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## R&D disclosures and informativeness of future earnings

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## Literature review - motivation

- Investment in R&D is important to company value as a significant driver for future earnings (Chen et al., 2014; Curtis et al., 2020; Kreß et al. 2019; Mazzi et al., 2019), but R&D's benefits are intrinsically hard to predict (Amir et al., 2007; Kothari et al., 2002; Wyatt, 2008).
- Prior archival studies in the US document favourable market outcomes to R&D related disclosures.
  - Product-related disclosures in IPO prospectuses decrease information asymmetry (Guo et al., 2004)
  - Disclosures of biotech firms regarding the uncertainty associated with R&D are priced positively by investors (Xu et al., 2007)
  - R&D disclosures by R&D intensive firms lead to lower forecast errors (Jones, 2007)
  - R&D disclosure improves analyst following, earnings forecast accuracy, earnings forecast dispersion and the information content of 10-K filings (Merkley, 2014)
- Limited evidence for firms reporting under IFRS
  - Chen et al. (2017) and Dinh et al. (2020): R&D disclosures are positively related to firm value, in Israeli and German settings respectively. However, this association is influenced differently by capitalised development costs across the two studies.
  - R&D disclosures in the annual report increase the cost of the equity financing (La Rosa and Liberatore, 2014)



## Context - I: Disclosure requirements under IAS 38

- IAS 38 Intangible Assets (1998) requires firms to recognise an internally generated intangible asset if, and only if, investment meets the criteria stipulated in Paragraph 57. Expenditure not meeting these criteria should be expensed as incurred.
- Firms should disclose (para. 118):
  - i) whether the useful life of the asset is indefinite or finite and, if finite, the useful life or the amortisation rate
  - ii) the amortisation method for assets with finite life;
  - iii) the gross carrying amount and any accumulated amortisation;
  - iv) the line item(s) of the statement of comprehensive income in which any amortisation of intangible assets is included; and
  - v) reconciliation of the carrying amount at the beginning and end of the period.
- Firms should disclose the aggregate amount of R&D expenditure recognised as an expense (para. 126)
- Companies are *encouraged* but not *required* to disclose is “a brief description of significant intangible assets ...not recognised as assets because they did not meet the recognition criteria” (Para. 128)



## Context - II: National regulations in relation to R&D disclosures

European firms are required to “*give an indication of... activities in the field of research and development*” (Section 9 Article 46 of the Fourth Directive 78/660/EC, which refers to the contents of management report)

GAS 15 “Management Reporting” effective from 2005, and GAS 20 “Non-Financial Reporting”, effective from 2012, both mandate R&D disclosures (Dinh et al., 2020): *firms are required to disclose inputs and outputs of R&D activities along with R&D-related co-operations and employees*

Country	Regulation effective	Source	Regulation in place
Australia		Regulatory Guide RG 247	No national regulation requiring companies to explicitly discuss R&D activities.
Belgium	Prior to sample selection	CBN advice 138-4	National regulation requires companies to discuss or report financial information on R&D activities, albeit at a very generic level.
Canada		Canadian Securities Administrations 52-109	No national regulation requiring companies to explicitly discuss on R&D activities.
China	Prior to sample selection and subsequently to 2012	No. 2 Standard on the Content and Format of Information Disclosure for Publicly Issued Securities Companies - Content and Format of Annual Reports Article 27I	From 2001, companies to discuss or report financial information on R&D activities, albeit at a very generic level. From 2012, national regulation provides more detailed requirements for quantitative and/or qualitative disclosures around R&D activities.
Denmark	Prior to sample selection	LBK no. 196 of 23/03/2004	National regulation requires companies to discuss or report financial information on R&D activities, albeit at a very generic level.
Finland	2016	Accounting Act 1336/1997	National regulation requires companies to provide information on the scope and extent of the R&D activities.
France	Prior to sample collection	CNC 138-4 and L232-1 Code du Commerce	National regulation requires companies to discuss or report financial information R&D activities, albeit at a very generic level.

