The Positive Externalities of IFRS R&D Rule:

Enhanced Voluntary Disclosure

By

Ester Chen*

Ilanit Gavious*

and

Baruch Lev**

March 2015

* Ben Gurion University, Israel

** New York University

The authors thank Zack Assaf, Yiwei Dou, Nir Ehud, Zvika Eckstein, Ilan Guttman, Mascia Ferrari, Doron Israeli, Gideon Kandler, Simon Kogan, Tamir Masuri, Dan Segal, Ron Shalev, Michael Tang, Joseph Tendler, Guy Tabibian, Danny Vitan, Paul Zarowin, and workshop participants at Arison School of Business, Interdisciplinary Center, Israel. We gratefully acknowledge the financial support of the New York University Stern School of Business and the Guilford Glazer School of Business and Management at Ben-Gurion University. All errors remain our responsibility.

Abstract

Studies comparing IFRS with U.S. GAAP generally focus on differences in the attributes and consequences of the *recognized* financial items. We, in contrast, focus on a major externality of arguably the most significant difference between IFRS and GAAP: the capitalization of development costs, the "D" of R&D, required by IFRS but prohibited by GAAP. We document on a sample of Israeli firms, some using IFRS and others U.S. GAAP, a significant externality of development capitalization in the form of extensive voluntary forward−looking information on development potential and consequences disclosed by IFRS firms. A disclosure which we document is value-relevant to investors beyond the mandated financial information. In the on-going debate about the merits of R&D capitalization, such a value-relevant externality should be of interest to both standard-setters and researchers.

1. Introduction

There is scant experimentation in setting accounting standards and therefore no trial and error lessons are available to improve standard setting. Accounting standards are uniform throughout all states in the US, and once these standards are enacted, they are rarely abolished. In contrast, corporate laws and many other regulations, like environmental or insurance, differ by state, and are frequently changed and improved, such as the state–specific natural gas fracking regulations. Whatever experimentation there is in accounting standards, is restricted to the two leading systems: US GAAP and the international standard (IFRS) adopted by European and certain other countries. No wonder then that a large number of accounting studies examined the differences between these two reporting systems and their impact on investors' and firms' decisions, such as the effects on information asymmetry and firm performance, in order to assess the pros and cons of each reporting system (e.g., Leuz, 2003, Barth et al., 2008; Jamal et al. 2010; Kim et al. 2012; Hail et al. 2010).

We also compare US GAAP with IFRS, but with a different and hitherto unexamined objective: we conjecture that certain accounting standards not only affect the mandated (recognized) disclosures, but also motivate firms to voluntarily release relevant information to investors, thereby enriching the information environment beyond the direct disclosure impact of the standards. A positive externality of accounting standard-setting, so to speak.

Specifically, we focus in this study on accounting for R&D, which creates one of the most significant differences between US GAAP and IFRS: while GAAP mandates the immediate expensing of all internal R&D outlays, IFRS calls for the capitalization of development costs, under certain circumstances. Indeed, R&D capitalization is quite prevalent among IFRS-using R&D-intensive firms: forty percent of our IFRS sample firms capitalize development costs.

While not taking a stand in this study on the merits of R&D capitalization, we hypothesize that IFRS *process* of capitalization generates a substantial amount of valuation-relevant

information, some of which firms choose to disclose voluntarily to investors. Specifically, the capitalization of development costs under IFRS (the initial research costs have to be expensed as incurred) requires meeting several conditions, each calling for the collection and generation of new information.[1] For example, in order to capitalize development costs, the firm has to demonstrate the *technological feasibility* of the project, that is, a technical ability to complete it, such as passing a "beta test" for a software project under development, or the existence of a working model for an electronic device. The various tests and experts' certifications involved in establishing technological feasibility create considerable valuation-relevant information about the firm's pipeline of products-under-development, which allows investors to penetrate the R&D "black box" and distinguish between successful and unsuccessful R&D.[2] And there is lots of unproductive R&D. In Lou Gerstner's first years as IBM CEO (1994−95), he slashed 30% of IBM's R&D without adverse effects on the firm's innovation (e.g., no decrease in number of patents granted to IBM). But until the massive R&D cut, investors didn't know that a large part of IBM's vaunted, multi−billion dollars R&D, is unproductive.

Or take another IFRS condition for R&D capitalization: demonstrating an ability to sell the product and generate future economic gains. Satisfying this condition requires an extensive marketing study, comparing the attributes of the firm's products under development with those of competitors'. Often, ascertaining future economic gains calls for a cost-benefit analysis and a competitive pricing study. These tests generate a host of investors' relevant information on the target markets for products under development and the firm's ability to exploit these markets. Firms may share all, or some of this highly relevant information with investors.[3]

[1] Detailed in IAS 38, *Intangible Assets*, 2004.

[2] There are, of course, obvious proprietary concerns with making such information public, but considerable benefits too. For example, announcing that a product under development passed conclusive technical feasibility tests will deter competitors from embarking on the development of similar products.

[3] Our study is somewhat related to Christensen and Nikolaev (2013) who examine IFRS free choice between fair value and historical cost accounting for non-financial assets. They report an overwhelming use of historical cost for PPE, except where the costs of applying fair value are low and when it facilitates performance evaluation. We document that firms voluntarily disclose information when the generation costs are low (they already have this information), and when investors find the information value-relevant.

Thus, IFRS standard for R&D capitalization (IAS 38) requires adopters to generate substantial investment-relevant information, mostly of the type of strategic considerations analysts try to elicit from managers in conference calls. Will managers disclose this information to investors—thereby creating an important externality of accounting-standard-setting? Disclosure models (e.g., Grossman, 1981) predict, based on adverse selection, that when investors know that managers possess certain information, it will be disclosed. In our case, investors obviously know that mangers have the capitalization-related information, since it is required to be generated in the process of R&D capitalization. However, if the disclosure is costly (e.g., benefitting competitors), managers may exercise discretion in disclosing their information, suppressing unfavorable news (Jovanovic, 1982; Verrecchia, 1983). In our case, most of the capitalization-related information is favorable (e.g., the product passed a feasibility test, or it's expected to generate net benefits), since otherwise, development costs will not capitalized. But competitor-related concerns may still deter full information disclosure. So, ultimately, the *extent* of capitalization-related disclosure by IFRS companies, and the *relevance* to investors of such information are empirical questions to be examined in this study. We thus study the spillover effect of accounting regulation on voluntary information disclosure, a question that, to the best of our knowledge, was not examined before.

We chose to focus on R&D-intensive firms not only because the accounting for R&D differs markedly between GAAP and IFRS, but also because constant technological changes and the considerable scientific complexity of the business models of high tech and science-based firms create particularly large information asymmetries which make it difficult, sometimes even impossible, for investors to reliably assess the performance and financial condition of these firms without considerable disclosure of voluntary, value-relevant information. In fact, R&D intensity is often chosen by researchers as a proxy for financial information opaqueness (e.g., Aboody and Lev, 2000; Vincente-Lorente, 2001). Strong investor demand for R&D-related information is thus expected to induce certain voluntary disclosure. Our sample choice was also motivated by the fact

that R&D-intensive firms populate large sectors of developed economies and the most important ones in terms of growth, innovation, and contribution to social welfare. There are thus compelling reasons to focus on R&D-intensive firms in our comparison of GAAP with IFRS regarding regulatory impact on voluntary disclosure.

Our sample consists of 180 (798) Israeli high-technology firms (firm-years), of which 116 (497) report financial statements in accordance with IFRS, and 64 (301) adopted US GAAP. The sample period is 2007 through 2011.[4] Although IFRS is mandated in Israel, the many Israeli firms listed in the US (either in US exclusively, or cross listed with Israel) are allowed by the Israeli SEC to report under US GAAP. We chose to focus on Israeli firms because Israel's unique setting, allowing the use of IFRS and GAAP, provides a rare opportunity to explore our research question on firms using IFRS or US GAAP while operating in the *same country*. By focusing on a single country, we maintain the institutional, legal and economic factors constant across all sample firms, thereby avoiding the onerous need to control for the different economic, cultural and institutional differences in the typical cross-country GAAP-IFRS studies. Israel also befits an R&D study like our since it is recognized globally as a leader in innovation: at 4.27% of GDP, Israel has the world's highest R&D intensity, which is over twice the OECD average of 2.01%, and substantially higher than the US 2.77% average.[5]

For our empirical analyses, we construct a firm-specific disclosure index which quantifies the extent of voluntary information conveyed by firms in their annual financial statements (including MD&A). This hand-collected index summarizes information items that are relevant to investors in science-based and technology companies, as well as information items required by IAS 38 as a condition for development cost capitalization. Specifically, our disclosure index reflects the following eight information categories: capitalization-related information, R&D activities, feasibility of

[4] Adoption of IFRS in Israel became mandatory for public companies in 2008. However, most companies had already started reporting according to IFRS in the previous year (2007).
[5] OECD Internet Economy Outlook, 2013. http://www.oecd-ilibrary.org/sites/factbook-2013-en/08/02/01/index.html.

project completion, assessment of future benefits and market information, product specifications, product target uses, future plans, and "innovation revenues" (share of total revenues from new products).

Our major finding corroborates our conjecture: whereas in the pre-IFRS adoption period the disclosure level of the two sub-samples was practically identical, in the post-adoption period the extent of voluntary, R&D-related disclosure is significantly higher in IFRS firms than in US GAAP firms. Furthermore, based on a difference-in-difference test, we document that while the voluntary disclosure by IFRS firms significantly increased from the first year of its implementation in Israel (2007) to the last year of our sample (2011), the voluntary disclosure by Israeli firms using US GAAP has not changed throughout this period. These findings thus document an important positive externality of IFRS generated by the capitalization of R&D. An intriguing question still remains whether the extra voluntary disclosure by IFRS firms is relevant to investors. We address this question by two tests: price regressions, relating the disclosure index at the firm level to the firm's market value, and the impact of disclosure on the informativeness of share prices. The results indicate that indeed the voluntary disclosed information has a positive incremental value for investors over the mandated accounting information (earnings, book value of equity, R&D expenditures), and that it enhances significantly share price informativeness. This incremental value-relevance of the voluntary disclosures is significantly higher for IFRS firms, compared with US GAAP firms.

When dealing with voluntary disclosure, the question of disclosure costs arises naturally. Consistent with Guo et al. (2004), we document that four proprietary cost proxies affect the amount of information disclosed by Israeli R&D intensive firms: the firm's extent of patent protection of its R&D innovations, the firm's progress in its product development, the availability of venture capital funding, and firm size. This holds for IFRS as well as for US GAAP adopters. But even after controlling for the impact of these determinants of disclosure, we find that firms reporting under IFRS voluntarily

disclose more relevant information on their R&D activities than their US GAAP counterparts. We conduct several robustness tests to the price analyses and obtain consistent results: the positive relation between our disclosure index and firms' market values validates the positive consequences of voluntary disclosure, particularly by IFRS firms. All in all, we establish here an important externality of accounting standard-setting: voluntary information disclosure.

The next section briefly presents the differences between US GAAP and IFRS' treatment of R&D expenditures and provides examples of the conditions for capitalization set by IAS 38 that are expected to affect the firms' extent of voluntary disclosures. Section 3 describes our sample, while Section 4 presents the disclosure index (with detailed examples provided in Appendix A). Section 5 reports disclosure changes over time for GAAP and IFRS firms, while Section 6 validates the higher voluntary disclosure level by IFRS firms. Section 7 reports the market consequences of voluntary disclosure, and Section 8 concludes the study.

2. R&D Disclosure under IFRS versus US GAAP

US GAAP mandates the full expensing of all internally-generated R&D expenditures, due to concerns with the reliability, objectivity and value-relevance of R&D capitalization (SFAS 2). In contrast, IFRS requires firms to recognize an intangible R&D asset if certain criteria are met (IAS 38). The standard also specifies how to determine the carrying value of these intangible assets.

According to IAS 38, in order to capitalize development costs (the initial research costs must be expensed as incurred), a firm has to show that it meets several conditions related to the successful completion and marketing of the developed product or service. These conditions include: the technical feasibility of the product under development, the intention and availability of financial resources to complete the development, an ability of the firm to use or sell the product, specifying how the product will generate future economic benefits, and an ability to reliably measure the expenditures attributable to the product development, separately from the research phase. These

capitalization conditions are quite stringent, but nevertheless, 40% of our IFRS adopters capitalize all or some development costs. Obviously, firms seeking to capitalize development costs, as per IAS 38, generate a substantial amount of information complying with the conditions set by the standard for capitalization, information that they may not have generated otherwise.

In what follows we briefly discuss the most relevant conditions of IFRS' R&D capitalization and the voluntary disclosures they are likely to elicit.

