomination and appointment process and succession planning[25], the pool of non-executive directors[26], professional development[27] and performance evaluation[28]. From the perspective of new economy companies, the findings in relation to the pool of non-executive directors were perhaps rather depressing given the requirement to include them on the board: they were shown to be “ ... typically white males nearing retirement age with PLC director experience”[29]. But perhaps more worrying about the Review from the perspective of new economy companies was that the Review did little to address the potential differences between the types of listed companies that may exist and their potentially differing needs.

In January 2003, the Department of Trade and Industry commissioned what became the Tyson Report which took further how the “gene pool” of non-executive directors might be widened and reported in June 2003[30]. It did rather more to recognise the diversity of listed companies. Notably, it identified that successful leadership in the non-commercial and charity sectors could be relevant in providing capabilities in technical or scientific knowledge in boardrooms through the use of individuals from academic or research organisations[31]. Also in January 2003, the Department of Trade and Industry set up the Accounting for People Task Force to look at the performance measures currently used and to consider best practice in human capital reporting and to establish and champion the business case[32]. The Task Force issued a consultation paper[33] in May 2003 and its final report in October 2003[34]. Whilst the focus of these documents and the underlying research was on “ ... the way organisations manage their people ...” it also contained recommendations as to leadership and succession planning relevant to corporate governance[35].

New economy companies can be seen, therefore, to have some important distinguishing characteristics and to be a major focus of attention for policymakers. Company law itself does not, however, in general, discriminate between different companies by reference to their commercial nature or purpose[36]. There are some minimal restrictions on the name which a company may adopt, for example, a company may not use the words “Institute”, “Chemist” or “Chemistry” without the permission of the Secretary of State for Trade and Industry[37]. In addition, where the objects of a company are the promotion of science, and the company’s memorandum or articles contain a restriction on the distribution of profits, there is a procedure for the company to be exempted from the requirement to adopt the word “limited” as part of the company name[38]. The Listing Rules go much further with special Chapters devoted to scientific research based companies[39] and innovative high growth companies[40] and the Bioindustry Association has issued its own Code of Best Practice for relevant companies[41]. Yet, the Combined Code on Corporate Governance does not distinguish between different types of company other than to make minor concessions to smaller listed companies. The appropriateness of the legal and regulatory regimes for the corporate governance of new economy companies must, therefore, be an important issue for policymakers to address and is the reason for this paper.

Aims and objectives

The aims and objectives of this paper are to:

0. identify the differences in new economy companies and in particular the extent to which these relate to human asset specificity;

1. to identify the “ideal” legal and regulatory framework for the governance of new economy companies;
2. to evaluate the “real-life” regulatory framework in the light of the “ideal”;
3. to analyse the practical effect of the legal and regulatory framework on a sample of such companies;
4. to identify examples of inappropriate regulation and make proposals for reform.

The definition of “new economy” companies

Since the early 1980s a large number of different terms have been adopted to support arguments that there has been some sort of fundamental change taking place in society and the nature of organisations in society. The DTI White Paper draws attention to the importance of knowledge as the distinguishing feature[42]:

“Authors have tried to describe aspects of the changes affecting modern economies in different ways. Terms such as de-industrialisation, globalisation, the information age, the digital or weightless economy all capture elements of what we observe. The knowledge driven economy is a more general phenomenon, encompassing the exploitation and use of knowledge in all production and service activities, not just those sometimes classified as high-tech or knowledge intensive”.

Many authors distinguish “dotcom” companies. However, since this tends to be based upon the name of the company rather than the underlying nature of the company it would seem not to have any particular analytical value to it[43]. Indeed, the well-publicised “dotcom bubble” and subsequent crash have done much to discredit such companies. Indeed, as Gregory and Armitage observed in 2000, two distinct types of organisation operate in the new economy: “ ... large, well established firms, for which e-commerce is crucial, but not central to their core businesses ...” and “ ... the new “ ... dotcoms” run by founder entrepreneurs with an idea, but little experience in business or elsewhere ...”[44]. The UK Listing Authority has adopted the term “innovative high growth company”[45]. “Innovative” is intended to encompass companies whose business is innovative in nature, whether through the development of new products and / or services or new methods of business[46]. The London Stock Exchange has grouped together a wide variety of companies under the TechMARK label for marketing purposes, but as will be seen later in this paper, its definition presents some difficulties. Accordingly, the term “new economy company” has been adopted for this paper because it is the most neutral and does not possess any linkage either to a particular name or to a particular regulatory regime. It also supports well the groupings of sectors of companies which will be examined most closely, which include health related, computer hardware, telecommunications and computing services companies. It should be noted that the principal focus of this paper will, however, be upon publicly traded new economy companies and the term should be taken to refer to these throughout.

Approach of this paper

This paper commences by establishing the methodology for an analysis of the regulation applicable to new economy companies and for the survey of Techmark companies. It then proceeds to analyse the distinctiveness of the companies in the sample by reference to the following broad groupings of sectors which include health related, computer hardware, telecommunications and computing services companies. The “ideal” regulatory system is then identified by a review of the relevant literature on the competing regulatory goals of economic efficiency, good governance and investor protection, facilitation of innovation and human capital. Company strategies for dealing with human asset specificity are then evaluated by reference to relevant incentives and constraints, in particular, remuneration, contract, insurance and governance. Conclusions are then drawn as to how regulation might be improved.

METHODOLOGY

Analysis of regulation applicable to new economy companies

The regulation of new economy companies formed the central focus of the research. The approach adopted to this was the “doctrinal” or “black-letter” method, which is often assumed in legal writing, but merits explanation in a multi-disciplinary context. Van Hoecke and Warrington have described the task of “legal doctrine” as being to describe and systematise the law[47]. Its methodology involves[48]:

“ ... either implicitly or explicitly, formulating hypotheses as regards the meaning of legal concepts, legal rules, legal principles or legal institutions. These hypotheses are checked out on the basis of materials which generally are considered to be authoritative (e.g. established precedents, supreme court decisions, legislative materials) and by using the classical interpretation methods. Accepting an interpretation, eventually, is not based on some “objective” certainty but on an inter-subjective consensus within the legal community. However, the interpretation of (relatively isolated) rules and concepts is also influenced by the systematicity of a larger whole (a legal institution, a branch of the law or even the whole legal system).”

Similarly, MacGuinness has summarised the “doctrinal” or “black-letter law method” as follows[49]:

“It is ... largely deductive in approach: basic rules of law are stated as axioms, and from these axioms, one reasons out the result, testing the broad probability of each particular outcome against an extensive data base of previously decided cases. The non-quantitative approach of traditional black-letter law analysis results more from the nature of the questions that form the basis of legal study, than from any other factor. For the most part, quantitative analysis is irrelevant for the purpose of determining the rules of law that govern a particular situation, along with their meaning and application to a particular set of facts - these subjects being the focus of traditional black-letter law analysis.”

The areas of law which the research straddled were company law, contract law and tax law. Tax law was considered to the extent necessary to explain the structure of share options where it is a particularly important regulatory factor; it was necessary to exclude the fields of competition law

and intellectual property law entirely as there were few direct linkages between them and the core issues to be covered in this paper and they would have increased its length by an unacceptable amount. In addition, law methodology also provides, by analogy, a suitable method for the analysis of “soft law” comprising regulatory codes of best practice, which are significant to the corporate governance aspects of this paper. However, the limitations of law methodology is that it essentially provides a means of identification of the relevant law and regulation; legal methodology is only of limited value when it comes to evaluating the appropriateness of law or regulation to achieve specific social goals, for example, the encouragement of innovation or the achievement of economic efficiency. For those goals alternative methodologies require consideration.

In theory, the principles for the evaluation of the law are left to the related field of jurisprudence. However, as Copp has observed “... in contrast to the richness of the materials claimed to be offered, jurisprudence offers more the pursuit of a “needle in a haystack” for the academic evaluation of any particular area of law. Certainly, formal jurisprudential references are absent from many important documents which seek to justify or critique law reform ...”[50]. Accordingly, a core section of this paper below will seek to establish suitable models for an “ideal” regulatory framework for the governance of new economy companies.

Survey of Techmark companies

The aims and objectives of this research – to evaluate the efficiency of the legal and regulatory framework for the governance of human capital in new economy companies and identify examples of inappropriate law - might, in principle, have been conducted purely as a theoretical exercise. However, this would have been undesirable for a number of reasons. As a consequence, a survey was conducted of relevant company listing particulars and prospectuses and also of annual reports and accounts. This section will explain and justify the selection of these documents. The approach adopted to the analysis of numerate and narrative information respectively will, for simplicity, be addressed in this paper in relation to the appropriate issue.

Survey of company listing particulars and prospectuses

The survey of Techmark companies was based on a detailed examination of listing particulars and prospectuses prepared by the companies, generally in relation to raising capital on a market for publicly traded shares. The characteristics which made listing particulars of especial value for the purpose of this research were that listing particulars are required to contain detailed additional information on the management of a company, some of which may not be easily available from other sources[51]. Furthermore, the verification process which such documentation undergoes combined with the daunting sanctions for misleading information[52], render it of particularly high quality. Information which was particularly valuable for the purposes of this paper was the identification of investor risk factors, which enabled some measure of the significance of human capital to the companies to be ascertained, as well as more detailed information as to director expertise, integrity and contractual arrangements than would ordinarily be available.

A sample of prospectuses or listing particulars of 50 Techmark companies was selected. The sample was selected based upon capital raising transactions which took place within the period from 1st April 1998 to 31st March 2003, based on an initial sample taken in 2002 and a

subsequent sample in 2004. For this purpose the date of the transaction was taken as the date upon which unconditional dealings in the relevant shares on a fully-paid basis was expected to take place, failing which the most analogous alternative was taken. The dates of the transactions within the sample are set out in Table 1.

Table 1: Transaction Dates: Number of Transactions per Year, 1998-2003, by Sector				
Year	HR	CH/T	CS	All
1998	2	1	0	3
1999	3	3	1	7
2000	5	7	14	26
2001	3	3	3	9
2002	1	1	2	4
2003	1	0	0	1

There were a number of reasons for adopting such a 5 year period: (1) to ensure that the sample was not overly affected by time-specific issues, such as risk factors deriving from Y2K; (2) to avoid the sample being distorted by the boom prior to and including the year 2000 and the subsequent decline in activity; (3) to reflect the nature of the transactions which formed the subject of the survey, namely one-off high value transactions, unlikely to take place in relation to any particular company in any given year; (4) to exclude companies where the documentation might be stale in terms of changing regulatory requirements, and (5) to maximise the number of companies which might satisfy the conditions of Chapters 20 or 25 Listing Rules, where very full disclosure would have been required. The markets on which the company's shares were traded, or to be traded, are set out in Table 2 below.

Table 2: Market, by Sector		
Sector	OL	AIM
HR	12	3
CH/T	15	0
CS	19	1
All	46	4

The UK Listing Authority has for some time made provision for modifications to the listing regime to allow for the listing of companies where listing is seen as desirable. At present, these apply to: overseas companies[53]; property companies[54]; mineral companies[55]; scientific research based companies[56]; investment entities[57]; public sector issuers[58]; innovative high growth companies[59]; venture capital trusts[60]; strategic investment companies[61]. Those which were of specific interest to this paper were those relating to scientific research based companies and innovative high growth companies, and their specific provisions will be evaluated later in this paper. The proportion of the sample relating to such companies is set out in Table 3 below.

Table 3: Listing Chapter, by Sector	
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Sector	Chapter 20	Chapter 25
HR	5	0
CH/T	0	0
CS	0	8
All	5	8

A number of means of obtaining prospectuses and listing particulars for analysis was considered and/ or attempted. The most obvious possibility was to seek to obtain them from Companies House, where such documents must be filed by law. However, the disadvantage of this would have been the difficulty in identifying in advance whether there would have been any such documentation and, if so, whether it fell within the time-limits established. Furthermore, there would have been a cost of either £3 per document or £9 per microfiche and it would have been wasteful to incur such costs with a high potential for wasted data. A further possibility was to seek to obtain such documents from companies direct but initial attempts indicated that this would be likely to produce a patchy response at best and remain subject to the difficulties already identified. The method adopted for identifying and selecting the prospectuses or listing particulars was the use of the Thompson Analytica “ONE Banker” database.

Using the Thompson Analytica database, it was possible to select “filings” and thereby identify a list of documents filed with Thompson and then to scroll to the appropriate documentation readily identifiable as filing type “PROSP” and take a sample based on filing dates within the appropriate period. Whilst the sampling was randomly derived, where certain inappropriate documents were encountered, for example, a German language prospectus, a replacement random sample was taken instead. The types of documents utilised in the sample are set out in Table 4.

Table 4: Transaction Documents Used, by Sector

Sector	Transaction documents			Missing
	P	LP	ELD	
HR	11	4	0	0
CH/T	9	3	1	2
CS	6	12	1	1
All	26	19	2	3

Key to Table 4: transaction documents

P	Prospectus
LP	Listing particulars
ELD	Exempt listing document

The overwhelming majority of the documents analysed consisted of prospectuses or listing particulars. A small number consisted of exempt listing documents prepared in accordance with *Listing Rule, 5.23A*. In accordance with that, the UK Listing Authority has the power to exempt issuers from the obligation to publish listing particulars where, broadly speaking, equivalent information has been published within 12 months of admission, or the securities have been listed in another EC member state for 3 years or more and the issuer has complied with all requirements for information and admission, or where the issuer's shares have been traded on the Alternative Investment Market for at least two years and equivalent information is available to investors prior to admission[62]. Accordingly, Exempt Listing Documents were considered to be acceptable for inclusion in the sample because equivalent information should have been available.

A particular problem was encountered in relation to a group of 4 companies associated with telecommunications where the documents contained strong prohibition on disclosure or use; whilst it was arguable that the documents were in the public domain and therefore the restrictions need not be observed, it was decided that as a matter of research ethics the restrictions would be observed.

No distinction was drawn between the variety of means by which such capital might have been raised, for example, by way of placing, introduction or rights issue, since the reason for the selection of the documentation was the quality of information disclosed rather than the transaction type. Indeed, it was seen as an advantage to take a random sample of various transaction types as this made it more likely that a representative sample of moments in the corporate life-cycle would be presented. The types of transaction represented in the sample are set out in Table 5.

Sector	Transaction types				
	A	P	O	I	RI
HR	6	13	11	1	0
CH/T	8	7	8	4	2
CS	16	9	6	4	2
All	30	29	25	9	4

Key to Table 5: Transaction Types

A	Admission
P	Placing
O	Offer
I	Introduction
RI	Rights issue

Furthermore, the sample was selected with a view to achieving a broad spread across a range of 14 industrial or commercial sub-sectors associated with the “new economy”. This proved useful because it was important to consider whether such companies could be truly be regarded as distinct, an issue explored in the next section of this paper, and enabled the sample to be sub-analysed by grouping companies according to their potential asset specificity. In broad terms, the groupings adopted related to the health, computer hardware/ telecommunications and computing services. The reason for the selection of these broad groupings is the perception that computing and related services are highly human asset specific, computer hardware, telecommunications and related sectors are highly fixed asset specific and health related sectors are both highly human and fixed asset specific. 15 companies were selected from each of the health related and computer hardware/ telecommunications and related sectors and 20 from the computing and related services groupings, reflecting the larger number of such companies. The health related companies were selected from companies within the biotechnology, health, medical equipment & supplies, pharmaceuticals sectors. The computer hardware/ telecommunications and related companies were selected from companies within the electronic equipment, fixed-line telecommunication services, semi-conductors, telecommunications equipment and wireless telecommunications services’ sectors. The computing and related services companies were selected from companies within the computer services, software, home entertainment, internet and e-commerce sectors. The initials “HR”, “CH/T” and “CS” have been adopted throughout to distinguish the groupings.

Survey of company annual reports and accounts

Company prospectuses have many advantages in terms of the richness of data they present and their quality in terms of the almost unparalleled verification process undertaken. They are therefore very suitable for the analysis of their narrative data. However, they are less valuable as a consequence for the analysis of numerate data where it is desirable that the time frame of the data sample is as compressed as possible. For this reason, it was decided to supplement the sample by a sample of company annual reports and accounts where the analysis of numerate data was required. Two possible approaches were considered: firstly, to take a further random sample of Techmark companies, the second to base the sample on the annual reports and accounts of the companies already in the sample. It was decided to follow the second option because it would provide some degree of consistency in terms of the information gathered and enable further linkages to be made. For example, it was desirable to identify the founders of a company and the ability to cross-reference biographical information from the annual report and accounts to the appropriate prospectus enabled the information on founders provided to be verified and on

occasions supplemented. However, great caution was adopted: it would not have been appropriate to attempt any longitudinal study based on a comparison of information in the two samples because of divergences in the prospectus dates. The disadvantage of this approach, however, was that inevitably annual accounts and reports for all of the companies in the original sample could not be obtained.

The annual reports and accounts were obtained in the same way as the prospectuses: an initial sample was taken from the Thompson Analytica “ONE Banker” database and then this was updated, where necessary, by visiting the individual web-site of the company. A total of 5 were missing, generally on account of takeovers etc; however, a difference of 10% was felt to be acceptable given that no longitudinal study was being attempted. Furthermore, the industry classifications of three of the companies in the sample had changed; however, two companies had been reclassified from e-commerce to general retailers and one had moved from computer hardware to computer software. Given that the London Stock Exchange had changed its classifications and, therefore, there was some doubt as to the true significance of the changes, it was felt that these were not sufficiently material as to outweigh the benefits of consistency arising from their inclusion. The dates to which the annual reports and accounts were prepared are set out in Table 6 below.

Table 6 : Dates of Accounts, by Sector				
End of:	HR (%)	CH/T (%)	CS (%)	All (%)
Nov-02	1 (8%)	0 (0%)	0 (0%)	1 (2%)
Dec-02	0 (0%)	4 (29%)	2 (11%)	6 (13%)
Mar-03	1 (8%)	4 (29%)	4 (22%)	9 (20%)
Apr-03	0 (0%)	1 (7%)	1 (6%)	2 (4%)
Jun-03	2 (15%)	0 (0%)	2 (11%)	4 (9%)
Jul-03	0 (0%)	0 (0%)	1 (6%)	1 (2%)
Sep-03	1 (8%)	1 (7%)	4 (22%)	6 (13%)
Nov-03	1 (8%)	0 (0%)	0 (0%)	1 (2%)
Dec-03	7 (54%)	4 (29%)	4 (22%)	15 (33%)

The most recent available accounts for the sample had year-ends which ranged from November 2002 to December 2003. This was advantageous because 16 (35%) had as a consequence year-ends which began on or after 1st November 2003 and, therefore, were required to comply with the revised Code on Corporate Governance[63], reflecting as a consequence the requirements introduced as a consequence of the Smith and Higgs Committees.

THE DISTINCTIVENESS OF NEW ECONOMY COMPANIES

A major question to consider from the outset of this research related to the distinctiveness of new economy companies; in particular, whether it was correct that such companies were truly distinguishable by reference to the role played in them by human capital. This proved problematic in terms of defining an appropriate category of comparator companies. It was found that one survey, considered below, entailed a comparison between TechMARK-100 companies and FTSE-100 companies. Yet such an approach was considered unsatisfactory for the purpose of this paper because FTSE –100 companies are in many ways atypical companies. Equally, it would have been

unsatisfactory to have attempted a comparison with a representative sample of companies generally – the majority being in all probability owner-managed companies. A further alternative would have been to have attempted a comparison with other listed companies of similar size. However, any such comparison would have involved first identifying companies where human capital was important and then comparing them with companies where human capital was not important.

It became apparent that the argument that new economy companies are distinctive because of the role played in them by human capital possessed a degree of circularity: new economy companies are defined by reference to the importance played in them by human capital. However, it would have been unsatisfactory not to attempt any comparative analysis because that would have led to an extensive and unfocused analysis of the characteristics of new economy companies, some of which might be relevant to their corporate governance but many of which might be totally irrelevant. Accordingly, it was decided to conduct a comparative survey of three groups of new economy companies distinguished by perceptions as to their differing asset specificity – “HR”, “CH/T” and “CS” companies - , as explained in the previous section of this paper, with the issues for comparison being determined by a review of relevant literature. New economy companies are regarded as distinctive for a number of reasons which will be discussed in this section by reference to their age, size, type of assets, research and development, governance and human capital.

Zingales has distinguished the traditional firm as having 4 characteristics: (1) it emerged during the industrial revolution to exploit economies of scale and scope, was very asset intensive and highly vertically integrated; (2) it had a high degree of control over its employees; (3) the size and asset intensity of the traditional firm required more investment and risk-taking than was within management’s capacity; (4) the concentration of power at the top of the organisational pyramid, separation of ownership and control made agency the problem[64]. In contrast, he argued that the new firm witnesses three changes: (1) physical assets have become less unique and are commanding lower rents; (2) increased competition has increased demand for process innovation and quality improvement which can only be generated by talented employees; (3) firms’ grip on human capital has weakened[65]. Hence, new firms tend to be non-vertically integrated, human-capital intensive organisations operating in a highly competitive environment, with the exercise of HQ authority severely limited by the ability of human capital to leave[66].

Age of new economy companies

Generally, new economy companies tend to be perceived as relatively new companies. Goergen has shown that the average age of a company coming to the UK stock market has been around 12 years, in contrast to 50 years in Germany and 6 years in the United States[67]. A possible reason for this is that, as Hill and Rothaermel observe, the standard model of the innovation process suggests that new entrants pioneer radical technologies while incumbents decline[68]. The ages of companies at the prospectus transaction date, by sector, is set out in Table 7.

Table 7: Company Ages, by			
Sector			
Sector	Average age (years)		

	From founding date	From incorporation
HR	14	9
CH/T	22	9
CS	15	7
All	17	8

The prospectus date was taken because prospectuses generally contained more detailed historical information on the origins of a company, setting out not only the incorporation date but also the founding date of any underlying business activity. This was particularly valuable for research purposes because the process adopted to float a considerable number of companies on a publicly traded market often entailed the creation of a new corporate vehicle to be the flotation vehicle with the existing company becoming a subsidiary. To have taken the incorporation date then would have presented a misleading picture of the youthfulness of many of the companies in the sample. Whilst it is not possible to be confident that all companies disclosed details of predecessor companies, the picture that emerges from Table 1 is that the average age of companies was fairly consistent across industrial sectors, with CH/T companies typically being the longest established, an unsurprising result perhaps given their greater size, considered in the next section. Overall, the picture which emerges is that the companies within the sample were, on average, well established at the transaction date and do not fit the perception that such companies are new. This is consistent with Hill and Rothaermel's observation that it had been almost 25 years since the first bio-technology company went public yet the pharmaceutical industry is still dominated by the same companies that dominated it beforehand[69].

Size of new economy companies

Company size appears to be correlated to differing experiences in relation to innovation. Besanko, Dranove and Shanley, for example, observe that large firms present particular tensions in managing innovation between the need for a formal structure and controls to coordinate it and looseness and flexibility to foster it[70]. Kleinknecht has found that barriers to innovation are related to company size and, in particular, comprise access to capital, management qualification and ability to obtain technical information and know-how[71]. Table 8 below sets out the average size of the companies in the sample based on the annual reports and accounts.

Sector	Average turnover (£000)	Average value of assets (£000)	Turnover as a % of assets (%)
HR	4,479	23,012	19.5
CH/T	268,640	216,832	123.9
CS	86,249	45,993	254.1
All	116,873	90,993	128.4

The typical sizes of the companies surveyed varied dramatically with CH/T companies being by

far the largest, whether measured by turnover or assets, and HR companies the smallest, but with CS companies generating the most turnover in relation to their assets.

Type of assets in new economy companies

Many authors comment on the importance of intangible assets in a new economy context. Kontor and Day review a number of attempts to estimate the value of such intangibles using techniques, such as calculating the ratio of market values of companies to their accounting book values for different industries, and conclude that the results provide evidence that in most industries significant amounts of assets are not represented in the published financial accounts of enterprises, which may include intangible assets[72]. However, as they point out, business, legal and accounting concepts of “intangibles” differ markedly[73]. For example, the definition of “intellectual capital” is very broadly defined, whereas the legal definition of intellectual property rights – which they argue are “ ... probably among the most important types of property on which the “new economy is based ...”[74] is very narrow. The approach adopted in this paper is to calculate the ratio of average intangible assets to tangible assets, by industry sector. The results are set out in Table 9 below.

Sector	Average value of intangible assets (£)	Average value of tangible assets (£)	Ratio of intangible to tangible assets
HR	3,587,499	3,165,002	1.13
CH/T	561,204,500	533,991,143	1.05
CS	36,565,167	17,728,167	2.06
All	190,259,411	174,133,067	1.092

Typically, the figures recorded for intangible assets related to intellectual property rights, such as the value of patents. However, it was also noted that frequently a substantial proportion of intangible assets related instead to goodwill. Since goodwill may arise on any acquisition, and does not demonstrate any necessary relationship to the high-technology status of a company, it was decided to recalculate the figures subtracting the value of goodwill with a view to ascertaining whether this produced a difference. The results are set out in Table 10 below.

Sector	Average value of intangible assets less goodwill (£)	Average value of tangible assets (£)	Ratio of 'intangible assets less goodwill' to tangible assets
HR	1,904,722	3,165,002	0.60
CH/T	269,350,42	533,991,143	0.50

	9				
CS	1,004,500		17,728,167		0.06
All	84,513,742		174,133,067		0.49

The subtraction of goodwill from the value of intangible assets, creating a sharper focus on, for example, intellectual property rights indicates a marked difference. The ratio of intangible to tangible assets fell below 1.0 in each instance and that for CS companies became almost insignificant. Such results demonstrate that care must be taken in relation to claims that intangible assets represent the bulk of the assets of new economy companies. However, a degree of caution must be observed when interpreting these results, especially when, as here, it has been based around acknowledgedly narrow measures of intangibles. As Teece, Pisano and Shuen observe, global competitive battles in high-technology industries, such as semiconductors and software, demonstrate that some well-known companies, despite having accumulated valuable technology assets, often guarded by an aggressive intellectual property rights stance, may not have a significant competitive advantage[75]. They conclude by stressing the importance of management capability to effectively co-ordinate and redeploy competences[76]. Similarly, Holbrook, Cohen, Hounshell and Klepper, in a detailed historical case study of 4 semi-conductor manufacturers, observed that one of the company's belief that a strong patent position was key to its success doomed it[77]. These findings are suggestive of the importance of good corporate governance.