### Research question:

Do R&D disclosures enable investors to better understand the value and future benefits arising from R&D and, therefore, assist them to better anticipate future earnings?



## Hypothesis development

- Primary purpose of disclosure is “to inform investors about the amount, timing, and uncertainty of future cash flows” (Gelb & Zarowin, 2002, p. 34).
- Management has information that can help investors to estimate future cash flows (Barker et al., 2022)
- Investors “will look around for further [such] information that will allow them to make better inferences” (Dargenidou et al., 2018, p. 485).
- Mazzi et al. (2022) report on their respective interviews with analysts that R&D disclosure assists in valuing a firm’s stock.
- UK Endorsement Board (UKEB, 2023) quote investors stating that more disclosure about intangibles in general is useful.

We conjecture that R&D disclosures enable investors to better understand the value and future benefits arising from R&D and, therefore, assist them to better anticipate future earnings

**H1:** *The association between current stock returns and firm future earnings increases as R&D disclosure levels increase.*

## Multivariate analysis

$$R_{i,t} = a_0 + b_1 E_{i,t+1} + b_2 E_{i,t} + b_3 E_{i,t-1} + b_4 R_{i,t+1} + \varepsilon_{i,t} \quad (1)$$

Lundholm and Myers (2002)

$$R_{i,t} = a_0 + b_1 E_{i,t+1} + b_2 E_{i,t} + b_3 E_{i,t-1} + b_4 R_{i,t+1} + b_5 E_{i,t+1} * LN\_DISC_{i,t} + b_6 E_{i,t} * LN\_DISC_{i,t} + b_7 E_{i,t-1} * LN\_DISC_{i,t} + b_8 R_{i,t+1} * LN\_DISC_{i,t} + LN\_DISC_{i,t} + CONTROLS + \varepsilon_{i,t} \quad (2)$$

(Gelb & Zarowin, 2002; Ettredge et al., 2005; Oswald & Zarowin, 2007; Hussainey & Walker, 2009; Dargenidou et al., 2011; Haw et al. 2012; Chou, 2013; Athanasakou & Hussainey, 2014; Moumen et al., 2016; Dargenidou et al., 2021)

- $R_{i,t}$  = annual stock return of firm  $i$  in year  $t$ , measured from nine months before the year end to three months after the year end;  $R_{i,t+1}$  represents the annual stock return of firm  $i$  in year  $t+1$ ;
- $E_{i,t}$  = firm's  $i$  earnings in year  $t$ ,  $E_{i,t-1}$  represents firm's  $i$  earnings in year  $t-1$ ; and  $E_{i,t+1}$  represents firm's  $i$  earnings in year  $t+1$ , scaled by the market value of equity measured at the firm's year end.
- $LN\_DISC_{i,t}$  is the natural logarithm of the frequency of R&D related terms
- Controls: *LENGTH*, *CAP*, *CORRUPTION*, *AUDENF*, *RD\_LAW*, *RD\_DIVERGENCE*, *ANTISELF\_DEAL*, *CIVCOM*, *IMR*
- Year/Industry fixed effects, SE clustered at the firm level

## Capturing R&D disclosure levels

Computerised content analysis of annual reports, capturing the number of times each firm refers to each keyword in the dictionary (e.g., Merkley, 2014; Oh et al., 2024)

*The dictionary: 119 R&D related terms*

- Mazzi et al. (2019b) for IFRS reporters (116 keywords), building on Merkley (2014) (68 keywords) for US firms, augmented by three additional keywords

We classify the keywords in four broad topics:

1. Research phase: 38 keywords (e.g., “research program”, “research finding”, “new project”, “preclinical data”);
2. Development phase: 54 keywords (e.g., “clinical trial”, “development cost”, “development phase”, “product development”, “new technology”);
3. Conditions for capitalisation: 16 keywords (e.g., “ability to use”, “generate future economic benefit”, “intention to complete”, “technical feasibility”);
4. Intellectual property: 11 keywords (e.g., “patents”, “invention”, “application(s) pending”, “innovation”).