- ***Control over the product:*** An entity controls an asset if it has the power to capture the future economic benefits emanating from it and restrict the access of others to those benefits. The capacity of an entity to control the future benefits stems from legal rights that are enforceable in court, generally in the form of patents and trademarks on the developed concept. According to section 22 of IAS 38, an entity should assess the probability of obtaining future economic benefits, using reasonable assumptions that represent the best estimates of management of the economic conditions that will exist during the life of the capitalized asset. This requirement calls for the collection of information on intellectual capital ownership (patents, trademarks), as well as conducting systematic market research about the prospective product (service), potentially yielding highly relevant information for investors (and often for management too).

- ***Meeting capitalization conditions:*** according to section 57 of IAS 38, an intangible asset arising from the development phase of an internal project shall be recognized as such if and only if the entity can demonstrate all of the following:

(a) The technical feasibility of completing the development of the product (service) so that it may be available for use or sale.

(b) The firm's intention to complete the project.

(c) The ability to use or sell the developed product.

(d) Obtaining future economic benefits from the product. (The entity should demonstrate the existence of a market for the product, or, in the event that it will be used internally, the usefulness

of the product to the firm.)

(e) The existence of adequate technical and financial resources to complete the development of the product.

(f) The ability to measure reliably the expenditures attributable to the product during its development.

Meeting these capitalization conditions requires the generation of considerable data on results of feasibility tests, estimates of resources needed to complete and market the product, and prospective sales projections, all relevant to investors.

- ***What should be capitalized:*** According to section 59 of IAS 38, development activities include:

(a) The design, construction and testing prior to production or use of models and prototypes,

(b) The design of tools, dies, molds and templates involving new technology,

(c) The design, construction and operation of a pilot plan feasible for commercial production, and

(d) The design, construction and testing of a chosen alternative for materials, devices, products, processes, systems or services that are new or have been improved.

- ***Business plan:*** According to section 61 of IAS 38, the availability of resources to complete, use, and benefit from the product should be demonstrated by a business plan that highlights the firm's technical and financial capacity. In some cases, an entity should demonstrate the availability of external funding. A business plan, or parts of it, are obviously of interest to investors.

It is thus clear that a considerable amount and variety of valuation-relevant information is collected and generated in the process of meeting IFRS R&D capitalization conditions, available to be shared with investors. Our tests are aimed at ascertaining the extent of such information sharing and the relevance of the information to investors.

3. Sample Selection

Our sample selection procedure begins with all the 186 Israeli high-technology and science-based firms that had been listed on the Tel Aviv Stock Exchange (TASE), and/or on US exchanges between 2007 and 2011. Of the 186 firms, 118 are listed on TASE only, 34 are listed on US exchanges only, and the remaining 34 firms are cross-listed on TASE and the US. Adoption of IFRS in Israel became mandatory for public companies in 2008. However, most companies had already adopted IFRS in 2007, hence, our sample period begins in 2007. All dual listed firms in the US are allowed by the SEC to report under IFRS and by the Israeli SEC to report under US GAAP. Most of these firms report under US GAAP. Specifically, all the sample 118 firms listed on TASE use IFRS. Of the 68 US listed or cross listed firms, two firms report under IFRS, and the remaining 66 firms use US GAAP.

The list of Israeli high-technology firms during the sample period was obtained from the Israel Venture Capital (IVC) Online database. IVC Online is a comprehensive database on Israel's high-tech and science–based industries, created by the Israel Venture Capital Research Center. Consistent with prior studies, we identify high-tech firms by the likelihood that they have significant unrecorded intangible assets (e.g., Core et al. 2003; Francis and Schipper 1999). By this definition, high-tech firms are those included in the following industry segments: life sciences (pharmaceuticals and biotechnology), computer hardware and electronic equipment (computers and electronics for parsimony), software, and telecommunications. To focus on R&D intensive firms, we eliminated from the sample 3 IFRS and 2 US GAAP firms having no R&D expenditures.

We obtained the financial information for our sample from the *Bloomberg Professional* database, and supplemented this data with information from the firms' disclosures, manually collected from the PDF files of financial statements in the *Bloomberg Professional* database. Firms with insufficient *Bloomberg* data are excluded from the analysis. Table 1 summarizes the sample selection procedure. After excluding firms with no R&D, along with those with insufficient data, we

obtained a sample of 180 (798) firms (firm-years) with sufficient information required for our various analyses, of which 116 (497) use IFRS and 64 (301) use US GAAP. Table 2, Panel A shows the sample firms by industrial affiliation. Life sciences, computers and electronics firms comprise roughly half of our sample. Table 2, Panel B — Summary Statistics — shows that GAAP firms are larger (total assets) than IFRS firms, but the two groups are very similar in revenue growth rate and R&D intensity (relative to total assets).

4. The Disclosure Index

The disclosure index is constructed by hand collecting information from the firms' annual financial statements and MD&As, focusing on R&D-related information. Our disclosure index consists of eight information categories: capitalization-related information, R&D activities, feasibility of project completion, assessment of future benefits and market information, product specifications, product target uses, future plans, and innovation revenues (% sales from recently introduced products).

Appendix B specifies the components of the disclosure index and the scores assigned to each item. In what follows, we provide a brief description of the eight categories and the scoring system making up our index. Appendix A provides examples of specific disclosures for each category.

4.1. Capitalization-related information

This index category captures information related to meeting the requirements for capitalizing development costs. To capitalize development costs, IFRS firms must be able to distinguish the research phase from the development of the product or service, and identify the expenditures incurred in each phase. If a firm shares this information with investors, we assign a

score of 1 if it discusses the two phases, and 0 otherwise. An additional score of 1 is given if the firm provides the amounts of research and development, and 0 otherwise. The human capital associated with the R&D activities is an important information element.[6] Based on the extent of discussion of the human capital, a score of 3 is given if a detailed description (including names and numbers) of key research personnel is provided, 2 if a general description (including numbers) is provided, 1 if a brief description (with no numbers) is provided, and 0 if there is no discussion of the R&D human capital. The firm's protection of its R&D innovations through patents, licenses, or trademarks (confirming ownership), along with the various risk factors related to R&D activities, and regulations potentially affecting the products under development are essential information for capitalization. Based on the extent of discussion of each of these three items, a score of 3 is given if a detailed description that extends over at least 5 sentences per product is provided, 2 if a general description covered by 3-4 sentences is provided, and 1 if a brief description is provided by 1-2 sentences. Zero score is given if there is no discussion of the product protection, risk factors, or related regulation. Adding these individual scores, the capitalization-related information category of the disclosure index has a maximum score of 14 points and a minimum of 0.

4.2. R&D activities

This index category is designed to capture the extent of specific R&D-related information provided by the firm. The first item is the description of the R&D activities aimed at obtaining new knowledge or products, including: exploration, evaluation and final selection from applications of research proposals; the search for alternative materials, devices, products, processes, systems or services used by the firm;[7] and the formulation, design, evaluation and final selection of devices, products, processes, systems or services that are new or have been improved. Based on the extent

[6] Personnel costs constitute about 60% of R&D expenditures.
[7] This is generally known as "process R&D," aimed at economizing on production processes, in contrast with "product R&D," aimed at developing new products or services.

of description of such R&D activities, a score of 3 is given if a detailed description (including numbers, such as R&D expenditures) that extends over at least 5 sentences is provided, 2 if a general description (including numbers) covered by 3-4 sentences is provided, 1 if only a brief description (with no numbers) is provided by 1-2 sentences, and 0 for no description of R&D activities.

The timing of the various stages of R&D is an important information dimension. A score of 3 is given if the firm provides details on the timing (e.g., "the company plans to launch the combined solution in the second half of 2012…"), duration (e.g., "the project's duration started on May 1, 2011 and will extend up until April 30, 2012."), or frequency (e.g., "we annually invest in changing and improving our products in response to changes…"). A score of 2 (1) is given if the firm provides details on at least two (one) of the three features (timing, duration, frequency), and 0 if none of the features are mentioned. A firm may also discuss the results of the trial/s conducted throughout the development process. A score of 3 is given if it provides a detailed discussion, citing test results and analyzing the results; 2 if the firm provides a general discussion of the results, citing data but not analyzing them; 1 if the firm provides only a brief discussion of trial results without data; and 0 if the firm does not mention any trial results, though trials were included in the development process. A discussion of existing R&D alliances/collaborations yields a score of 2 if it included the names of the entities with which the firm collaborates, 1 if no names were mentioned, and 0 otherwise. A further point is given if the firm provided breakdowns of the amounts spent on R&D (e.g., payment to consultants, cost of laboratory equipment, etc.), and 0 otherwise. Finally, regarding the discussion of how is the R&D related to existing products, 2 points are given for a 3-sentence or more discussion; a brief description of 1 sentence is given1 point; and 0 otherwise. Adding these individual scores, the research and development activities category of the disclosure index can have a maximum score of 15 points and a minimum of 0.

4.3 Feasibility of Completion

This index category aims to capture the feasibility of completing the development, as prescribed by IAS 38. We give 3 points if the firm provides a detailed description of a business plan that highlights the technical requirements and its ability to complete development; 2 points for a general discussion of this dimension; 1 point if it provides only a brief presentation; and 0 otherwise. Another prerequisite for capitalization is demonstrating adequate financial resources to complete the development. A score of 3 is given if the firm presents a detailed plan, including amounts that highlights the financial requirements and its ability to secure them; 2 points, if the firm provides a general presentation including numbers, one point if it provides only a brief discussion with no numbers; and 0 otherwise.[8] The firm is further required to indicate its intention to complete the development. A score of 1 is given if the firm provides such indication and 0 otherwise. Furthermore, the firm is required to show its ability to use or sell the new product. A score of 3 is given for a detailed marketing description per product that extends over at least 5 sentences; 2 points for a general description covered by 3-4 sentences; 1 point for a brief description provided by 1-2 sentences only; and 0 otherwise. Adding these scores, the firm can have a maximum of 10 and a minimum of 0 points in the feasibility of completion category.

4.4 Future Benefits and Product Market Information

Demonstrating ability to assess the future benefits from the products under development and to provide relevant target market information is another condition for capitalization. We give a score of 2 (1, 0) points if the firm provides a detailed (only general, or no) description indicating whether the product is expected to generate revenues from its sale; a score of 2 (1, 0) if the firm provides a detailed (only general, or no) description indicating whether the product is expected generate cost savings; and a score of 2 (1, 0) if the firm provides a detailed (general, no) description

[8] For example, an entity demonstrates the availability of external funding by obtaining a lender's indication of its willingness to finance the plan, or grants from the Office of the Chief Scientist of the Israeli Ministry of Economy, etc.

indicating whether the product is expected to generate income from its own use of the product. The firm is also required to disclose information about the target market for the product. A score of 3 is given for a detailed description that extends over at least 5 sentences, including numbers, demonstrating the existence of a market for the product, 2 points for a general description with numbers covered by 3-4 sentences; 1 for a brief description provided by 1-2 sentences only with no numbers; and 0 otherwise.

In the event that the asset will be used internally, we give a score of 3 for a detailed description of the internal use per product that extends over at least 5 sentences, 2 points for a general description covered by 3-4 sentences, 1 point for a brief description provided by 1-2 sentences only, and 0 otherwise. The firm must also discuss the degree of certainty attached to the future economic benefits attributable to the product. Accordingly, we give a score of 2 points if it provides reliable evidence in this regard (e.g., evidence from external sources, such as drug resellers), 1 point if no independent sources are quoted, and 0 if no evidence of benefits is provided. Lastly, information on the timing of marketing or internal use—both dates and duration—grants the firm 2 points; 1 point if only one of the two (dates or duration) is given; and 0 otherwise. Adding the maximum score given for information items regarding probable future economic benefits, gives a maximum score of 9 points and a minimum of 0.

4.5 Product Specifications

This index category is designed to capture information on the properties of the firm's products under development.[9] Based on the extent of discussion of product properties and particularly of the effectiveness of the product, a score of 3 is given if the discussion per product extends over at least 5 sentences, 2 if properties are covered by 3-4 sentences, 1 if the information

[9] Notably, for firms in our sample with more than one product under development, the extent of information provided by the firm was similar for its different products.

is provided by 1-2 sentences, and 0 if there is no discussion of product properties. Occasionally, firms compare the product under development with existing products on the market, and point out whether the former is superior to competing products. A score of 2 is given if other products are mentioned by name, 1 if other products are discussed without mentioning names, and 0 if no competing products are mentioned.[10] From the discussion of the product structure (e.g., chemical, biological, technological aspects) a score of 2 is given if the firm provides a detailed discussion, 1 for a general discussion, and 0 if the product structure is not mentioned. With respect to the useful life of the product, 1 point is given if the firm indicates either the period during which it expects to use or generate benefits from the product, or the number of units expected to be sold, and 0 otherwise. Adding these individual scores, the product specifications category can have a maximum score of 8 points and a minimum of 0.

4.6 Target Uses

This index category is designed to capture information on the intended use of the product. A score of 2 is given if the firm discusses consumers needs that the product satisfies, or any other uses of the product, mentioning specific consumers or needs (e.g., diseases). One point is given if the firm provides just a general discussion without mentioning specific consumers or needs. Adding these scores, the firm can have a maximum score of 2 and a minimum score of 0 in the target uses category.