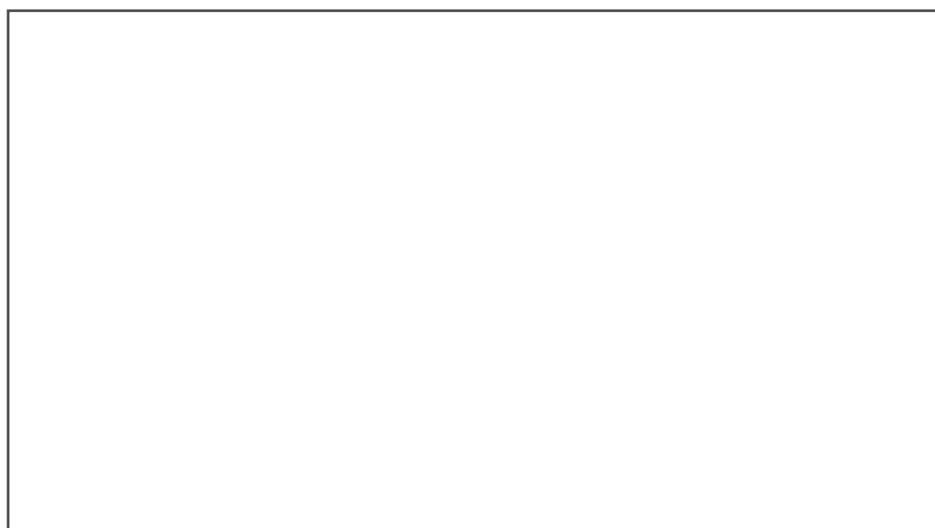
Research and development in new economy companies

Generally, new economy companies tend to be perceived as significant investors in research and development. Furthermore, Mayer has noted that listed companies are concentrated in research and development intensive sectors of the economy[78]. As Youndt, Subramaniam and Snell observe, "... investment in research and development is one of the fundamental ways organizations create new knowledge ..."[79]. Accordingly, they argue that the more an organisation invests in research and development, the more it supports individual managers to enhance their knowledge and expertise and therefore builds human capital[80]. Accordingly, they sought as part of their research into how human, social and organizational capital coexisted to form distinct intellectual capital profiles across organisations, they sought to identify a measure of research and development investment by dividing an organisation's yearly research and development expenditures by its annual sales[81]. An analogous approach has been taken in this paper where average research and development expenditure has been divided by average turnover, by sector, based on the sample of annual reports and accounts. Nonetheless, a degree of caution must be adopted in the interpretation of these figures. Coombs and Tomlinson, for example, have commented on how research and development expenditure has long been recognised as an incomplete indicator of innovativeness because it may be reported in varying ways by companies[82]. Similarly, Audretsch and Feldman observe how small companies forsake formal research and development for informal research, which defies measurement[83]. The results are set out in Table 11 below.

Table 11: Turnover and R&D Expenditure					
Sector	Average turnover		Average R&D expenditure		Ratio of R&D turnover

	(£)	(£)	r
HR	12,731,791	9,187,113	0.722
CH/T	485,583,857	6,238,357	0.013
CS	262,128,556	6,840,111	0.026
All	259,600,029	7,330,921	0.028

It can be seen from the results in Table 11 that the ratio of research and development expenditure to turnover is markedly stronger in HR companies than in either CH/T or CS companies. Indeed, the ratio in relation to health companies is highly striking at 0.722. It was considered possible that much research and development expenditure might relate to employee costs and therefore the percentage of staff engaged in research and development were identified. The figures were taken from the prospectuses because often the relevant breakdown was given in more detail. The results are set out in the chart below.



The average percentage of research and development staff by sector varied significantly with health related companies, unsurprisingly given that some were scientific research based companies, being much higher.

The conduct of research and development on such a scale has significant implications for corporate governance. Deeds, DeCarolis and Coombs have demonstrated in an analysis of newly public biotechnology companies that a strategy of narrowly focusing on research and development during the development stage leads to significant increases in shareholder wealth[84]. However, as Jensen has observed, between 1980 and 1990 GM's research and development and investment programmes produced significant losses; the total of \$67.2 billion spent produced a company worth \$26.2 billion, enough to have enabled GM to have purchased both Toyota and Honda[85]. Such apparently inconsistent results are, perhaps, explained by the research of Holbrook, Cohen, Hounshell and Klepper, who found that the companies differed in their ability of their top managers to integrate research and development and the relative absence of the sort of decision-making process assumed by economists, that would lead to convergence on similar research an

development activities[86]. Carlin and Mayer, in contrast, point to the role of comparative institutional advantage, demonstrating a link between investment in research and development and the dependence of industries on equity finance and highly skilled labour, with such investment being large in countries with good information disclosure[87]. There is, again, evidence to suggest a link between research and development and its governance but also with good information disclosure.

Governance

A major – and valuable - survey has been conducted by Cook and Leissle into the comparative governance of FTSE-100 and TechMARK-100 index companies[88]. The survey was based on mutually exclusive samples of annual reports and accounts of 72 TechMARK companies and 87 FTSE-100 companies for the financial year ending between August 1999 and August 2000[89]. They considered the following main areas: director age; director gender; board composition; board committees; board leadership; board shareholdings; a variety of remuneration issues; meeting activity; contract terms; reporting on board process; and director interlocks. Key areas of difference were:

5. TechMARK-100 directors were younger than FTSE-100 directors, with the age difference most noticeable amongst executive directors[90].
6. A much larger proportion of TechMARK-100 executive directors were women than FTSE-100 directors[91].
7. FTSE-100 boards were larger and more independent than TechMARK-100 boards[92].
8. TechMARK-100 companies had a nomination committee much less frequently than FTSE100 companies [93].
9. FTSE-100 companies made far greater use of other committees, especially in areas such as risk management and compliance, social responsibility and strategy and investment, than TechMARK companies, although only TechMARK companies made use of technical advisory committees[94].
10. TechMARK-100 boards held far greater proportions of their company share capital than FTSE-100 boards[95].
11. TechMARK-100 directors earned much less than FTSE-100 directors and received much less by way of benefits-in-kind[96].
12. TechMARK boards met slightly more frequently, and TechMARK board committees, less frequently, than in FTSE-100 companies[97].
13. FTSE-100 boards generally provide much longer notice periods for executive directors than TechMARK-100 boards[98].
14. FTSE-100 boards contained a much greater number of multiple directorships and interlocks than TechMARK-100 boards[99].

Whilst the information gathered in relation to TechMARK companies is highly informative, there must be some doubt as to the adoption of a comparison with FTSE 100 companies because they are not representative of the population of companies as a whole and it is likely that any comparison of such companies with other companies would have concluded that such companies were broadly older, larger and have more formal and structured systems of governance. Accordingly, for the reasons indicated at the beginning of this section of the paper, this survey

focused on analysing the differences between three distinct groups of such companies. Nonetheless, Cook and Leissle's survey drew attention to some differences in TechMARK companies which are very pertinent to this paper with its focus on human capital issues, especially the differences in relation to committee structures. The results of the survey conducted for this paper in relation to a selection of commonly used corporate governance measures are set out in Table 12 below.

Table 12: Corporate governance measures, by Sector							
Sector	HR	CH/T	CS	All			
Average board size	8.5 (2.4)	6.9 (1.5)	8.0 (2.0)	7.8	(2.0)		
Average no. of non-executives	4.3 (1.4)	3.7 (1.7)	3.9 (1.3)	4.0	(1.4)		
Average no. of independents	2.8 (0.6)	2.8 (1.9)	3.4 (1.0)	3.1	(1.6)		
Average age of board	53.7 (0.3)	51.5 (3.0)	48.1 (3.6)	50.7	(4.0)		
% of companies with separate CEO/Chairman	92.3	100	77.8	88.9			
% of companies with at least half the board comprising independent non-executives	30.8	46.2	76.5	53.5			
% of companies with a senior independent director	69.2	92.3	58.8	72.1			

The basic structure of the boards of companies as between the three sectors surveyed differed little in terms of measures such as average size, number of non-executives, number of independent non-executive directors. However, there were much sharper differences in relation to measures relating to the diffusion of power on the board, especially in terms of the proportion of the board comprising independent non-executives, where HR companies demonstrated poor compliance. This raised a question as to whether the boards of new economy companies demonstrate commitment or entrenchment. Further analysis was conducted to ascertain whether problems with the diffusion of power were additionally reflected in director shareholdings. The definitions of "insider" and "outsider" are explained fully in the next section of this paper. Table 13 below sets out average individual director shareholdings by sector together with a histogram illustrating the range of board shareholdings so that their significance in company law terms can be seen.

Table 13: Share Ownership, by Sector							
Sector				HR	CH/T	CS	All
Average % of issued shares held by::							
All directors (%)				1.14	1.34	1.94	1.52
All executive directors (%)				0.81	2.27	3.50	2.32
All non-executive directors (%)				1.44	0.63	0.57	0.85
All 'insider' executive directors (%)				1.97	4.07	6.85	4.60
All 'outsider' executive directors (%)				0.04	0.34	0.91	0.50

Key to Table 14: new economy corporate governance indicators

CTO	Chief Technical Officer, Chief Technological Officer/ Chief Scientific Officer/ Chief Medical Officer
R & D	Research and Development Director
D	Development Director/ Business Development Director

The divergences between the three sectors become much more marked again where alternative measures were used. In particular, HR and CS companies were far better served by scientific or technical expertise – or even development expertise - on the board than were CH/T companies. This justifies the focus on human capital issues in the governance of new economy companies, which will be explored in the next section.

Human capital and human asset specificity in new economy companies

Human capital and human asset specificity: definition

It is widely thought to be the case that new economy companies are distinguished by their human capital. Becker[100] has traced the concept of “human capital” to the work of Walsh in 1935[101], although the modern approach would appear to derive from Schultz in 1959[102] and, of course, Becker himself[103]. The term itself appears to have been coined by Schultz[104]. A number of writers have reviewed the extensive literature which has built up subsequently on the meaning of the term and how it can be distinguished from related concepts such as intellectual capital, social capital, organisational capital and structural capital[105]. Foong and Yorston identify that the term human capital has been used to refer to a combination of skills, experience and knowledge[106] and even personality, appearance, reputation and credentials[107], whilst noting that the significance of the term “capital” is used figuratively to what might probably be better described as the “quality of labour”[108]. A further categorisation of human capital has been made between the concepts of “firm-specific”, “industry-specific” and “generic” human capital, which is potentially of great value in explaining some existing legal problems, for example, as to confidential information. Milgrom and Roberts distinguish firm-specific human capital as including the skills and knowledge that are valuable only in the context of a particular firm from “general purpose” or “nonspecific” human capital, which increases a person’s productivity when working for any of several employers[109]. They give as examples of firm-specific human capital, knowledge of the idiosyncracies of the particular firm’s machinery or its accounting system, and of nonspecific human capital, knowledge of how to operate a type of machine or prepare accounting statements, a familiarity with general business terminology and procedures, and general skills in sales and marketing[110]. Harris and Helfat distinguish “firm-specific”, “industry-specific” and “generic” skills in relation to the role of the Chief Executive Officer in the US, a useful foundation for considering an appropriate classification at board level generally[111]. They argue that generic skills are those that can be transferred across all businesses and firms, even though the nature of the skills can vary from person to person; industry-specific skills are only transferable to firms that operate in the same industry and firm-specific

skills cannot be transferred outside of the firm[112].

Human capital has been identified as the distinguishing feature of the “new enterprise” by writers such as Rajan and Zingales[113] They argue that the growing importance of human capital at the expense of other more tangible assets makes it hard to keep the vertically integrated firm intact because it weakens the command and control process[114]. They argue that what makes the new enterprise distinctive are mutual dependencies and specialization between various units of the enterprise because the primary source of power is no longer the ownership of inanimate objects[115]. It is unsurprising in such a context that links with universities can be strong, since it would be expected that universities would play a vital role in the creation and development of human capital. Accordingly, Audretsch and Stephan have demonstrated that out of 101 founders of new biotechnology companies in the early 1990’s, 50 –nearly half - were from universities and that of those 50, 35 continued to be associated with their universities on a part-time basis, with the other 15 having left their universities to work full-time for the biotechnology company[116].

There are detractors as to the importance of human capital, notably Donaldson[117]. He argues that the role of tacit knowledge in organisations is exaggerated and that, in contrast, an increase in the formal rationality of knowledge is taking place, accompanied by increasing bureaucratization, seen, for example, in the creation of knowledge champions, who provide a focus for the development and propagation of knowledge across a company, so that new assignments can be tackled by consultants who lack experience and expertise[118]. Disagreeing with conventional assumptions that power and wealth are accruing to a new class of “knowledge workers”, he argues that instead technical experts and professionals are confined to the lower levels of hierarchical organisations even they enjoy some degree of autonomy and influence[119]. The exceptions to this are seen as the disciplines of finance and accounting where experts have risen to powerful positions at higher levels of firms because of their relevance to the markets and property rights[120]. The significance of this in terms of the governance of new economy companies is that it would suggest that such companies may be or, as they grow in size, become, governed by those who are not technical experts in the specialised field in which the company is engaged.

A concept which is related to human capital and which can be easily – but mistakenly – confused with it is that of human asset specificity. Asset specificity has received a strong emphasis in neo-institutional economics where it was defined by Williamson as follows[121]:

“A specialised investment that cannot be redeployed to alternative uses or by alternative users except at a loss of productive value. Asset specificity can take several forms of which human, site and dedicated assets are the most common. Specific assets give rise to bilateral dependency which complicates contractual relations ...”

Since the ideal transaction from a transaction cost economics perspective has zero asset specificity[122], Williamson argues that such investments should never be made except to contribute to prospective reductions in production costs or additions to revenue[123]. Nonetheless, as Deeds, DeCarolis and Coombs demonstrate, increases in firm-specific research and scientific capabilities, measurable by citation analysis of scientists across companies, dramatically improve a company’s absolute ability to create wealth[124]. New economy companies are likely to be affected by asset specificity in a variety of ways, for example, they may

own both tangible and intangible assets and possess human capital all with an especially high specificity. Whilst human asset specificity, considered below, is an important example, the concept has a bearing on other forms of investment which in a high-technology environment may be equally specific. Maughan and Copp, in particular, have argued that insofar as there were any real differences between innovative high growth companies and others is that they exhibit marked characteristics of human resource asset specificity and are often weak in physical assets, a problem common to many categories of business activity[125]. An alternative approach, which cuts across this problem, is provided by Quince and Whittaker, who argue that with many high technology activities, such as software and telecommunications, the distinction between product and service is blurred; accordingly, they argue that the true distinction is between activities where the product is embodied in the person and those in which it is embodied in the product, with research and development and intellectual property rights being unimportant in the former but crucial in the latter[126].

Human capital and human asset specificity: measurement

Measurement of human capital is regarded as a significant research priority because of the perceived link between human capital and corporate performance. Foong and Yorston surveyed the most common indicators used in human capital reporting by reference to the percentage of times mentioned, but noted that detailed empirical analysis was rare because there was no common measure, even within the same country over time, let alone for comparisons between countries[127]. Their conclusions are summarised in Table 15.

Table 15

Foong and Yorston: Most common indicators used in human capital reporting

Turnover/ retention/ absence	19%
Competencies/ training	17%
Employee productivity	16%
Workforce profile	16%
Employee attitude/ engagement	12%
Employee compensation	8%
Recruitment	4%
Health and safety	3%
Other statistics	6%

A high proportion of the measures which were surveyed were focused, as would be expected, on measures of employee human capital, although some had potential relevance to the measurement of human capital within the governance function of a company as well. Those with potential relevance related to turnover/ retention, competencies, engagement and compensation and were followed in this survey, for example, competencies were measured by using a measure of academic distinction.

The measurement of human asset specificity and an examination of its role in corporate governance was anticipated to be a major component of this paper. A very helpful precedent of

the way in which this might be conducted was found in the work of Harris and Helfat who examined the relationship of the compensation of Chief Executive Officers in the United States to three types of skills: firm-specific, industry-specific, and generic skills[128]. Their survey was extensive consisting of 305 CEO successors listed in 10 years of Forbes annual surveys of executive compensation for the years 1978 through 1987[129]. The classification of CEO's was conducted by using the work history of the CEO from proxy statements and the Wall Street Journal article which announced the appointment[130]. An external successor was defined as a CEO with 2 or fewer years of tenure in the company before becoming CEO to reflect the possibility of a CEO being appointed to another role with an expectation of becoming CEO[131]. External successors were then classified as "within-industry" or "outside-of-industry" successors depending on whether the CEO had prior work experience in at least one of the industries in which his/ her employer conducted business within 5 years of moving to the company[132]. This was, in turn, determined by identifying all 3-digit SIC code industries in which the employing company had revenues in the year prior to the CEO's first year, based on information in annual reports, Form 10-K reports and Moody's manuals[133]. The rest of the study entailed a regression analysis to test two hypotheses, namely that external CEO successors received greater initial non-contingent compensation than internal successors[134] and that external CEO successors with generic skills only received greater initial non-contingent compensation than external successors with industry-specific experience[135]. The detailed conclusions will be discussed later in this paper.

The criteria adopted in this paper were adopted after various pilot attempts of varying degrees of success. For example, at an early stage it had been thought possible to distinguish all directors by reference to whether they presented some distinction in the following categories: management, professional, finance, technical, scientific/ academic or experience. This worked well for many companies and was usually intuitively obvious; however, it was abandoned because of a risk of lack of rigour – some directors moved at different stages of their career between categories and there was a risk of undue weight being placed on subjective criteria.

The category of "founder" directors was identified primarily from a review of the biographies contained in the annual reports and accounts of the companies within the sample but secondarily by comparison with the information on the same directors from the prospectuses. The reason for this approach was that it was necessary to make the identification from the annual reports and accounts so that the information could be linked to other indicators which could only be derived from the annual reports and accounts. However, where the prospectus gave more information in respect of the same individual there could be no objection to supplementing it in this way; although, in a number of cases, the biographical information in the annual reports and accounts appeared to be fairly identical and not updated from that in the prospectus. A "founder" was often identified as such; the leader of a management buy-out team was also included for the purposes of analysis as a "founder". An "insider" director was defined by reference to the following categories, again primarily by reference to the annual reports and accounts and secondarily by reference to prospectuses: founders; directors appointed from within the company after tenure of more than 12 months[136]; directors who had held office for more than 6 years[137]. An "outsider" director was defined as a director who had demonstrably been appointed from outside the company. There were regrettably a fair proportion of directors where the information was inadequate to make a confident determination and these were excluded. An "academic" director

was defined as a director with one of the following distinctions, based again primarily on the sample of annual reports and accounts and secondarily on the prospectuses: high level prize-winning, for example, a Nobel prize, a Professorship, a Research Fellowship, a PhD, or publications. Whilst there is a risk that such categories might be to some extent arbitrary, for example, they exclude academic management qualifications such as an MBA, they possessed the advantage of being identifiable on a consistent basis and clear indicators of possession of strong human capital.

Distinctiveness of new economy companies

The main approach adopted in this paper was to focus upon the identification of human capital as an investment risk factor. The use of a risk-based approach has much to comment itself in an analysis of corporate governance since it was the risk of major corporate failure led to the establishment of the Cadbury Committee and risk management the reason for the establishment of the Turnbull Committee. If it were possible to ascertain what risks were actually perceived by new economy companies as peculiarly a problem for them, and thereby to ascertain the weight placed upon human capital issues as a specific risk, then it would be possible to evaluate the extent to which this truly distinguished such companies. This approach also had the benefit that is related closely to the concept of human asset specificity which is also concerned with risk in terms of bilateral dependency. This was a major factor in the decision to rely upon the information disclosed in company prospectuses and listing particulars for this purpose where risk factors must be disclosed since gaining access to information from companies as to their risk profile would have been likely to be difficult, because: (1) questionnaires, especially as to commercially sensitive issues were unlikely to receive a response; (2) interviews, conducted at such a level as to elicit valuable information, were unlikely to be agreed to; (3) observation would be out of the question.

There is a general requirement on a company publishing listing particulars to include[138]:

“... information on the group’s prospects for at least the current financial year. Such information must relate to the financial and trading prospects of the group together with any material information which may be relevant thereto, including all special trade factors or *risks* (if any) which are not mentioned elsewhere in the listing particulars and which are unlikely to be known or anticipated by the general public, and which could materially affect the profits ...”

In the case of a scientific research based company, the listing particulars must additionally set out fully, explain and give appropriate prominence to the risks associated with the exploitation of its products and must include an independent report(s) assessing them[139]. Innovative high growth companies are subject to a more broadly defined obligation to include in a separate prominent section entitled “Risk factors” full details and an explanation of the risks associated with the business and, in particular, any factors which could have a substantial adverse effect on the company’s financial condition or which could endanger the company’s business success and must similarly be subject to an independent report[140].

McCrum, in comparing the requirements for the identification of risk factors in the UK with US

practice[141], notes that the US Securities and Exchange Commission (“the SEC”) requires that investors are made aware of any material risks of investment[142] and that the SEC’s plain English rules include a requirement that risks should be set out in short sentences, avoiding technical or legal jargon and that each heading should specify the risk[143]. She concludes that on account both of *Chapter 25 Listing Rules* and the importance of maintaining consistency in disclosure across jurisdictions, that UK listing documents would increasingly include substantial sections on risk factors[144]. Nonetheless, it was apparent from the survey that there was a “UK” and a “US” style of drafting of prospectuses with the UK style appearing to be much crisper and clearer.

A good example of the level of disclosure provided in relation to a human capital investment risk factor was as follows[145]:

“Dependence on key executives and personnel

Actinic believes its future success will depend greatly upon the expertise and continued service of certain key executive, sales/ marketing and technical personnel, in particular: Kevin Grumball, Chief Executive Officer; Christopher Barling, Chief Operating Officer; David Dawson, Chief Financial Officer; and the senior management detailed in Part I of this document. Furthermore, Actinic’s ability to expand its operations to accommodate its anticipated growth will also depend on the Company’s ability to attract and retain additional qualified finance, management, marketing, sales and technical personnel. However, competition for these type of employees is intense due to the limited number of qualified professionals. Actinic has attempted to reduce this risk by (i) entering into employment contracts with certain of its Directors which contain limited non-competition provisions, (ii) offering incentive schemes to such employees typical for this industry, such as an employee share option plan and (iii) taking out key man insurance on certain of its key executives. However, these measures do not guarantee that such employees will join and / or stay employed with Actinic, and the key man insurance may not be sufficient to compensate the Company adequately in the event of the loss of those key executives. If Actinic fails to attract and retain such personnel it may be difficult for the Company to manage its business and meet its objectives and its business, results of operations or financial condition may be adversely affected.”

A key to the main categories of risk factor identified are set out below.

Key to Risk Factor Codes

Competition	Commercial competition
Customer	Dependence on key customers
Development and manufacturing	Risks associated with development and manufacturing capability
Environment	Environmental risk, use of hazardous materials
Financial	History of losses, absence of prior market, fluctuation of results, future additional capital needs, dilution of existing shareholders, share price volatility

Growth	Limited history, management of growth, integration of acquisitions and mergers and costs of merger
Human capital	Retention of employees, key personnel and management [? check]
International	Problems of international growth, currency fluctuations and US factors
Internet	Internet risk
Intellectual property	Intellectual property protection
Other	Other risks
Pricing	Pricing environment
Product	Risks associated with early stage of product development, product testing, customer acceptance, growth in markets, obsolescence, insurance and liability
Regulation	Tax, competition law, regulatory approval of products
Supplier	Dependence on suppliers
Y2K	Year 2000 risk

The approach adopted to the analysis of the narrative information was based on a modified form of content analysis[146]. Content analysis can be defined as “ ... a quantitatively orientated technique by which standardised measurements are applied to metrically defined units and these are used to characterised and compare documents ...”[147]. It is regarded as an accepted method of textual investigation and essentially consists of establishing categories and then counting the number of instances where those categories are used in a particular item of text[148]. Its strengths are accordingly seen as its reliability and its validity, but its weakness that it may come to trite conclusions[149]. To this must be added that reliability may be threatened unless care is taken to respect the text. For example, any survey must be careful to ensure that the use of language truly reflects a perceived emphasis and is undistorted, for example, by something as simple as the word “not” prefixing a word.

The purpose of the records being examined for this paper were to comply with regulatory requirements and were often summed up with an opening statement, such as[150]:

“Before deciding whether to invest in the Ordinary Shares, prospective investors should carefully consider the risks set out below together with all other information contained in this document. If any of the following risks actually materialises, the Company’s business, financial condition and/ or results of operations could be materially and adversely affected. If as a consequence the trading price of the Ordinary Shares declined, an investor might lose some or all of his investment.”

The benefit of this from a methodological perspective is that the documents were intended for the benefit of similar categories of recipients and for an essentially common purpose so ensuring a degree of comparability. However, there were significant divergences in the approach to the drafting of the documents, for example, some contained simple lists of risk factors, some contained separate categories of risk factors, others sought to comply with US practice in drafting. As a consequence, the approach taken to their analysis was to use a spreadsheet recording the priority with which particular risks were identified and the number of lines of text associated with each risk. These were classified into groupings of the most common types of risk factor and

additional explanatory narrative information recorded. These were then analysed by reference to the average number of lines of text devoted to selected risk factors and the ranking of particular risk factors, in each case by sector. The results of the analysis of the average number of lines of text devoted to types of risk factor is set out in Table 16 below.

Table 16: Average Number of Lines of Text Devoted to Selected Risk Factors

RISKS	HR	CH/T	CS	All Companies
Product	25 (13%)	24 (11%)	29 (15%)	78 (13%)
IP	30 (16%)	19 (9%)	16 (8%)	65 (11%)
Competition	10 (5%)	21 (10%)	13 (6%)	44 (7%)
Price	7 (4%)	2 (1%)	2 (1%)	11 (2%)
Human	7 (4%)	10 (5%)	15 (8%)	32 (5%)
Capital				
Growth	6 (3%)	9 (4%)	16 (8%)	31 (5%)
International	5 (3%)	8 (4%)	17 (9%)	30 (5%)
1				
Regulation	31 (17%)	14 (6%)	7 (4%)	62 (10%)
Customers	7 (4%)	6 (3%)	8 (4%)	21 (3%)
Suppliers	4 (2%)	17 (8%)	6 (3%)	27 (4%)
D and M	11 (6%)	8 (4%)	5 (3%)	24 (4%)
Internet	0 (0%)	8 (4%)	15 (8%)	23 (4%)
Environment	4 (2%)	3 (1%)	0 (0%)	7 (1%)
Financial	29 (16%)	53 (24%)	37 (19%)	119 (20%)
Y2K	4 (2%)	7 (3%)	6 (3%)	17 (3%)
Other	6 (3%)	8 (4%)	8 (4%)	22 (4%)
TOTAL	187 (100%)	217 (100%)	200 (100%)	604 (100%)



The most significant risks for CH/T companies and CS companies, by this measure, related to financial issues (24% and 19% respectively) whereas in the case of HR companies this was very important (16%) but ranked slightly behind regulation and the protection of intellectual property rights (17% and 16%, as rounded, respectively), issues which were not especially significant for the other types of company. Human capital issues were most important in relation to CS companies, where they ranked equal fifth (5%) whereas in relation to the other types of company they ranked seventh (4% and 5% respectively). In conclusion, then, it would seem that human capital issues must be regarded as an important perceived risk though far from the most significant. The results of the alternative analysis of the priority, in terms of place within the relevant section of the prospectus, of types of risk factor is set out in Table 17 below.