## Validity of the research instrument (i.e., R&D disclosure)

“Validity relates to how well the results of a study mirror reality” (Jones & Shoemaker, 1994, p. 5). In our case, this translates to how well R&D disclosures reflect actual R&D activity levels and hence related discussion.

- Semantic validity
  - Mazzi et al. (2019b) discussed the content of the research instrument with two experienced professionals.
  - We received and considered detailed feedback from six experienced professionals in relation to the four topics.
- Construct and hypothesis validity
  - Tests the association of R&D disclosure with common variables identified in prior relevant literature as significant determinants of R&D related disclosures in other settings (e.g., Chen et al., 2017; Dinh et al., 2020; La Rosa & Liberatore, 2014; Merkley, 2014; Nekhili et al., 2016).
  - Given that R&D exhibits high levels of persistence and it is stable over the years (Childs & Triantis, 1999; Mañez & Love 2020), a firm’s R&D related disclosures in a given year ( $t$ ) should not only be correlated with R&D intensity in that year but should also be positively correlated with next year’s R&D intensity ( $t+1$ ).
- Predictive ability
  - Examines the association between R&D disclosure and future earnings to assess its predictive ability considering prior literature showing that R&D expenditure can positively predict future earnings (Curtis et al., 2020; Mazzi et al., 2019; Sougiannis, 1994).





## Sample selection & distribution

Firms in top 15 countries by R&D intensity, which have adopted or have converged their national standards to IFRS or permit firms to report under IFRS. The sample period is 2006 to 2015	31,212
Exclude firm-year observations:	
For which the data item indicating the accounting standards following is either missing or yields a non-IFRS code	(2,409)
Reporting under IFRS for the first time	(2,416)
That had their financial year end changed	(119)
Belonging in the Energy industry or the industry classification is missing	(238)
In which neither R&D expense nor R&D asset are reported in the financial statements	(6,688)
With missing firm-level data	(1,826)
With non-downloadable and non-processable annual report in English in PDF format	(11,045)
<b>Final sample [<math>t = 2006, 2015</math>] [firms = 1,491]</b>	<b>6,471</b>

Country	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Australia	39	56	57	69	84	71	75	67	73	55	646
Belgium	12	12	13	12	11	12	8	10	11	12	113
Canada	0	0	0	0	0	14	27	27	32	26	126
China	0	2	4	4	6	6	10	6	11	16	65
Denmark	15	20	19	17	18	24	15	16	13	13	170
Finland	26	36	37	38	32	27	28	19	18	14	275
France	45	51	60	50	62	60	51	46	50	60	535
Germany	94	119	114	120	127	124	112	111	118	117	1,156
Israel	0	0	3	3	3	6	2	4	3	5	29
Japan	0	0	0	0	1	1	1	2	1	3	9
Netherlands	12	14	13	23	20	23	18	19	15	13	170
Norway	7	12	12	17	13	15	15	13	14	11	129
Sweden	31	34	39	40	37	44	46	37	43	39	390
Switzerland	1	1	1	1	2	1	1	1	1	1	11
UK	179	230	315	310	319	310	276	247	242	219	2,647
<b>Total</b>	<b>461</b>	<b>587</b>	<b>687</b>	<b>704</b>	<b>735</b>	<b>738</b>	<b>685</b>	<b>625</b>	<b>645</b>	<b>604</b>	<b>6,471</b>

Industry	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Basic Materials	45	60	70	71	78	79	67	61	53	50	634
Consumer Discretionary	56	64	68	66	81	88	70	68	70	65	696
Consumer Staples	25	33	37	44	44	44	41	40	35	33	376
Financials	7	11	13	12	14	15	11	8	9	8	108
Health Care	75	96	118	119	119	114	115	117	131	125	1,129
Industrials	113	138	166	179	185	186	169	149	156	152	1,593
Real Estate	0	0	0	1	0	0	0	0	1	1	3
Technology	107	140	167	166	168	162	165	141	144	126	1,486
Telecommunications	21	34	36	35	30	33	31	29	34	34	317
Utilities	12	11	12	11	16	17	16	12	12	10	129
<b>Total</b>	<b>461</b>	<b>587</b>	<b>687</b>	<b>704</b>	<b>735</b>	<b>738</b>	<b>685</b>	<b>625</b>	<b>645</b>	<b>604</b>	<b>6,471</b>