4.7 Future Research and Development Plans

This category includes the firm's future plans for research and development activities. A score of 3 is given for a detailed description that extends over at least 5 sentences, including numbers, of the planned research and development activities aimed at obtaining new knowledge or

[10] Consistent with Guo et al. (2004), we take the maximum score on either of the two sub-categories—the developed product in relation to existing products or in relation to products under development. This is because firms often discuss their products in relation to either available products or competing products under development.

products; 2 points if the firm provides just a general description, including numbers, covered by 3-4 sentences; 1 for a brief description with no numbers, covered by 1-2 sentences, and 0 otherwise. A score of 1 is further given if expected or planned dates are mentioned, and 0 otherwise. Also, a score of 1 is given if expected or planned development duration is mentioned, and 0 otherwise. This category may also include the firm's plans to form alliances with other entities. A score of 2 is given if the alliance partners are mentioned by name, 1 if alliances are generally discussed but not mentioned by name, and 0 if alliances are not mentioned, but other information indicates the firm has alliances. Finally this category may include plans to try the product for other than original uses or in combination with other products. A score of 2 is given if other uses, or if the names of other products, are mentioned; 1 if these plans are discussed without specificity, and 0 otherwise. Adding these scores, the firm can have a maximum of 9 and a minimum of 0 points for the future plans category.

4.8 Innovation Revenues

The final category of the disclosure index relates to an important indicator of firm innovativeness — "innovation revenues," namely the percentage of total revenue generated by recently−introduced products.[11] If the firm launched new products, a score of 1 is given for disclosure of innovation revenues, and 0 otherwise. If the firm has not introduced new products to the market recently, it gets 1 point so that its total score will be comparable to firms that did. Overall, the firm can have a maximum of 1 and a minimum of 0 points on the innovation revenues category.

[11] Studies have documented a strong association between this indicator and future firm growth; see Thornhill (2006) and Hall and Bagchi-Sen (2002).

4.9. Total Disclosure Index

The total score of the disclosure index for each sample firm is obtained by summing the eight category scores outlined above. Within the second category, 'R&D Activities', one item—'trial results'—is relevant only for the "life sciences" industry. As such, firms in the life sciences industry can potentially obtain the maximum sub-total score of 15 points from this category, whereas firms in all the other industries can obtain a maximum subtotal score of 12 points only (the maximum score of the trial results item is 3).[12] To assure the cross-sectional comparability of sample firms' scores, we scale the total score of the sample life science firms by 68, and the scores of firms in all the other industries by 65 (see appendix B for scoring details). We thus construct a *scaled* disclosure index for each of the 798 firm-years.

4.10. Index Attributes

As shown in panel A of Table 3, the mean (median) of the scaled total disclosure score for our pooled sample is 0.46 (0.44), indicating that the actual voluntary disclosure by sample firms was, on average, 46% of the maximum score. The interquartile range of disclosure (0.30-0.62) and the standard deviation (0.19) indicate considerable cross-sectional variability of R&D-related disclosures by the sample firms. Panel A of Table 3 further shows the descriptive statistics of the disclosure scores by the individual categories of the index. The lowest level of disclosure, on average, is about future plans (24%), likely due to competitive concerns, followed by the disclosure

[12] In the fifth category, 'Product Specifications', item 4.b.: "The number of production or similar units expected to be obtained from the product" is relevant only for the life sciences and computers and electronics industries. Nevertheless, since the score for question 4 in this category is *max(4a, 4b),* and the maximum score for both *4a* and *4b* is 1, the total score for all other industries is unaffected by the exclusion of question 4.b. Similarly, in the sixth category, 'Target uses', item 2: "What are the other possible uses of the product?" may be relevant for some companies in an industry whereas for other companies it may be irrelevant. The distribution of the scores for this item shows us that this question is relevant for a significant number of companies in each industry. Nonetheless, we determine the subtotal score of this category to be *max (1,2),* assuring that firms for whom this question may not be relevant are not affected by the inclusion of the question in the index. Lastly, in the seventh category, 'Future Plans', item 2.a.: "Is there any plan to try the product for other uses?" may be irrelevant for some companies in an industry whereas for other companies it may be relevant. Clearly, this question is more relevant for life sciences. Notwithstanding, here too the total scoring is unaffected by this question since the score for question 2 in this category is *max(2a, 2b),* and the maximum score for both *2a* and *2b* is 2.

on feasibility of completion (37%), future benefits and market information (39%), R&D activities (43%), capitalization-related information (54%), product specifications (58%), innovation revenues (73%), and target uses (88%).

Panels B and C of Table 3 present the descriptive statistics of the disclosure scores separately for IFRS and US GAAP firms. Notably, the actual voluntary disclosure by IFRS firms was, on average (median), 50% (48%) of the maximum disclosure, compared with only 38% (36%) of disclosure by US GAAP firms.[13] These differences in the means and medians of the overall disclosure between IFRS and US GAAP firms are highly significant ($p<0.01$), as shown in Panel D of Table 3. When we split the IFRS firms to those that capitalized development costs and those that didn't capitalize development costs, we find, as expected, that capitalizers disclosed more information (mean/median scores of 0.56/0.50) than IFRS non-capitalizers (0.46/0.47 scores). Note that the disclosure level by IFRS non-capitalizers (0.46/0.47) is significantly higher than that of GAAP firms (0.38/0.36), which also don't capitalize R&D. The reason apparently is that IFRS capitalization requirement leads most firms to collect certain capitalization-required data (e.g., on expected product benefits, technological feasibility, or funds availability to complete the development), whether they ultimately decide to capitalize R&D or not. And some of this information is shared with investors by most IFRS users.[14] Regarding the individual disclosure categories, the level of disclosure by IFRS firms is significantly higher than that of GAAP firms for all the categories except for target uses and patent protection of the innovation. The reason: information about these categories is readily available to managers even without complying with IFRS capitalization requirements, and competitive concerns are minimal. The significant disclosure

[13] We point out that the US GAAP sample firms include three firms with very high disclosure scores. When these three firms are deleted from the sample, the average scaled disclosure score for US GAAP firms drops to 35%.
[14] IFRS "Management Commentary" disclosed by most IFRS users includes performance measures and indicators, risk statistics and certain prospective information, some of it potentially relevant to investors.

differences in Table 3 is our first indication that IFRS mandate of development cost capitalization leads to a substantial increase in voluntary disclosure.

5. Intertemporal Disclosure Improvement

We have documented above that, on average, IFRS firms disclose voluntarily more R&D-related information than GAAP firms. But what about the pattern, or trend, of information disclosure? Table 4 presents the mean scaled disclosure scores, totals as well as category subtotals, by year, for IFRS versus US GAAP firms. The medians (untabulated) yield similar inferences. Panel A of Table 4 shows that the total disclosure score for IFRS firms gradually increased from the first year of its implementation (0.380 in 2007) to the last year of the sample period (0.549 in 2011), and that the difference in disclosure scores between 2007 and 2011 is statistically significant (0.100, p-value<0.01). The IFRS firms' disclosure increase is likely due to a learning curve effect: as firms increase their knowledge of IFRS requirements and observe other firms' capitalization choices, they enhance their own disclosure. In contrast, the total disclosure score for US GAAP firms has not changed throughout the period. Notably, we observe a significant difference between the total disclosure score for IFRS and that of GAAP firms in *each* of the years 2007−2011, with the former being higher than the latter, and the difference increase over time. The difference-in-differences between the IFRS and GAAP firms' total score between 2007 and 2011 is 0.094, significant at the 1% level.

When we examine the disclosure in the year prior to IFRS adoption (2006), we find that both groups of firms had an identical level of disclosure—38% of the maximum score. This similarity is expected, given that prior to IFRS adoption, Israeli GAAP was largely based on the accounting principles generally accepted in the US (US GAAP; see Chen et al., 2013). As shown in Table 4, while IFRS firms significantly increased their disclosure in the year of adoption (from

38% to 45% of the maximum disclosure), and more so throughout the sample period, US GAAP firms remained on a fairly stable and relatively low level of disclosure over time. Panels B and C of Table 4 show similar results for the subtotals of the disclosure index. Thus, we can safely conclude that it was the *exogenous* IFRS adoption in 2007, rather than other endogenous factors, that triggered the sharp increase in voluntary disclosure by IFRS firms.

6. IFRS vs. GAAP Disclosure Differences: Multivariate Analysis

The univariate data in Table 3 indicate that the extent of R&D-related voluntary disclosure by IFRS firms is substantially higher than that of GAAP firms, as measured by the overall index (mean 0.50 for IFRS vs. 0.38 for GAAP), as well as for most of the individual components of the disclosure index. This difference, however, may reflect the effect of various structural differences between IFRS and GAAP firms affecting their disclosure strategies.[15] For example, it has been documented that the extent of voluntary disclosure varies positively with the stage of development of the R&D projects: the more advanced the stage, the lower the concern that competitors will imitate the products under development, and therefore the stronger the incentive to disclose information. Thus, for example, if IFRS firms have, on average, products in a more advanced stage of development than GAAP firms, it will explain the more extensive disclosure by IFRS firms. We accordingly need to control for the major determinants of voluntary disclosure by IFRS and GAAP firms. Given that we deal with R&D-related disclosures, previous studies on voluntary disclosure by high-tech and biotech companies, such as Guo et al. (2004), are particularly relevant to our choice of control variables.

[15] Given that all our sample firms are headquartered and largely operate in Israel, and subject to Israeli laws, we are not concerned in this study with legal and institutional factors affecting disclosure.

Specifically, in our multivariate analyses we control for five disclosure determinants: (1) the legal protection of R&D innovations; (2) the extent of progress in the product pipeline; (3) venture capital backing of the firm; (4) ownership concentration; and (5) firm size. *Protection of R&D* innovations is a binary variable that equals 1 if the firm discloses that it has protected its R&D innovations by patents, licenses, or trademarks, and 0 otherwise. Legal protection is expected to motivate higher disclosure levels, because managers are less concerned about imitation by competitors. *Progress of the product pipeline* is also a binary variable that equals 1 if the firm disclosed that it indeed progressed in the stage of product development, like "the project progressed from Phase I to Phase II clinical test," and 0 otherwise. Given the considerable technological uncertainty which characterizes the development process of R&D projects, the progress made in the product pipeline is a very favorable and highly value-relevant information to investors, and it is therefore safe to assume that a firm will disclose any progress made. Moreover, for advanced products under development, there is less concern of imitation by competitors and, therefore, a higher incentive to disclose voluntarily. *Venture backing* is a binary variable that equals 1 for firms backed by venture capitalists, and 0 otherwise.[16] Venture capitalists generally wish to exit from the firm and will, therefore, be motivated to disclose information that will boost share prices. For each firm, information on the progress made in the product pipeline, the legal protection of R&D innovations, as well as venture capital backing is collected from the annual financial statements.

Ownership concentration is the percentage ownership held by managers, directors, and 5% or greater beneficial owners. The information on ownership structure was extracted from the Israeli *If'at Capital Disc Co*. database. We conjecture that managers of firms with a concentrated

[16] In this variable we included support by venture capitalists and/or by The Office of the Chief Scientist [OCS] in the Ministry of Economy in Israel. "The OCS is charged with execution of government policy for support of industrial R&D. The goal of the OCS is to assist in the development of technology in Israel as a means of fostering economic growth, encouraging technological innovation and entrepreneurship, leveraging Israel's scientific potential, enhancing the knowledge base of industry in Israel, stimulating high value-added R&D and encouraging R&D collaboration both nationally and internationally. A variety of ongoing support programs developed and offered by the OCS play a major role in enabling Israel to be a key center for high tech entrepreneurship" (http://www.matimop.org.il/ocs.html).

ownership, feel less investor pressure to impart strategic information, potentially benefiting competitors, and will therefore disclose less. Indeed, previous research indicates a negative relation between ownership concentration and disclosure (e.g., McKinnon and Dalimunthe, 1993; Mitchell et al., 1995; Schadewitz and Blevins, 1998), though one study suggests that blockholder ownership is not related to disclosure (Eng and Mak, 2003). Our fifth control variable, *firm size,* is measured by total market value, and is expected to be positively correlated with the extent of disclosure, as has been shown in previous studies.

Table 3 (bottom) presents descriptive statistics of the five disclosure determinants. For the pooled sample (panel A of Table 3), we find that 88% of the sample firms protected their R&D innovations through patents, 48% disclosed that progress was made in their product pipeline during the last year, and 52% were backed by venture capitalists. The average (median) percentage of insider ownership was 48% (55%). Examining differences between IFRS and US GAAP firms (panels B and C of Table 3), we find that 85% (92%) of IFRS (US GAAP) firms protected their R&D innovations, 50% (38%) disclosed progress in their product pipeline, and 50% (55%) were backed by venture capitalists. As for ownership structure, the average (median) percentage of insider ownership in IFRS firms is 51% (55%), compared with 44% (52%) for US GAAP firms. Notably, these differences are significant only with respect to patent protection of R&D innovations, progress in the product pipeline and firm size. Nonetheless, despite the lower prevalence of R&D protection and the lower market cap, the extent of voluntary disclosure is higher for IFRS firms, as shown in Table 3.