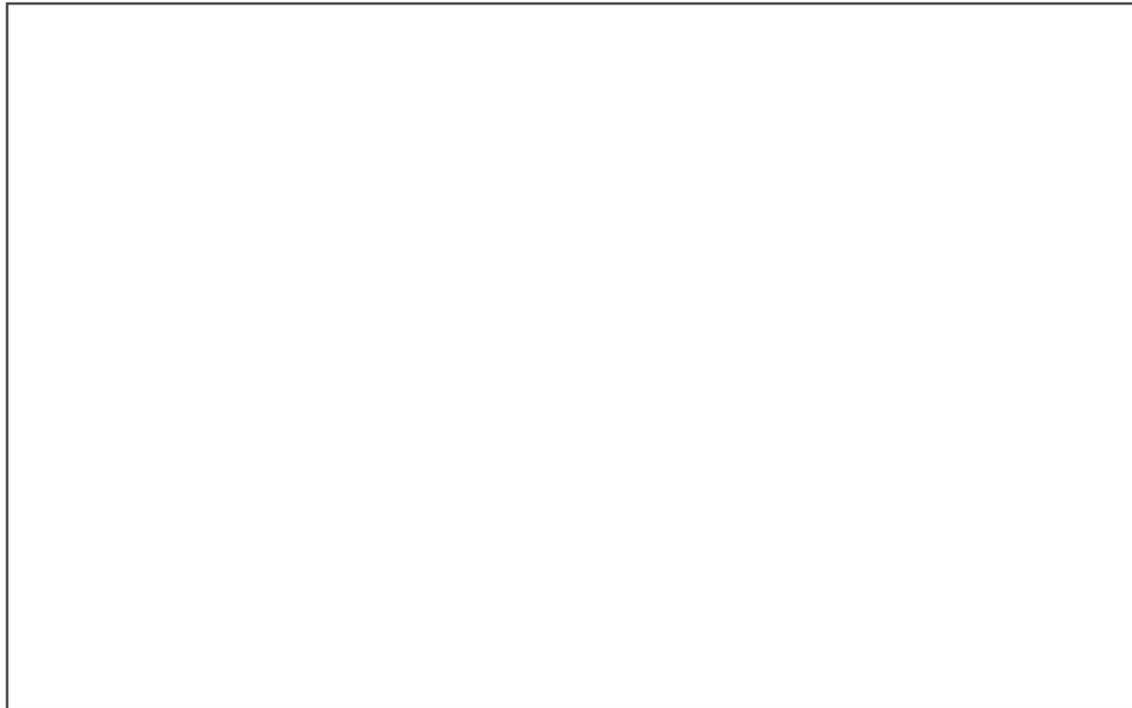
RISKS	HR	CH/T	CS
Product	1	3	2
IP	2	7	8
Competition	2	2	4
Price	8	13	15

Human Capital	6	5	3
Growth	12	9	5
International	14	11	12
Regulation	5	8	11
Customers	9	6	7
Suppliers	11	4	9
D and M	7	10	10
Internet	16	15	6
Environment	10	16	16
Financial	4	1	1
Y2K	15	14	14
Other	13	12	13

The analysis of the priority of investment risk factors based on their order in the document showed that financial risks were the most important for both CH/T companies and for CS companies, whereas product risks were the highest priority for HR companies. The importance of financial risks was consistent with the previous analysis; product risk had also been a significant factor for HR companies where it fell immediately below those specifically identified. The explanation for this would almost certainly be the presence of scientific research based companies in the sample who were at the earlier stages of product development. The risks which received lowest priority related broadly to the environment and Year 2K. Risks associated with human capital fell somewhere towards the higher end of the spectrum at 6th, 5th and 3rd respectively, confirming again that such risks were regarded as important, but far from being the most significant.

What these analyses failed to do was to identify whether the risks associated with human capital related to employees generally or those in governance roles. Accordingly, a further analysis was conducted to investigate whether when human capital issues were identified as a risk factor, the risk related to employees, management or governance. A number of the references to management in risk factors were quite vague so that it is unclear whether this was additionally intended to encompass those in governance roles. The results were tabulated by categorising the risk between those companies which identified employees only, those which identified employees and management only and those that identified all three. The results of this analysis are set out in Table 18 below.

	HR (%)	CH/T (%)	CS (%)
Management	43.3	40.0	20.0
Governance	33.3	20.0	70.0
Employee	0	15.3	5.0
No record/ no such factor	23.4	26.7	5.0
	100.0	100.0	100.0



There were marked differences in the profile of the nature of human capital risks identified in CS companies where that relating to governance amounted to 70%, contrasting with that for CH/T companies at 20%, although this might have been (partially) accounted for by differences in language given that such companies recorded a risk in relation to management at 40% rather than 20%. The reason for the dominance of concerns in CS companies may well reflect the higher proportion of founder directors in such companies, identified earlier in this section.

An alternative approach to measuring human capital, based on the prospectuses, was simply to analyse those companies which had identified this as a key strength. Whilst perhaps an overly simplistic measure, given that some statements were fairly brief, it was nonetheless interesting. The results are set out in Table 19 below.

Sector	% of Companies
HR	20.0
CH/T	46.7
CS	50.0
All	44.4

The results were surprising with health related companies which presented a much lower score than the other types of company.

THE GOVERNANCE OF NEW ECONOMY COMPANIES: AN “IDEAL” REGULATORY SYSTEM

Competing or complementary regulatory goals: efficiency, good governance and investor protection, innovation and human capital

This section will seek to identify an “ideal” regulatory system for the governance of new economy companies, focusing especially on the human capital issues which arise. It will commence by examining some of the more important regulatory goals which are relevant: economic efficiency, good corporate governance and investor protection, the promotion and development of innovation, and human capital, and the extent to which these can be seen as competing or complementary with a view to identifying from the relevant literature specific indicators as to the ideal regulatory approach. The order in which these regulatory goals is not a signifier of their priority; they have been addressed in this way because much of the recent literature in relation to innovation and human capital relies to some extent on concepts developed within an economic or governance context.

Economic efficiency

The rationale for the use of “law and economics” analysis in this paper has been stated by Maughan and Copp in the following terms[151]:

“Economic efficiency, the rationale for the discipline of economics, is not “real”. It is an entirely abstract concept which is the outcome of a theoretical model of how resources can best be allocated in society.”

However, economic efficiency is not an indivisible concept and, in principle, consists of a series of interconnected efficiencies, all of which must be achieved simultaneously if resource allocation is to be efficient: these consist of productive or technical efficiency, allocative efficiency and dynamic or innovative efficiency[152]. The most relevant of these to the regulation of new economy companies is dynamic or innovative efficiency where technological change is encouraged and productivity gains retained rather than frittered away in slackness and rent-seeking activities[153]. Viscusi, Vernon and Harrington observe, however, that a competitive equilibrium results in static efficiency but that it is not clear whether it results in dynamic efficiency, especially in terms of research and development expenditure[154]. Accordingly, there may – albeit rarely - be a conflict between the regulatory goals of encouraging economic efficiency and encouraging innovation.

There are a number of assumptions made in neo-classical economic theory as to the role of law, some of which are explicit, others implicit. They have been summarised by Copp as requiring: the protection of natural and legal persons; the protection of property rights; the assurance that promises will be enforced; the protection of free and fair competition; and state intervention where there is evidence of market failure[155]. These explain and justify the existence of seemingly disparate fields of law, such as criminal law, tort, property law, contract law and competition law. The criteria for state intervention in company law in the event of market failure have been summarised by Cheffins by reference to the following criteria: imperfect information; transaction costs; judgement problems, negative externalities and collective action problems or related types of strategic behaviour[156]. He contrasts non-efficiency justifications for state intervention such as fairness, participation, the protection of community ideals, and the

preservation of morality in the market system[157]. The relevance of the criteria for state intervention to innovative high growth companies has been argued by Copp and Maughan to lie in the problems which such companies give rise to in terms of the costs of measuring information, asymmetric information and investor judgement problems[158].

The need for a property law is of particular relevance to new economy companies, since it extends to the existence of intellectual property law because, as Cooter and Ulen explain, the special problems in defining property rights in information lie in that buyers cannot determine the value of information until they have it and this removes their willingness to pay for it and that, because information is costly to produce and cheap to transmit, buyers become competitors and consumers may free ride [159]. Accordingly, as they argue, an unregulated market may undersupply ideas so that state intervention may take place in the form of state supply, public subsidies for private provision, or the creation and protection of property rights in information[160]. Even then they argue that markets may produce problems because producers of information can obtain profits from speculative investments, for example, private companies searching for a cure for cancer may duplicate efforts[161].

Competition law is also of importance to new economy companies. Cooter and Ulen observe that, in addition to legal monopolies created by intellectual property laws, high technology industries have elements of a natural monopoly, because average costs fall as the scale of production rises[162]. Given natural monopoly the largest firm with lowest costs can drive out competition, for example, spreading research and development costs over larger production volumes reduces the average cost of innovation. It is observed that monopoly theory and policy were developed to analyse resource allocation in industries with stable technologies and “the development of high technology industries challenges both economic theory and policy”[163].

Contract law is also potentially significant to new economy companies because of the problem of human asset specificity, defined earlier in this paper. Zero transaction costs have to be assumed to exist if economic efficiency is to be attained and the presence of transaction costs has been seen to be a potential justification for state intervention. Williamson has argued that bilaterally dependent parties – such as where there is human asset specificity - cannot respond quickly and easily because of disagreements and self-interested bargaining so maladaptation costs are incurred[164]. The transfer of such costs from market to hierarchy in the company adds bureaucratic costs but these may be offset by bilateral adaptive gains[165]. Bilateral dependency, according to Williamson, poses contractual hazards in the face of incomplete contracting and opportunism in response to which contractual safeguards are commonly provided[166]. Maughan and Copp have argued in relation to innovative high growth companies that human asset specificity can only be said to constitute a “problem”, and then only to the companies concerned, in relation to borrowing from risk-averse lenders, entailing instead reliance on equity capital, high-risk unsecured borrowing or some system of guarantors, unless there is the reification of intellectual property and the use of contracts with covenants[167].

The role of company law in general terms might be expected to be fairly neutral in terms of its consequences for the economic efficiency of new economy companies. Care must be taken to avoid the oversimplification of the economic analysis of companies for, as Easterbrook and Fischel have demonstrated, each aspect of company law presents unique and complex questions of

economic analysis[168].

Perhaps the most important insight towards explaining the phenomenon of the company is Coase's seminal work which viewed the company as primarily a means of reducing transaction costs[169], although his perception of the company as, in effect, a miniature command economy, would seem at odds with the perception (at least) of new economy companies[170]. In contrast, the alternative and more recent "property-rights" approach put forward by Grossman and Hart suggests that corporate organisation is desirable because it increases the incentive to make relationship-specific investments, so enabling an acquiring company to own an acquired company's non-human assets and exploit the perceived contractual incompleteness that such assets are subject to[171]. The extensive mergers and acquisition activity between new economy companies may suggest that such a theory is not limited to "ownership" of non-human assets and may extend to incomplete contracts for human assets.

Company law is often seen not through the lens of the reduction of transaction costs but, on account of the work of Jensen and Meckling, through the lens of being responsible for their increase in the form of the agency costs incurred through the need for increased monitoring[172]. The relevance of this to new economy companies is plain: since such companies often involve much more complex issues than traditional companies, it would be expected that monitoring costs would be higher, potentially throwing into doubt the benefits of corporate organisation. This emphasis on monitoring costs is also significant because of the susceptibility of the company form to problems of imperfect information and judgement problems. Both these have the potential to induce market failure because of their tendency to lead to management opportunism and may justify extensive state intervention by way of mandatory disclosure requirements[173]. Problems of imperfect information may be particularly severe in the case of new economy companies where confidentiality may be vital to corporate performance and where many investors may face judgement problems in attempting to assess complex product information. One of the principal means by which management opportunism may be addressed is by the alignment of ownership and managerial interests and there is an extensive literature on the effectiveness of this. One such study by Morck, Sheleifer and Vishny sought to relate performance to insider ownership percentages finding that between 0 and 5% performance improved, between 5 to 25%, performance deteriorated, and that over 25%, performance improved, although the interpretation of this was not necessarily straightforward[174].

An alternative, and more sophisticated alternative approach to the concept of asset specificity and the identification of firm-specific assets, with a substantial bearing on the form that company law might take, has recently been put forward by Rock and Wachter[175]. It is particularly pertinent to this paper because the context of their analysis is that of "Silicon Valley start-up" companies and their use of a hypothetical case study, involving the development of a high-technology product, the "network switch". They define "match specific investments" as "... investments that are more valuable to the contracting parties than to a third party ..."[176]. The reasons given for preferring this definition are that it captures a broader range of activities, including training, learning-by-doing and adaptation to interaction with each other, is not limited to investments taking place within a firm and that it requires the identification of the specific asset created or improved by the investment[177]. "Match assets" are created by the "match-investments" because they will have great value to insiders and little value to outsiders – the pay-off from success would be huge, from

failure nil[178].

Rock and Wachter observe that in the early stages of the development of the switch, the venture will be hugely dependent on the individuals who provide human or financial capital[179]. Whilst Rock and Wachter focus on the problems of close corporations in obtaining finance, their conclusions are relevant for companies which may wish to seek finance from a public listing of shares as well because they raise important questions as to the governance of the venture. They argue that such companies will have difficulties obtaining venture capital finance because of the high cost entailed in outside investors needing to learn and stay informed as to the potential value of the switch[180]. They argue, therefore, that such investors would need to be brought in as insiders but would remain vulnerable to insiders threatening dissolution to extract a greater share of the enterprise, thus threatening the prospect of optimal investment[181]. Yet they conclude that the close corporation form is preferable to a public listed company because limitations on exit and the rule against non-pro-rata distributions, largely prevent opportunistic behaviour[182]. One significant factor is argued to be that the reason for reduced agency costs in high-technology close corporations compared with listed companies arises on account of the need to lock-in parties whilst developing vulnerable match-specific assets[183]. This contrasts with the usual reason for reduced agency costs being related to the presence of family relationships which are rarely present in high technology ventures[184].

This analysis raises potentially interesting questions for the governance of new economy companies which are listed. The effect of a listing will remove the limitations on exit which characterise the close corporation. In the case of the close corporation the absence of a market for shares means that a shareholder/ director will usually have an incentive to remain a director as the most effective means of monitoring, and ultimately realising, the investment; in the case of a listed company the constraint will be much weaker. This would suggest that risk-averse investors in a listed company would seek to recreate some of the advantages found in close corporations by requiring strong contractual protection against the termination of the employment relationship by those who have made match-specific investments, combined with restrictions on the realisation of shares. It would suggest the importance of an analysis of the role these play in particular in relation to founders and insiders.

Good governance and investor protection

Good corporate governance encompasses an exceptionally broad range of issues, reflecting its multi-disciplinary nature. These issues have been identified by Copp as the following: a lack of consensus as to the purpose of the company; a lack of consensus as to the purpose of company law; concern over corporate structure; concern over high profile scandals and failures; concern over directors' remuneration levels; and concern over corporate ethics[185]. Most of these apply to a greater, or lesser, extent to new economy companies. Investor protection is, in principle, a separate goal but the two will be addressed together in this paper.

The theoretical debate over the purpose of the company might appear to be dulled by the focus on innovation in such companies but in practice the conflict between shareholder and stakeholder interests can be as marked, for example, as to consumer protection in drug development. Similarly, it might be anticipated that the purpose of company law should veer on the side of

being facilitative rather than regulatory out of a desire to promote innovation but an argument to the contrary based on the unique risks posed by such companies could also be put. Concern over corporate structure might appear to pose less of an issue because the perception is that employee interests are already well represented in such companies; however, it will be seen from this paper that in practice even directors' holdings in such companies are typically low in relation to the whole and therefore may carry limited influence. Concerns over high profile scandals and corporate ethics have impacted on new economy companies much as for other companies, as the example of British Biotech has readily demonstrated. Perhaps the only significant exception relates to directors' remuneration where there appears to be a high level of tolerance of pay awards, indeed, the reverse concern can be demonstrated in the case of the companies involved in health: that there might be a "brain drain" of such skills overseas if those with relevant academic backgrounds were not appropriately rewarded.

The range of issues with which "good corporate governance" is concerned potentially renders it a diffuse tool for evaluating particular legal and regulatory mechanisms. There are two core issues, however, which appear to dominate academic perspectives on the relationship between corporate governance, innovation and human capital. These are whether a "shareholder" or "stakeholder" concept of corporate governance or the related concept of "outsider" and "insider" control are the more desirable. Debate over these concepts has dominated the development of corporate governance and attracted a vast literature both as to the implications of stakeholder theory[186] and the practical ramifications of the "outsider" and "insider" systems for international convergence[187]. Accordingly, it would be neither feasible, nor desirable, to attempt to reconcile such issues in this paper, not least because it would involve the need to evaluate issues as broad as the institutional framework for corporate governance, including the mechanisms for financing business, which would clearly be impracticable. Indeed, it would be irrelevant in terms of this paper to revisit the case for a "stakeholder" company law when a "pluralist" approach to company law reform has been so clearly and recently rejected by the Modern Company Law Review[188]. The reasons for this rejection were that a pluralist company law would confer a broad policy discretion on directors; would not necessarily achieve its objectives given the realities of a broad and largely unpoliced managerial discretion; be largely unnecessary if the law made clear the inclusive character of existing duties and maximised the opportunity for synergy between shareholder and wider interests; would constitute an attempt to achieve external benefits, often better secured by specific legislation bearing on business activity as a whole; and enable directors to frustrate takeover bids where a wider public interest requires it[189]. Similarly, the corporate governance committees, considered further below have also consistently rejected any fundamental change to the system of corporate governance[190]. However, it is recognised that some of the potential features of a regulatory framework which facilitates new economy companies, for example, the encouragement of employee shareholding may be consistent with a stakeholder approach.

Whilst the theoretical foundations of corporate governance may be fairly diffuse and, therefore, fail to provide a straightforward method of evaluating relevant regulation, the conceptual foundations of the work of the various non-governmental bodies which have contributed to the development of the Combined Code on Corporate Governance are rather clearer[191]. The emerging values on which their work has been based has been examined by Copp who traces the early emphasis on broad principles of openness, integrity and accountability in the Cadbury

Report to accountability, responsibility, alignment of directors and shareholder interests and improved company performance in the Greenbury Report[192]. Whilst such values are clearly significant in human capital terms, the emphasis appears to have changed in subsequent reports. Copp notes how the Hampel Committee stressed the role of people, team work, leadership, enterprise, experience and skills in producing prosperity over that of accountability and how the Higgs Committee took the view that transparency and accountability were more developed in the UK than in some other markets and that people were the key[193]. He argues that there are signs of a new direction in corporate governance with the Tyson Report emphasis on values such as diversity, defined in terms of the backgrounds, skills and experiences of non-executive directors”[194]. However, in terms of the utility of identifying such values for the purpose of evaluating law and regulation affecting corporate governance, there is an inherent difficulty given that hostility to legal regulation has been a strong emphasis of the corporate governance committees[195]. The solution adopted by Copp is to identify the following overriding principles which characterise “good” corporate governance, entailing the need to: define the role of the board; improve the quality of board members; diffuse power within the board; improve information and information flows within and without the board; and to facilitate self-accountability[196].

Innovation

There are various definitions of innovation. Porter has remarked that[197]:

“Innovation can be manifested in a new product design, a new production process, a new marketing approach, or a new way of conducting training. Much innovation is mundane and incremental, depending more on accumulation of small insights and advances, than on a single major technological breakthrough ... It always involves investment in skill and knowledge, as well as in physical assets and brand reputations.”

O’ Sullivan has adopted a similarly broad definition of innovation as[198]:

“ ... the process through which productive resources are developed and utilised to generate higher quality and/or lower cost products than had previously been available ...”.

It is, therefore, not limited to particular sectors of the economy, such as perceived fields of high technology which can rapidly become out of date. Maughan and Copp have contrasted the approach then adopted by the London Stock Exchange in giving guidance for companies applying for inclusion in Techmark, by stating that six core sub-sectors were immediately identifiable as areas of technological innovation and therefore automatically included in Techmark, although the majority of companies from eight other sub-sectors, were to be assessed individually by the London Stock Exchange[199]. Companies from other sub-sectors were eligible for inclusion subject to nomination by their corporate sponsor or broker and were required to satisfy the London Stock Exchange’s perhaps rather unhelpful definition of technology companies as a[200]:

“ ... company whose business growth and success is dependent on the development of one or more technologies or on the development of products or services which require significant technological innovation.”

Competition law would appear to play a significant role in encouraging innovation because there is a strong link between the strength of competition and innovation. Innovation may be explained by differing incentives to innovate or differing abilities to innovate[201]. Incentives may include Schumpeter's evolutionary process of "creative destruction" and D'Aveni's phenomenon of "hyper-competition", with the incentive being provided by shocks such as new technology, affecting or possibly created by the company[202]. Disincentives may be provided by the presence of "sunk costs", for example, where a company is committed to current technology or the "replacement effect", where a new entrant has more to gain from innovation which would give it a monopoly than an existing company which already has a monopoly[203]. The question of monopoly is significant since an existing company with a monopoly may have a stronger incentive to innovate than a new entrant if the result of entry would be to create duopoly, the "efficiency effect"[204].

Intellectual property rights also play a key role in encouraging innovation in creating incentives to innovate. The reason is that the existence of the possibility of gaining intellectual property rights may give rise to a race to achieve them and achieve at best a lawful monopoly and even otherwise the possibility of "early mover" advantages, such as setting an industry standard[205].

The role of the framework for corporate governance in facilitating innovation has been challenged. O'Sullivan focuses on the enterprise as the central unit of analysis, an interesting perception given that neo-institutional economists – who tend to be against realist perceptions of the company - would argue that it should be the transaction[206]. She argues against a shareholder perspective in corporate governance on the basis that shareholders are not the only residual risk bearer and criticises both shareholder and stakeholder models for depending on the neo-classical model of static resource allocation which directly contradict research on innovation that shows it requires an allocation process which is developmental[207], organisational[208] and strategic[209]. She argues that a system of corporate governance supports innovation by generating three conditions: financial commitment, organisational integration[210] and insider control[211]. She warns that governance institutions which support innovation in one activity and era may not be appropriate in another and may need to change[212]. This is consistent with Jensen's view that as ownership falls, a manager's incentive to learn about new technologies also falls[213].

Tylecote and Conesa have also focused on the appropriateness of the theoretical framework for corporate governance and innovation, and build upon the concepts of firm-specific and industry-specific expertise identified earlier in this paper[214]. Their framework consists of three principles related to the novelty, visibility and appropriability of innovation[215]. Firstly, where an industry is characterised by a high degree of novelty, shareholders/ stakeholders with high levels of industry-specific expertise are required[216]. Second, where an industry is characterised by a less visible activity, shareholders/ stakeholders with a greater degree of firm-specific expertise are required[217]. Third, depending on the extent to which intellectual property protection is possible in an industry, the returns from innovation may accrue to shareholders or involve large spillovers to other stakeholders, such as employees, in which case strategies of stakeholder inclusion may be required[218]. Ramirez and Tylecote argue, in the context of a case study of AstraZeneca, that the pharmaceutical industry is characterised by all three principles and that, therefore, an outsider-dominated corporate governance system should be more favourable than an insider-dominated

corporate governance system[219]. They concluded, however, that the UK outsider dominated corporate governance system showed a serious weakness in supporting innovation because many UK institutional investors did not develop either firm-specific perceptiveness or in many cases even the industry-specific expertise required[220]. The framework developed by Ramirez and Tylecote is potentially valuable to this paper because it provides a means of evaluating the corporate governance structures of the three differing industries in the sample.

Mergers and acquisition activity is influenced by a variety of regulatory frameworks and institutions, not least competition law and company law. Its desirability in facilitating or restricting innovation is therefore significant. Generally, there has been some scepticism as to whether mergers and acquisitions do improve corporate performance. As Pisano observes, in an examination of the biotechnology industry, acquiring such companies by vertical integration is a dangerous strategy because it is difficult to guarantee that the key assets of the company, the people, will stay and also because a large firm lacking experience in research and development may not have the know-how to manage the acquisition in such a way as to preserve the incentive structure to keep key people on board[221]. Rajan and Zingales similarly argue that horizontal acquisitions simply represent a way of a company strengthening its control over its employees and, therefore, postponing the adaptation of a company's governance system to change[222]. In contrast, Ahuja and Katila, based on a survey of the acquisition behaviour of companies within the global chemicals industry, concluded that under the appropriate circumstances, acquisitions could have a positive impact on innovation output[223]. They suggest that the reason for this is that such acquisitions enable companies to access new technology, although managers can make mistakes in picking acquisitions to closely related to existing activities[224]. These findings again emphasise the importance of the robustness of corporate governance in supervising the merger and acquisition process.

Human capital

From a macro-economic perspective, the role of the state in encouraging or providing appropriate investment in human capital through training and education should form a significant aspect of the legal and regulatory framework for new economy companies. Neo-classical growth theory seeks to explain the overall growth in an economy by reference to the contributions made by different inputs such as capital, labour and technological progress[225]. A significant part of growth in developed economies appears to be correlated with exogenous technological change and productivity growth but it has been difficult at a theoretical level to explain how and why this had such an effect[226]. Endogenous growth theory seeks to explain productivity growth by reference to investment in training and education to enable labour to make better use of available technology[227]. Given these assumptions it would be hardly surprising if universities could not be demonstrated to play a key role in the development of human capital. Zucker, Darby and Brewer have shown that universities play a fundamental role in endogenous growth because of the role played by geographically localised knowledge spillovers by a study of the effects of individual scientists, major universities and United States' federal research support[228]. The range of policy measures, therefore, to encourage human capital growth at a macro-economic level, which might be adopted would include either public sector provision or subsidy or alternatively concessions through the taxation system.

The role of the framework of corporate governance in facilitating intellectual capital has been highlighted by Keenan and Aggestam[229]. They argue, in essence, that corporate governance should be concerned with strategy, critical decisions, monitoring the management of and being accountable for the investment of intellectual property[230]. They are critical of the role of market-orientated corporate governance systems (i.e. those with an active market for corporate control) because of the short-term focus on profit and short-term investment combined with an insistence on innovating as fast as possible[231]. However, they are equally critical of network-orientated corporate governance systems (i.e. one predominantly influenced by networks of interconnected shareholders) on the basis that, despite their stability and long-term focus being consistent with the development of knowledge capital, they may be relatively impervious to market, professional, scientific and technological influences[232]. Perhaps more interesting are the questions that they pose as an agenda-setting exercise. These in essence relate to how the differing paradigms of corporate governance and intellectual property might be aligned; the differing responsibilities of investors, directors and executives for intellectual capital; what expertise and commitment is needed at governance level, for example, to create and develop, intellectual capital; whether the questions vary with type of business entity[233]. Whilst interesting, it is difficult to distinguish how these insights in relation to intellectual capital add to the approach adopted by corporate governance for other types of asset.