## Descriptive statistics of R&D disclosure

Variable*	Mean	SD	25 <sup>th</sup> perc	Median	75 <sup>th</sup> perc
<i>Annual Report (AR)</i>					
LENGTH	55,481	75,946	29,307	43,336	68,306
DISC	58	265	19	36	67
LN_DISC	3.557	1.033	2.996	3.611	4.220
<i>Financial Statements (FS)</i>					
LENGTH	28,401	22,995	16,809	23,278	33,518
DISC	20	29	8	14	24
LN_DISC	2.654	0.902	2.197	2.708	3.219
<i>Narratives (NR)</i>					
LENGTH	27,080	56,928	10,811	19,469	34,508
DISC	39	243	8	19	43
LN_DISC	2.936	1.227	2.197	2.996	3.784
	Mean Diff.	t-stat		Median Diff.	z-stat
LENGTH_NR- LENGTH_FS	-1322***	-2.526		-3809***	-15.974
DISC_NR- DISC_FS	19***	6.780		5***	31.189
LN_DISC_NR- LN_DISC_FS	0.282***	22.672		0.288***	23.315

Keyword	Topic	AR	FS	NR
Patent*	Intellectual property	79,202	19,730	59,472
Research and development*	Development phase	62,421	24,991	37,430
Development cost	Development phase	53,810	21,138	32,672
Innovation	Intellectual property	42,489	17,515	24,974
R&D*	Development phase	32,940	13,209	19,731
Clinical trial	Development phase	18,760	5,610	13,150
Product development*	Development phase	10,771	1,524	9,247
Technical feasibility	Conditions for capitalisation	10,109	3,903	6,206
Internally generated	Conditions for capitalisation	6,903	2,969	3,934
Research development*	Development phase	5,526	1,003	4,523

Topic	Keyword	AR	FS	NR
Research phase	new project	1,888	414	1,474
	research phase	1,450	538	912
	research center*	1,048	338	710
	research project*	955	180	775
	research facility*	950	237	713
Development phase	research and development*	62,421	24,991	37,430
	development cost	53,810	21,138	32,672
	R&D*	32,940	13,209	19,731
	clinical trial	18,760	5,610	13,150
	product development*	10,771	1,524	9,247
	technical feasibility	10,109	3,903	6,206
Conditions for capitalisation	internally generated	6,903	2,969	3,934
	ability to use	4,165	1,158	3,007
	intention to complete	2,419	1,117	1,302
	generate future economic benefit	1,333	517	816
	patent*	79,202	19,730	59,472
Intellectual property	innovation	42,489	17,515	24,974
	invention	1,718	443	1,275
	applications pending*	85	11	74
	announced a collaboration*	80	28	52