Table 5 presents univariate data of voluntary disclosure classified by the protection of R&D innovations (panel A), and by the progress of the product pipeline (panel B). The data show a significant disclosure difference between firms that protected their R&D innovations and those that did not: both the means and medians of the scaled disclosure score are significantly higher (at the 1% level) with R&D protection than without it, regardless of the accounting standard adopted

(IFRS, GAAP). Similarly, we obtain a univariate confirmation of the conjectured relation between the progress of the product pipeline (panel B in Table 5), as well as the three other disclosure determinants (untabulated for parsimony), and the extent of voluntary disclosure. These results corroborate our five disclosure determinants as valid control variables for the following multivariate tests.

Table 6 presents estimates from regressions of our disclosure index on an indicator variable (IFRS dummy) that takes the value of 1 for an IFRS reporting firm, and 0 for GAAP firms, as well as on the five determinants of disclosure (control variables): protection of R&D innovations, progress of the product pipeline, venture capital backing, ownership concentration, and firm size. Industry and year fixed effects are also included in the regression. The results displayed in Table 6 present the estimates from the regressions on the pooled sample. In all the four regression configurations of Table 6, the IFRS dummy is positive and highly statistically significant, implying that reporting under IFRS is associated with more extensive voluntary R&D and product development disclosure.[17] With respect to the control variables, the coefficients on R&D protection, progress of the product pipeline, venture backing, and firm size are all positive, as conjectured, and highly significant ($p<0.01$). R&D protection and development progress seem to capture similar proportions of the variation in the disclosure scores, as the adjusted R-squared is similar in the regressions on each of these disclosure determinants alone (33% in models 1 and 2). Model 4 of Table 6 indicates that, as expected, the disclosure score is higher for firms with venture capital backing than those without, and lower for high ownership concentration. We also ran the regressions reported in Table 6 by interacting the five control variables with the IFRS disclosure dummy. The only significant interaction (positive) was that with venture capital backing. Thus, IFRS companies' venture capitalists—mostly Israeli firms, while GAAP venture capitalists are

[17] When we replace the IFRS dummy with a capitalization dummy (for IFRS R&D capitalizers), we obtain, as expected, a larger and more significant regression coefficient.

mostly U.S. firms—apparently induce managers to disclose more value–relevant information. Overall, our regressions analysis indicates that, after controlling for the various determinants of disclosure, firms reporting under IFRS voluntarily disclose more information on their R&D activities and prospects compared with their US GAAP counterparts.

A. Disclosure Relevance: Contemporaneous Price Regressions

Is the voluntary disclosure captured by our index relevant to investors' decisions? And if relevant, does it depend on whether the firm reports under IFRS or US GAAP? Importantly, this consequence investigation also provides a validity check of our disclosure index, which is based on certain subjective judgments regarding the choice of information variables and the assigned scores. If the disclosure index is associated with market values, then our choices of information items and weights indeed yields relevant information.

We relate the disclosure index (*DISCLOSURE*) to the price of the firms' shares, based on a version of the Ohlson (1995) model:

$$(1) \qquad P_{it} = \beta_0 + \beta_1 BV_{it} + \beta_2 E_{it} + \beta_3 RD_{it} + \beta_4 DISCLOSURE_{it} + v_{it} \ ,$$

where *P* is price per share five months after fiscal year-end; *BV* is the most recent book value of equity per share; *E* is current earnings per share before the (tax adjusted) R&D expense and extraordinary items;[18] *RD* is the annual R&D expense plus the change in capitalized R&D;[19] and

[18] Accounting-based valuation models that use net earnings as an explanatory variable generally separate earnings into positive and negative earnings to account for differences in the valuation of profits and losses (Hyan 1995; Basu, 1997; Collins et al., 1997). This separation is particularly important in studies of R&D-intensive industries. Previous studies have shown that the earnings in such industries are depressed due to the immediate expensing of large R&D amounts, resulting in firms predominately reporting losses. Because our earnings measure is taken before R&D expense, this variable is positive for most of our sample firm-years (around 70% of the IFRS and of the US GAAP firm-years). As such, Eq. (1) does not include a separate coefficient for negative *E*. When we allow for a separate coefficient for negative and positive *E* we find no significant difference between the two.

[19] For our sample of R&D-intensive high-tech firms, we test and find that other proxies for growth in future earnings, such as sales growth, capital expenditures and advertising expenditures, have no incremental contribution to the explanation of stock prices beyond the firm's expenditures on R&D.

DISCLOSURE is the firm's scaled disclosure index. Note that for IFRS firms, *RD* in Eq. (1) consists of both the annually capitalized and expensed R&D expenditures. We repeat the regressions using price per share three and four months after fiscal year-end and obtain similar results. Market price data were derived from *Bloomberg Professional* database.

To allow for differentiation between IFRS and US GAAP firms, we interact each of the explanatory variables in Eq. (1), including the intercept, with a dummy variable that takes the value of 1 if the firm reports in accordance with IFRS, and zero for US GAAP firms. The regression estimates for equation (1), including the interaction variables, are presented in Table 7. We note that the coefficients on book value (*BV*) and earnings (*E*) are, as expected, positive and significant at the 1% level. The value-relevance of these fundamental financial variables does not differ between IFRS and US GAAP firms, as indicated by the insignificant coefficients of the interactions of *BV* and *E* with *IFRS*. In contrast, we do find a significant difference in the valuation of R&D between IFRS and US GAAP. As expected for our sample R&D-intensive firms, the coefficient on R&D (*RD*) is positive (rather than negative for a regular expense), and significant (at the 1% level). But the coefficient on *RD* is 0.422 for US GAAP firms, whereas for IFRS firms it is substantially higher, by 1.060 ($p<0.01$), as indicated by the significant interaction term. Recall that for IFRS firms, the R&D variable includes the annually capitalized R&D, indicating that IFRS' R&D capitalization is deemed highly relevant by investors. The reason for the relevant capitalized R&D coefficient is that such R&D passed technological feasibility tests, among others, which regular R&D does not, reducing significantly the uncertainty associated with R&D outcomes.

Importantly, the coefficient on the scaled disclosure index—the focus of our study—has the expected positive sign and is highly significant. Moreover, in comparison to US GAAP firms, for whom the coefficient on *DISCLOSURE* is 0.557 ($p<0.01$), for IFRS firms the coefficient is significantly larger, by 0.859 ($p<0.01$). Thus the regression estimates provide evidence that the

more extensive voluntary disclosure elicited by IFRS' capitalization rule, is relevant to investors beyond the GAAP information reflected by earnings and book value.

The right column of Table 7 shows the price regressions where the disclosure index is decomposed into its eight categories. This mitigates somewhat our judgment in constructing the index since by running the eight index components separately, we don't impose equal weight as in the overall index. The estimates indicate that most of the index components are value-relevant (significant). Particularly relevant to investors is information on the various R&D activities of the firm, the feasibility of project completion, the expected benefits of the projects, and data on "innovation revenues" (percentage of revenues from recently-introduced products) which is an important innovation capabilities indicator not required by GAAP.

To examine the robustness of our regression results, we conducted the following sensitivity analyses (not tabulated for parsimony). First, we repeat the price regression analysis without the interaction variables (multiplied by an IFRS dummy) and find very close results to those of Table 7. Second, we run the regressions for IFRS firms and for US GAAP firms separately and find, as expected, that the coefficients on the disclosure index, and on certain index components (feasibility of completion, future benefits, innovation revenues) are substantially higher for IFRS than for GAAP firms. Third, we run a regression specification with unscaled financial variables for the pooled sample as well as for IFRS and US GAAP firms separately, namely total market capitalization regressed on book value, earnings, and the remaining independent variables, plus the number of outstanding shares. Results are very close to those of Table 7. Finally, to avoid issues with pooling our data over years, we run year-by-year regressions of model (1). The results across all years are similar to those reported. We thus conclude that IFRS' R&D capitalization provision incents firms to disclose voluntarily highly relevant information to investors.

B. Share Price Informativeness

A recent, widely quoted study examined the informativeness of financial markets over the last 50 years by regressing corporate earnings on lagged markets values and controls (Bai, Philippon, and Savov, 2014). We adopt this study's methodology to examine the following question: has the voluntary R&D-related disclosure elicited by IFRS capitalization rule improved the informativeness of IFRS firms' share prices relative to US GAAP reporters?

We run the Bai et al. (2014) regression:

$$\frac{E_{i,t+k}}{A_{i,t}} = a_t \log\left(\frac{M_{i,t}}{A_{i,t}}\right) + b_t\left(\frac{E_{i,t}}{A_{i,t}}\right) + \in_{i,t,} \qquad (2)$$

Were $E_{i,t+k}$ are subsequent, three year earnings (EBIT), $A_{i,t}$ is total assets, $M_{i,t}$ is current market value, and $E_{i,t}$ is current earnings (EBIT). We also run a version with the independent variables interacted with a year dummy, and industry dummies. We run these regressions separately for IFRS and GAAP reporters, and for IFRS R&D capitalizers and non-capitalizers. Regression estimates are reported in Table 8.

Panel A of Table 8 compares IFRS with GAAP firms. The coefficients on current earnings (E/A) for the three subsequent years are practically identical for the two groups. Thus, Israeli IFRS and GAAP users report earnings with essentially identical association with future earnings. In contrast, the estimate of market value (M/A) — indicating share informativeness — are markedly different between the two groups: for each of the three subsequent years, IFRS coefficients are orders of magnitude larger than the GAAP coefficients (e.g., for year t+1, IFRS market value coefficient is 0.241 vs. GAAP coefficient of 0.008). IFRS R_s^2 are also substantially larger than GAAP R_s^2.

Panel B of Table 8 shows the regression estimates for IFRS R&D capitalizers and non-capitalizer. The difference in price informativeness (coefficient of M/A) is once more striking: the coefficient of R&D capitalizers in all three future years are substantially higher than of non-capitalizers, as are the regressions' R_s^2. Panel C provides the estimates of the independent variables

with year interactions and industry dummies. Here too, IFRS M/A (share informativeness) coefficients are substantially larger than GAAP reporting coefficients.

We believe that a major reason for the (M/A) coefficient — or share price informativeness — differences is the value-relevant voluntary product-related disclosure by IFRS firms, a result consistent with our preceding tests. However, given that IFRS and GAAP reporters are different firms, we cannot rule out other factors making the share prices of IFRS reporters more predictive of future earnings than those of GAAP reporters. To alleviate some of these concerns we note that IFRS and GAAP reporters are fairly well matched on factors that affect share price informativeness: As shown in Panel B of Table 2, the revenue growth and R&D intensity of the two groups are virtually identical. The mean market-to-book ratio of IFRS and GAAP firms is also very close (2.96 vs. 3.00). Also recall that the earnings coefficients (E/A) of IFRS and GAAP firms — indicating earnings' predictive ability — are virtually identical (Panel A, Table 8). Moreover, the findings of Panel B (Table 8) relate to IFRS R&D capitalizers and non-capitalizers all trading on the Tel Aviv stock exchange, and have similar industry composition, and therefore seem to be quite similar except for the extra voluntary disclosure by the R&D capitalizers. And yet, the price informativeness of IFRS capitalizers is substantially higher than that of non-capitalizers. All this enhances our confidence that the extra voluntary disclosure by IFRS firms, and particularly by R&D capitalizers, is a major factor in the substantially higher share price informativeness.

8. Summary

We examine in this study our conjecture that IFRS' requirement to capitalize product development costs has a spillover effect on voluntary R&D-related disclosure, beyond the recognized capitalized values. The reason for this conjecture is that IFRS' R&D capitalization conditions require firms to collect and process extensive information concerning the feasibility of the developed products, the likelihood of their completion and marketability, among other strategic

information of considerable interest to investors, some or all of which managers may choose to disclose to investors.

For a sample of Israeli technology and science-based firms, some using IFRS and others US GAAP, we indeed document a considerable amount of voluntary disclosure by IFRS' R&D capitalizers, which is unmatched by GAAP users. Furthermore, we find that this R&D-related voluntary disclosure is value-relevant to investors beyond the recognized earnings and book values, and is associated with higher share price informativeness. We are also able to distinguish the types of voluntary disclosures by their value relevance. We thus identify a positive externality of a specific accounting regulation.

In the on-going debate about the merits of R&D (and intangible investments, in general) expensing versus capitalization, our finding of an important positive externality of capitalization should be of considerable interest to both standard-setters and researchers.

References

Aboody, D. and B. Lev, 2000. Information asymmetry, R&D and insider gains, *Journal of Finance* 55(6), 2747-2766.

Bai, J., T. Philippon, and A. Savov, 2014. Have financial markets become more informative? Working Paper, New York University.