The use of increased remuneration to encourage the development of human capital is, perhaps, unsurprising. Keenan and Aggestam suggest that executive compensation should be linked to creating, nurturing and using intellectual capital to create value for stakeholders[234]. The problem in relation to directors' remuneration in new economy companies appears to lie in the incentives for the creation of firm-specific as opposed to "industry-specific" or "generic" skills observed earlier in this paper. Milgrom and Roberts argue that it is worthwhile for an employer to invest in firm-specific human capital because there will be no market pressure to pay more for these skills, since they do not increase an employee's value to other employees[235]. Indeed, they argue that unless employees remain with a company for a long period of time, then it would be illogical to invest in such skills at all[236]. Consequently, the company may generate a quasi-rent from not paying such employees the full value of the extra output of their firm-specific human capital[237], who will therefore be a bargain in comparison with those with generic skills[238]. Harris and Helfat have tested the question of differential remuneration for Chief Executive Officers with firm-specific, industry-specific and generic skills and demonstrated that on average external Chief Executive Officer successors received 13% more initial salary and bonus than internal successors and that, even after controlling for factors such as company size, there was a premium to external successors of 30%, suggesting a marked differential in the returns to these skills[239].

One particular form of remuneration which attracts much attention is the potential role of share options because these additionally present other advantages in the context of new economy companies. There is some measure of consensus that enabling employees to acquire share options can be an effective measure to encourage the development of human capital. Rajan and Zingales observe that human capital poses new challenges because legal mechanisms do not help confer control over it[240]. Their solution is for a company to build links between it and the person it wants power over, which enable the person to be better off voluntarily following its commands: complementarity[241]. The answer to getting employees to make firm-specific investments (as

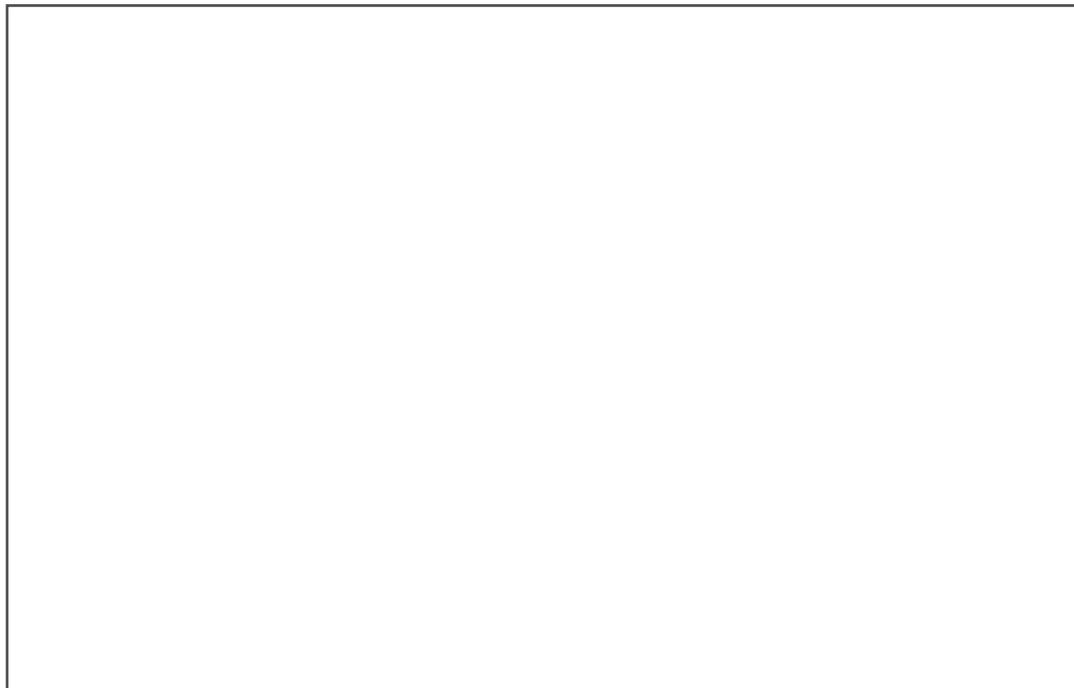
opposed to more marketable technical skills rewarded in an industry) is by greater rewards, that is, through privileged access to the company or its resources, so that they have power if they specialise[242]. They, therefore, suggest the use of ownership to motivate employees, citing specifically the use of long-term stock options, because these vest over a long period of time[243]. They also argue for the use of share options because they avoid the possible conflict of interests arising from giving employees voting power[244]. Zingales subsequently goes further arguing that the differences between traditional and new companies have implications for the boundaries of the firm in terms of power over human capital, how this power can be maintained and lost, how this power system differs from market transacting and how the surplus should be allocated (including between employees)[245]. He concluded that the de-integration of the company and the growing importance of human capital meant that power in firms was now diffuse and that accordingly a move to a cooperative framework of corporate governance was desirable to prevent conflicts among stakeholders[246]. Roberts and den Steen distinguish contractual and governance approaches to protecting employees investments in human capital and conclude that shareholder-dominated governance results in low investments in firm-specific human capital whereas employee representation in corporate governance makes more sense where high levels of such investment is desirable[247]. They observe that employee share ownership is significant in knowledge intensive and human capital intensive companies, with one extreme being the partnership form used for professional services[248]. Accordingly, they argue that as the importance of human capital relative to physical capital increases the net attractiveness of including human capitalists in governance increases[249]. It is notable that the rationale behind the proposals to encourage employees holding share options involves one of the non-economic criteria for state intervention identified by Cheffins, namely that of participation[250]. However, O' Sullivan warns that to focus on firm-specific skills is to ignore the dynamics of the innovation process and is likely to encourage the entrenchment of the claims of economic actors who have participated in and benefited from wealth creation in the past, even when the integration of these skills is no longer a viable basis on which the economy can generate the returns to meet those claims[251]. Ferran goes further and argues that share options can have a counter-productive effect where, for example, a senior manager fails to object to strategic decisions because of the adverse effect on share price and share option value[252].

GOVERNANCE IN NEW ECONOMY COMPANIES: AN EVALUATION OF THE REGULATORY SYSTEM

Company strategies for dealing with human capital risk

The survey of prospectuses identified the extent to which human capital issues were regarded as a risk factor and further the extent to which this related specifically to governance. Although not required, except perhaps to demonstrate the materiality of the risk, many companies gave some indication of their strategy for addressing such risks. These are summarised in Table 20. It should be noted that the figures in Table 20 can represent multiple entries for one company; however, only 1 company in each grouping had 3 or more entries.

Table 20 Strategies for Dealing with Human Capital Risk			
	HR	CH/T	CS
C	38.9	15.8	20.8
R	22.2	26.3	25.0
I	11.1	10.5	29.2
T	0.0	5.3	0.0
X	27.8	42.1	25
	100.0	100.0	100.0



Key to Table 20: Strategies for dealing with human capital risk

- C Contract, typically restrictive covenants
- R Remuneration/ share options
- I Insurance
- T Technical edge attracts
- X No strategy mentioned

In the main, the strategies identified by the companies were contractual in nature, whether by providing incentives or imposing constraints or seeking insurance through a third party. Even

reliance on a technical edge to attract employees is a pre-contractual measure. It is significant that there was only one company which specifically identified a corporate governance related strategy for reduction of this risk. That related to one of the companies in the sample of CS companies and involved reliance on a succession plan. It will be seen that overall there was approximately the same degree of reliance on remuneration as an incentive and contractual constraints (24.5% and 25.2% respectively) with significant, but less, reliance on insurance (16.9%). Perhaps more surprising was the proportion of companies which did not mention a specific strategy when identifying the risk, an astonishing 31.6% of the sample. However, this should not be taken as meaning that such companies do not possess such a strategy, only that it was not considered material to qualify the risk factor identified in this way.

There were a few significant variations by sector. The use of remuneration was the most consistently relied upon strategy of the three sectors surveyed, although there was a slight drop in the case of HR companies. HR companies appeared to place more reliance on the use of contractual constraints than the use of remuneration and this was markedly higher than the other companies in the sample. This, perhaps, reflected the need to reassure risk-averse investors where products were at the development stage and also the higher percentage of academically distinguished directors who might have possessed more firm-specific skills. CS companies placed far greater reliance upon insurance solutions than the other sectors. One additional factor identified on one occasion in relation to a CS company was succession planning, implying a link to governance. It was, perhaps, disappointing that the role that good governance might play received little attention. CH/T companies noted that it was their technical edge that assisted in the attraction and retention of employees, perhaps reflecting the greater size of such companies and differing career opportunities presented as a consequence. However, it was CH/T companies, in contrast, which were the most likely not to expressly identify their strategy in the investment risk factors.

It was interesting to note that human capital issues were often identified as a specific reason in the prospectus for the transaction, in other words the company was being brought to market partly to assist in employee motivation either by enabling share options to be conferred in a publicly traded company, the realisation of shares or simply prestige. The results are set out below:



It is clear that human capital issues were a far more important factor, towards entering the transaction, in relation to CS companies (60%) than to the others (20% in relation to both).

Remuneration as an incentive

Remuneration payments

Company law has traditionally been concerned with the regulation of the adjectival aspects of payments and other benefits provided to directors, such as where and how responsibility lies, rather than with the regulation of their substantive size, other than in exceptional cases[253]. In contrast, corporate governance has been primarily concerned with their size, although this has necessarily entailed some consideration of adjectival aspects. More recently, both aspects have been brought squarely within the boundaries of company law with the introduction of *The Directors' Remuneration Report Regulations 2002*, which make extensive amendments to the *Companies Act 1985*[254]. Central to the new regime is the requirement that the directors of quoted companies must now prepare a directors' remuneration report[255], which is subject to members' approval[256] and parts of which are subject to audit[257]. Information which is not subject to audit relates broadly to how the directors considered matters relevant to their remuneration[258], such as details of any person who provided any remuneration committee with advice or services[259], a statement of the company's policy on directors' remuneration[260], a performance graph[261] and details of directors' service contracts[262]. Information which is subject to audit relates broadly to the amount of directors' emoluments and compensation in the relevant financial year[263], share options[264], long-term incentive schemes[265], pensions[266], excess retirement benefits (past and present directors)[267], compensation (past directors)[268] and sums paid to third parties in respect of a director's services[269].

The purpose of such disclosures is essentially to seek to control increases in directors' rewards by requiring their disclosure. As such it may be tempting to conclude that their relevance is limited to new economy companies where, broadly, there tends to be greater public acceptance of reward levels than in companies perceived as less innovative – and consequently less risky. Nonetheless, they may well be relevant because of the distinction drawn between firm-specific, industry-specific and generic human capital. The reason for this is that the acceptability of reward levels in such companies is probably because of the perception that high levels of reward, say for scientists working on anti-cancer drugs are justifiable, rather than for those introducing generic skills into such companies (though some might argue that the increased risk instead means that such salaries would be justifiably higher). Accordingly, the research in this paper was directed towards establishing to what extent those with firm-specific skills were less well rewarded than those with industry-specific or generic skills.

The revised Code on Corporate Governance sets as a main principle that “ ... levels of remuneration should be sufficient to attract, retain and motivate directors of the quality required to run the company successfully, but a company should avoid paying more than is necessary for this purpose ...”[270]. Despite the neutral appearance of this principle the rest of the Code is orientated rather more towards avoiding paying too much than to attraction, retention or motivation. It requires the board to establish a remuneration committee of at least three independent non-executive directors or, in the case of a smaller company, two[271]. Its terms of reference should be made available[272]; in addition, the Higgs Report included a summary of the principal duties of the remuneration committee, which are annexed to the Code and which were compiled with the assistance of the Institute of Chartered Secretaries and Administrators[273]. Where remuneration

consultants are appointed a statement is required of whether they have any other connection with the company[274]. Such principles may or may not be appropriate for mainstream companies but there must be a question as to their orientation in terms of new economy companies, not least because performance conditions may be very difficult to assess in the case of companies where performance may not be easily assessed in the short-term, for example, drug development companies.

There are no distinct rules for scientific research based companies; however, there is a requirement that the listing particulars must state that the proceeds of the issue of securities made at the time of the listing, together with the company's own resources, will be applied primarily towards progressing identified products to a stage where they can generate significant revenues[275]. Furthermore, the listing particulars must explain in detail the uses to which the monies will be applied[276]. There is a much weaker requirement in relation to innovative high growth companies, relating to disclosure amongst other things of how the company's funding requirements will be met from existing resources and the issue proceeds[277]. Such disclosure might serve to act as a constraint on remuneration levels.

The Bioindustry Association Code of Best Practice states that companies with publicly traded shares should seek to achieve a balance among non-executive directors between those who can offer relevant business expertise and those who understand and are familiar with the risks and uncertainties of product development in the relevant product sector[278]. This is an interesting provision from a number of perspectives but it raises the prospect that such a company will have on its remuneration committee a non-executive with appropriate ability to assist in valuing the contribution made by executive directors with, say, a scientific background.

Sector	HR	CH/T	CS	All
Average annual remuneration of:				
All directors (£)	92,115	129,397	132,472	118,828
All executive directors	154,916	250,731	244,738	221,061
All non-executive directors	25,148	36,063	34,047	31,948
All 'insider' executive directors	170,390	278,369	205,445	219,294
All 'outsider' executive directors	238,550	235,592	275,964	253,981

Sector	HR	CH/T	CS	All
Average annual remuneration (£000s)				

of:							
Founders			163.5 (85.2)		199.5 (175.3)	168.3 (66.7)	174.4 (104.5)
Academics			210.4 (136.0)		144.4 (45.7)	172.3 (82.9)	176.6 (98.7)
CTOs			158.0 (79.6)		N/A	141.3 (61.7)	148.9 (68.2)
(Standard deviations in brackets)							

The analysis of the use of remuneration as an incentive was based on the annual reports and accounts since the figures in the prospectuses were spread over a longer period and invalidate any comparison. The comparison was made by analysing the total figures for directors' remuneration (including, therefore, such items as benefits, bonuses and pensions, but excluding certain transactions involving share capital). The reason for this is that no great significance was seen in the breakdown of these elements for the purpose of this survey by type of director or industry sector, which was concerned with testing an academic hypothesis.

The most striking aspect of the results was that in HR companies, the average remuneration of founders, directors with academic distinction and chief technology officers all exceeded the average of all executive directors whereas in CH/T companies and CS companies all fell below the average. However, the results for insider directors were patchier with remuneration exceeding the average executive remuneration in both HR and CH/T companies but being slightly below in CS companies. In theoretical terms, this might imply a number of possibilities. The most likely would appear that founders, directors with academic distinction and chief technology officers generally possess firm-specific skills which receive lower remuneration as expected but that there was some factor unique to the HR companies to reverse this. It is submitted that the most likely explanations are either that such directors in fact possess industry-specific skills or alternatively that there are specific valuation or agency problems in such companies which merit attention. However, there was another possibility, given that some companies were subject to the Bioindustry Association Code of Best Practice, that the requirement for a balance of business and product development expertise among non-executive directors ensured a more accurate valuation of these directors' services.

Share options

A share option has been defined in the following terms[279]:

“ ... a conditional contract for the allotment of shares to a person (called an option holder) under which the option holder is given an option to require the allotment of shares at a time specified in the contract ...”

Extensive disclosure of information on directors' share options is required in the directors' remuneration report[280]. Otherwise, the regulation of share options by company law is fairly

limited[281]. Much more extensive is the impact of tax law on the structure of share options and, accordingly, this paper will concentrate on this aspect of their regulation.

Standard tax treatment of share options (income treatment)

There is no tax charge on the grant of a share option. However on exercise an employee or director is subject to income tax on the difference between the open market value of the shares received and the amount paid.[282] For a higher rate taxpayer[283] this will be taxed at 40%, and in addition[284] the employer will be liable to employer’s national insurance at 12.8%.[285] On sale of the shares, the employee is subject to capital gains tax on any increase in value since the date of exercise. Any fall in value will create a capital loss.[286]

Tax-advantaged share option schemes (capital gains treatment)

Certain types of ‘approved’ share schemes instead qualify for capital gains treatment. Under this there is still no tax on grant of the share options, but also there is no tax charge on exercise. Instead the employee or director is subject to capital gains tax on the sale of the shares, on the difference between the sale proceeds and the actual price paid under the option. Tax rates on income and capital gains have been harmonised since the late 1980s,[287] but capital gains treatment still carries various advantages:

(1) Taper relief

Introduced by *Finance Act 1998*, Taper Relief exempts a proportion of a capital gain from tax, the proportion depending on the type of asset and the length of time it has been held for. After various amendments, taper relief can exempt up to 75% of the gain from tax, after only 2 years of ownership. This effectively reduces the tax rate (for a higher rate taxpayer) from 40% to 10%, and so is a significant advantage of capital gains treatment. The maximum exempt amounts, and the number of years ownership required to achieve the maximum, are given below:

	Max. exempt	Years
Non-business asset	25%	10
Business asset:		
April 1998 - April 2000	75%	10
April 2000 - April 2002	75%	4
April 2002 -	75%	2

Clearly the distinction between business and non-business assets is critical, and this has changed frequently in the few years since taper relief was introduced. For shares in a company held by an employee of that company, the relevant conditions are:

April 1998 – April 2000

Minimum 5% holding (calculated by voting rights)

April 2000 –

No minimum shareholding. Company must be unlisted or trading. For listed non-trading companies, must own less than 10% of shares.

(2) Annual Exemption

An individual's first £7,900[288] capital gains in any tax year are exempt. The vast majority of taxpayers do not have enough taxable capital gains (if any) to use this exemption, so capital gains treatment for share options takes advantage of an exemption that would otherwise be wasted. The annual exemption is deducted after taper relief, so if full 75% taper relief is available effectively £31,600 of actual gain can be exempted.

(3) National insurance contributions

National insurance contributions are not charged on capital gains, saving 12.8%[289] for the employer.

(4) Timing

Income tax on share options is collected under the Pay As You Earn (PAYE) system if the shares are 'readily convertible assets' (all quoted shares, and any unquoted shares where there is a ready market).[290] Tax is therefore due at the end of the month in which exercise occurs. This does not apply to options that qualify for capital gains treatment; instead tax is due by 31st January following the tax year in which the shares are sold.

Types of share options qualifying for capital gains treatment

There are several types of 'approved' share option scheme that will give capital gains treatment, each with its own rules and requirements. Some are intended to apply to all (or a wide range of) the company's employees, and are not covered here. There are also two targeted schemes that can be limited to senior employees:

(1) Approved Company Share Option Plans[291]

Commonly known as an ‘executive’ share option scheme, this has been in existence since the early 1990s. Options may be granted to as many, or as few, employees or directors as the company desires (although directors must work for at least 25 hours per week), and exercise can be set for any time from 3 to 10 years after grant. The option price must not be less than the value of the shares at the time of grant. Although flexible, the main restriction under this scheme is that the maximum value of shares[292] over which any employee can hold options at any time is £30,000.

(2) Enterprise Management Incentives[293]

The £30,000 limit was seen as too low for some companies, particularly those that were growing rapidly and those that, due to a shortage of cash, had to give a high proportion of executive pay through share options. Consequently a new type of scheme, the Enterprise Management Incentive (EMI) was introduced in 2000. Under the EMI, options over up to £100,000 of shares[294] can be granted to each employee, subject to an overall limit for the company of £3million. Exercise can be set for any time up to 10 years after grant, and options can be granted at a discount[295] (although any discount will be subject to income tax at the time of grant). Employees must work at least 25 hours per week for the company. EMI is not available for all companies; there are restrictions on the company’s activities.[296] Effectively the company must be small (gross assets less than £30million), trading (excluding certain land-based trades), operating mainly in the UK, and independent (not controlled by another). If the company ceases to qualify, then any unexercised options lose their beneficial treatment. As an additional advantage, where shares are acquired under an EMI scheme the period of ownership for taper relief purposes is calculated from the date of grant of the option (rather than the date of exercise under other schemes). This means that potentially an employee can exercise an option and sell the shares immediately, and yet still qualify for full taper relief. Initially EMI options could only be granted to a maximum of 15 employees,[297] and had to be “to recruit or retain a key employee”. This requirement was dropped by *Finance Act 2001*.

Key dates

There are therefore several key dates when approved share options became increasingly attractive (as opposed to unapproved share options or salary) for small high-tech companies. These are set out in Table 23 below.

Table 23

Key dates for approved share options

April 1998

Introduction of taper relief

April 1999

All new unapproved share options liable to National Insurance contributions.

April 2000

Introduction of EMI

Extension of business asset taper relief to virtually all employee shareholdings

Reduction of ownership period for maximum taper relief from 10 to 4 years.

April 2002

Reduction of ownership period for maximum taper relief to 2 years.

Of these, April 2000 was the most important, with significant improvements in taper relief and the ability to grant options over £100,000 of shares under EMI.

Results of survey

(1) Data

The level of detail disclosed in the accounts in respect of share option schemes varied considerably. Five companies gave too little information for useful analysis, and these were therefore excluded from the sample, leaving 40. At the other end of the spectrum a few companies gave generous amounts of information, and were this group larger it would have been possible to perform far more analysis. However in order to be properly representative the study was limited to those areas where information was available across the bulk of the sample.

(2) Use of share option schemes

All companies in the main sample had, or were in the process of establishing, at least one share option scheme. As can be seen from the following table all companies studied used an unapproved share scheme, usually in combination with one or more of the tax-advantaged schemes. Many of the companies that operated a tax-advantaged scheme made use of more than one type, which left **25%** of companies in the sample apparently not taking advantage of any of

the tax-advantaged schemes.

Table 24:

Percentage of companies in sample using each type of share option scheme:



Table 25

Types of share option scheme adopted by operations sector

When examining the types of share option scheme adopted by each of the business operations sectors in the study, the percentage of companies adopting the standard approved scheme was roughly comparable across all three sectors. However with the other schemes there was a notable difference, with CH/T companies far more likely to adopt an all-employee plan (67% compared to 36% for health and 25% for CS), but with no CH/T companies adopting an EMI scheme. This may be partially explained by the different size of companies in the three sectors (in terms of gross assets the average size of CH/T company in the sample was £18 billion, against only £46 million for Health and £210 million for CS). Larger companies are of course unable to adopt an EMI scheme and may also be more likely to adopt an all-employee scheme. However the average company size masks wide variations, and on further investigation it appeared that despite the high average gross assets approximately one third of CH/T companies in the sample were still small enough to qualify to adopt an EMI scheme (the proportion for CS companies was similar). The percentage of qualifying companies in Health was slightly higher (54%), but not sufficiently so to account for the far greater level of adoption. Accounts do not disclose sufficient information to discover the reasons for these differences so further research, possibly in the form of interviews or a questionnaire, would be needed.

The most common type of tax-advantaged share scheme is the ‘executive’ approved scheme, used by over half of the companies in the sample. This may reflect the relative simplicity and flexibility of these types of scheme, or merely companies’ familiarity with them. The ‘all-

employee' types of scheme[298] are also popular, but due to the flat nature of these schemes, with options over a small number of shares being awarded to a wide number of participants, they are unlikely to be significant in retention of key staff. The number of companies in the study having in place an EMI share option scheme is very low. This was initially surprising, as the scheme was introduced primarily for the benefit of high-growth companies such as those the subject of this study. However further analysis showed that most of the companies in the study did not qualify for EMI, mainly due to having assets in excess of £30 million but also in two cases (5%) solely due to more than 50% of the company's activity being outside the UK.[299]

Table 26:

Percentage of companies qualifying for and using the EMI scheme:



This table show that of those companies that appear to satisfy the EMI criteria the take-up is approximately one-third, higher than suggested by the initial analysis but still disappointingly low given how advantageous the tax reliefs available are.

(3) Importance of share option schemes

Not only did all companies in the sample use at least one share option scheme, the schemes also tended to be of significant size. Two criteria were used to assess the significance of share options for the companies in the sample. Firstly the number of shares under option at the accounts date was compared to the total issued share capital of the company, to assess the size of the schemes relative to that of the company.

Secondly the value of shares under option as at the accounts date was compared to the company's total employee costs (excluding options). If the value of shares under option were high as compared to employee costs, this would suggest that share options are a significant part of the company's remuneration, and therefore staff attraction and retention, policy.

Table 27:

Value of shares under option by company as percentage of total issued share capital (bar, left hand

scale) and total employee costs (line, right hand log scale):



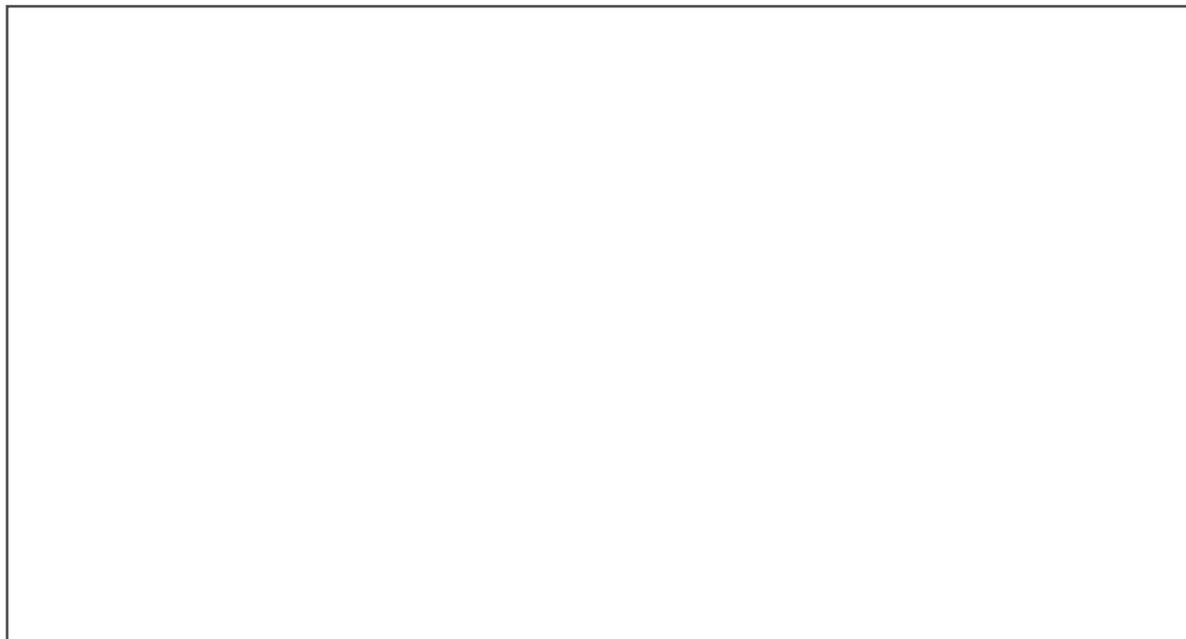
The table shows that for the majority of companies in the sample share options, if all exercised, would increase the company's issued share capital by between **4% and 10%** (mean average 7%). This suggests that share options are significant for the company, as involving an appreciable dilution of shareholder equity and a substantial potential employee stake. In addition, when comparing share options to other employee costs the options were found to be a significant element of total remuneration. For most of the sample the value of shares under outstanding options was in the range **10% to 50%** of total other employee costs, with a significant minority in excess of 100% (although it must be remembered that the exercise of the options would normally be expected to be spread over a number of years). The graph shows a reasonable correlation between the two tests, suggesting that they reinforce each other, although with a few divergent results (in some cases due to very low staff costs).