## Informativeness of future earnings and R&D disclosure

	(1) <i>Base line</i>	(2) <i>AR</i>	(3) <i>FS</i>	(4) <i>NR</i>
Constant	-0.340** (-2.45)	-0.075 (-0.43)	-0.147 (-0.86)	-0.223 (-1.44)
<i>FUT_E<sup>w</sup></i>	0.238*** (7.31)	0.072 (0.83)	0.195** (2.35)	0.097 (1.36)
<i>CURR_E<sup>w</sup></i>	0.581*** (14.67)	0.614*** (4.99)	0.512*** (4.38)	0.659*** (6.76)
<i>LAG_E<sup>w</sup></i>	-0.370*** (-6.21)	-0.373** (-2.11)	-0.408** (-2.48)	-0.386*** (-2.76)
<i>FUT_R<sup>w</sup></i>	-0.012 (-0.89)	-0.097** (-2.19)	-0.104*** (-2.78)	-0.052 (-1.59)
<i>FUT_E<sup>w</sup>*LN_DISC</i>		0.050** (2.23)	0.016 (0.61)	0.056** (2.38)
<i>CURR_E<sup>w</sup>*LN_DISC</i>		-0.008 (-0.23)	0.027 (0.68)	-0.027 (-0.86)
<i>LAG_E<sup>w</sup>*LN_DISC</i>		0.003 (0.07)	0.016 (0.27)	0.008 (0.17)
<i>FUT_R<sup>w</sup>*LN_DISC</i>		0.024** (2.07)	0.034*** (2.64)	0.014 (1.41)
<i>LN_DISC</i>		0.002 (0.28)	-0.001 (-0.18)	0.003 (0.47)
<i>LENGTH</i>		-0.030** (-2.39)	-0.022* (-1.88)	-0.017* (-1.70)
<i>CAP</i>	0.029** (2.55)	0.026** (2.28)	0.027** (2.35)	0.026** (2.31)
<i>IMR</i>	0.329*** (8.67)	0.344*** (8.91)	0.337*** (8.81)	0.343*** (8.85)
<i>CORRUPTION</i>	-0.002** (-2.37)	-0.002* (-1.85)	-0.002** (-1.98)	-0.002** (-2.21)
<i>AUDENF</i>	0.002 (1.16)	0.003 (1.43)	0.003 (1.32)	0.003 (1.37)
<i>RD_LAW</i>	0.061*** (3.45)	0.065*** (3.69)	0.061*** (3.49)	0.067*** (3.78)
<i>RD_DIVERGENCE</i>	0.148*** (5.39)	0.160*** (5.78)	0.154*** (5.62)	0.157*** (5.70)
<i>ANTISELF_DEAL</i>	-0.108 (-1.47)	-0.131* (-1.78)	-0.117 (-1.59)	-0.122* (-1.66)
<i>CIVCOM</i>	-0.019 (-0.36)	-0.014 (-0.26)	-0.012 (-0.22)	-0.018 (-0.34)
Year/Industry FE	Yes	Yes	Yes	Yes
<i>FUT_E<sup>w</sup>*LN_DISC + FUT_R<sup>w</sup>*LN_DISC</i>		0.074***	0.050*	0.070***
Partial F-Test		6.61***	4.46**	5.09***
Observations	6,471	6,471	6,471	6,471
Adjusted R <sup>2</sup>	0.259	0.261	0.261	0.261
F	43.10	32.02	29.82	32.19

## Informativeness of future earnings and topics of R&D disclosure - I

Panel A. Full sample				
Topic of R&D disclosure	Coefficient	AR	FS	NR
Research phase	$\beta_1 FUT\_E^w$	0.209*** (5.16)	0.220*** (6.12)	0.217*** (5.75)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.049 (0.86)	0.079 (1.34)	0.048 (0.70)
Development phase	$\beta_1 FUT\_E^w$	0.094 (1.26)	0.184*** (2.96)	0.121* (1.94)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.053** (2.34)	0.027 (1.09)	0.058** (2.40)
Conditions for capitalisation	$\beta_1 FUT\_E^w$	0.154*** (3.43)	0.225*** (4.98)	0.184*** (5.01)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.085*** (2.83)	0.018 (0.43)	0.110*** (3.26)
Intellectual property	$\beta_1 FUT\_E^w$	0.169** (2.45)	0.238*** (3.87)	0.157*** (2.93)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.033 (1.39)	0.000 (0.01)	0.057** (2.52)