Basu, S., 1997. The conservatism principle and the asymmetric timeliness of earnings. *Journal of Accounting and Economics* 24, 3–37.

Chen, E., Gavious, I. and Yosef, R. (2013). "The Relationship between the Management of Book Income and Taxable Income under a Moderate Level of Book-Tax Conformity". *Journal of Accounting, Auditing and Finance* 28(4): 323 – 347.

Christensen, H., and Nikolaev V., 2013, Does fair value accounting for non-financial assets pass the market test? Working Paper, the University of Chicago.

Collins, D., Maydew, E., Weiss, I., 1997. Changes in the value-relevance of earnings and book values over the past forty years. *Journal of Accounting and Economics* 24, 39–67.

Core, J.E., Guay, W.R., Van Buskirk, A., 2003. Market valuations in the new economy: An investigation of what has changed. *Journal of Accounting and Economics* 34, 43-67.

Eng, L.L. and Mak, Y.T. Corporate governance and voluntary disclosure. *Journal of Accounting and Public Policy* 22 (4): 325-345.

Francis, J., Schipper, K., 1999. Have financial statements lost their relevance? *Journal of Accounting Research* 37, 320-352.

Guo, R., Lev, B. and Zhou, N., 2004. Competitive costs of disclosure by biotech IPOs. *Journal of Accounting Research* 42(2), 319-355.

Grossman, S., 1981. The informational role of warranties and private disclosure about product quality, *Journal of Law and Economics*, 461-83.

Hail, L., Leuz, C., Wysocki, P. 2010. Global Accounting Convergence and the Potential Adoption of IFRS by the United States: An Analysis of Economic and Policy Factors. *Accounting Horizon*, 24(3): 355-394.

Hall, L.A. and S. Bagchi–Sen. 2002. A study of R&D, innovation, and business performance in the Canadian biotechnology industry. *Technovation* 22(4), 231-244.

Hayn, C., 1995. The information content of losses. Journal of Accounting and Economics 20, 125–153.

Jamal, K., Bloomfield, R., Christensen H.E., Colson, R.H., Moehrle, S., Ohlson, J., Penman, S., Stober, T., Sunder, S., Watts, R.L. 2010. A Research-Based Perspective on the SEC's Proposed Rule—Roadmap for the Potential Use of Financial Statements Prepared in Accordance with International Financial Reporting Standards (IFRS) by U.S. Issuers. *Accounting Horizon*, 24(1), 139-147.

Jovanovic, B., 1982. Truthful disclosure of information, *Bell Journal of Economics*, 36-44.

Kim, Y., Li, H. and Li, S. 2012. Does eliminating the form 20-F reconciliation from IFRS to US GAAP have capital market consequences? *Journal of Accounting and Economics* 53 (1-2): 249-270.

Leuz, C., 2003. IAS versus U.S. GAAP: information asymmetry-based evidence from Germany's new market. *Journal of Accounting Research* 41, 445-472.

McKinnon, J.L., Dalimunthe, L., 1993. Voluntary disclosure of segment information by Australian diversified companies. *Accounting and Finance* 33 (1), 33–50.

Mitchell, J.D., Chia, C.W.L., Loh, A.S., 1995. Voluntary disclosure of segment information: Further Australian evidence. *Accounting and Finance* 35 (2), 1–16.

Ohlson, J. A., 1995, Earnings, Book Value and Dividends in Security Valuation, *Contemporary Accounting Research*, 11, 661-687.

Schadewitz, H.J., Blevins, D.R., 1998. Major determinants of interim disclosures in an emerging market. *American Business Review* 16 (1), 41–55.

Thornhill, S., 2006. Knowledge, innovation and firm performance in high- and low-technology regimes. *Journal of Business Venturing* 21(5), 687-703.

Verrecchia, R., 1983. Discretionary disclosure, *Journal of Accounting and Economics*, 179-94.

Vincente-Lorente, J. 2001, Specificity and opacity as resource-based determinants of capital structure: evidence from Spanish manufacturing firms, *Strategic Management Journal* 22(2), 157-177.

Appendix A: Examples of voluntary disclosure from sample firms' financial statements

A description of human capital:

Division	At the time of publishing this report		On 31st December 2010	
	Employees	Service Providers	Employees	Service Providers
Sales, marketing, operations, and business development	5	1	6 (1 part time)	1
Management, finance, and administration	1	3	3 (1 part time)	1
R&D, production and logistics (including chief scientist and regulation)	1 part time	2	2 (1 part time)	1
Total	7	6	11	3

Dr. Benyamin Gavish – 20 years of experience researching small blood vessels and how breathing influences the cardio-vascular system. Developed the company's technology and IP. Given his knowledge and experience in the area of developing the interactive breathing technology, the IP and the clinical development – which are of crucial importance to the company – we believe that if the need arises it would take a long time to find a suitable replacement for Dr. Gavish.

A description of protection of R&D innovations:

Our intellectual property assets are our principal assets. These assets include the intellectual property rights subsisting in our proprietary know-how and trade secrets underlying our predictive biology capabilities and discovery platforms, our patents and patent applications, particularly with respect to Compugen discovered molecules and utilities, and the copyrights subsisting in our software and related documentation. We seek to vigorously protect our rights and interests in our intellectual property. We expect that our commercial success will depend on, among other things, our ability to obtain commercially valuable patents, especially for our therapeutic and diagnostic product candidates, maintain the confidentiality of our proprietary know-how and trade secrets and otherwise protect our intellectual property.

Example of risk factors:

Development and manufacturing of advanced medical equipment by competitors – development of advanced medical equipment by the company's competitors, which can serve as suitable replacement/upgrades to our products could bite into the company's market share in its target markets.

Tightening product approval regulations by relevant regulatory bodies – the company's activities are influenced by the policies of various regulatory agencies regarding approval of its products in target markets, in such a way that delays in- or refusal to approve manufacture and sales of one of the company's products would have a negative impact on our financial results.

Uncertainty regarding patent awards and protection of intellectual property – the is no certainty that patent applications filed by the company will ultimately lead to granting of a patent and/or that there will be no attempt by a third party to challenge the company's previously registered patents, which could result in competitors introducing products that are identical to our own, and could harm the company's competitiveness even after marketing of products has begun.

Technological changes – the company's results are dependent on our ability to develop at any time new systems and products and sell them on a commercial basis. There is no guarantee that our R&D activity will bear fruit in a manner that will allow us to successfully compete with other products. Moreover, it is possible that even after a successful development and patenting cycle, third parties could develop alternative products with technological replacements that would enable them to bypass patent protections granted to the company and thus increase competition against our products and reduce expected profit margins.

Changes in regulation, permits, and global standardization – sales of the company's products are subject to various standards, global and regional. Changes in the regulatory environment regarding the company's products, including changes in compliance/non-compliance status for the company, could place various limitations on its activities, including permits for selling products in the future.

Regulations potentially affecting the R&D activities:

Regulation of Therapeutic Product Candidates
In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and implementing regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state and local statutes and regulations require the expenditure of substantial time and financial resources.
United States Review and Approval Processes
The results of product development, preclinical studies and clinical trials, along with descriptions of the manufacturing process, analytical tests conducted on the chemistry of the drug, proposed labeling, and other relevant information are submitted to the FDA as part of an NDA or BLA requesting approval to market the product for one or more indications

A description of the R&D activities:

Significant R&D projects nearing maturity or market entry relating to civilian applications: alongside continued development of the 40/40 series of detectors and introducing it to market, the company plans to strengthen the product's market penetration by improving manufacturing processes, completing compliance requirements, and continuing to reduce the prices of raw materials for the series. In addition, the company plans to expand this product lineup with the development of the 40/40 F detector which is a rapid detector that combines an explosion detector (military) with a civilian detector with a 15 meter range, that is intended for applications in explosive manufacturing or for areas where an explosion could occur and rapid detection is necessary without harming the sensitivity of the detector. In addition, the company has completed development of a line of accessories for the 40/40 product family.

The company has also begun to explore new and advanced technologies for developing gas detectors using cameras and volumetric analysis of gasses, and developing a fire camera with integrated multi-channel spectral analysis capabilities. Research in these two areas is conducted in partnership with external R&D firms. In addition, the company is nearing the final development stages of a series of gas detectors with improved performances.

Outlook for future developments in the coming year

The group will complete development of the 900 series gas detectors, capable of detecting Hydrocarbon (HC) gasses for the drilling rig and petrochemical industry sectors, with the goal of strengthening the group's position in the linear gas detector field. This detector will be a cheaper and better-performing alternative to detectors in the 200 and 300 lines.

At the same time, the company is working on expanding its technological capabilities in the field of optical sensing systems for detecting fires and gasses. Towards this aim, the company is in contact with a number of R&D firms with capabilities that are complementary to our own.

Schedule of research/development activities:

The company plans to begin commercial launch of the combined solution in the second half of 2012, following completion of clinical trial runs in the company's centers for excellence and completion of clinical development.

Trial results:

Additionally, we have leveraged our ability to manufacture high purity liquid AAT to develop the next generation of our AAT product, Inhaled AAT for AATD, which is in pivotal Phase II/III clinical trials in Europe and is entering Phase II clinical trials in the United States. If approved, Inhaled AAT for AATD will be the first AAT product that is not required to be delivered intravenously and, instead, is administered through an easy to use nebulizer in two short daily sessions. We believe that the non-invasive Inhaled AAT for AATD will increase patient convenience and reduce the need for patients to use intravenous infusions of AAT products, thereby further reducing the risk of infection, decreasing the need for clinic visits or nurse home visits and reducing medical costs**.**

Existing alliances/collaborations:
During December 2011 we entered into collaboration with BiolineRx for the purpose of developing and commercializing mutually selected Compugen discovered drug candidates that are not in our areas of focus, ranging from acute and chronic inflammatory diseases through cardiac diseases, retinopathy and cancer. According to this agreement, we will provide promising drug candidates, primarily peptides, which were identified using our predictive drug discovery platforms, while BiolineRx will develop these candidates through Phase II clinical trials, with the goal of ultimately licensing them to pharmaceutical companies for advanced clinical development and commercialization. This collaboration has been initiated with the mutual selection of three peptides discovered by Compugen.

A description of the amounts expensed on the R&D:

Research and development expenses were $56.8 million for the year ended December 31, 2010 compared to $42.2 million for the year ended December 31, 2009, representing an increase of approximately 35%. The increase was primarily attributable to higher employee related expenses of approximately $10.0 million due to additional headcount and merit increases, higher facility related expenses of approximately $1.9 million related to additional office space in Israel, higher share-based compensation of approximately $1.5 million associated with new share-based awards, and an increase in outsourcing expenses of approximately $1.1 million partially offset by a decrease in new product expenses of approximately $2.1 million primarily due to tapeout costs during 2009. We expect that research and development expenses will increase in absolute dollars in future periods as we continue to devote resources to develop new products, meet the changing requirements of our customers, expand into new markets and technologies and hire additional personnel.

A discussion of whether the R&D is related to other research and/or to existing products:

As part of the para-clinical and clinical testing the company performs on these drugs as described above, the company also carries out various development activities for possible companion and complementary products for our drugs, which grow out of the R&D activities carried out by the company. On September 24, 2007, the company announced that it had developed a blood test for measuring levels of Adenosine receptors (A3, the receptor targeted by the company's drugs) for candidate patients for treatment by the company's drugs. The company estimates that this blood test will raise the likelihood for successful trials of our drugs.

Discussion of the technical feasibility of completing the production of the intangible asset:

As of this report's publication date, StemEx is "fresh" product: it must arrive and be transplanted in the patient within no more than 18 hours after manufacturing is completed. This fact has crucial bearing on location of manufacturing sites and the overall logistical support network required at the stage of commercial production. At the end of 2010, in the course of the joint project, Gamida-Cell successfully proved the technological feasibility of producing a frozen StemEx product (henceforth: the frozen product), which would have long-term durability and would allow

flexibility in the timeframe between finishing production and the implantation procedure, and as a result would lead to reduction of manufacturing and distribution costs by making it possible to construct a central manufacturing center. In 2011, Gamida-Cell completed, in the course of the joint project, the main development process of the frozen product. However, Gamida-Cell is working to complete various aspects relating to the development of the frozen product. During 2012, Gamid-Cell plans to continue working with the FDA in order to receive guidelines regarding the necessary clinical tests required for receiving approval for marketing the frozen product.

Availability of adequate financial resources:

We may need additional financing to operate or grow our business. We may not be able to raise additional financing for our capital needs on favorable terms, or at all, which could limit our ability to grow and to continue our longer term expansion plans.
We may need additional financing to operate our business or continue our longer term expansion plans. To the extent that we cannot fund our activities and acquisitions through our existing cash resources and any cash we generate from operations, we may need to raise equity or debt funds through additional public or private financings.