(4) Reasons for non-use of approved schemes

There are several potential reasons for non-use of approved share option schemes by companies, including complexity and set-up costs, restrictions on exercise period and restrictions on exercise price. One potentially significant restriction is the limit of £30,000 of shares under option (calculated by market value at time of grant) per employee. In order to determine whether or not this was a significant reason for non-adoption of approved schemes, for each of the companies in the sample the maximum value^[300] of shares under option for any one director^[301] was calculated. All companies in the sample granted options in excess of the £30,000 limit to at least one director. Options beyond that limit would of course have to be granted under a parallel unapproved scheme^[302], hence all companies in the sample have an unapproved scheme even where they also have an approved one.

Table 28:

Value of shares under for director with highest level of options in each company (bar); companies with approved share options are marked with a diamond:



From the graph it appears that there is no link between the level of options that a company wishes to grant and the likelihood of its using an approved scheme, suggesting that there is another constraint on adoption that is more relevant than the financial limit. Analysis of those companies that appear to qualify to grant options under the EMI scheme showed a similar absence of any correlation between the level of options to be granted and whether or not such a scheme were in place. Indeed it appears that none of those companies that could have covered all of their share option within the EMI limit (£100,000) had introduced a scheme. However the number of apparently qualifying companies in the sample (15) was relatively small and it may be unsafe to extrapolate from this finding without further research.

Table 29:

Value of shares under for director with highest level of options in each company that appears to qualify to introduce an EMI scheme (bar); companies with EMI share options are marked with a diamond:



(5) Options under water

On initial analysis of the accounts it came to light that nearly all (**88%**) of the companies in the sample clearly had at least some options granted and unexercised that were under water (i.e. the exercise price was in excess of the market value of the shares). In some cases this excess was small, but in many cases the shares would have to increase in value by several hundred percent or even tenfold before the option became worth exercising. This may in many cases explain the need for the substantial levels of options (way in excess of the limits for the approved schemes) that were encountered (see Table T4 above). If options have been issued at a time when share values are high, then they will rapidly exhaust the limits of the approved scheme. When share prices fell with the collapse of the dot.com bubble and it became necessary to re-incentivise management by issuing new options from the new share value base, these would then have had to be issued under the unapproved scheme. Further analysis was performed, looking at one director for each company (in each case the one with the highest level[303] of options) to determine the percentage of options that were under water as at the accounts date.

Table 30:

Percentage of director options under water for each company in sample:

For 17% of the sample the studied director[304] had no options under water, although in some cases this may be as a result of cancellation of options that are hopelessly overpriced. For an astonishing 43% of companies *all* of the chosen director's options were under water, in some cases by substantial amounts, despite the director continuing in office. Clearly if options are substantially under water then this casts doubt on their having a realistic prospect of incentivising the director concerned, despite the claims in the companies' remuneration reports that this is the intention of the scheme. In the remaining 40% of companies in the sample some of the director's options were under water but others were worth exercising; generally this appears to indicate that further tranches of options have been granted at a lower strike price to re-incentivise the director, but without cancelling the earlier options.

Recommendation:

This may be an area that the government should wish to address, in order to permit the transfer of under-water options from the approved to the unapproved scheme, freeing up capacity in the approved scheme. Alternatively of course the company could cancel options that are substantially under water, but this could have a demotivating effect on the employee (who may see at least a 'hope' value in the option) and could be perceived as signalling a loss of long-term confidence by the company in its prospects.

(6) Limitations of study

The existence of substantial numbers of share options that are significantly under water constitutes a limitation on parts of this study. When analysing the importance of share options for the company figures for the amounts of shares under option, and hence their value, are artificially inflated by the existence of a large number of options which the company and employee may feel are highly unlikely to ever be worth exercising. Some analysis of this problem has been performed, but it has been limited to directors' options (as the disclosure requirements in relation to directors are significantly more substantial); unfortunately too few companies give sufficient information to make any overall determination of the value of the extant options possible. In addition it was hoped that it would be possible to look for changes in company practice following the changes in tax legislation (e.g. an increase in the use of EMI following the improvements in taper relief). Unfortunately only a very small proportion of companies give sufficient information for this to be undertaken reliably. It is also possible that the study has suffered more generally from limited disclosure in the companies' accounts; in particular there may be more approved schemes than is apparent and fewer companies may qualify for EMI than it appears.

Contractual constraints on human capital

Company strategies to address human capital risk have been seen to involve a mix of contractual incentives and constraints. However, the role that might be played by contractual constraints would appear to be very different in nature and involve very different implications from an innovation and human capital perspective because their role is deterrent and may involve the prospect of litigation if they are to be enforced. In conducting any survey of contractual constraints, however, it is important to be aware that business norms may override contractual norms. Macaulay in the United States found that business disputes were frequently settled without

reference to the contract of potential or actual legal sanctions and that law suits for breach of contract appeared to be rare[305]. The reasons he suggested for this was because of the existence of effective non-legal sanctions, such as reputational factors combined with the potential impact of gossip and because the gains from litigation often failed to outweigh the costs[306]. Beale and Dugdale conducted a smaller survey, but with more emphasis on the role played by individual contract clauses, in the United Kingdom and came to rather more mixed conclusions[307]. Nonetheless, they also found, for example, that delivery delays gave rise to few serious disputes and only one in which legal action was likely[308]. However, great care must be taken in applying the results of the earlier of these two surveys: firstly they took place some years ago in what may have been a different business culture; furthermore, a significant factor may have been, as Macaulay identified[309], that the parties may have wished to avoid a “divorce” between the parties, a consideration which may be negated on the termination of an employment relationship, even with a senior director. A more recent study by Deakin, Lane and Wilkinson of contract practices in Britain, Germany and Italy found that the vast majority of British companies saw both the use of writing and the attachment of legal force as important means of clarifying the agreement and providing security in the event of a dispute[310]. Furthermore, British companies were far more likely to take legal action against customers or suppliers than in the other countries[311]. Accordingly, it may be that the importance of the contractual mechanisms examined in this section should not be underestimated.

The use of restrictive covenants

The basic economic model for efficiency assumes that all exchanges are voluntary and costless and that they take place in response to price signals in perfectly competitive markets in which information is perfect, entry is unrestricted and prices are unable to be distorted by individual agents or colluding groups of agents[312]. This statement, however, highlights a potential dilemma for economic theory in the face of a voluntary exchange which would purport to prevent one or more parties from competing. Which principle from within the model should be preferred in the event of a conflict? Macneil has stated the issue well in stating that[313]:

“It is plain that contracts in restraint of trade may be used in attempts to destroy the market mechanism itself, to destroy its diversity and multiplicity of decision making, and to centralise it in the hands of those who enter the contracts in restraint of trade. This fact is but one facet of potential or actual monopoly control of an economy.”

Milgrom and Roberts argue that it would be inefficient for the employer and employee to agree to any contract in which the employee is discouraged from moving when the value created in the new job is greater than in the current one[314]. Their reason is that penalties for leaving would make the initial job offer less attractive and require the payment of other compensating benefits, which would be worthwhile only when the penalties discourage value-reducing job moves[315]. However, this may be putting the case too highly since some discouragement of an employee from leaving, especially perhaps where the employee has valuable firm-specific skills, may be necessary to prevent opportunistic hold-up problems. It is also interesting to reflect that such measures amount to an attempt to protect firm-specific knowledge or skills that the law fails – or cannot – protect as property rights, and, therefore, may possess some economic justification. However, there is a more fundamental argument to be considered in relation to the enforceability

of restrictive covenants, namely that even were they consistent with economic efficiency based upon a static equilibrium, they would still be likely to be inconsistent with dynamic efficiency. If a broader range of policy goals were to be taken into account, it is probable that they would be regarded as inconsistent with the facilitation of either innovation or human capital, since it is often new businesses which are responsible for innovation and restrictive covenants will ordinarily be structured to prevent their establishment and restrictive covenants are more likely to be conducive to the maintenance of (less valued) firm-specific skills than the development of (more valued) industry-specific skills.

The use of restrictive covenants is particularly relevant to the governance of new economy companies for the following reasons: (1) their innovative and high technology nature makes it probable that their directors will have access to know-how which is not susceptible to intellectual property right protection; (2) they are critically vulnerable at the time of a flotation or major capital raising exercise to commercial damage from the departure of a key director to a competitor[316]. Such restrictive covenants will usually take the form of restrictions on competition, soliciting or dealing with customers, suppliers or employees and/ or on using confidential information. The significance of such covenants is that they seek to restrict the activities of an employee after their contract of employment has ended; during an employee's contract of employment an employer has an exclusive right to an employee's services, as will be considered in relation to "garden leave" clauses in the next section of this paper.

The basic common law rule was settled by the House of Lords in *T. Nordenfelt v. The Maxim Nordenfelt Guns and Ammunition Company Ltd* in the following terms[317]:

"... The public have an interest in every person's carrying on his trade freely: so has the individual. All interference with individual liberty of action in trading, and all restraints of trade of themselves, if there is nothing more, are contrary to public policy, and therefore void. That is the general rule. But there are exceptions: restraints of trade and interference with individual liberty of action may be justified by the special circumstances of a particular case. It is a sufficient justification, and indeed it is the only justification, if the restriction is reasonable – reasonable, that is, in reference to the interests of the parties concerned and reasonable in reference to the interests of the public, so framed and so guarded as to afford adequate protection to the party in whose favour it is imposed, while at the same time it is in no way injurious to the public."

The context in which the restrictive covenant is made may well be relevant to its enforceability. The law generally distinguishes between covenants which accompany the sale of the goodwill of a business and those which apply between employer and employee, with the former being accorded more latitude[318]. In particular, where the employee is also a shareholder (as will almost invariably be the case with a director) and the restrictive covenant is taken as part of an arrangement for the sale of shares in the relevant company then a more wide-ranging restraint may be upheld than would otherwise be acceptable[319]. This is potentially applicable in the case of a flotation of a company where some existing shares are being brought onto the market.

The law also distinguishes between covenants made by employees with greater and lower seniority, with the latter being afforded a greater measure of protection[320]. Mehigan and

Griffiths have prepared an interesting “ready reckoner” as a quick reference guide to decisions in relation to employees in restraint of trade cases, tabulating the job involved, the time of the restraint, the restricted area or activities and validity[321]. They identify 67 cases between 1909 and 1991, of which 7 relate to directors[322] (excluding one which refers to a “divisional director” which is unlikely to be a main board director[323]). In 28 of the cases (41.8%) the restrictive covenant was successfully enforced (subject to some examples of judicial severance). In contrast, in 6 of the 7 cases (85.7%), which involved a director the restrictive covenant was successfully enforced (subject to one example of judicial severance)[324]. In 2 of the cases a managing director was involved and in both the restrictive covenant was successfully enforced (subject to one example of judicial severance)[325]. Further analysis would be required to establish whether there was a formal correlation in statistical terms between the status of director and the enforceability of a clause. However, whilst it is interesting to reflect on the significance of the empirical data which can be derived from such a survey it is important to bear in mind the very different dynamics of law methodology, for example, the precedent value of the older cases in the survey, the precedent value of cases decided by different courts and judges and the need to take into account the factual matrix not easily reduced into such a tabulation. This last point cannot be too strongly emphasised because the courts have consistently stressed the need for the judge in every case to decide whether or not a restraint of trade is reasonable, having regard to the appropriate evidence and the particular circumstances of the case[326].

Regrettably, there is some doubt as to the precise boundaries of the interests which an employer may legitimately protect, extending to whether trade secrets and confidential information will be protected, whether an employer may be protected from the “poaching” of employees, customers and suppliers and how reasonable the restraint is in terms of its scope, area and length.

The most controversial issue relates to the extent to which the law will restrict an employee’s use of trade secrets and confidential information to which he has had access. Whilst it is fairly clear that a “trade secret” may be protected, the definition of what amounts to a trade secret is somewhat unclear and furthermore there is some overlap between the two concepts. This is likely to be especially relevant to new economy companies which operate at the leading edge of innovation. A typical example of what the courts regard as a trade secret is that of a product manufacturer’s secret formula[327] yet the courts are also willing, in principle, to recognise other forms of confidential information, broadly where they amount to the equivalent of a trade secret[328].

An early test which still finds some favour[329] was to distinguish between “objective” knowledge and “subjective” knowledge. Objective knowledge was originally defined to include matters such as trade secrets, whereas subjective knowledge was that comprising the employee’s own aptitudes, skill, dexterity, manual or mental dexterity[330]. The significance of the distinction is that objective knowledge will be treated as the employer’s property even if it is in the employee’s memory, whereas subjective knowledge belongs to the employee[331]. One alternative test is whether the relevant information can be easily isolated from other information which the employee is free to use or disclose[332]. Another alternative is rather more subjective being based upon whether a person of average intelligence and honesty would think there was anything improper in disclosure[333].

It is tempting to see in these judicial *dicta* a reflection of economic theory and the distinction between firm-specific and generic skills, with the courts being broadly willing to protect the former. Yet this is unconvincing because there would be no benefit to an employee in seeking to use truly firm-specific skills elsewhere (except perhaps in direct competition). A reasonable question to ask, especially from an economic perspective, is whether the language adopted of property rights ought to be translated into legal recognition of confidential information as a form of property, normally regarded as an efficiency enhancing approach. The arguments have been reviewed by Leng and Leong, who conclude that the majority of academic opinion is against treating confidential information as property[334]. Harvey not unnaturally concludes that[335]:

“... the boundaries between information which an employer may legitimately seek to protect and that which he may not remain shadowy and ill defined. Inevitably, given the enormous range of potential factual permutations, any attempt to accurately define that boundary is doomed to fail ...”

Uncertainty also exists in relation to the extent to which the law will protect an employer from the “poaching” of his employees, customers and suppliers. Whilst there are inherent difficulties in seeking to prevent an employee working for another employer if both want this, or in seeking to prevent any employee regardless of their expertise or juniority from working for another employer[336], it does appear that the courts will protect an employer’s interest in maintaining a stable trained workforce in a highly competitive business[337]. This is particularly so where the restrictive covenant is limited to the soliciting of directors and senior employees[338]. This is particularly relevant to new economy companies which suffer from a degree of instability in any event and which may suffer from a market shortage of appropriately skilled staff. In relation to customers, the test is particularly nebulous where enforceability may depend on the personal qualities of the employee, such as personality, temperament and ability to get on with people[339].

The reasonableness of a restrictive covenant in terms of its scope, length and area is a further source of uncertainty since the covenant must do no more than protect the legitimate interests of the employer. No restraint may be imposed in respect of a business different from the one in which the trade secrets exist or where the customer connection was built up[340]. This raises the question as to how a business may be defined which may not constitute a problem in the examples of bakers and milkmen cited but may not be so easily resolvable in the case of new economy companies where the activity may be less readily understood. In *Mehigan and Griffith’s “ready reckoner”*, the covenants restraining directors that were upheld involved restraints of 5 years and 3 miles, 3 years and 16 countries, 5 years and Great Britain and Northern Ireland, 18 months and a severed non-solicitation clause, and 2 years and not working in the UK. The restrictive covenant not upheld involved 1 year and the UK[341]. Whilst this returns to the principle enunciated above, that the courts have consistently stressed the need to consider each case on its facts, it also creates substantial uncertainty.

Yet further obstacles may lie in the successful enforcement of a restrictive covenant. Even where a restrictive covenant is considered by a court to be reasonable as between the parties, it is still possible that it may be invalidated as contrary to the public interest. The hypothetical example given by Beatson is that of a distinguished engineer or economist whose restraint would be

detrimental to the community at large[342]. Such an example is readily applicable to many new economy companies, not least those surveyed in this paper, which includes scientists at the forefront of the development of new medical treatments and where it is not hard to imagine that a court would not be minded to restrain the scientist from continuing such activity. In addition, it is possible that skilled drafting of a restrictive covenant may render an otherwise overly extensive clause enforceable on account of the doctrine of severance – the “blue pencil” test[343] -, though there is some evidence of judicial antipathy towards artificial stratagems[344], perhaps posing problems for drafters who include numerous alternative options in the hope that the court might choose the least unfavourable. Further, whilst it has long been settled that an employee will not be bound by a restrictive covenant where wrongfully dismissed[345], there is some evidence that the courts may be weakening in their robust attitude towards attempts to contract around this[346]. Finally, it is important to bear in mind the differential impact of legal costs in such cases between claimant and defendant, a recent example of which can be seen in *IS Innovative Software Ltd v. Howes*, a claim brought by the company against its former managing director[347]:

“This has been ruinously expensive litigation and in due course Mr Howes decided to appear at the trial on his own behalf, without legal assistance ... Mr Howes bore the brunt of conducting the action, which he did with considerable forensic skill and without many unnecessary diversions.”

A fair proportion of companies within the sample disclosed details of restrictive covenants in executive director service agreements in their prospectus. These were analysed by sector by reference to the scope of the covenant and its length.[348]. The results are set out in Table 31 below.

Table 31: Restrictive covenants					
Sector	HR	CH/T	CS	All	
% of companies disclosing information	40%	40%	40%	40%	
% OF EXECUTIVE DIRECTORS WITH THE FOLLOWING TYPES OF RESTRICTIVE COVENANTS					
Soliciting employees	91.6%	50.0%	61.3%	42.2%	
Competing	91.6%	96.4%	100.0%	96.4%	
Soliciting customers	62.5%	50.0%	96.4%	67.5%	
Intellectual property	25.0%	14.3%	6.5%	12.0%	
Research and development	12.5%	0.0%	32.3%	15.7%	
TYPICAL (MODAL) LENGTHS OF RESTRICTIVE COVENANTS					
Soliciting employees	6 MONTHS	12 MONTHS	12 MONTHS	12 MONTHS	

Competing	12 MONTHS	12 MONTHS	12 MONTHS	12 MONTHS
Soliciting customers	12 MONTHS	12 MONTHS	12 MONTHS	12 MONTHS
Research and development	6 MONTHS	12 MONTHS	12 MONTHS	12 MONTHS

A substantial example of the disclosure of details of a restrictive covenant was as follows[349]:

“The service contracts referred to above (with the exception of ...) contain covenants on the part of the executive Director such that, for a period of six months immediately following termination of employment thereunder, the executive Director shall not, directly or indirectly, (without the written consent of the board) within the United Kingdom or any other country in the world where, on the date the service contract is terminated, the Company develops, sells, supplies, manufactures or researches its products or services or where the Company is intending within three months following the date the service contract is terminated to develop, sell, supply or manufacture its products or services and in respect of which the executive Director has been responsible (whether alone or jointly with others), concerned or active on behalf of the Company during any part of the 12 months immediately preceding the date the service contract is terminated:

- (a) be employed or engaged in; or
- (b) perform services in respect of; or
- (c) be otherwise concerned with:
 - (i) the research into, development, manufacture, supply or marketing of any product which is of the same or similar type to any product researched, or developed, or manufactured, or supplied, or marketed by the Company during the six months immediately preceding the date the service contract is terminated; or
 - (ii) the development of provision of any services (including but not limited to technical and product support, or consultancy or customer services) which are of the same or similar type to any services provided by the Company during the six months immediately preceding the date the service contract is terminated.

These provisions only apply in respect of products or services with which the executive Director was either personally concerned or for which he was responsible whilst employed by the Company during the six months immediately preceding the date the service contract is terminated.”

The most common type of restrictive covenant was against competition (96.4%), followed by conventional restrictions relating to employees and customers (42.2% and 67.5% respectively).

Perhaps surprising in the light of the high technology nature of the companies, a relatively low proportion sought to impose a specific covenant restricting competing research and development activity (15.7%): indeed the highest proportion of those which did were CS companies, rather than HR companies (32.3% as against 12.5%). It is only possible to speculate as to what the possible reasons for this might be, perhaps differing perceptions as to risk or perceived difficulties of enforcement might be explanations. The length of the restrictive covenants adopted might at first sight appear modest; however in the fast moving fields of expertise covered by many new economy companies the restrictions might do considerable damage. However, given that the courts stress the need to examine each case on its own facts, it is impossible to seek to make any generalisations as to enforceability on such a limited factual matrix.

The use of director notice periods as a constraint

Generally, the corporate governance debate has concentrated on contractual notice periods which a company is required to give to a director rather than on the notice period which a director is required to give to his company. The reason for this was well stated by the Hampel Committee[350]:

“The fundamental problem lies in the fiction of the notice period. Neither party seriously expects the typical notice period required from the employer under a director’s service contract to be worked out. It is merely a mechanism for the payment of money. However, it is an inherently unsatisfactory mechanism because it hinges on a breach of contract, leading to damages for breach. The damages are (i) quantifiable only at the time of termination and (ii) subject to an obligation (which can be significant) to mitigate, for which it is impossible to provide a mechanical calculation and this therefore leads to uncertainty and hence controversy. A solution which brings certainty would be desirable”.

The solution, in practical terms, has taken the form of progressive restrictions on the notice period which a company is required to give a director. The present position under the Combined Code is that notice or contract periods should be set at one year or less and that if it is necessary to offer longer notice periods to a new director recruited from outside then the period should reduce to one year or less after the initial period[351]. The assumption which appears to underpin this provision is that of the Hampel Committee, namely that the issue to be addressed is that of reducing the company’s monetary exposure.

New economy companies give rise to different questions from those which have led to the drafting of the Combined Code and it has been seen earlier that there is less evidence of concerns over remuneration in them. In contrast, there are concerns raised by the identification of a directors’ ability to leave the company, which must in turn raise the issue of the adequacy of the notice period which such directors are required to give their company.

The legal position regarding the termination of a contract of employment by a director is that at common law a contract for an indefinite period is terminable by notice given by either party to the other[352]. This would also appear to apply to the termination of a contract for services by a non-executive director. Where there is no indication to the contrary, a court will infer that the contract is terminable by “reasonable” notice, to be assessed by reference to all the circumstances, such as

seniority, length of service, nature of employment, frequency of paydays etc[353]. An employer is entitled by statute to at least one week's notice of termination of employment for employees who have been continually employed for at least one month[354]. It has been held that 3 months was a reasonable period of notice for an executive director of an advertising agency to give his company and that a failure to give such notice could result in liability to the company for resulting loss[355]. But, as Freedland points out, resort rarely needs to be had to the implied or default requirement of notice of reasonable length because of the requirement to specify the length of notice in the statutory particulars of terms and conditions of employment[356]. There must be a question over compliance with such requirements at board level though the existence of formal contracts of employment would appear to dominate. Quoted companies have an obligation to disclose in the directors' remuneration report details of the date of a director's contract of service or contract for services, the unexpired term and "... the details of any notice periods ..."[357].

Sector	HR	CH/T	CS	All
Executive directors				
Minimum notice (months)	12 (8)	24 (4)	12 (4)	12 (16)
General notice (months)	12 (48)	12 (43)	6 (61)	12 (152)
Non-executive directors				
Minimum notice (months)	24 (6)	36 (9)	36 (15)	36 (30)
General notice (months)	3 (30)	3 (21)	3 (22)	3 (73)

[Note: The figures in the table are modal lengths in months. As data on notice periods is somewhat patchy, the figures in brackets represent the number of directors for whom data were available.]

The data on notice periods was regrettably patch as the information above on the number of directors in the sample demonstrate. It is difficult, therefore, to be confident in the interpretation of the results, especially in the case of non-executive directors where, as a consequence, there may be no notice required. Subject to this, it would appear that many companies have negotiated fairly lengthy notice periods which would enable them to rely on the provision of directors' services for a reasonable length of time, typically 12 months minimum followed by a further 12 months.

A "garden leave" clause has been defined in the following terms[358]:

"Under such a provision, the employer inserts a term in the contract stating that following notice of termination of the contract, the employee will not be permitted to work for another employer until the expiration of the notice period".

Such clauses can be distinguished from restrictive covenants because they impose restrictions during the currency of the employment relationship and might therefore be thought to be more effective. There is a close relationship between the use of "garden leave" clauses and the use of

restrictive covenants[359] and it has been observed that there is a trend towards increasing reliance on them in preference to conventional restrictive covenants because the courts have in the past treated them with greater flexibility[360]. The purpose of a garden leave clause is, in effect, to attempt to sterilise an employee's knowledge, for example, as to up-to-date technical developments within the company and also to weaken any bond between the employee and fellow employees, customers and suppliers. As Dillon, L.J. put it in *Provident Financial Group plc and Whitegates Estate Agency Ltd v. Hayward*[361]:

“The practice of long periods of ‘garden leave’ is obviously capable of abuse. It is a weapon in the hands of the employer to ensure that an ambitious and capable executive will not give notice if he is going to be unable to work at all for anyone else for a long period of notice. Any executive who gives notice and leaves his employment is very likely to take fresh employment with someone in the same line of business, not through any desire to act unfairly or to cheat the former employer but to get the best of his own personal expertise.”

It is self-evident that, if successful, such a strategy could prove more effective than the use of restrictive covenants. To take a hypothetical example a former employee could attempt to breach a restrictive covenant by soliciting former colleagues the very day after departing work; it would be much more difficult to do this after, say 3 months garden leave has weakened such links, and policing a breach of an exclusivity obligation contained in a contract of employment might be easier, perhaps, than policing a non-compete obligation in a restrictive covenant.

At common law, there is no duty on an employer to provide an employer with work, although the employer must continue to pay an employee who is willing to work[362]. There are, however, exceptions to this principle, such as where an employee needs to continue to exercise skills[363] or where publicity received from working is part of the bargain[364]. Such exceptions may well apply to employees in new economy companies engaged, for example, in research work, though it is interesting to speculate on how such principles might be applied at board level. However, an express garden leave clause is highly desirable because the courts may be unwilling to imply a power to insist on garden leave where there is a contractual obligation to provide the employee with work[365], the test for which has been seen to be ill-defined. The courts have been willing to grant an injunction to enforce the full period of a garden leave clause amounting to 6 months following a resignation without due notice[366] but have also indicated that similar principles will be applied as to the validity of restrictive covenants[367]. The courts, however, take the view that there is no relationship between a garden leave clause and a restrictive covenant so that there was no basis for allowing a set off of the period of paid leave against the restrictive covenants[368], although the combined effect of the two might be relevant to the validity of a restrictive covenant[369].