## Informativeness of future earnings and topics of R&D disclosure - I

**Panel A. Full sample**

Topic of R&D disclosure	Coefficient	AR	FS	NR
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Research phase	$\beta_5 FUT\_E^w * LN\_DISC$	0.049 (0.86)	0.079 (1.34)	0.048 (0.70)
	$\beta_1 FUT\_E^w$	0.094 (1.26)	0.184*** (2.96)	0.121* (1.94)
Development phase	$\beta_5 FUT\_E^w * LN\_DISC$	0.053** (2.34)	0.027 (1.09)	0.058** (2.40)
	$\beta_1 FUT\_E^w$	0.154*** (3.43)	0.225*** (4.98)	0.184*** (5.01)
Conditions for capitalisation	$\beta_5 FUT\_E^w * LN\_DISC$	0.085*** (2.83)	0.018 (0.43)	0.110*** (3.26)
	$\beta_1 FUT\_E^w$	0.169** (2.45)	0.238*** (3.87)	0.157*** (2.93)
Intellectual property	$\beta_5 FUT\_E^w * LN\_DISC$	0.033 (1.39)	0.000 (0.01)	0.057** (2.52)
Research and development phase	$\beta_1 FUT\_E^w$	0.097 (1.24)	0.184*** (2.90)	0.118* (1.84)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.051** (2.09)	0.027 (1.06)	0.058** (2.25)

## Informativeness of future earnings and topics of R&D disclosure: Capitalisers vs Expensers

Panel B. Expensers and capitalisers				
Topic of R&D disclosure	Coefficient	Expensers		
		AR	FS	NR
Total R&D disclosure (DISC)	$\beta_1 FUT\_E^w$	0.145 (1.07)	0.279* (1.93)	0.178* (1.66)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.035 (0.99)	-0.004 (-0.10)	0.031 (0.91)
Research phase	$\beta_1 FUT\_E^w$	0.288*** (4.39)	0.246*** (4.04)	0.298*** (4.72)
	$\beta_5 FUT\_E^w * LN\_DISC$	-0.028 (-0.33)	0.093 (1.27)	-0.052 (-0.51)
Development phase	$\beta_1 FUT\_E^w$	0.125 (1.16)	0.182** (2.08)	0.188** (2.03)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.051 (1.50)	0.044 (1.21)	0.036 (1.03)
Conditions for capitalisation	$\beta_1 FUT\_E^w$	0.152** (2.14)	0.233*** (3.28)	0.201*** (3.30)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.110*** (2.80)	0.056 (1.07)	0.104** (2.33)
Intellectual property	$\beta_1 FUT\_E^w$	0.240** (1.96)	0.326*** (2.92)	0.193** (2.17)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.011 (0.30)	-0.038 (-0.78)	0.049 (1.41)
Research and development phase	$\beta_1 FUT\_E^w$	0.148 (1.30)	0.179** (1.98)	0.197** (2.02)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.041 (1.09)	0.045 (1.19)	0.030 (0.77)

## Informativeness of future earnings and topics of R&D disclosure: Capitalisers vs Expensers

Panel B. Expensers and capitalisers							
Topic of R&D disclosure	Coefficient	Expensers			Capitalisers		
		AR	FS	NR	AR	FS	NR
Total R&D disclosure (DISC)	$\beta_1 FUT\_E^w$	0.145 (1.07)	0.279* (1.93)	0.178* (1.66)	-0.014 (-0.13)	0.105 (1.07)	0.017 (0.18)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.035 (0.99)	-0.004 (-0.10)	0.031 (0.91)	0.068** (2.30)	0.038 (1.15)	0.079*** (2.60)
Research phase	$\beta_1 FUT\_E^w$	0.288*** (4.39)	0.246*** (4.04)	0.298*** (4.72)	0.136*** (2.81)	0.192*** (4.63)	0.155*** (3.34)
	$\beta_5 FUT\_E^w * LN\_DISC$	-0.028 (-0.33)	0.093 (1.27)	-0.052 (-0.51)	0.139*** (2.76)	0.070 (0.71)	0.167*** (3.38)
Development phase	$\beta_1 FUT\_E^w$	0.125 (1.16)	0.182** (2.08)	0.188** (2.03)	0.036 (0.36)	0.160* (1.88)	0.050 (0.61)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.051 (1.50)	0.044 (1.21)	0.036 (1.03)	0.063** (2.06)	0.021 (0.63)	0.082** (2.51)
Conditions for capitalisation	$\beta_1 FUT\_E^w$	0.152** (2.14)	0.233*** (3.28)	0.201*** (3.30)	0.165*** (2.89)	0.218*** (3.99)	0.161*** (3.52)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.110*** (2.80)	0.056 (1.07)	0.104** (2.33)	0.045 (0.94)	-0.020 (-0.32)	0.113** (2.31)
Intellectual property	$\beta_1 FUT\_E^w$	0.240** (1.96)	0.326*** (2.92)	0.193** (2.17)	0.091 (1.12)	0.144** (2.13)	0.111* (1.70)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.011 (0.30)	-0.038 (-0.78)	0.049 (1.41)	0.056* (1.79)	0.043 (1.14)	0.067** (2.13)
Research and development phase	$\beta_1 FUT\_E^w$	0.148 (1.30)	0.179** (1.98)	0.197** (2.02)	0.021 (0.21)	0.163* (1.88)	0.039 (0.47)
	$\beta_5 FUT\_E^w * LN\_DISC$	0.041 (1.09)	0.045 (1.19)	0.030 (0.77)	0.067** (2.17)	0.020 (0.57)	0.086*** (2.68)