Firm's ability to use or sell the intangible asset:

There is no certainty that the use of the company's products will be possible in the future with any or all cellular phones on the market at a given time. Similarly, the is no assurance that use of the company's products will be possible in the future with any or all cellular phones on which they can be used today, including, but not limited to, in the case of technological changes that would prevent or limit in some form the use of the company's products in these devices. An inability to use the company's products in current or future cellular phones, including but not limited to, devices that can be used as of this report, could substantially harm the company, its forecasts and its future financial and/or business results. As of this report, it is impossible to predict the company's ability, or lack thereof, to adjust the use of its products to all or most of the cellular phones existing in the market or that may exist in the future.

Discussion of whether the product will generate probable future economic benefits:

Global pharmaceutical market potential and the company's products: management assesses that the effectiveness of the aforementioned drugs, on the one hand, and the optimum safety profile they have, on the other, give our drugs a potential for holding a large market share in the market for drugs for autoimmune diseases, cancer and eye diseases (with OphthaliX) which is estimated at tens of billions of USD. The company estimates, based on various studies, that the market for these drugs as of 2011 looks like this (in billions USD):

CF101		CF102	
Rheumatoid Arthritis	12.0	Liver Cancer	1
Psoriasis	3.5	Hepatitis C	6.0
Dry eye	2.0		
Glaucoma	3		
Crohn's	3.5		
Uveitis	0.3		

Demonstration of the existence of a market for the output of the asset or the intangible asset itself:

The primary field the company has operated in since its founding has been R&D of technologies and devices for non-pharmaceutical, non-invasive treatment of chronic diseases including hypertension, heart failure, sleep disorders and stress. Here follows a discussion of the hypertension (HTN) market, with a discussion of the need for effective non-pharmaceutical treatments. Hypertension, also referred to as "the silent killer", is one of the most prevalent diseases amongst the population at large and amongst the elderly in particular. In the US there are 75 million sufferers from the disease, and worldwide there are more than a billion. In Israel, for instance, around one million people suffer from the disease, and they represent 20% of the adult population. The total annual cost of treating HTN in the company's central market, the US, is estimated at USD 76.6 billion, of which 25 billion are spent on various antihypertensive drugs. Even before the redefinition of high blood pressure, the disease and its complications led to more US doctors' visits than any other disease. In addition, HTN is on average the most expensive disease for individual American patients themselves, who pay on average USD 550 per year to treat the disease, not including additional treatments covered by insurance companies.

Discussion of the degree of certainty attached to the flow of future economic benefits:

In order to increase our annual revenues, we must continue to achieve design wins over other InfiniBand and Ethernet providers and providers of competing interconnect technologies. We consider a design win to occur when an original equipment manufacturer, or OEM, or contract manufacturer notifies us that it has selected our products to be incorporated into a product or system under development. Because the life cycles for our customers' products can last for several years if these products have successful commercial introductions, we expect to continue to generate revenues over an extended period of time for each successful design win.

Timing of marketing or use:

According to a recent international study, the next six years (2011-2017) are predicted to see a significant growth in the market for AMI systems (smart meters). Expected shipments of smart meters are expected to grow from a level of approximately 550 thousand product units in 2011, to around 2300 million product units in 2016. The expected growth is due to regulatory influences, alongside a growth in research and development grants in the field of water conservation. Additionally, in the next 20 years demand for water is expected to rise by 40% - and as a result there will be pressure on owners of water utility companies to enforce more efficient monitoring of water usage through smart metering. According to the study, the growth in the smart meter market during the years 2010-2015 is expected to come primarily from countries in North America and Western Europe.

A description of how the product works:

Security Management Architecture (SMART) – A core component of our unified security architecture, SMART enables our customers to configure and manage security policies from a central administrative point. This technology enables the definition and ongoing management of security policies for enterprises of all sizes. This object-oriented architecture maps real-world entities, such as networks and users, to graphical representations that can be manipulated in a database. Integrated monitoring and reporting tools improve the manageability of the system by providing administrators with real-time information on the state of network and security systems. These tools also provide longer term trending information that is useful for periodic security management tasks, such as security audit.

A discussion of why the product is better than previous ones:

In addition to reselling our adapter cards, one of our major OEM customers has begun to embed our ConnectX VPI Ethernet and InfiniBand silicon devices directly on motherboards of a number of server and server blade products. This will increase the proliferation of our IB and Ethernet solutions in the market. Over time, we expect other major OEMs will similarly embed our high-speed interconnect products due to the market demand for higher I/O throughput and performance. We have established significant expertise with high-performance interconnect solutions from successfully developing and implementing multiple generations of our products. Our expertise enables us to develop and deliver products that serve as building blocks for creating reliable and scalable InfiniBand and Ethernet solutions with leading performance.

A discussion of why the product is better than competing products:

The following table shows the advantages and drawbacks of the company's product in comparison to competing products. The table also compares safety of the company's product with competing products.

Attributes	Company's product	Competing product – SEEK	Competing product – DynaVax	Competing product – Juvaris	Competing product – Sanofl-Pasteur
Universal Vaccination	Yes, based on preserved common peptides for flu viruses	Yes, based on synthetic peptides	Yes, based on whole proteins: M2e, NP	Yes, based on M2e protein and B-type flu	Yes, based on M2e protein
Regulatory Compliance	Yes (under the guideline of improving existing vaccines)	No	No	No	No
Harmfulness Testing	Vaccine is safe	Vaccine is safe	Vaccine is safe	Hasn't been tested on humans	Vaccine is safe

Discussion of the product structure:

We use our proprietary platform technology and know-how for the extraction and purification of proteins from human plasma to produce Alpha-1 Antitrypsin ("AAT") in a high purity, liquid form, as well as other plasma-derived proteins. AAT is a protein derived from human plasma with known and newly discovered therapeutic roles given its immuno-modulatory, anti-inflammatory, tissue protective and antimicrobial properties. Our flagship product, Glassia, is the first and only liquid, ready-to-use, intravenous plasma-derived AAT product approved by the United States Food and Drug Administration (the "FDA").

Indication of the useful life of the product:

The following table sets forth the components of intangible assets associated with the Protect Data development: Core technology (2) 107,000 5 years.

Discussion of future plans for research and development:

The company plans to enter this field with a modular platform for aggregation of a large number of Gigabit channels to several 10G channels. The main goal is to provide a compact product, similar to MetroStar – but with higher performance and a competitive price. This product is not meant to compete directly with similar products on the market, especially from large manufacturers, but to provide slightly reduced capabilities in exchange for a much lower price-

point. In addition, there will be large peripheral integration with the Falcon product family – enabling us to offer a complete solution. Under this platform, the company also plans to develop integration and connectivity modules for SDH networks.

R&D activities are slated to begin towards the end of 2012.

Disclosure of recently introduced product(s):

In the fourth quarter of 2009, the company launched a computerized “Self” (self-propelled, self-loading mixer), that was the first of its kind, henceforth: **Computerized Self** (“MIXELLENT”).

Disclosure of the percentage of total revenue generated by recently introduced products*:*

During the years 2010 and 2011, the Company received a total of $10 million for the achievement of the first two milestones in the License Agreement and an advance in respect of the Distribution Agreement in the amount of $20 million. The advanced payment related to the distribution right was recorded as deferred revenues and is recognized as revenues according to the actual products sales during the reporting period, divided by the total products sales achieved to date plus the expected products sales in the remaining Distribution Agreement period, which is expected to end in late 2015, with the start of production by Baxter. Non-refundable revenues due to the achievement of milestones were recognized upon reaching the milestone.

Appendix B: Scoring Procedure for the R&D Disclosure Index

The disclosure index is constructed for each firm by hand collecting relevant information from the annual financial statements. Information is derived for the following eight categories: Capitalization-related information, R&D activities, feasibility of completion, assessment of future benefits and market information, product specifications, target uses, future plans, and innovation revenues.

I. Capitalization-related information

1. Does the firm distinguish the research phase from the development phase to create an intangible asset? (yes=1; no=0)
2. Does the firm distinguish expenditures incurred within each phase? (yes=1; no=0)
3. Human capital information (Detailed description including names of key personnel and numbers=3; general description+ numbers= 2; brief description with no numbers= 1; none= 0)
4. Protection on R&D innovations (e.g., through patents, licenses, trademarks, intellectual property) (Detailed description= 3; general description= 2; brief description= 1; none= 0)
5. Risk factors related to R&D activities (Detailed description= 3; general description= 2; brief description= 1; none= 0)
6. Regulation potentially affecting the R&D activities (Detailed description= 3; general description= 2; brief description= 1; none= 0)

Subtotal I = total scores of (1+2+3+4+5+6)

II. R&D activities

1. A description of the R&D activities aimed at obtaining new knowledge or new products (Detailed description+numbers= 3; general description+ numbers= 2; brief description with no numbers= 1; none= 0)
2. Schedule of R&D activities (timing, duration, or frequency) (all of the three given=3; two of the three given=2; one of the three given=1; none given=0)
3. Trial results (Detailed = pro and cons +numbers (3); general = numbers (2); brief = no numbers (1); none (0))
4. Existing alliances/collaborations (2= name mentioned; 1=no name mentioned, 0= not mentioned)
5. Description of the amounts expensed on R&D (detailed components of R&D expenditures provided=1; detailed components of R&D expenditures not provided=0)

6. Is the R&D related to other R&D and/or to existing products (Detailed description = 3; general description = 2; brief description = 1; none= 0)

Subtotal II = total scores of (1+2+3+4+5+6)

III. Feasibility of Completion

1. The technical feasibility of completing the production of the intangible asset so that it may be available for use or sale (the firm presents a business plan that highlights the technical requirements and its ability to complete the production: detailed presentation=3; general presentation=2; brief presentation=1; none=0)
2. The availability of adequate financial resources to complete the development and use or sell the intangible asset (the firm presents a business plan that highlights the financial requirements and it's ability to source these resources: detailed presentation+numbers=3; general presentation+numbers=2; brief presentation with no numbers=1; none=0)
3. The firm's intention to complete the intangible asset, and use or sell it (1=given; 0=absent)
4. The firm's ability to use or sell the intangible asset (detailed description=3; general description =2; brief description =1; none=0)

Subtotal III = total scores of (1+2+3+4)

IV. Assessment of Future Benefits and Market Information

1. Will the intangible asset generate probable future economic benefits?
   (a) Is the product/service expected to generate revenues from its sale (detailed description=2; general description =1; none=0)
   (b) Is the product/service expected to result in cost savings (detailed description=2; general description =1; none=0)
   (c) Is the product/service expected to generate other income different from the use of the asset by the entity? (detailed description=2; general description =1; none=0)

2. How will the intangible asset generate probable future economic benefits?
   (a) The firm demonstrates the existence of a market for the output of the asset or the intangible asset itself (Detailed description+numbers= 3; general description+ numbers= 2; brief description with no numbers= 1; none= 0)
   (b) In the event that the asset will be used internally, the firm demonstrates the usefulness

of the intangible asset (detailed description=3; general description =2; brief description =1; none=0).

3. The degree of certainty attached to the flow of future economic benefits attributable to the use of the asset (2= reliable evidence provided (e.g., evidence from external sources, patent protection); 1= unreliable evidence provided; none= 0).
4. The timing of marketing or use (dates and duration) (both dates and duration given=2; one of the two given=1; none given=0)

Subtotal IV = total scores of (max (1a, 1b, 1c)+ max (2a, 2b)+3+4)

V. Product Specifications

1. How does the product work? (3 points = three sentences; 2 points = two sentences; 1= one sentence; 0= none)

2a. Why is it better than previous products? (2= name mentioned; 1=no name mentioned, 0= no discussion)

2b.Why is it better than competing products? (2= name mentioned; 1=no name mentioned, 0= no discussion)

3. What is the product structure (chemical/biological/technological etc.)? (2= detailed discussion; 1= general discussion; 0 = not mentioned)

4. What is the useful life of the product:

(a) The period during which the firm expects to use or generate benefits from the product (1=given; 0=absent)

(b) The number of production or similar units expected to be obtained from the product (1=given; 0=absent).