The sample of healthcare companies revealed some use of garden leave clauses. In all cases the clauses were incorporated into the service agreements with all of the executive directors. However, information was available in relation to only 3 of the relevant 15 companies in that part of the sample (20%). Since it was not possible to say whether the reason for this was that no such clause had been used or alternatively that it had not been considered material to disclose it was considered that reliance on such a small amount of data would be unreliable. An example of a

disclosure linking a garden leave clause to restrictive covenants, from within the sample, is set out below[370]:

“The agreement includes a garden leave clause, a restriction on the use or disclosure of the Company’s confidential information and post-termination restrictions for a period of 12 months (less any period spent on garden leave) which prohibit him from soliciting or having dealings with the Company’s or Group’s customers or potential customers and from soliciting the Company’s or Group’s directors or senior employees, or from competing with the business of the Company during that period.”

Garden leave clauses may be useful in the context of good corporate governance where they may serve to minimise risk to companies. However, the growing practice of companies of requiring garden leave clauses, in addition to restrictive covenants, would appear questionable in terms of economic efficiency and the facilitation of innovation and human capital. There may be some merit in their use being prohibited.

The use of shareholder lock-ins as a constraint

The term “lock-in” agreement used in this section should be distinguished from the form of lock-in agreements which have received extensive academic consideration, namely those which, in effect, attempt to create an agreement to negotiate or to agree. The term is used here to refer to an agreement by a shareholder in a company on the admission of share to trading on a publicly traded market not to sell shares for a specified period. The practical impact of clauses may well be to effectively tie directors (who are also shareholders) into the relevant company as they may consider it unwise to retain shareholding in a company without the ability to participate in its management. It would seem probable that a lock-in agreement should be subject to the same principles as apply to restraint of trade clauses generally and that the relevant standard might be analogous to that which applies on the sale of the goodwill of a business. However, there are only two reported cases which concern a lock-in agreement or deed; both arise out of essentially the same factual matrix and the judges in both cases appear to have assumed the validity of such agreements without argument[371].

Directors, as well as senior management and substantial shareholders, who hold shares in a scientific research based company or in an innovative high growth company are subject to special rules after admission of their company to listing. The listing particulars must contain a prominent and detailed statement of the arrangements agreed for them not to dispose of their shares following admission[372]. If there are no such arrangements for one or more of the persons concerned then there must be a prominent statement that there are none for them, together with an explanation of the reasons[373].

Sector	Health	CH/T	CS	All
Number of companies (% of sample)	7 (47%)	5 (33%)	12 (60%)	24 (48%)
Lengths (months)	6 months	2	3	7
	9 months	0	0	2
	12 months	3	3	12
	18 months	1	0	1
	24 months	0	0	0

| In all three sectors, the typical (modal) lock-in length is |
| 12 months. |

An example of the disclosure of a lock-in agreement is as follows[374]:

“A lock-in deed dated 30th October 2000 between those Directors and members of management who hold Ordinary Shares and certain other Shareholders (1), the Company (2) and Williams de Broe (3), pursuant to which the Directors and certain members of management have agreed not to dispose of their Ordinary Shares for two years following Admission, subject to limited exceptions, and for a further period of one year will notify Williams de Broe of any proposed disposal of Ordinary Shares and effect the sale through them. Certain other shareholders have agreed not to dispose of their Ordinary Shares for six months following Admission, thereafter being able to dispose up to one half of their Ordinary Shares for a further period of six months. The limited exceptions referred to above include a general offer for the whole of the issued equity share capital, a compromise or arrangement sanctioned by the court under sections 425 to 427A of the [Companies Act 1985] ..., death, and the disposal of Ordinary Shares by certain shareholders to repay loans due to EBT1 or to pay deferred consideration to EBT2.”

The typical modal lock-in agreement period was 12 months. This was consistent with both the typical length observed for restrictive covenants and to general (i.e. not the initial minimum) notice periods. The purpose of such clauses would appear to be valuable for corporate governance since their purpose is to seek to minimise share price volatility – already identified in this paper as a significant risk factor. Whilst further research might be conducted into the nature of the exceptions to these agreements and whether they operate equitably, there appears to be no reason to question their use.

Insurance

Insurance was identified as a means of dealing with human capital risk by relatively few HR or CH/T (11.1% and 10.5% respectively) but it was the most significant strategy adopted by CS companies. It typically took the form of key-man insurance for specified directors and/ or senior employees. One possible explanation for its use by CS companies was that the highest proportion of companies with founder directors fell into this category and it is possible that in such companies there was a greater perceived need to reassure investors as to the risk. However, further research would be necessary to determine this.

Governance

Good corporate governance was not identified in the survey of risk factors as being a strategy adopted by companies for addressing human capital issues, either generally or specifically in relation to the board itself (apart from one oblique reference to succession planning). This is, perhaps, disappointing given that the regulatory frameworks for corporate governance now do much to address such human capital issues but may reflect a perception, given that the prospectuses analysed were issued prior to the Higgs Committee Review, that corporate governance was more about accountability. Much of the legal framework for corporate

governance, for example, requirements as to meetings, have no particular significance for new economy companies or their human capital aspects and, therefore, will not be discussed. This paper will concentrate on the role of corporate governance in ensuring that the board of a company has the appropriate quality of human capital required to be effective.

The immediate problem presented by the regulatory framework for the governance of human capital issues at board level, and especially in new economy companies, is the array of superficially similar or overlapping requirements, but often with widely differing legal consequences attached for breach. To take one illustration, compare the statement of Jonathan Parker, J. as follows[375]:

“ ... Directors have, both collectively and individually, a continuing duty to acquire and maintain a sufficient knowledge and understanding of the company’s business to enable them properly to discharge their duties as directors ...”

with the requirements of the Listing Rules[376]:

“The directors and senior management ... must have collectively appropriate expertise for the management of the group’s businesses. Details of such expertise and experience must be disclosed in any listing particulars prepared by the company ...”

The first statement relates to case law concerned with the imposition of liability in an action for negligence; the second is a requirement imposed on the directors under the Listing Rules, supported by a regulatory regime which includes the power to impose civil penalties for breach. Yet there are significant differences in emphasis, for example, the first refers to directors, the second encompasses senior management. This sort of confusion is undesirable and it is clear that a more joined-up approach is required.

Appointment

Ultimate responsibility for the quality of the board of a company lies with the shareholders, who have the power to appoint[377]. Directors may also appoint a director, but the person only holds office until the next annual general meeting, when the person must be reappointed[378]. In practice, shareholders in large companies with diffuse shareholder bodies may find collective action to oppose the directors wishes on such issues difficult, which is one reason why this has become a matter for corporate governance regulation.

The Combined Code on Corporate Governance has emphasised the need for the appointments of directors to be on merit and against objective criteria, yet does little to give guidance on what that means[379]. It is helpful that the Combined Code requires the papers accompanying a resolution to elect or re-elect a director to include sufficient biographical details and any other relevant information to enable shareholders to make an informed decision[380]. It would be hoped that such papers will give further information than has been given to date in prospectuses and annual reports and accounts. During the course of this survey, such information was often found to be of poor quality for analytical purposes. For example, qualification details were given in the form of lists of letters, the significance of which might be far from clear to any but a specialist from the

same field; career histories were often very incomplete, even extending to whether the director had been recruited internally or externally. Perhaps worse still the lack of any standardised format made intra-company comparisons very difficult. If an assessment of the quality of human capital is to be regarded as significant in making investment decisions, this needs to be remedied.

The Combined Code provides that appointees, especially to chairmanships, should have enough time[381] and that non-executive directors should undertake that they have sufficient time[382]. More specific controls apply in the case of FTSE-100 companies[383]. The average number of current directorships may provide a proxy measure of availability and was derived from the survey of prospectuses. The results (which should usually exclude group companies of the relevant company) are set out in Table 34 below.

Table 34: Number of current and previous directorships per director, by sector					
Sector	HR	CH/T	CS	All	
Average number of current directorships	3.4 (3.6)	4.4 (7.2)	3.3 (4.0)	3.7 (5.1)	
Average number of previous directorships	3.3 (4.7)	5.3 (11.1)	4.1 (7.0)	4.2 (8.0)	
(Standard deviations in brackets)					

It can be seen that the average number of directors, which encompasses both executive and non-executive directors, appears quite high, though further research would be desirable to evaluate the true significance of these figures.

Competence

The distinctiveness of new economy companies in terms of their human capital was measured principally by reference to whether directors had founder or insider/ outsider status (as a measure of firm-specific or generic skills) and academic distinction. The results are set out in Table 35 below.

Table 35: Board Structure - Founders, Academics and Insiders, by Sector				
Sector	HR	CH/T	CS	All
% of companies with 'founder' directors	46%	50%	61%	53%
Academic distinction as % of all directors	21%	14%	5%	11%
Insiders as a % of all executive directors	39%	53%	41%	46%
Outsiders as a % of all executive directors	27%	33%	32%	30%

The proportion of directors possessing some academic distinction revealed the sharpest distinction in these measures of human capital, with a much higher proportion in relation to HR companies than in CS companies. This may well be explained by the presence of scientific research based companies in the sample; however, it is perhaps interesting to reflect that the overall proportion – in the region of 1 in 5 – is relatively slight compared with what might have been expected. Equally, it may be explained by the presence of some computer entertainment companies in the CS sample where there were a number of examples of self-trained technical experts as directors. Such a distinction might also have been reflected in the comparatively disproportionate number of founder directors identified in CS companies compared with HR companies, some of which may have started life as university spin-off companies and, therefore, not have a founder in the conventional sense.

Company law has been much criticised for failing to ensure an adequate level of directorial competence, not least in failing to require any minimal level of educational qualification. However, some of the criticism is misplaced given that Parliament has not demonstrated any significant enthusiasm for change[384] and the ability of judges to innovate in this area is significantly limited by the doctrine of judicial precedent and the inherent ability of the common law to lay down rules of sufficient specificity. Accordingly, the common law rules have had to be developed in such a way to apply to companies of all types, including therefore new economy companies where the skills required may be of considerable complexity. The general standard of care applicable to a director is that a director need not exhibit a greater degree of skill than may reasonably be expected from a person of his knowledge and experience[385] – usually referred to as a “subjective” test, in that it is subjective to the director in question, rather than an “objective” standard[386]. Historically, there has been evidence of some laxity in the interpretation of this rule. Accordingly, in a well-known 1911 case the court found that a director might undertake the management of a rubber company in complete ignorance of everything connected with rubber without incurring liability for mistakes resulting from this ignorance[387]. Yet, seemingly paradoxically, the same court went on to observe that if such a director were acquainted with the rubber business, he was bound to give the company the benefit of his knowledge[388]. Such an approach presents dangers for directors of new economy companies because it would provide a

disincentive for appropriately qualified persons to become directors.

Such laxity has, however, been challenged both by statutory intervention in the case of insolvency[389] but also as a result of the Barings Bank scandal. The litigation arising from the Barings Bank litigation is especially pertinent, however, because of the statement of Jonathan Parker, J. as follows[390]:

“ ... Directors have, both collectively and individually, a continuing duty to acquire and maintain a sufficient knowledge and understanding of the company’s business to enable them properly to discharge their duties as directors ...”

The case, of course, arose, of course, out of disqualification proceedings relating to the collapse of Barings Bank. Its applicability to new economy companies is potentially serious since the duty is stated as one imposed on directors individually as well as collectively. If this were to be applied strictly then it could make it difficult for technically complex companies (as many new economy companies appear to be) to find sufficient directors with generic but not firm- or industry- specific skills; alternatively, that such directors face greater potential liabilities than perhaps they realise.

In terms of considering directorial competence, it was interesting to review the insolvency records of directors in the sample of prospectuses, which are set out in Table 36.

Table 36: Number of Directors with Insolvency Records, by Sector						
Sector	Number of directors with:				Total	% of all directors
	AD	AR	C	CVA		
Health	2	4	4	1	11	9.3
CH/T	3*	5	5	2	15	13.8
CS	2	2	3	0	7	4.9
All	7	11	12	3	33	8.9

* One director had a US Ch 11 administration order.

A surprisingly high proportion of directors had been a director of a company which had been involved in a formal insolvency procedure, such as administration, administrative receivership or a compulsory winding up (8.9% overall). The highest proportion came from the CH/T sector (13.8%). However, it is difficult to know what weight to place on such information. One interpretation would be to see this as a sign of incompetence; another as the gaining of valuable experience; perhaps both.

Key to table as to insolvency records

- A Administration
- AR Administrative receivership
- C Compulsory winding up

- CVA Corporate voluntary arrangement
- D Dissolution
- V Voluntary winding up

Companies seeking to have their shares publicly traded must in addition satisfy the requirements of the Listing Rules as follows[391]:

“The directors and senior management ... must have collectively appropriate expertise for the management of the group’s businesses. Details of such expertise and experience must be disclosed in any listing particulars prepared by the company ...”

These rules are especially noteworthy in that they extend the test of expertise to cover a company’s senior management, which might appear to amount to a concession where the directors themselves do not have adequate expertise.

Scientific research based companies are subject to additional rules. The company must be able to demonstrate that not only the directors but again senior managers as well have, collectively, the knowledge and experience necessary for the company’s activities, including technical, financial, marketing and, if appropriate, manufacturing experience[392]. These categories are well supported by the risk factors identified earlier in this paper. In particular, the board or senior managers must include at least one executive director or senior manager responsible for the company’s research activities throughout the relevant period and other persons who have played “... a significant role ...” in the company’s activities throughout the relevant period[393]. Furthermore, the listing particulars must demonstrate that laboratory research and development operations are supported by directors and technical staff of appropriate expertise and experience and that those directors are reasonably expected to remain available to the company[394]. Contractual constraints, such as those discussed earlier in this paper may be one method of satisfying this latter requirement.

Innovative high growth companies are subject to a less rigorous standard than scientific research based companies. The directors and senior managers must be able to demonstrate that they have, collectively, the knowledge and experience necessary for the development of the company’s activities, including technical, financial, marketing and, if appropriate, manufacturing experience[395]. Listing particulars must identify the extent to which the development of the company’s business is dependent on any key individuals, identifying those concerned[396]. Table 37 below identifies the comparative numbers of boards and key employees respectively.

Table 37: Average Board Size and Average Number of Key Employees Disclosed in the Prospectus, by Sector		
Sector	Average Board Size	Average No. of Key Employees
Health	7.9	4.8
CH/T	7.5	6.4
CS	7.4	6.7

All	7.5	6.5		

The importance of human capital issues in the Combined Code on Corporate Governance is demonstrated by the explicit requirement that the board should ensure that the necessary human and financial resources are in place for the company to meet its objectives[397]. In addition, the board is expected to satisfy itself that plans are in place for an orderly succession to the board and senior management, with non-executive directors having a prime role in this[398]. The evidence from investment risk factors for human capital considered earlier in this paper suggested that there was only limited succession planning (in prospectuses prior to the new version of the Code) to address such risks in which case the introduction of these requirements will hopefully have brought about a significant change in practice. Non-executive directors are required to satisfy themselves as to whether systems of risk management are robust and defensible, and, presumably, this should extend to issues of human capital risk management at all levels[399].

The role required of board committees under the Combined Code has some potential relevance for new economy companies but, again, shows signs of a lack of a joined-up approach. Accordingly, important aspects of board level human capital are spread across at least three separate board committees. The nomination committee is required to evaluate the balance of skills, knowledge and experience on the board and to prepare a description of the role and capabilities required for any board appointment[400]. Whilst the role of the remuneration committee is dominated by the attempt to control excessive remuneration it is nonetheless required to ensure that remuneration levels are sufficient to attract, retain and motivate directors of the quality required[401]. The audit committee is required to review internal controls and risk management systems generally[402] as well as to monitor the effectiveness of the audit process[403].

The chart below sets out the various committee structures found in the sample of companies.



This chart shows that, whilst there is complete compliance with the requirements to have an audit and remuneration committee, there is much poorer compliance with the requirement to have a nomination committee, a conclusion consistent with other academic research. This presents a serious problem in terms of human capital issue because of the pivotal role of the nomination

committee in this regime. In addition, 2 HR companies were found to possess scientific advisory boards, one of which was entirely composed of independent experts. However, no such equivalent technically orientated committees were identified in respect of companies from other sectors, although there was a fairly even spread of risk committees across the sectors (2, 2 and 4 respectively). Other committees identified included safety, environmental, charity, commercial, regulatory, finance, treasury and executive and their use was most common within HR companies. The composition of such committees varied strikingly as to mixes of board and non-board members.

The Bioindustry Association Code of Best Practice, as has been considered earlier in this paper, to state that the board should seek to achieve a balance among non-executive directors between relevant business expertise and understanding of the risks and uncertainties of product development[404]. It also provides that companies should have access to external scientific, regulatory and clinical advice and that boards should make appropriate use of that advice and take it into account[405]. One example of how the requirement for access to relevant external advice may be satisfied might involve the use of a scientific advisory board. Accordingly, one such [prospectus] disclosure that such a board had been established to: “... to assist the Group with the assessment of its core technologies and research and development programmes and to provide scientific advice to the board ...”[406]. Audretsch and Feldman, more cynically, note that the concept of scientific advisory boards provides a company with the option of having, at minimal cost, a full roster of the key players doing research in its area of expertise[407]. However, they also observe that in addition to the ostensible role of providing a company with knowledge, university-based scientists provide a signal of company quality to the scientific and financial communities and cite a case study of how one company attributed much of its success to the role of its scientific advisory board in enabling it to recruit young scientists[408].

A small number of companies in the sample have already been identified as having access to a scientific advisory board; Table 38 below contains the results of the survey in terms of access to board directors as a source of expertise.

Table 38: Board access to technical expertise							
Sector			HR	CH/T	CS	All	
			21%	14%	5%	11%	
Academic distinction as % of all directors							
			53.8	7.1	33.3	31.1	
% of companies with a CTO							
			15.4	0	5.6	6.7	
% of companies with an R&D director							
			15.4	0	5.6	6.7	
% of companies with a development director							

The results in Table 38 have already been evaluated in relation to the distinctiveness of the companies within the sample.

Consistent with the regulatory expectations of directorial competence, the Combined Code now emphasises the needs for induction[409] and training[410] and the role of the chairman in ensuring that directors continually update their skills and the knowledge and familiarity with the company required[411]. The company secretary is responsible for facilitating aspects of this[412] and in practice may play a larger role in suggesting appropriate training. This raises an interesting question again as to the perceived nature of skills which are required at board level: firm-specific, industry-specific or generic. Arguably, a balanced board will contain a range of such skills, giving rise to a diversity which might call into question what might constitute effective training.

Removal

Another feature of the Combined Code relevant to the effective governance of human capital are the requirements for board self-evaluation. Under company law generally the shareholders have, in principle, ultimate responsibility for corporate performance, extending to the power to remove directors[413]. Yet this suffers in practice from the same weaknesses as were identified in relation to appointments. The Board is required to undertake a formal and rigorous review of its own performance and that of its committees and individual directors[414]. The chairman is required to act on the results of the performance evaluation, where appropriate, seeking the resignation of directors[415].

CONCLUSIONS AND RECOMMENDATIONS

The importance of an analysis of new economy companies

The reason for this paper was the near universal perception of a major change taking place in the worldwide economy associated with significant rises in knowledge investment and the development of a new type of company, referred to in this paper as a “new economy” company. Such companies, associated with sectors as diverse as biotechnology, information technology and even retailing, have as a consequence become a major priority for policymakers, demonstrated by a range of policy documents which acknowledge this, notably in fields such as company law which have a bearing on corporate governance. This paper aimed to evaluate the true significance of human capital in the governance of such companies and how existing regulation might be evaluated by the potentially competing or complementary goals of economic efficiency, good corporate governance, innovation and human capital development.

Methodology

A number of differing methodologies were used throughout the paper to achieve its aims, including “black letter” legal analysis, the economic analysis of law, an empirical survey of Techmark companies (using both company prospectuses and annual reports and accounts), content analysis and the use of accounting ratios. The legal analysis focused upon company law, contract law and, in relation to share options, taxation law, but specifically excluding intellectual property law. The survey of company prospectuses was relatively novel in the United Kingdom, although not without precedent - and not without difficulties in terms of the bulk and complexity of the relevant documentation. Nonetheless, the benefits in terms of the richness and quality of the data gathered justified this approach, providing fresh insights into areas as diverse as company

risk profiles and individual director integrity.

The survey itself consisted of prospectuses, listing particulars or exempt listing documents over a 5-year period, with the majority relating to the boom year of 2000. Almost all (92%) related to the Official List rather than the Alternative Investment Market, with 10% consisting of scientific research based companies applying under Chapter 20 of the Listing Rules and 16% consisting of innovative high growth companies applying under Chapter 25 of the Listing Rules. The majority of transactions related to admission, a placing and/ or an offering. The survey further consisted of the most recent annual accounts and reports of 45 companies available from the original sample, with year-ends falling between November 2002 and December 2003. This was also beneficial as it meant that 35% of the sample were required to report under the provisions of the revised Code on Corporate Governance, introduced as a consequence of the Smith Committee and Higgs Committee.

It proved valuable to be able to subdivide the companies surveyed into three broad groupings of health related companies, computer hardware and telecommunications and related companies, as well as computing and related services companies, reflecting the perceived asset specificity of such companies. 15 companies were selected from each of the health related and computer hardware/ telecommunications and related sector groupings and 20 from the computing and related services sector groupings, reflecting the larger number of such companies. The health related companies were selected from companies within the biotechnology, health, medical equipment & supplies, pharmaceuticals sectors. The computer hardware/ telecommunications and related companies were selected from companies within the electronic equipment, fixed-line telecommunication services, semi-conductors, telecommunications equipment and wireless telecommunications services' sectors. The computing and related services companies were selected from companies within the computer services, software, home entertainment, internet and e-commerce sectors. The initials "HR", "CH/T" and "CS" have been adopted throughout to distinguish the groupings.

Distinctiveness of new economy companies

The first question addressed related to the distinctiveness of new economy companies and whether it was correct that such companies were truly distinguishable by reference to the role played by human capital. To avoid identifying too diffuse a range of characteristics the comparison was based around confirming or rejecting existing academic views that key issues surrounded company age and size and the relative importance of intangible assets and research and development, as well as their corporate governance and human capital.

There was no real distinction which could be drawn between the different types of company based on their age. On average, when the original founding date of the underlying business activity was taken into account, the perception that such companies were very young proved to be only partially founded, being on average 8 years old. When, in relation to governance, this paper examined the ages of directors, it was found that average age (for executive directors and non-executive directors combined) was 50.7 years overall, again dispelling any preconceptions that directors of such companies were youthful. Accordingly, these factors raised little in the way of any implications for the governance of new economy companies.

There was, in contrast, a marked difference between the different types of company in the sample in terms of their size. CH/T companies were, unsurprisingly, the largest, whether measured by turnover or assets, and HR companies the smallest, but with CS companies generating the most turnover in relation to their assets. The significance of these figures for the governance of such companies is that it would be expected that the larger companies would experience particular tensions in managing innovation in terms of the looseness or formality of structures and that the smaller companies might experience barriers in access to capital, management qualification and ability to obtain technical information and know-how.

Claims that new economy companies mainly comprise intangible assets were rebutted. When goodwill was subtracted from the value of intangible assets, creating a sharper focus on, for example, intellectual property rights, the ratio of intangible to tangible assets fell to below 1.0 in each instance and that for CS companies became almost insignificant. Such results demonstrate that care must be taken in relation to claims that intangible assets represent the bulk of the assets of new economy companies. However, academic views indicate that formal intellectual property right holdings in isolation can prove an unreliable guide to competitive advantage and suggest a link with their governance instead.

The ratio of research and development expenditure to turnover was found to be markedly stronger in HR companies than in either CH/T or CS. Indeed, the ratio in relation to HR companies was highly striking at 0.722. The average percentage of research and development staff by sector varied significantly with HR companies, being much higher, unsurprisingly given that there were some scientific research based companies in the sample. Academic views again suggested a link between research and development and its governance but also, in this context, with good information disclosure.

The governance of TechMARK companies had been demonstrated by other researchers to be distinct in a number of ways from that of FTSE 100 companies, although such a conclusion was perhaps to be expected, and that some of the distinctions, for example, as to committee structure had potential ramifications for human capital issues. The research conducted for this paper confirmed that, in terms of a range of conventional measures, such as average size, number of non-executives, number of independent non-executives, there was a surprising degree of homogeneity across the sectors surveyed.

There were much sharper differences relating to the diffusion of power across the board, especially in terms of independent non-executive directors, where HR companies were far weaker. Further analysis was conducted to ascertain whether problems with the diffusion of power were additionally reflected in director shareholdings. The proportion of companies where the directors between them held significant shareholdings was interesting; not least in some cases the directors between them held percentages of shares carrying specific company law rights. For example, at the top end of the spectrum there were two companies where the directors between them held in excess of 50% of the issued share capital.

When a selection of measures which might be more relevant to the specific governance needs of new economy companies were surveyed the differences between the three sectors were very marked. Accordingly, 53.8% of HR companies had a board member responsible for scientific,

technological or medical issues and 15.4% of such companies had a director responsible for research and development, only 7.1% of CH/T companies had either. In case differences of classification might have played a part, the presence of a general development director was analysed, but it was then found that 15.6% of HR companies possessed one, but not any of the CH/T companies surveyed. This was considered to justify the focus on human capital in this paper.

The problem of how to define and measure human capital in relation to the governance of new economy companies presented a significant difficulty. Human capital was seen to be a wide-ranging term, capable of including such diverse traits as skills, experience, knowledge and even personality, appearance, reputation and credentials, capable of being summed up as the quality of labour. Unsurprisingly, it was found that links with universities could play a vital role in the creation and development of human capital. A useful distinction could be drawn between firm-specific skills, industry-specific skills and generic skills, not least because in economic terms, firm-specific skills posed difficulties from an efficiency perspective because they resulted in bilateral dependency and therefore had the potential to increase transaction costs. Put simply, there are problems in convincing an employee to invest in skills which are of limited market value which, it was seen later in the survey, may lead companies to offer governance related incentives, such as share options. The problem of the definition of human capital was compounded by the diversity of potential means by which to measure it, especially at board level. Nonetheless, a range of valuable measures were identified for adoption. For example, a valuable precedent was found in a US study, which sought to relate chief executive pay between insider and outsider appointments serving, in effect, as a proxy for firm-specific and generic skills respectively and was adopted widely throughout the paper.

The preliminary question which needed to be addressed was whether the human capital profiles of the companies in the industry sectors surveyed were similar or diverged. The principal approach adopted was to analyse the risk factors identified in the prospectuses of the companies surveyed. One reason that this was considered a valuable measure was its potential rigour: there is a wide perception that it is fashionable for companies to talk about how much they value their human capital and there may be a suspicion that this may simply be good public relations. Because of the limited circulation of prospectuses and because of the severe legal sanctions attached to misrepresentation, it was felt that the adoption of such a measure would reduce, if not avoid, such distortion. A modified form of content analysis was adopted to analyse the risk factors.