## Country level cross sectional tests

### ❖ *Corruption*

(Leventis et al., 2023; Xu et al., 2020; Elamer et al., 2019; Mazzi et al., 2019a; Mazzi et al., 2018; Baldini et al., 2018; Ioannou & Serafeim, 2012).

- R&D disclosure improves future earnings informativeness where corruption is low

### ❖ *Accounting and audit enforcement*

(Burgstahler et al., 2006; Lang et al., 2006; Leuz et al., 2003; Windisch, 2020)

- R&D disclosure assists investors to anticipate future earnings in the presence of enforcement

### ❖ *National regulation on R&D disclosure*

- The results on capitalisers hold irrespective of level of regulation





## Sensitivity tests

1. No firm controls and instead use year/industry/country fixed effects
2. Firm controls and country fixed effects
3. Additional control variables as main effect and interacted with future earnings
4. Exclude countries with less than 100 firm-year observations
5. Exclude UK firms
6. Exclude firm-year observations with earnings management incentives
7. Use of three year ahead of earnings and returns
8. Substitute  $\ln$  of frequency of R&D terms ( $LN\_DISC$ ) with proportion of R&D words to total number of words ( $DISC\_PROP$ )



## Contribution

- In contrast to prior (mostly US-based) studies, we focus on how well stock returns incorporate information about future earnings. This allows us to examine the informational efficiency of prices. More informationally efficient prices facilitate more efficient resource allocation (Durnev et al., 2003). Further, the US setting does not allow for considering the role of the capitalised development costs specified under IAS 38 and any influence this may have on related disclosures.
- Prior studies do not look at topics of R&D disclosures.
- Oswald and Zarowin (2007) and Dargenidou et al. (2021) examine whether capitalisation of development costs improves the market's ability to anticipate future earnings. However, none of the two studies examines or even controls for the potential informativeness of R&D related disclosures.
- Stream of literature that examines the effect of corporate disclosures more broadly on the share price anticipation of future earnings (e.g., Gelb & Zarowin, 2002; Lundholm & Myers, 2002; Dargenidou et al., 2011; Athanasakou & Hussainey, 2014; Schleicher et al., 2007; Wang & Hussainey, 2013; Ettredge et al., 2005). However, despite its importance, this literature has not examined whether R&D disclosure in particular assists investors to better anticipate future earnings.

## Policy implications

- First stage of IAS 38 potential revisions on “*the development of enhanced disclosure requirements, including disclosures about unrecognised intangible assets*” (IASB, 2022, para. 37).
  - Our evidence supports this project. R&D disclosures in notes of FS are minimal.
  - We propose introduction of disclosures on different “topics”
    - Points of departure can be:
      - Preamble to IAS 9 Research and Development Costs (revised in 1993) did state that “*further information which might usefully be provided could include a general description of the project, the stage which the project has reached, and the estimated future costs to complete it*” (para 14).
      - IAS 38, Para 128. “*a brief description of significant intangible assets ...not recognised as assets because they did not meet the recognition criteria*” (Para. 128)
      - UKEB (2024): usefulness of disclosure categories (i.e., topics) as rated by users
- Our findings also inform the Financial Accounting Standards Board’s (FASB) Accounting for and Disclosure of Intangibles project, which “*will consider potential ways to improve the accounting for and disclosure of intangibles, including internally developed intangibles and research and development*”