Subtotal V= total scores of (1+max(2a, 2b)+3+ max(4a, 4b))

VI. Target uses

1. What kind of consumers/needs does the product target/fulfill? (2= specific consumers/needs mentioned; 1= specific consumers/needs not mentioned; 0= no discussion)
2. What are the other possible uses of the product? (2= specific consumers/needs mentioned; 1= specific consumers/needs not mentioned; 0= no discussion)

Subtotal VI= max (1,2)

VII. Future Plans

1. Future plans for research and development activities:
   (a) Planned date (1 = mentioned; o= not mentioned)
   (b) A description of the planned research and development activities aimed at obtaining new knowledge or new products (Detailed description+numbers= 3; general description+ numbers= 2; brief description with no numbers= 1; none= 0)
   (c) Duration (1 = mentioned; o= not mentioned)
   (d) Possible alliances (2= name mentioned; 1=no name mentioned, 0= not mentioned)

2a. Is there any plan to try the product for other uses? (2= use mentioned; 1=use not mentioned, 0= no discussion)

2b. Is there any plan to try the product with other products? (2= name mentioned; 1=no name mentioned, 0= no discussion)

Subtotal VII= total scores of (1a+1b+1c+1d+max(2a, 2b))

VIII. Innovation Revenues

1. Does the firm have product(s) that were recently introduced to the market? (1= no; 0= yes)
2. Does the firm disclose the percentage of total revenue generated by recently introduced products (yes= 1; no= 0)

Subtotal VIII= max(1, 2)

Table1: Sample-Selection Procedure

	No. of firms		
	Pooled	IFRS firms	US GAAP firms
Israeli high-technology firms listed in the Israel Venture Capital (IVC) Online database	186	120	66
Excluding firms with no R&D	5	3	2
Excluding firms with insufficient *Bloomberg* data	1	1	0
Final firm sample	180	116	64

Table 2: Summary Statistics

The sample consists of 798 Israeli high-tech firm-years: 497 observations of firms reporting in accordance with IFRS and 301 observations of firms reporting in accordance with US GAAP during the years 2007-2011.

Panel A: Industry Affiliation

	No. of firms			No. of firm-years		
Industry:	IFRS firms	US GAAP firms	Pooled	IFRS firms	US GAAP firms	Pooled
Life sciences	40 (35%)	14 (22%)	54 (30%)	156 (32%)	63 (21%)	219 (27%)
Computers and electronics	26 (22%)	12 (19%)	38 (21%)	46 (9%)	89 (30%)	135 (17%)
Software	8 (7%)	11 (17%)	19 (11%)	116 (23%)	59 (20%)	175 (22%)
Telecommunications	12 (10%)	20 (31%)	32 (18%)	40 (8%)	55 (18%)	95 (12%)
Other technologies	30 (26%)	7 (11%)	37 (20%)	139 (28%)	35 (11%)	174 (22%)
Total	116 (100%)	64 (100%)	180 (100%)	497 (100%)	301 (100%)	798 (100%)

Table 2: Continued

Panel B: Descriptive Statistics

Variable	No. of Obs.	Mean	25th Percentile	50th Percentile	75th Percentile	Std. Dev.
Pooled sample	798					
Total assets ($ millions)		108.089	8.668	31.613	103.292	240.118
Revenue growth%		0.274	0.045	0.105	0.283	0.489
R&D intensity		0.161	0.017	0.109	0.200	0.222
IFRS firms	497					
Total assets		70.975	5.784	16.294	57.540	171.356
Revenue growth%		0.268	0.076	0.101	0.280	0.429
R&D intensity		0.160	0.018	0.108	0.209	0.241
US GAAP firms	301					
Total assets		169.415***	12.145	50.288***	144.496	295.479
Revenue growth%		0.285	0.009	0.110	0.291	0.621
R&D intensity		0.162	0.014	0.111	0.183	0.208

Table 3: Disclosure Index Attributes

Total (subtotal) Scaled Disclosure Score is calculated by dividing the disclosure index, obtained by the scoring procedure in Appendix B, by the overall (category's) available scores of 68 for life sciences firms and 65 otherwise (Capitalization-related information - 14; R&D activities- 15 for life sciences firms and 12 otherwise; Feasibility of Completion- 10; Future Benefits and Market Information- 9; Product Specifications- 8; Target Uses- 2; Future Plans- 9; Innovation Revenues- 1). For each firm, information on the progress made in the product pipeline, the protection on R&D innovation as well as venture capital backing is collected from the annual financial statements. Progress in Product Pipeline is a binary variable that equals to 1 if the firm has disclosed that a progress was made in its products pipeline, and 0 otherwise. Protection on R&D Innovation is a binary variable that equals to 1 if the firm has protected its R&D innovations (e.g., through patents, licenses, trademarks, intellectual property), and 0 otherwise. *Venture Backing* is a binary variable that equals 1 for firms backed by venture capitalists, and 0 otherwise. Ownership Concentration is the percentage share ownership of managers, directors and 5% or greater beneficial owners. *Firm Size* is the firm's total market value (in $ millions). *** and * indicate that the difference between IFRS and US GAAP firms is significant at the 1% and 10% level, respectively.

Panel A - Pooled Sample

Variable	**No. of Obs.**	**Mean**	**25th Percentile**	**50th Percentile**	**75th Percentile**	**Std. Dev.**
Scaled Disclosure Score- Total	798	0.46	0.30	0.44	0.62	0.19
By subtotals of disclosure:						
Capitalization-related information	798	0.54	0.43	0.57	0.71	0.22
R&D activities	798	0.43	0.25	0.41	0.60	0.25
Feasibility of Completion	798	0.37	0.20	0.30	0.50	0.21
Future Benefits and Market Information	798	0.39	0.17	0.42	0.58	0.24
Product Specifications	798	0.58	0.38	0.63	0.88	0.26
Target Uses	798	0.88	1	1	1	0.26
Future Plans	798	0.24	0.00	0.11	0.33	0.26
Innovation Revenues	798	0.73	0	1	1	0.44
Progress in Product Pipeline	798	0.48	0	0	1	0.50
Protection of R&D Innovation	798	0.88	1	1	1	0.33
Venture Backing	798	0.52	0	1	1	0.50
Ownership Concentration	798	0.48	0.43	0.55	0.59	0.29
Firm Size	798	65.08	6.67	22.00	90.55	16.801

Table 3: Continued

Panel B - IFRS Firms

Variable	No. of Obs.	Mean	25th Percentile	50th Percentile	75th Percentile	Std. Dev.
Scaled Disclosure Score	497	0.50	0.34	0.48	0.66	0.21
By subtotals of disclosure:						
Capitalization-related information	497	0.55	0.36	0.57	0.71	0.22
R&D activities	497	0.46	0.25	0.42	0.67	0.27
Feasibility of Completion	497	0.39	0.20	0.40	0.50	0.23
Future Benefits and market information	497	0.43	0.25	0.50	0.67	0.25
Product Specifications	497	0.61	0.38	0.63	0.88	0.28
Target uses	497	0.87	1	1	1	0.276
Future Plans	497	0.28	0.00	0.22	0.44	0.28
Innovation Revenues	497	0.74	0	1	1	0.44
Progress in Product Pipeline	497	0.50	0	1	1	0.50
Protection of R&D Innovation	497	0.85	1	1	1	0.35
Venture Capital	497	0.50	0	0	1	0.50
Ownership Concentration	497	0.51	0.47	0.55	0.61	0.28
Firm Size	497	40.02	4.93	14.64	65.3	10.82

Table 3: Continued

Panel C – US GAAP Firms

Variable	No. of Obs.	Mean	25th Percentile	50th Percentile	75th Percentile	Std. Dev.
Scaled Disclosure Score	301	0.38	0.24	0.36	0.46	0.15
By subtotals of disclosure:						
Capitalization-related information	301	0.53	0.43	0.57	0.64	0.21
R&D activities	301	0.37	0.25	0.33	0.50	0.21
Feasibility of Completion	301	0.32	0.20	0.30	0.40	0.17
Future Benefits and market information	301	0.31	0.17	0.33	0.42	0.20
Product Specifications	301	0.54	0.38	0.50	0.75	0.23
Target uses	301	0.89	1	1	1	0.25
Future Plans	301	0.17	0.00	0.11	0.22	0.20
Innovation Revenues	301	0.67	0	1	1	0.45
Progress in Product Pipeline	301	0.38	0	0	1	0.49
Protection of R&D Innovation	301	0.92	1	1	1	0.27
Venture Capital	301	0.55	0	1	1	0.50
Ownership Concentration	301	0.44	0.33	0.52	0.57	0.31
Firm Size	301	106.45	22.00	51.71	134.50	24.32

Table 3: Continued

Panel D – Differences between IFRS and US GAAP firms

Variable	Mean	Median
Scaled Disclosure Score	0.12*** (t=5.738)	0.12*** (z=5.334)
By subtotals of disclosure:		
Capitalization-related information	0.02 (t=1.052)	0.00 (z=1.021)
R&D activities	0.09*** (t=5.688)	0.09*** (z=4.878)
Feasibility of Completion	0.07*** (t=4.667)	0.10*** (z=4.202)
Future Benefits and market information	0.12*** (t=7.084)	0.17*** (z=6.835)
Product Specifications	0.07 (t=0.596)	0.13 (z=0.596)
Target uses	-0.02 (t=1.292)	0.00 (z=1.547)
Future Plans	0.11*** (t=6.027)	0.11*** (z=5.499)
Innovation Revenues	0.07*** (t=5.489)	0.00 (z=0.596)
Progress in Product Pipeline	0.12*** (t=4.612)	1.00*** (z=4.560)
Protection on R&D Innovation	-0.07*** (t =-2.853)	-0.00*** (z=-2.841)
Venture Capital	-0.05 (t =-1.504)	-1.00 (z =-1.503)
Ownership Concentration	0.07 (t =-1.116)	0.03 (z =-1.022)
Firm Size	-66.43*** (-5.775)	-37.07*** (-10.205)

Table 4: Patterns of voluntary disclosure over time

This table presents mean scaled disclosure scores by year over the sample period. Panel A shows the total scores for the subsamples of IFRS and US GAAP firms. Panels B and C show the annual subtotals for IFRS and for US GAAP firms, respectively. *** and ** indicate that the differences in the respective scores between 2007 and 2011 are significant at the 1% and 5% level, respectively.

Panel A: Mean scaled disclosure score by year: a difference-in-difference analysis

	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**Difference 2006-2007**	**Difference 2007-2011**
IFRS	0.380	0.449	0.471	0.500	0.518	0.549	0.069*** (t=2.27)	0.100*** (t=2.74)
US GAAP	0.382	0.380	0.374	0.373	0.391	0.386	0.004 (t=0.32)	0.006 (t=0.45)
Difference-in-differences							0.065*** (t=2.58)	0.094*** (t=2.99)

Panel B: Subtotal scaled disclosure scores by year- IFRS firms

	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**Difference 2006-2007**	**Difference 2007-2011**
Capitalization-related information	0.469	0.518	0.509	0.549	0.571	0.587	0.049*** (t=2.89)	0.069*** (t= 3.08)
R&D activities	0.380	0.440	0.461	0.456	0.484	0.485	0.060*** (t=5.41)	0.045*** (t= 6.28)
Feasibility of Completion	0.319	0.367	0.374	0.393	0.406	0.410	0.048*** (t=5.06)	0.043*** (t= 5.47)
Future Benefits and market information	0.325	0.407	0.426	0.421	0.439	0.444	0.082*** (t=4.62)	0.037*** (t= 5.65)
Product Specifications	0.531	0.570	0.597	0.618	0.640	0.625	0.039 (t=3.11)	0.055*** (t= 2.75)
Target uses	0.802	0.857	0.838	0.875	0.895	0.895	0.055*** (t=2.99)	0.038*** (t= 3.12)
Future Plans	0.186	0.272	0.299	0.271	0.268	0.294	0.086*** (t=5.13)	0.022*** (t= 3.45)
Innovation Revenues	0.643	0.675	0.711	0.750	0.768	0.782	0.032*** (t=4.76)	0.106*** (t= 5.45)

Table 4: Continued

Panel C: Subtotal scaled disclosure scores by year- US GAAP firms

	2006	**2007**	**2008**	**2009**	**2010**	**2011**	**Difference 2006-2007**	**Difference 2007-2011**
Capitalization-related information	0.505	0.514	0.518	0.521	0.523	0.528	0.009 (t=0.43)	0.014 (t= 0.30)
R&D activities	0.373	0.369	0.358	0.365	0.378	0.357	-0.004 (t=-0.29)	-0.012 (t= -0.88)
Feasibility of Completion	0.330	0.325	0.308	0.330	0.316	0.326	-0.005 (t=-0.18)	0.001 (t= 0.59)
Future Benefits and market information	0.319	0.316	0.329	0.292	0.302	0.322	-0.003 (t=-0.95)	0.005 (t= 1.17)
Product Specifications	0.527	0.533	0.540	0.543	0.540	0.535	0.006 (t=1.01)	0.002 (t= 0.96)
Target uses	0.870	0.919	0.906	0.891	0.875	0.887	0.049 (t=1.12)	-0.032 (t= -0.64)
Future Plans	0.169	0.174	0.168	0.179	0.168	0.167	-0.005 (t=-0.82)	-0.007 (t=-1.01)
Innovation Revenues	0.642	0.700	0.676	0.638	0.660	0.669	0.058 (t=0.77)	-0.031 (t= -0.50)

Table 5: Firm Level Disclosure Scores

This table shows the difference in the scaled disclosure score of firms that have protected their R&D innovations versus firms that did not (panel A) and of firms that reported on a progress in their product pipeline versus firms that did not (panel B). The scaled disclosure score for each firm is calculated by dividing the disclosure index by overall available scores (68 for life sciences firms and 65 otherwise). *** indicates the two-tailed significance at the 1% level**.**