The most significant risks for CH/T companies and CS companies, measured by the number of lines devoted to them, related to financial issues (24% and 19% respectively) whereas in the case of HR companies this was very important (16%) but ranked slightly behind regulation and the protection of intellectual property rights (17% and 16%, as rounded, respectively), issues which were not especially significant for the other types of company. Human capital issues were most important in relation to CS companies, where they ranked equal fifth (5%) whereas in relation to the other types of company they ranked seventh (4% and 5% respectively).

The analysis of the priority of investment risk factors, based on their order in the document, showed that financial risks were the most important for both CH/T companies and for CS companies, whereas product risks were the highest priority for health related companies. The

importance of financial risks was consistent with the previous analysis; product risk had also been a significant factor for HR companies where it fell immediately below those specifically identified. The explanation for this would almost certainly be the presence of scientific research based companies in the sample who were at the earlier stages of product development. Risks associated with human capital fell somewhere towards the higher end of the spectrum at 6th, 5th and 3rd respectively.

The overall pattern of results adopting alternative measures were sufficiently similar as to provide some confidence in the accuracy of the method adopted. What it confirmed was that the risks associated with human capital issues were an important priority for companies but far from the most significant. In contrast, CH/T companies and CS companies were much more prepared to identify human capital factors as a “key strength” (46.7% and 50% respectively), but the brevity and tenor of such statements would suggest that they were a less effective source of information. When the text of the risk factors was further analysed to identify their significance specifically for corporate governance, it was found that CS companies had the greatest concerns (70% of companies) contrasting with CH/T companies (20% of companies). There were a number of potential explanations for this, for example, the higher proportion of CS companies containing a founder director (61% of companies).

The quality of information disclosed as to the risk factors associated with investment in any particular company was, despite the overall success of the exercise, found to be disappointing. Firstly, there was no attempt to quantify risk, either in terms of potential monetary value, or probability – a stark contrast with many internal risk management policies. Second, the disclosures were often found to be formulaic in nature and therefore were informative by exception. Disclosures as to the risks associated with governance and human capital were as much subject to these general criticisms as other risks identified. In some cases companies identified what measures had been taken to reduce risk exposure, in other cases this was left unclear. The quality of other information disclosed to investors in relation to human capital and governance, in particular, the biographical information needed to identify founder, academic, insider and outsider directors, was also found to be deficient. In particular, such information was not provided in a consistent format as between different companies which made inter-company comparisons difficult.

Ideal regulatory system

Once it had been confirmed that human capital issues were an important issue in the governance of new economy companies, though far from being as significant as might have been supposed, it was necessary to consider what the “ideal” regulatory system for such companies might be. The approach adopted, so as to avoid being confused by an excessively broad range of issues, was to examine some of the more important regulatory goals relevant to new economy companies: economic efficiency, good corporate governance and investor protection, the promotion and development of innovation, and human capital. The order of these was not significant but reflected the development of the underlying concepts. The exercise was based on a review of the relevant theoretical literature on innovation and human capital. Regrettably, much of the literature was found to be too vague for specific application to the development of policy measures or to be concentrated on “big” issues that could not easily be changed, for example, the contrast between

US/UK and Continental European systems of governance. Furthermore, much of the literature emphasised the importance of competition law and intellectual property law, which was necessarily outside the scope of this paper.

It was seen for economic efficiency to be attained, it was important for dynamic or innovative efficiency to be achieved simultaneously, although this could – albeit rarely – give rise to a conflict, for example, in terms of the encouragement of research and development expenditure. Much of the approach to economic analysis of law which was relied upon was familiar and broke no new ground, for example, in terms of the justifications for state intervention and the role of market failure, which in the case of new economy companies could be seen to be linked to problems, such as information asymmetry and investor judgement problems.

The use of contract law, for example, to enforce restrictive covenants in employment contracts was seen as essential if risk-averse investors were to invest in such companies. The use of company law as a means of imposing disclosure requirements was seen as valuable in addressing the information asymmetry and investor judgement problems identified. It was also seen that in economic theory the private company form was preferable for such companies because limitations on exit would serve to prevent opportunistic behaviour and therefore reduce agency costs. In contrast, therefore, it was seen that if the public company form was adopted then alternative means of alleviating agency problems would need to be utilised, including share ownership to align incentives, linked to restrictions on sale (if possible in a public company context), and contractual protections.

In contrast to the clarity of economic thinking, what constituted “good” corporate governance was seen to encompass an exceptionally diffuse range of issues, reflecting its multi-disciplinary nature, including matters such as the purpose of the company and company law. The approach adopted was to identify the overriding principles which have guided the development of the Combined Code, and which relate to human capital issues, which were subsequently interpreted to lead to a focus on appointment, competence and removal.

The goal of facilitating innovation was seen to again require sound competition laws and intellectual property laws. In addition, the appropriateness of the shareholder model of corporate governance was seen to have been questioned in academic research, not least in relation to industries where intellectual property protection was difficult and where as a consequence there might be large spillovers of the returns from innovation to other stakeholders, such as employees. Two perspectives from academic research were identified as a consequence: one to minimise the effect of spillovers by a strategy of stakeholder inclusion, the other to ensure that control over resources was conferred on decision makers integrated with the innovation process. Similar considerations applied in the academic literature as to the goal of developing human capital, with the principal strategies involving enhanced remuneration or share options. An important problem was identified from a theoretical economic perspective that companies may be able to avoid paying employees who develop firm-specific skills the full value of the extra output for their human capital, who will therefore be a bargain compared with those with generic skills. Academic research indicates the possibility as a consequence of significant insider/ outsider differences at board level. Share options were again the preferred solution to this problem with shareholding being regarded as giving rise to a risk of employee entrenchment.

Company strategies

The survey of investment risk factors in prospectuses was beneficial because in many cases companies not only set out the risks associated with human capital in the company but also their strategy for addressing these risks. Unsurprisingly, these were essentially contractual in nature, although all to a greater or lesser extent operated in the shadow of either common law or statutory regulation. Overall, there was approximately the same degree of reliance on remuneration as an incentive and contractual constraints (24.5% and 25.2% respectively) with significant, but less, reliance on insurance (16.9%). Perhaps more surprising was the proportion of companies which did not mention a specific strategy when identifying the risk, an astonishing 31.6% of the sample. However, this should not be taken as meaning that such companies do not possess such a strategy, only that it was not considered material to qualify the risk factor identified in this way.

There were a few significant variations by sector. The use of remuneration was the most consistently relied upon strategy of the three sectors surveyed, although there was a slight drop in the case of HR companies. HR companies appeared to place more reliance on the use of contractual constraints than the use of remuneration and this was markedly higher than the other companies in the sample, perhaps reflecting the sensitivity of the issue to risk averse investors at the product development stage and the differing backgrounds of many of the relevant directors. CS companies placed far greater reliance upon insurance solutions than the other sectors. CH/T companies noted that it was their technical edge that assisted in the attraction and retention of employees. However, it was CH/T companies, in contrast, which were the most likely not to expressly identify their strategy in the investment risk factors. When the reasons given by companies for entering the transaction were analysed, it was clear that human capital issues were a far more important factor in relation to CS companies (60%), than to the others (20% in relation to both).

Remuneration

The most striking aspect of the results was that in HR companies, the average remuneration of founders, directors with academic distinction and chief technology officers all exceeded the average of all executive directors whereas in CH/T companies and CS companies all fell below the average. However, the results for insider directors were patchier with remuneration exceeding the average executive remuneration in both HR and CH/T companies but being slightly below in CS companies.

In theoretical terms, the results might imply a number of possibilities. The most likely would appear that founders, directors with academic distinction and chief technology officers generally possess firm specific skills which receive lower remuneration as expected but that there was some factor unique to the HR companies to reverse this. It is submitted that the most likely explanations are either that such directors in fact possess industry-specific skills or alternatively that there are specific valuation or agency problems in such companies which merit attention. However, there was another possibility, given that some companies were subject to the Bioindustry Association Code of Best Practice, that the requirement for a balance of business and product development expertise among non-executive directors ensured a more accurate valuation of these directors services.

Share options

Share options were found to be a universally significant part of overall remuneration strategy for quoted high-growth companies. Despite this, take-up of tax-advantaged schemes appears to be relatively low. The low level of options permitted under such schemes does not appear to be the primary reason for this low use, and further research (perhaps in the form of interviews) on this point could be beneficial.

When examining the types of share option scheme adopted by each of the business operations sectors in the study, the percentage of companies adopting the standard approved scheme was roughly comparable across all three sectors. However with the other schemes there was a notable difference, with CH/T companies far more likely to adopt an all-employee plan (67% compared to 36% for health and 25% for CS), but with no CH/T companies adopting an EMI scheme. This may be partially explained by the different size of companies in the three sectors (in terms of gross assets the average size of CH/T company in the sample was £18 billion, against only £46 million for Health and £210 million for CS). Larger companies are of course unable to adopt an EMI scheme and may also be more likely to adopt an all-employee scheme. However the average company size masks wide variations, and on further investigation it appeared that despite the high average gross assets approximately one third of CH/T companies in the sample were still small enough to qualify to adopt an EMI scheme (the proportion for CS companies was similar). The percentage of qualifying companies in Health was slightly higher (54%), but not sufficiently so to account for the far greater level of adoption. Accounts do not disclose sufficient information to discover the reasons for these differences so further research, possibly in the form of interviews or a questionnaire, would be needed.

The Enterprise Management Incentive (EMI) scheme is, despite its intentions, not significant for the quoted high-growth sector. This is primarily due to over half (58%) of the companies being excluded from the scheme by the low maximum permitted gross assets (£30 million), however some companies (10% of the sample) that met the gross asset test were still excluded by the requirement for the majority of its business to be in the UK; consideration should be given to the adverse impact of this requirement on international growth by UK companies; and even amongst apparently qualifying companies the take-up rate is low, and further research may be beneficial to establish the reasons for this in order to inform potential reform of the scheme.

Too many companies have allowed their options for key directors to fall severely under water, without granting replacements from a lower base. This casts serious doubt on the efficacy of share option plans as motivational tools for such companies. The government could assist with this problem by permitting under-water options to be transferred out of the approved scheme without being cancelled, freeing up capacity for new worthwhile approved options to be granted.

Use of contractual constraints

Existing academic studies demonstrated a degree of uncertainty as to the extent to which contractual mechanisms were likely to be effective or were overridden in practice by business norms. Accordingly, the results of this aspect of the survey must be interpreted cautiously.

Information as to restrictive covenants was disclosed by approximately 40% of the companies surveyed. The most common type of restrictive covenant used in executive director service agreements was against competition (96.4%), followed by conventional restrictions relating to employees and customers (42.2% and 67.5% respectively). Perhaps surprising in the light of the high technology nature of the companies, a relatively low proportion sought to impose a specific covenant restricting competing research and development activity (15.7%): indeed the highest proportion of those which did were CS companies, rather than HR companies (32.3% as against 12.5%).

The common law regulation of restrictive covenants through contract law was seen to be surrounded by a number of serious uncertainties, which potentially pose problems for both the company and the director. Since the seniority of an employee subject to a restrictive covenant is taken into account by a court, this increases the likelihood of a court being willing to enforce such a covenant against a director. However, there is some doubt as to the precise boundaries of the interests which the courts will protect, especially with regard to confidential information, a doubt which must pose a serious concern to new economy companies where confidential information may be of considerable importance and value and which may not be susceptible to protection as an intellectual property right. Another source of doubt relates to the reasonableness of a restrictive covenant being determined by reference to its scope, length and area, not least in terms of the test as to whether a restraint has been imposed in relation to a business different from the one, say, where trade secrets exist – determination of what is a different business may not be straightforward in highly technical fields. A further problem relates to the possibility that a court might be unwilling to enforce a restrictive covenant in the public interest, a considerable possibility where innovation generally and specifically in relation to health related matters might be concerned.

The use of restrictive covenants was seen to pose a dilemma in terms of economic theory as to whether the principle of voluntary contracting or freedom of competition should prevail. Generally, it seemed that it would be inefficient to seek to restrict an employee from moving to a new job with higher prospects of value-creation. In the case of restrictions upon the use of confidential information the position was more complex, given the debate as to whether such information should be recognised as property, which would normally be efficiency enhancing.

The data on notice periods was regrettably patchy because of the limited information in the sample. It is difficult, therefore, to be confident in the interpretation of the results, especially in the case of non-executive directors where, as a consequence, there may be no notice required. Subject to this, it would appear that many companies have negotiated fairly lengthy notice periods which would enable them to rely on the provision of directors' services for a reasonable length of time, typically 12 months minimum followed by perhaps a further 12 months. A number of companies in the sample also disclosed details of the use of garden leave clauses of varying degrees of sophistication. There is a close relationship between the use and enforceability of garden leave clauses and restrictive covenants discussed above. The use of such clauses must be questionable given their purpose is to attempt to sterilise an employee's knowledge prior to leaving a company.

The typical modal lock-in agreement period was 12 months. This was consistent with both the

typical length observed for restrictive covenants and to general notice periods. The purpose of such clauses would appear to be valuable for corporate governance since their purpose is to seek to minimise share price volatility – already identified in this paper as a significant risk factor. Whilst further research might be conducted into the nature of the exceptions to these agreements and whether they operate equitably, there appears to be no reason to question their use.

Insurance was identified as a means of dealing with human capital risk by relatively few HR or CH/T companies (11.1% and 10.5% respectively) but it was the most significant strategy adopted by CS companies (29.2%), perhaps because the highest proportion of companies with founder directors fell into this category and it is possible that in such companies there was a greater perceived need to reassure investors as to the risk.

Role of governance

Good corporate governance was, perhaps, surprisingly, not identified by companies in their prospectuses as a means of addressing human capital risks. This is disappointing given the potential for good corporate governance to make a difference in this area and it may be that with the recent reforms to the Combined Code, companies might have responded differently.

The legal and regulatory framework for the governance of board level human capital issues was seen to be extremely fragmented and confusing with superficially similar or overlapping requirements being imposed in different contexts with divergent sanctions for breach. New economy companies may be affected by not only general provisions of company law and the Listing Rules and the Combined Code on Corporate Governance but also the specific provisions of Chapter 20 or 25 of the Listing Rules and the Code of Best Practice of the Bioindustry Association. Whilst each of these was seen to make valuable contributions, a joined up approach might serve to reduce compliance costs and foster innovation as a result.

It was found that, on average, directors in the sample of prospectuses had 3.7 other current directorships. This would appear rather high and possibly interfere with some directors' abilities to perform their duties effectively.

The proportion of directors possessing some academic distinction revealed the sharpest distinction in these measures of human capital, with a much higher proportion (21%) in relation to HR companies than in CS companies (5%). This may well be explained by the presence of scientific research based companies in the sample as well as some computer entertainment companies in the CS sample where there were a number of examples of self-trained technical experts as directors. Such a distinction might also have been reflected in the comparatively disproportionate number of founder directors identified in CS companies.

It was found that HR companies were the best served by board level access to technical expertise with 53.8% having a chief technology officer or equivalent and 15.4% having a research and development director. Generally, the CH/T companies were poorest served with none identified having either a research and development director or a development director.

A surprisingly high proportion of directors had been a director of a company which had been

involved in a formal insolvency procedure, such as administration, administrative receivership or a compulsory winding up (8.9% overall). The highest proportion came from the CH/T sector (13.8%). However, it is difficult to know what weight to place on such information. One interpretation would be to see this as a sign of incompetence; another as the gaining of valuable experience; perhaps both.

The common law rules on directors' duties were seen to pose risks for directors of new economy companies because the subjective standard of care – usually criticised for its laxity – could act as a deterrent to highly qualified or experienced persons being appointed or retained. This was combined with the uncertainty as to the effect of recent case law which stated that directors have both collectively and individually a duty to acquire and maintain a sufficient knowledge and understanding of the company's business, which though seemingly innocuous, could present difficulty when applied on an individual basis in a highly technical new economy context.

The Combined Code on Corporate Governance appeared to lack a joined-up approach when dealing with human capital, with differing responsibilities being spread between the board as a whole, the remuneration committee, the audit committee and the nomination committee. There was poorer compliance with the requirement to possess a nomination committee which appears to be a serious weakness given the pivotal role this is expected to play in board level human capital issues. A few companies in the sample had established scientific advisory boards which would appear to be a valuable way of ensuring access to appropriate additional human capital.

RECOMMENDATIONS FOR REFORM

The overall impression of the impact of law and regulation upon issues of governance, innovation and human capital was a picture of fragmentation of policy efforts. This was unsurprising given the very broad range of fields that require consideration, including competition law, intellectual property law, tax law, company law, contract law, employment law and corporate governance. Yet given the undoubted importance of governance, innovation and human capital to economic performance, the need for a “joined-up” approach to law and regulation is strongly desirable. It is probable, given the existing role of European law in certain of these fields, that such a review can only be conducted effectively at a European level.

The use of restrictive covenants was seen to pose risks for both companies and for their directors in terms of the uncertainty of the circumstances in which they would be enforced by the courts. Given the hazards of litigation, which can have a chilling and economically detrimental effect on both parties, it is recommended that the law be reformed so as to clarify when a restrictive covenant may be enforceable. Whilst further research would be necessary on the point, there might be merit in investigating both the existing use and possibilities of alternative dispute resolution in relation to such disputes.

The growing practice of companies of requiring garden leave clauses, in addition to restrictive covenants, would appear questionable in terms of economic efficiency and the facilitation of innovation and human capital, even if consistent with good governance. There may be some merit in their use being prohibited.

The quality of information provided on human capital measures of the board was generally patchy, though much better in the sample of prospectuses than in annual reports and accounts; in particular, the quality of biographical information provided in both prospectuses and annual reports and accounts was poor: insofar as human capital factors are significant to investors much could be done to improve the quality, clarity and consistency of disclosure. It is recommended that consideration be given to extending some of the disclosure requirements for prospectuses to annual reports and accounts and in any event establishing minimum criteria for biographical information.

The requirement under the Bioindustry Association Code of Best Practice that companies with publicly traded shares should see to achieve a balance among non-executive directors between those with relevant business expertise and relevant product development expertise appeared to be valuable (although further research would be needed to evaluate this further) and might usefully be made applicable to other new economy companies.

RECOMMENDATIONS FOR FURTHER RESEARCH

This paper focused on company law, tax and contract law issues. However, it has shown that competition law and intellectual property law also have a significant potential impact on innovation at a theoretical level. This was supported by the survey of risk factors identified, where regulation, competition and intellectual property were identified as being particularly significant (28% of average number of lines of text). It is recommended that further research evaluate the impact of competition law and intellectual property law upon innovation and human capital in new economy companies.

There was evidence that research and development activities posed particular problems for the governance of new economy companies. This was supported by the attempts of the Bioindustry Association Code of Best Practice to address such issues relevant to its sector and the evidence of a link to performance. Whilst falling outside the scope of this paper, it is recommended that further research seek to identify and evaluate the particular problems posed by research and development activity and how corporate governance in this area might be made more effective.

There was evidence of some very high levels of board shareholdings in the sample which is significant in terms of corporate governance. Further research is recommended into the human capital and other consequences of this and how such high levels of shareholding are addressed by regulators with a view to ascertaining whether there is evidence of improved corporate performance through enhanced commitment or reduced corporate performance through greater entrenchment.

Human capital risks were relatively unimportant compared with some other risks identified as part of the analysis of investment risk factors. A wide range of specific risks were identified, for example, the financial risks arising from share price volatility or the risks associated with product development or the management of growth. This is especially rich and valuable research data on issues where empirical evidence is relatively sparse and further research is recommended into this data to evaluate the non-human capital risk factors and their significance in terms of corporate governance.

This paper has concentrated on strategies for addressing the risks associated with human capital which are readily identifiable either through companies identifying them as part of their investment risk factors or through requirements in relevant regulation. It is quite possible that these present an incomplete picture and that further research, for example, into the detailed terms of share option schemes might reveal further attempts by companies to constrain the departure of directors and others. This would be consistent with economic theory and it is therefore recommended that further research seek to identify such constraints and evaluate their significance.

The use of insurance as a means of protecting against the loss of a director or senior employee was disappointing given that from an economic perspective this would appear to be an efficient solution. It is recommended that further research be carried out of what insurance is available, and upon what terms, and why companies are reluctant to take it up.

The research showed that the average number of current other directorships held by directors of companies within the sample was quite high (3.7). Further research is recommended to evaluate the true significance of this in terms of director availability to perform their duties adequately. One possible means of doing so might be to correlate these with the figures now being published for director attendance at board meetings.

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- [30] “The Tyson Report on the Recruitment and Development of Non-executive Directors” (June 2003).
- [31] Ibid., p. 14.
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- [33] Ibid.
- [34] Ibid.
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- [36] But see, for example, the recognition of banking and insurance companies for the purposes of Schs. 9 and 9A, Companies Act 1985.
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- [38] s. 29 Companies Act 1985.
- [39] Chapter 20.
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- [43] Although it is interesting to observe evidence that mere adoption of a dot.com name by a company can lead to both substantial increases in share prices and trading volume: see Lee, P.M. “What’s in a Name.Com?: The Effects of ‘.Com’ Name Changes on Stock Prices and Trading Activity” (2000) 22 Strategic Management Journal 793 at 802, based on a survey of some 114 such name changes.
- [44] Gregory, S. and Armitage, A. “Retaining staff” Practical Law for Companies, November 2000, p. 41.
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- [47] Van Hoecke, M. and Warrington, M. “Legal Cultures. Legal Paradigms and Legal Doctrine: Towards a New Model for Comparative Law” (1998) 47 International and Comparative Quarterly 495 at 523. For a further discussion see Copp, S.F. “The Early Development of Company Law in

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[54] Listing Rules, Chapter 18.

[55] Listing Rules, Chapter 19.

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[57] Listing Rules, Chapter 21.

[58] Listing Rules, Chapter 22.

[59] Listing Rules, Chapter 25.

[60] Listing Rules, Chapter 26.

[61] Listing Rules, Chapter 27.

[62] Listing Rule 5.23A (December 2003 update). The information must be published in an exempt listing document instead of listing particulars under Listing Rule, 5.24.

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- [83] Audretsch, D.B. and Feldman, M.P. "Small-Firm Strategic Research Partnerships: The Case of Biotechnology" (2003) 15 Technology Analysis & Strategic Management 273 at 273.
- [84] Deeds, D.L., DeCarolis, D. and Coombs, J.E., op. cit., p. 68. But they acknowledge that such companies possess unique characteristics, such as their long product development cycle, see p. 69.
- [85] Jensen, M.C., op. cit., p. 858.
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- [131] Ibid., p. 903.
- [132] Ibid., p. 904. The latter requirement being to preclude out of date experience.
- [133] Ibid., p. 904.
- [134] Ibid., p. 900.

- [135] *Ibid.*, p. 903.
- [136] The period of 12 months was chosen to address the issue of directors appointed to some other capacity with a view to promotion; Harris and Helfat, *op. cit.*, preferred a longer period but the context of a CEO appointment was considered to be distinguishable.
- [137] The period of 6 years was chosen to be consistent with the Combined Code, Code Provision A.7.2 of which states that any non-executive directors term beyond 6 years (i.e. 2, 3 year terms) should be subject to particularly rigorous review; an alternative considered was a director who had held office for more than 5 years which would be defined as non-independent under Code Provision A.3.11. In practice, little would have turned on the distinction between the two measures.
- [138] Listing Rules, 6.G.1(b) (December 2003 update) (authors' emphasis); the obligation applies unless otherwise agreed by the UK Listing Authority " ... in exceptional circumstances ...", Listing Rule 6.G.1.
- [139] Listing Rules 20.8(h) and 20.11(c) (April 2002 update). The report must not only be independent but be made by an organisation of demonstrable high standing, repute and expertise in the field: Listing Rule 20.11 (April 2002 edition).
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- [145] Actinic prospectus, 26th May 2000, p. 26.
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- [158] Copp, S.F. and Maughan, C.W. "Innovative High Growth Companies: The Case Against Special Rules", *op. cit.*, p. 242.
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- [161] Ibid, p. 127. Accordingly, they are socially wasteful with efficiency better served by merging their efforts.
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- [163] Ibid, p. 129.
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- [165] Ibid.
- [166] Ibid., p. 62. The safeguards he refers to are: realignment of incentives, such as requiring a severance payment/ imposing a penalty for premature termination, supplanting court ordering, such as agreeing to an alternative forum for dispute resolution, or resorting to collective decision making under some form of combined ownership.
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- [171] Grossman, S. and Hart, O. “The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration” (1986) 94 *Journal of Political Economy* 691; Hart, O. “Firms, Contracts and Financial Structure” (Oxford: Clarendon Press, 1995), both as summarised by Pettet, B. “Company Law” (Harlow: Pearson, 2001), pp. 76 – 78.
- [172] Jensen and Meckling, *ex Romano*, *op. cit.*, p. 7.
- [173] See, for example, in favour of mandatory disclosure, Coffee, J.C. “Market Failure and the Economic Case for a Mandatory Disclosure System” (1984) 70 *Virginia Law Review* 717, extracted in Romano, R., *op. cit.*, p. 309 and against Easterbrook, F.H. and Fischel, D.R. “Mandatory Disclosure and the Protection of Investors” (184) 70 *Virginia Law Review* 669, extracted in Romano, R., *op. cit.*, p. 303 at p. 304.
- [174] Morck, R., Schleifer, A. and Vishny, R.W., “Management Ownership and Market Valuation: An Empirical Analysis”, cited in Weston, J.F., Siu, J.A. and Johnson, B.A. “Takeovers, Restructuring & Corporate Governance” (Upper Saddle River, NJ: Prentice-Hall, 2001), p. 602.
- [175] Rock, E.B. and Wachter, M.L. “Waiting for the Omelet to Set: Match-Specific Assets and Minority Oppression in Close Corporations” in “The Governance of Close Corporations and Partnerships” ed. McCahery, J.A., Raajmakers, T. and Vermulen, E.P.M. (Oxford: Oxford University Press, 2004), Chapter 4.
- [176] *Op. cit.*, p. 98 fn. 12.
- [177] Ibid.
- [178] Ibid.
- [179] Ibid., p. 98.
- [180] Ibid.
- [181] Ibid.
- [182] *Op. cit.*, p. 130.
- [183] *Op. cit.*, p. 99.
- [184] Ibid.
- [185] Copp, S. F. “A Christian Vision for Corporate Governance” in “Christian Perspectives on

Law Reform” ed. Beaumont, P.R. (Carlisle: Paternoster, 1998), pp. 108 – 128.

[186] For the arguments in favour of a stakeholding approach, see for example, Hutton, W. “Six Stakeholding Propositions” (1997) 8 *Business Strategy Review* 7. For the arguments against a stakeholder approach see, for example, Sternberg, E. “The Defects of Stakeholder Theory” (1997) 5 *Corporate Governance: An International Review* 3. For a discussion as to the link between stakeholder theory and corporate performance, see, for example, Greenley, G.E. “Multiple Stakeholder Orientation in UK Companies and The Implications for Company Performance” (1997) 34 *Journal of Management Studies* 259. See generally Hill, C.W.L. and Jones, T.M. “Stakeholder-Agency Theory” (1992) 29 *Journal of Management Studies* 131; Goldenberg, P. “IALS Company Law Lecture – Shareholders v Stakeholders: The Bogus Argument” (1998) 19 *Company Lawyer* 34; and Stoney, C. “Stakeholding: Confusion or Utopia? Mapping the Conceptual Terrain (2001) 38 *Journal of Management Studies* 603.