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## Appendix I - Descriptive statistics of the remaining variables

Variable	Mean	SD	25 <sup>th</sup> perc	Median	75 <sup>th</sup> perc
<i>CURR_R<sup>w</sup></i>	0.120	0.558	-0.238	0.043	0.342
<i>FUT_E<sup>w</sup></i>	-0.043	0.313	-0.026	0.044	0.073
<i>CURR_E<sup>w</sup></i>	-0.018	0.228	-0.019	0.046	0.075
<i>LAG_E<sup>w</sup></i>	-0.010	0.194	-0.021	0.046	0.075
<i>FUT_R<sup>w</sup></i>	0.130	0.560	-0.224	0.055	0.353
<i>CAP</i>	0.455	0.498	0.000	0.000	1.000
<i>IMR</i>	0.900	0.294	0.694	0.853	1.068
<i>CORRUPTION</i>	19.989	7.650	14.000	21.000	23.000
<i>AUDENF</i>	48.162	6.766	44.000	52.000	54.000
<i>RD_LAW</i>	0.988	0.618	1.000	1.000	1.000
<i>RD_DIVERGENCE</i>	0.805	0.396	1.000	1.000	1.000
<i>ANTISELF_DEAL</i>	0.645	0.289	0.333	0.757	0.950
<i>CIVCOM</i>	0.467	0.499	0.000	0.000	1.000

## Appendix I - Correlation Matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CURR_R <sup>w</sup> (1)	1															
LN_DISC_AR (2)	0.002	1														
LN_DISC_FS (3)	-0.011	0.823***	1													
LN_DISC_NR (4)	0.010	0.923***	0.596***	1												
FUT_E <sup>w</sup> (5)	0.217***	0.018	-0.037***	0.052***	1											
CURR_E <sup>w</sup> (5)	0.224***	-0.004	-0.064***	0.032**	0.413***	1										
LAG_E <sup>w</sup> (7)	-0.007	0.010	-0.049***	0.042***	0.288***	0.439***	1									
FUT_R <sup>w</sup> (8)	-0.011	0.003	0.005	0.002	0.257***	0.005	0.037***	1								
CAP (9)	0.015	0.006	0.098***	-0.046***	-0.003	0.058***	0.053***	0.008	1							
IMR (10)	0.053***	0.057***	-0.041***	0.092***	0.034***	0.007	0.003	-0.075***	-0.312***	1						
CORRUPTION (11)	0.005	0.084***	0.050***	0.096***	0.044***	0.036***	0.040***	0.046***	-0.009	0.043***	1					
AUDENF (12)	-0.024*	-0.250***	-0.174***	-0.259***	-0.077***	-0.082***	-0.095***	-0.014	0.041***	-0.127***	0.223***	1				
RD_LAW (13)	0.009	0.179***	0.057***	0.248***	0.083***	0.088***	0.082***	0.016	0.017	-0.057***	0.316***	-0.184***	1			
RD_DIVERGENCE (14)	-0.011	-0.171***	-0.071***	-0.209***	-0.069***	-0.076***	-0.077***	-0.004	0.073***	-0.241***	-0.207***	0.319***	-0.741***	1		
ANTISELF_DEAL (15)	-0.023*	-0.334***	-0.214***	-0.350***	-0.072***	-0.076***	-0.090***	-0.012	0.037***	-0.113***	0.193***	0.799***	-0.421***	0.559***	1	
CIVCOM (16)	0.019	0.345***	0.233***	0.364***	0.090***	0.093***	0.106***	0.012	-0.021*	0.065***	-0.080***	-0.855***	0.471***	-0.503***	-0.943***	1