Panel A - Sample Firms Grouped by Protection vs. No Protection on R&D

		Pooled	**Protection on R&D**	**No Protection on R&D**	**Difference**
Full Sample					
No. (Percentage) of Obs.		798	699 (88%)	99 (12%)	
Mean Scaled Disclosure Score		0.46	0.49	0.22	T-test: 14.638***
Median Scaled Disclosure Score		0.44	0.45	0.20	Wilcoxon Z: 12.745***
IFRS Firms					
No. (Percentage) of Obs.		497	422 (85%)	75 (15%)	
Mean Scaled Disclosure Score		0.50	0.55	0.24	T-test: 12.437***
Median Scaled Disclosure Score		0.48	0.54	0.23	Wilcoxon Z: 10.640***
US GAAP Firms					
No. (Percentage) of Obs.		301	277 (92%)	24 (8%)	
Mean Scaled Disclosure Score		0.38	0.40	0.14	T-test: 10.461***
Median Scaled Disclosure Score		0.36	0.37	0.13	Wilcoxon Z: 8.165***

Table 5: Continued

Panel B - Sample Firms Grouped by Progress in the Product Pipeline

		Pooled	**Progress in Pipeline**	**No Progress in Pipeline**	**Difference**
Full Sample					
No. (Percentage) of Obs.		798	356 (44%)	442 (56%)	
Mean Scaled Disclosure Score		0.46	0.57	0.36	T-test: 17.709***
Median Scaled Disclosure Score		0.44	0.58	0.35	Wilcoxon Z: 15.328***
IFRS Firms					
No. (Percentage) of Obs.		497	250 (50%)	247 (50%)	
Mean Scaled Disclosure Score		0.50	0.52	0.37	T-test: 13.888***
Median Scaled Disclosure Score		0.48	0.55	0.35	Wilcoxon Z: 12.046***
US GAAP Firms					
No. (Percentage) of Obs.		301	106 (35%)	195 (65%)	
Mean Scaled Disclosure Score		0.38	0.45	0.34	T-test: 10.123***
Median Scaled Disclosure Score		0.36	0.46	0.35	Wilcoxon Z: 8.876***

Table 6: Regressions of scaled disclosure scores on IFRS Dummy and Control determinants of disclosure

Scaled Disclosure Score =αo + α1 (*R&D Protection*) + α2 (*Progress of Product*) + α3 (*Venture Banking*) + α4 (*Ownership Concentration*) + α5 (*Firm Size*) +ε.

Scaled Disclosure Score for each firm is calculated by dividing the disclosure index by overall available scores (68 for life sciences firms and 65 otherwise). *R&D Protection* is a binary variable that equals to 1 if the firm has protected its R&D innovations (e.g., through patents, licenses, trademarks, intellectual property), and 0 otherwise. *Progress of Product* is a binary variable that equals to 1 if the firm has disclosed that a progress was made in its product pipeline, and 0 otherwise. *Venture Backing* is a binary variable that equals 1 for firms backed by venture capitalists, and 0 otherwise. *Ownership Concentration* is the percentage share ownership of managers, directors and 5% or greater beneficial owners. *Firm Size* is the natural logarithm of the firm's total market value (in $ millions). We control in the regressions for industry and year fixed effects. In the pooled sample regression, presented in the table, we account for the differences between IFRS and US GAAP firms by including *IFRS dummy*. *IFRS dummy* is a binary variable that equals 1 if the firm reports in accordance with IFRS, and 0 if the firm reports in accordance with US GAAP. Entries are coefficients; t-statistics appear in parentheses. ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Variable	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Intercept	0.150*** (8.35)	0.324*** (33.24)	0.147*** (9.08)	0.195*** (7.10)
R&D protection	0.251*** (14.88)		0.208*** (13.33)	0.187*** (12.11)
Progress of product		0.125*** (9. 59)	0.103*** (8.60)	0.095*** (8.20)
Venture backing				0.066*** (6.59)
Ownership concentration				-0.001** (-2.68)
Firm Size	0.119*** (9.40)	0.098*** (7.61)	0.088*** (7.55)	0.087*** (7.69)
IFRS dummy	0.096*** (8.29)	0.050*** (5.26)	0.069*** (6.49)	0.075*** (7.16)
Adjusted R^2	0.331***	0.331***	0.456***	0.489***
No. of Obs.	798	798	798	798

Table 7: Price regressions on firm disclosure scores and control variables

Table 7 shows the regressions results of market value of equity on accounting variables and the scaled disclosure scores. The dependent variable is price per share five months after fiscal year-end; *BV* is book value of equity per share; *E* is earnings per share before R&D expense and extraordinary items; *RD* is annual R&D expense plus the change in capitalized R&D; and *DISCLOSURE* is the firm's scaled disclosure index. *IFRS* is a binary variable that equals 1 if the firm reports in accordance with IFRS, and 0 if the firm reports in accordance with US GAAP. Total (subtotal) Scaled Disclosure Score is calculated by dividing the disclosure index, obtained by the scoring procedure in Table 2, by the overall (category's) available scores of 68 for life sciences firms and 65 otherwise (Capitalization-related information- 14; R&D activities- 15 for life sciences firms and 12 otherwise; Feasibility of Completion- 10; Future Benefits and Market Information- 9; Product Specifications- 8; Target Uses- 2; Future Plans- 9; Innovation Revenues- 1). Entries are coefficients; t-statistics appear in parentheses. *** and * indicate significance at the 1% and 10% level, respectively.

	Total scaled disclosure score	**Sub-totals of scaled scores, by disclosure categories**
Intercept	-0.386*** (-2.96)	-0.576*** (-2.18)
IFRS	-0.471*** (-2.64)	-0.666* (-1.95)
BV	0.118*** (4.23)	0.096*** (3.31)
*BV*IFRS*	0.003 (0.10)	0.006 (0.20)
E	0.342*** (2.04)	0.350*** (2.12)
*E*IFRS*	-0.134 (-0.70)	-0.153 (-0.80)
RD	0.422*** (2.58)	0.458*** (2.74)
*RD*IFRS*	1.060*** (4.11)	0.818*** (3.10)
DISCLOSURE	0.557*** (2.46)	
*DISCLOSURE*IFRS*	0.859*** (3.31)	
Capitalization-RELATED INFORMATION		0.043 (0.12)
*Capitalization-RELATED INFORMATION *IFRS*		-0.451 (-1.01)
R&D ACTIVITIES		0.911*** (2.16)
*R&D ACTIVITIES*IFRS*		0.138 (0.27)
FEASIBILITY OF COMPLETION		1.342*** (3.19)
*FEASIBILITY OF COMPLETION*IFRS*		2.635*** (2.91)

Table 7: Continued

	Total scaled score of disclosure	**Sub-totals of scaled scores, by disclosure categories**
FUTURE BENEFITS		0.561*** (1.89)
*FUTURE BENEFITS*IFRS*		0.604*** (2.62)
PRODUCT SPECIFICATIONS		0.135 (0.42)
*PRODUCT SPECIFICATIONS*IFRS*		0.446 (1.13)
TARGET USES		0.056 (0.24)
*TARGET USES*IFRS*		-0.057 (-0.18)
FUTURE PLANS		0.121 (0.24)
*FUTURE PLANS*IFRS*		-0.235 (-0.53)
INNOVATION REVENUES		0.919*** (3.93)
*INNOVATION REVENUES*IFRS*		1.477*** (1.98)
Adjusted R^2	0.573***	0.599***
No. of Obs.	696	696

Table 8: Future earnings regressions on current earnings and market values

Table 8 shows the regressions results of future earning on market cap and current earnings. as well as on The dependent variable is operating earnings *(EBIT)* for year t+1, t+2, and t+3, separately, scaled by total assets for year t; *Log[MV(t)/TA(t)]* is the natural log of the firm's market value as of the end of March following the firm's fiscal year end scaled by total assets; and *EBIT(t)/TA(t)* is EBIT scaled by total assets. The regressions include controls for year and industry fixed effects. In panel C we further interact the two independent variables, *Log[MV(t)/TA(t)]* and *EBIT(t)/TA(t)*, with the year indicator variables (*Y2007, Y2008, Y2009, Y2010 and Y2011*). *I_Life sciences, I_Computers&electronics, I_Software, I_Telecommunications,* and *I_Other technologies* are the industry indicator variables. Entries are coefficients; t-statistics appear in parentheses. *** and * indicate significance at the 1% and 10% level, respectively.

Panel A: IFRS versus US GAAP- Pooled samples

	IFRS			**US GAAP**		
	EBIT(t+1)/ TA(t)	***EBIT(t+2)/ TA(t)***	***EBIT(t+3)/ TA(t)***	***EBIT(t+1)/ TA(t)***	***EBIT(t+2)/ TA(t)***	***EBIT(t+3)/ TA(t)***
Intercept	0.044*** (T=2.93)	0.023*** (T=3.99)	0.015*** (T=3.19)	0.041*** (T=2.98)	0.013*** (T=3.25)	0.009* (T=1.83)
Log[MV(t)/TA(t)]	0.241*** (T=2.14)	0.472*** (T=2.66)	0.587*** (T=3.20)	0.008* (T=1.77)	0.015** (T=1.89)	0.020** (T=1.99)
EBIT(t)/TA(t)	0.191*** (T=2.80)	0.115*** (T=2.95)	0.114*** (T=2.66)	0.199*** (T=3.07)	0.118*** (T=4.25)	0.117*** (T=4.11)
Adjusted R2	0.428	0.472	0.321	0.223	0.261	0.199
No. of Obs.	497	497	497	301	301	301

Panel B: IFRS capitalizers versus non-capitalizers

	Capitalizers			**Non-capitalizers**		
	EBIT(t+1)/ TA(t)	***EBIT(t+2)/ TA(t)***	***EBIT(t+3)/ TA(t)***	***EBIT(t+1)/ TA(t)***	***EBIT(t+2)/ TA(t)***	***EBIT(t+3)/ TA(t)***
Intercept	0.069*** (T=3.10)	0.039*** (T=3.29)	0.026*** (T=3.08)	0.040*** (T=2.88)	0.022*** (T=4.41)	0.015*** (T=2.56)
Log[MV(t)/TA(t)]	0.333*** (T=3.66)	0.535*** (T=6.36)	0.651*** (T=6.62)	0.205*** (T=2.64)	0.309*** (T=3.53)	0.419*** (T=3.99)
EBIT(t)/TA(t)	0.136*** (T=8.41)	0.124*** (T=7.02)	0.112*** (T=6.49)	0.125*** (T=2.93)	0.121*** (T=3.59)	0.114*** (T=3.45)
Adjusted R2	0.489	0.494	0.331	0.359	0.457	0.302
No. of Obs.	198	198	198	299	299	299

Table 8: Continued

Panel C: IFRS versus US GAAP- Pooled samples including interactions with time

	IFRS			**US GAAP**		
	EBIT(t+1)/ TA(t)	***EBIT(t+2)/ TA(t)***	***EBIT(t+3)/ TA(t)***	***EBIT(t+1)/ TA(t)***	***EBIT(t+2)/ TA(t)***	***EBIT(t+3)/ TA(t)***
*Log[MV(t)/TA(t)]*Y2007*	0.120**	0.470***	0.555***	0.009*	0.019**	0.026**
*Log[MV(t)/TA(t)]*Y2008*	0.031*	0.136**	0.297***	0.008*	0.012**	0.013**
*Log[MV(t)/TA(t)]*Y2009*	0.150***	0.329***	0.491***	0.009*	0.019**	0.024**
*Log[MV(t)/TA(t)]*Y2010*	0.219***	0.489***	0.592***	0.011*	0.020**	0.025**
*Log[MV(t)/TA(t)]*Y2011*	0.474***	0.888***	0.947***	0.006*	0.010*	0.013**
*EBIT(t)/TA(t)*Y2007*	0.203***	0.310***	0.180***	0.118***	0.194***	0.201***
*EBIT(t)/TA(t)*Y2008*	0.193***	0.114***	0.062*	0.260***	0.155***	0.128***
*EBIT(t)/TA(t)*Y2009*	0.320***	0.124***	0.063**	0.059**	0.029**	0.028**
*EBIT(t)/TA(t)*Y2010*	0.252***	0.132***	0.116***	0.060**	0.031**	0.030**
*EBIT(t)/TA(t)*Y2011*	0.119***	0.088***	0.114***	0.299***	0.154***	0.112***
I_Life sciences	0.039***	0.020***	0.017***	0.039***	0.012***	0.037**
I_Computers&electronics	0.011**	0.005	0.008*	0.030***	0.015***	0.022**
I_Software	0.055**	0.025**	0.015*	0.051***	0.016***	0.006*
I_Telecommunications	0.077***	0.045***	0.023***	0.030***	0.010**	0.025**
I_Other technologies	0.028**	0.013*	0.019**	0.059***	0.014***	0.009*
Adjusted R2	0.593	0.603	0.518	0.454	0.487	0.428
No. of Obs.	497	497	497	301	301	301