[187] See, for example, Coffee, J.C. “The Future as History: The Prospects for Global Convergence in Corporate Governance and its Implications” (1999) 93 *Northwestern University School of Law* 641, Bebchuk, L.A. and Roe, M.J. “A Theory of Path Dependence in Corporate Ownership and Governance” (1999) 52 *Stanford Law Review* 127 and Bratton, W.W. and McCahery, J.A. “Comparative Corporate Governance and the Theory of the Firm: The Case Against Global Cross Reference (1999) 38 *Columbia Journal of Transnational Law* 213.

[188] *Modern Company Law For a Competitive Economy, Developing the Framework Consultation Document Volume 5* (London: DTI, 2000), para 3.24.

[189] *Ibid.*

[190] See Copp, S.F. “What is “Good” Corporate Governance? The New Code on Corporate Governance”, paper delivered at the Institute of Advanced Legal Studies, London (2004), pp. 3 – 4.

[191] See the Reports of the Cadbury Committee (1992), the Greenbury Study Group (1995), the Hampel Committee (1998), the Turnbull Working Party (1999), the Smith Committee (2003), the Higgs Review (2003) and the Tyson Task Force (2003).

[192] Copp, S.F. “What is “Good” Corporate Governance? The New Code on Corporate Governance”, *op. cit.*, p. 6.

[193] *Ibid.*

[194] *Ibid.*, pp. 6 – 7.

[195] *Ibid.*, pp. 4 – 5.

[196] *Ibid.*, pp. 9 – 18.

[197] Porter, M. “The Competitive Advantage of Nations” (Basingstoke: Macmillan, 1990), cited in Maughan and Copp, “Innovative High Growth Companies: the Case Against Special Rules”, *op. cit.*, p. 239.

[198] O’ Sullivan, M., “The Innovative Enterprise and Corporate Governance” (2000) 24 *Cambridge Journal of Economics* 393.

[199] Maughan and Copp, “Innovative High Growth Companies: the Case Against Special Rules”, *op. cit.*, p. 239.

[200] *Ibid.*

[201] Besanko, D., Dranove, D. and Shanley, M. “Economics of Strategy” (New York: John Wiley & Sons, 1996), p. 600.

[202] *Ibid.*, pp. 577 – 580.

[203] *Ibid.*, pp. 581 – 585.

[204] *Ibid.*, pp. 585 – 586.

- [205] Besanko, D., Dranove, D. and Shanley, M., op. cit., pp. 588 – 594.
- [206] Op. cit.
- [207] “Developmental” is used to mean that resources must be committed to irreversible investments with uncertain returns (see p. 407).
- [208] “Organisational” is used to mean that returns are generated through the integration of human and physical resources (see p. 408).
- [209] “Strategic” is used to mean that resources are allocated to overcome market and technological conditions that other firms take as given (see p. 409).
- [210] “Organisational integration” is used to mean that institutions should support participants to commit their skills to pursuing the enterprise’s goals rather than selling their human capital elsewhere (see p. 410).
- [211] “Insider control” is required to ensure that control over resources is in the hands of decision-makers who are integrated with the innovation process.
- [212] Op. cit. Lazonick, W. and O’Sullivan, M. “Corporate Governance and the Innovative Economy: Policy Implications”, paper prepared for the European Commission (DG XII) within the framework of the Innovation Systems and European Integration (ISE) Project (Oslo, 1998) further discusses how corporate law and corporate governance might be reformed but is regrettably vague: for example, corporate law and related practices should be reformed “ ... to reflect an awareness of the dependence of an economy and society on the innovative performance of corporate enterprises, while, at the same time ... ensuring the autonomy of the enterprise as a unit of control that integrates allocative strategy with organisational learning”, see p. 12.
- [213] Jensen, M. “Theory of the Firm: Managerial Behaviour, Agency Costs, and Ownership Structure” in Romano, R., op. cit., p. 9.
- [214] See Tylecote, A. and Conesa, A. “Corporate governance, innovation systems and industrial performance” (1999) 6 *Industry and Innovation* 25; this summary is based upon the development of this work in Ramirez, P. and Tylecote, A. “Hybrid Corporate Governance and its Effects on Innovation: a case Study of AstraZeneca” (2004) 16 *Technology Analysis & Strategic Management* 97 at 98 – 99.
- [215] Ibid.
- [216] Ibid., p. 98.
- [217] Ibid., p. 99.
- [218] Ibid., p. 99.
- [219] Ibid., p. 97. “Insider” is used here in the sense of governance by stakeholders, such as banks, see p. 104, whereas “outsider” is used in the sense of government by shareholders, such as financial institutions, see p. 102. The significance of the distinction is seen as relating to the extent of involvement in control, see p. 102.
- [220] Ibid., p. 117, based on interviews. It is noteworthy that, in contrast to Harris and Helfat whose work is considered earlier in this paper, Ramirez and Tylecote do not attempt to distinguish the role that may be played by generic (that is, non-firm specific and non-industry specific) skills and their conclusions support the possibility that generic expertise might be less valuable to high-technology companies.
- [221] Pisano, G.P. “The governance of innovation: vertical integration and collaborative arrangements in the biotechnology industry” (1991) 20 *Research Policy* 237 at 248.
- [222] Rajan, R.G. and Zingales, L. “The Governance of the New Enterprise”, op. cit., p. 27.
- [223] Ahuja, G. and Katila, R. “Technological Acquisitions and the Innovation Performance of Acquiring Firms: A Longitudinal Study” (2001) 22 *Strategic Management Journal* 197 at 216.

- [224] Ibid.
- [225] Griffiths, A. and Wall, S. "Applied Economics" (London: Longman, 1999), p. 715.
- [226] Ibid., p. 716.
- [227] Ibid., p. 717. One survey cited in support indicated that one-fifth of average recorded growth rate of output per worker across 98 countries during the period 1960 – 1986 could be explained by changes in human capital accumulation, citing Barro, R.A. "Economic Growth" (McGraw-Hill, 1995).
- [228] Zucker, L.G., Darby, M.R. and Brewer, M.B. "Intellectual Human Capital and the Birth of U.S. Biotechnology Enterprises" (1998) 88 American Economic Review 290. See also "Higher Education Contributes £35 billion to the UK Economy Each Year" (Universities, UK, 18th June 2002).
- [229] Keenan, J. and Aggestam, M. "Corporate Governance and Intellectual Property: some conceptualisations" (2001) 9 Corporate Governance 259. The term "intellectual capital" is used to refer to the capabilities of managers and other employees to make an organisation "happen" and survive, see p. 262.
- [230] Ibid., p. 265.
- [231] Ibid.
- [232] Ibid., p. 266.
- [233] Ibid., pp. 269 – 270.
- [234] Ibid.
- [235] Milgrom, P. and Roberts, J., op. cit., p. 328.
- [236] Ibid.
- [237] Ibid., p. 333.
- [238] Ibid., pp. 344 – 345.
- [239] Harris, D. and Helfat, C., op. cit., p. 915.
- [240] Rajan, R.G. and Zingales, L. "The Governance of the New Enterprise", National Bureau of Economic Research Working Paper No. 7958 (Cambridge, MA: National Bureau of Economic Research, 2000), pp. 3 and 5.
- [241] Ibid., p. 20. One example is through specialisation but need to distinguish between marketable and other skills.
- [242] Ibid., p. 21.
- [243] Ibid., pp. 32 – 33.
- [244] Ibid., p. 33.
- [245] Zingales, L., op. cit., pp. 31 – 33.
- [246] Ibid., p. 37.
- [247] Roberts and den Steen "Shareholder Interests, Human Capital Investment and Corporate Governance", Stanford University Graduate School of Business, Research Paper No. 1631 (Stanford: Stanford University, 2000), p. 24. They cite (at p. 18) in support of giving a governance role in the firm to those whose interests are not well protected by contract or exit options, Hansmaan, H. "The Ownership of Enterprise" (Cambridge, MA: Harvard University Press, 1996).
- [248] Ibid., p. 5.
- [249] Ibid., p. 4.
- [250] Cheffins, B.R., op. cit., Chapter 3.
- [251] Op. cit.
- [252] Ferran, E. "Company Law and Corporate Finance" (Oxford: Oxford University Press, 1999), p. 121. Interestingly, in the context of new economy companies, she cites in support a report that the former research and development director of British Biotech plc did not publicly

oppose the commercialisation of its drugs in order to preserve his share value on which he subsequently made a profit of more than £1 million: “Biotech Director Left Quietly to Keep Options”, *The Times*, 26th May 1998.

[253] For a detailed discussion of the legal regime, see, for example, Mayson, S., French, D. and Ryan, C. “Company Law” (Oxford: Oxford University Press, 2003), pp. 486 – 497.

[254] SI 2002, No. 1986. See further Copp, S.F. “Corporate Governance: Change, Consistency and Evolution – Part 2” (2003) *International Company and Commercial Law Review*, pp. 115 at 126 – 127.

[255] s. 234B(1) Companies Act 1985.

[256] s. 241A Companies Act 1985. The directors’ remuneration report must contain information, as specified in Sch. 7A Companies Act 1985.

[257] ss. 235(4) and 235(5) Companies Act 1985.

[258] Para. 2(1), Sch. 7A Companies Act 1985.

[259] Para. 2(1)(b), Sch. 7A Companies Act 1985.

[260] Para. 3, Sch. 7A Companies Act 1985.

[261] Para. 4, Sch. 7A Companies Act 1985.

[262] Para. 5, Sch. 7A Companies Act 1985.

[263] Para. 6, Sch. 7A Companies Act 1985.

[264] Paras. 7 - 9, Sch. 7A Companies Act 1985.

[265] Paras. 10 - 11, Sch. 7A Companies Act 1985.

[266] Para. 12, Sch. 7A Companies Act 1985.

[267] Para. 13, Sch. 7A Companies Act 1985.

[268] Para. 14, Sch. 7A Companies Act 1985.

[269] Para. 15, Sch. 7A Companies Act 1985.

[270] Main Principle, B.1.

[271] Code Provision, B.2.1.

[272] Code Provision, B.2.1.

[273] Combined Code, pp. 65 – 66.

[274] Code Provision, B.2.1.

[275] Listing Rules, Chapter 20.8(f).

[276] *Ibid.*

[277] Listing Rules, Chapter 25.6(e).

[278] Principle 1. Code Provision 1 requires board composition to be reviewed from time to time to ensure such a balance at each stage of the company’s evolution.

[279] Mayson, S., French, D. and Ryan, C., *op. cit.*, p. 189.

[280] Paras. 7 – 9, Sch. 7A, Companies Act 1985.

[281] See, for example, Mayson, S., French, D. and Ryan, C., *op. cit.*, p. 189.

[282] Income Tax (Employment and Pensions) Act 2003 (ITEPA 2003) Part 7 Chapter 5.

[283] Roughly one with total annual income in excess of £35,000.

[284] Since 6th April 1999.

[285] The national insurance liability can, by agreement, be transferred to the employee.

[286] Capital losses are of little use to most taxpayers, as they can only be set against future capital gains.

[287] For basic rate taxpayers there is a small advantage, in that capital gains are taxed at 20% rather than 22% for employment income.

[288] 2003/04 figure.

- [289] 2003/04 rates.
- [290] ITEPA 2003, s. 696.
- [291] ITEPA 2003, Part 7 Chapter 8 and Sch. 4.
- [292] Valued at the time of grant.
- [293] ITEPA 2003, Part 7 Chapter 9 and Sch. 5.
- [294] Valued at the time of grant.
- [295] That is, the exercise price can be set lower than the market value of the shares at the time the option is granted.
- [296] These are similar for those under the Enterprise Investment Scheme for outside investors.
- [297] Only 5 when initially announced.
- [298] By 'all-employee' the study refers to SAYE and related schemes under which only a relatively low value of shares can be issued to each participant. Other schemes may technically be open to all employees but due to their discretionary nature grants are generally targeted at directors and senior management.
- [299] The latter condition appears to be a somewhat counterproductive and unnecessary limitation on international expansion.
- [300] To properly reflect the tax legislation this should be calculated using share value at the time of grant. Due to information constraints exercise price was used instead, on the assumption that at each grant any discount or premium to the then market value would be relatively small.
- [301] Such specific information was generally only disclosed for directors, due to the more onerous reporting requirements, and so data was not available in relation to other key employees.
- [302] Unless EMI was also available.
- [303] Measured by number of options multiplied by exercise price.
- [304] 5% of companies had at least one other director with share options under water, but not the one with the highest level of options.
- [305] Macaulay, S. "Non-contractual relations in business: a preliminary study" (1963) 28 *American Sociological Review* 55 extract, p. 9.
- [306] *Ibid.*, pp. 11 – 12.
- [307] Beale, H. and Dugdale, T. "Contracts Between Businessmen: Planning and the Use of Contractual Remedies" (1975) 2 *Journal of Law and Society* 45 at 59.
- [308] *Ibid.*, p. 53.
- [309] Macaulay, S., *op. cit.*, p. 13.
- [310] Deakin, S., Lane, C. and Wilkinson, F. "Contract Law, Trust Relations and Incentives to Cooperation" paper delivered at a workshop on "The Role of Business Ethics in Economic Performance" at Robinson College, Cambridge, 28th October 1996, p. 12.
- [311] *Ibid.*, p. 13.
- [312] Maughan, C.W. and Copp, S.F. "The Law Commission and Economic Methodology: Values, Efficiency and Directors' Duties", *op. cit.*, p. 113.
- [313] Macneil, I. "Contracts – Instruments for Social Co-operation" cited by Tillotson, J. "Contract Law in Perspective" (London: Cavendish, 1995), p. 202.
- [314] Milgrom, P. and Roberts, J., *Economics, Organisation and Management*" (Englewood Cliffs, NJ: Prentice Hall, 1992), pp. 346 – 347. The types of constraint they identify are: large amounts of deferred compensation and unvested pensions that will be lost by the departing employee and sometimes the forfeiture of explicit bonds.
- [315] *Ibid.*, p. 347.
- [316] A director's duties may also achieve a similar result in certain circumstances, for example,

on account of the legal duty not to make a secret profit: see, for example, *Cook v. Deeks* [1916] 1 AC 554 and *Industrial Development Consultants Ltd v. Cooley* [1972] 1 WLR 443.

[317] [1894] AC 535 at 565, per Lord Macnaghten. But see *Esso Petroleum Co Ltd v. Harper's Garage (Stourport) Ltd* [1968] AC 269.

[318] See Beatson, J. "Anson's Law of Contract" (Oxford: Oxford University Press, 2002), p. 375, which notes, perhaps surprisingly, that the rules relating to the area and length of the restraint are, in principle, the same.

[319] See *Systems Reliability Holdings plc v. Smith* [1990] IRLR 377, which concerned an employee with 1.6% of the shares in the company, who was party to a restrictive covenant contained in the share sale agreement, which applied for 17 months from the date of the sale. Per Harman, J. at p. 383: "... in these days when it is increasingly a matter ... that employees are to be encouraged to have shareholding stakes in their companies that employ them ... it would be ... most undesirable for the courts to say that such person cannot be bound as vendors of the goodwill of the business".

[320] Beatson, J., op. cit., p. 374 and "Harvey on Industrial Relations and Employment Law", ed. Perrins, B., A/276.

[321] Mehigan, S. and Griffiths, D. "Restraint of Trade and Business Secrets: Law and Practice" (London: Longman Group Ltd, 1991), p. 258. Regrettably, the 2003 edition of this work was unavailable from the British Library at the time of writing which may have enabled this information to be extended.

[322] *Gilford Motor Co v. Horne* [1933] Ch 935; *Kerchiss v. Colora Printing Inks Ltd* [1960] RPC 235; *Standex International Ltd v. CB Blades* [1976] FSR 114; *Littlewoods Organisation v. Harris* [1978] 1 All E R 1026; *Greer v. Sketchley Ltd* [1979] FSR 197; *Rex Stewart, Jeffries Parker, Ginsberg Ltd v. Parker* [1988] IRLR 483; *Lawrence David Ltd v. Ashton* [1991] 1 All E R 385.

[323] *Lansing Linde Ltd v. Kerr* [1991] 1 All E R 418.

[324] The restrictive covenant was not upheld in *Greer v. Sketchley Ltd* [1979] FSR 197.

[325] *Gilford Motor Co v. Horne* [1933] Ch 935 and *Rex Stewart, Jeffries Parker, Ginsberg Ltd v. Parker* [1988] IRLR 483.

[326] Per Balcombe, L.J. in *Dairy Crest Ltd v. Pigott* [1989] ICR 92 (CA) at 95.

[327] See, for example, *Lansing Linde Ltd v. Kerr* [1991] 1 All ER 418.

[328] Per Lord Parker in *Herbert Morris Ltd v. Saxelby* [1916] 1 AC 688 at 710; per Megaw L.J. in *Littlewoods Organisation Ltd v. Harris* [1977] 1 WLR 1472 at 1484; per Neill, L.J. in *Faccenda Chicken Ltd v. Fowler* [1986] 1 All ER 617 at 626.

[329] *SBJ Stephenson Ltd v. Mandy* [2000] IRLR 233 at 238.

[330] Per Lord Shaw in *Herbert Morris Ltd v. Saxelby* [1916] 1 AC 688 (HL) at 714.

[331] Ibid.

[332] Per Neill, L.J. in *Faccenda Chicken Ltd v. Fowler* [1986] 1 All ER 617 at 627. Other tests relating to the nature of the information was whether the information was "highly confidential" (p. 626) and whether the employer impressed on the employee its confidentiality, although an employer could not prevent use of disclosure merely by this (p. 627).

[333] Per Cross, J. in *Printers & Finishers Ltd v. Holloway* [1965] 1 WLR 1 at 5.

[334] Leng, T.K. and Leong, S.H.S., "Contractual Protection of Business Confidence" (2002) *Journal of Business Law* 513 at 520 – 523.

[335] Op. cit., A/256 – 274.

[336] See *Hanover Insurance Brokers Ltd v. Schapiro* [1994] IRLR 82 (CA) at 84.

[337] Per Leggatt, L.J. in *Ingham v. ABC Contract Services Ltd* (1994) (FC2 93/6609/F) unreported, cited by counsel in *Alliance Paper Group plc v. Prestwich* [1996] IRLR 25 at 28; see also *TSC Europe (UK) Ltd v. Massey* [1999] IRLR 22 at 30.

[338] *Dawney, Day & Co Ltd v. De Braconier D'Alphen* [1997] IRLR 442 (CA) at 448.

[339] *Cantor Fitzgerald (UK) Ltd v. Wallace* [1992] IRLR 215.

[340] Beatson, J., op. cit., p. 373.

[341] Mehigan and Griffiths, op. cit.

[342] Beatson, J. cites in support *Bull v. Pitney-Bowes Ltd* [1967] 1 WLR 273, where the restraint would have deprived the public of a person's skilled services in promoting the export trade.

[343] Per Lord Sterndale MR in *Attwood v. Lamont* [1920] 3 KB 571 at 578.

[344] *Marshall v. NM Financial Management Ltd* [1996] IRLR 20 at 23. See also *Living Design (Home Improvements) Ltd v. Davidson* [1994] IRLR 69 at 71.

[345] *General Billposting Co Ltd v. Atkinson* [1909] AC 118 (HL).

[346] Compare, for example, *Living Design (Home Improvements) Ltd v. Davidson* [1994] IRLR 69 at 71 with *Rock Refrigeration Ltd v. Jones* [1997] 1 All ER 1 (CA).

[347] Per Yelton, J. LEXIS, 2nd April 2003, p. 2.

[348] One restrictive covenant entered into by a company in the sample formed an incidental part of a reported case in 2003; however, the legal point which arose is not material to the discussion in this section: see *iSoft Group plc v. Misys Holdings Ltd* [2003] EWCA Civ. 229, [2003] All ER 438.

[349] Oxford Glycosciences plc prospectus 7th April 1998, p. 126.

[350] Para. 4.10.

[351] Code Provision, B.1.6.

[352] See "Harvey on Industrial Relations and Employment Law", ed. Perrins, B. A443A (December 2003).

[353] Ibid.

[354] Employment Rights Act 1996, s. 86(2).

[355] *CMS Dolphin Ltd v. Simonet* [2001] 2 BCLC 704.

[356] Freedland, M.R. "The Personal Employment Contract" (Oxford: Oxford University Press, 2003), p. 415.

[357] Para. 5(1)(a), Sch. 7 Companies Act 1985. This would appear to imply notice to the company as well as notice by the company yet para. 5(1)(c) states that there should be disclosed "... such details of other provisions in the contract as are necessary to enable members of the company to estimate the liability of the company in the event of early termination ..." might be read as implying a limitation to notice given by the company.

[358] Collins, H., Ewing, K.D. and McColgon, A. "Labour Law" (Oxford: Hart Publishing, 2002), pp. 83 – 84.

[359] See, for example, the practical issues which arose in *L C Services Limited v. Brown* [2003] EWHC 3024, LEXIS transcript, p. 16.

[360] Per Morrit L.J. in *William Hill Organisation v. Tucker* [1998] IRLR 313 (CA) at 318.

[361] [1989] IRLR 84 (CA), p. 86.

[362] A point made rather pithily by Asquith, J. in *Collier v. Sunday Referee Publishing Co Ltd* [1940] 2 KB 647 at 650 as "Provided I pay my cook her wages regularly she cannot complain if I choose to take any or all of my meals out."

[363] Per Dillon, L.J. in *Provident Financial Group plc and Whitegates Estate Agency Ltd v. Hayward* [1989] IRLR 84 (CA) at 87, giving the example of a chartered accountant. But Taylor,

L.J. observed at p. 88 that the defendant's skills as a chartered accountant or financial director were unlikely to atrophy in a period of 3 months.

[364] Asquith, J. in *Collier v. Sunday Referee Publishing Co Ltd* [1940] 2 KB 647 at 650.

[365] Per Morritt L.J. in *William Hill Organisation Ltd v. Tucker* [1989] IRLR 313 (CA) at 317 - 8.

[366] *Eurobrokers Ltd v. Rabey* [1995] IRLR 206 at 210. The defendant had offered a period of 3 months but the judge stressed that "... this was a defendant who has pretty cynically sought to get out of his contract".

[367] Per Morritt, L.J. in *William Hill Organisation Ltd v. Tucker* [1998] IRLR 313 (CA) at 318.

[368] Per Neill, L.J. in *Credit Suisse Asset Management Ltd v. Armstrong* [1996] ICR 882 (CA) at 893 - 4.

[369] Ibid, p. 894. Neill, L.J. *obiter* said that "Terms which operate in restraint of trade raise questions of public policy. The opportunity for an individual to maintain and exercise his skills is a matter of general concern. I would therefore leave open the possibility that in an exceptional case where a long period of garden leave had already elapsed, perhaps substantially in excess of a year, without any curtailment by the court, the court would decline to grant any further prohibition based on a restrictive covenant" (p. 894).

[370] ARC International plc document 28th September 2000, p. 143.

[371] See *Vernon-Kell v. Clinch* [2002] EWHC 1417 (Ch) and *Vernon-Kell v. Clinch* [2002] EWHC 3092 (Ch). The purpose of the deed was stated in the earlier case to be to prevent share sales by "insiders" (i.e. the persons involved in bringing the company to market, from depressing the share price by an early exit (p. 39). Evidence given in the latter case interestingly alluded to the distinction between a "hard lock-in period", when the company's brokers could refuse consent for a disposal without giving any reason, and a "soft lock-in period", when again consent to a disposal could be refused, but the consent was not to be unreasonably upheld (p. 18).

[372] Listing Rule 20.8(e) (April 2002 update); Listing Rule 25.6(f) (April 2002 update)

[373] Ibid. In relation to variations, see Listing Rules, 20.14 -15 and 25.20 - 21.

[374] Bede plc prospectus, 6th November 2000.

[375] *Re Barings plc (No. 5)* [2000] 1 BCLC 523 at 535 - 536, citing Parker, J. (1999) 1 BCLC 433 at 489.

[376] Listing Rule 3.8 (December 2003 update).

[377] Table A, Reg. 78 empowers members by ordinary resolution to appoint a person who is willing to act to be a director, either to fill a vacancy or as an additional director.

[378] Table A, Reg. 79.

[379] Supporting Principle, A.4.

[380] Code Provision, A.7.1.

[381] Supporting Principle, A.4.

[382] Code Provision, A.4.4.

[383] See further Copp, S.F. "What is "Good" Corporate Governance? The New Code on Corporate Governance", *op. cit.*, p. 11.

[384] s. 214 Insolvency Act 1986 is one notable exception.

[385] Per Romer, J. in *Re City Equitable Fire Insurance Co Ltd* [1925] Ch 407 at 428.

[386] There has been some recent case law which has regarded the common law as reflecting the higher of a subjective or objective standard.

[387] Per Neville, J. in *Re Brazilian Rubber Plantations and Estates Ltd* [1911] 1 Ch 425 at 437.

[388] Ibid.

[389] Whilst, it is possible that in some circumstances a lack of technical competence could lead to a company failure and be responsible for wrongful trading, it is submitted that this is more likely to be a result of a failure of generic business skills and is therefore not considered further in this paper.

[390] *Re Barings plc (No. 5)* [2000] 1 BCLC 523 at 535 – 536, citing Parker, J. at (1999) 1 BCLC 433 at 489.

[391] Listing Rule 3.8 (December 2003 update).

[392] Listing Rule 20.4 (April 2002 update).

[393] Listing Rule 20.4 (April 2002 update).

[394] Listing Rule 20.8 (b) (April 2002 update).

[395] Listing Rule 25.4 (April 2002 update).

[396] Listing Rule 25.7(g) (April 2002 update).

[397] Supporting Principle, A.1.

[398] Supporting Principle, A.1.

[399] Supporting Principle, A.1.

[400] Code Provision, A.4.2.

[401] Main Principle, B.1.

[402] Code Provision, C.3.2.

[403] Code Provision, C.3.2.

[404] Principle 1.

[405] Principle 3. The Explanatory Note provides that this means that boards should have identified relevant advisers and have arrangements in place for consulting them.

[406] Oxford Glycosciences Plc prospectus, 7th April 1998, p. 32.

[407] Audretsch, D.B. and Feldman, M.P., *op. cit.*, p. 282.

[408] *Ibid.*

[409] Code Provision, A.5.1.

[410] Main Principle, A.5.

[411] Supporting Principle A.5.

[412] *Ibid.*

[413] s. 303 Companies Act 1985.

[414] Main Principle, A.6.

[415] Supporting Principle, A.6.

