
IASB® meeting

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Project	Post-implementation Review of IFRS 15—Revenue from Contracts with Customers
Topic	Review of academic literature
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Purpose and structure

1. This paper provides an overview of the academic literature relevant to the post-implementation review (PIR) of IFRS 15 *Revenue from Contracts with Customers*. The academic papers reviewed consist of:
 - (a) one paper presented at the International Accounting Standards Board (IASB)'s Research Forum in 2020;
 - (b) eighteen papers submitted to the joint conference of the IASB, Financial Accounting Standards Board (FASB) and *The Accounting Review* 'Accounting for an Ever-Changing World' in November 2022;
 - (c) one academic paper sent to staff by academics; and
 - (d) one paper identified through a search for papers on topics relevant to the PIR in databases of academic studies.
2. The summary of the academic literature is structured as follows:
 - (a) key messages;
 - (b) detailed research findings; and
 - (c) question for the IASB.

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3. The key messages and detailed research findings are based on academic papers that examine the implementation and application of both IFRS 15 and FASB's Accounting Standards Codification® Topic 606 *Revenue from Contracts with Customers* (Topic 606). This summary includes papers relevant to Topic 606 because:
- (a) IFRS 15 is substantially converged with Topic 606.
 - (b) the IASB's call for research papers to inform the post-implementation review of IFRS 15 was issued jointly with the FASB and *The Accounting Review*.
 - (c) academic papers that examine Topic 606 may highlight issues that are relevant to the PIR of IFRS 15. However, although the IFRS 15 and Topic 606 are substantially converged, findings in the papers based on Topic 606 may not always reflect the experience of IFRS adopters because of the differences in the previous US GAAP and IFRS revenue recognition requirements.

Key messages

4. Evidence on the effects of transition to IFRS 15 on entities' financial statements is based on two academic papers—a working empirical paper and a published paper based on a review of corporate annual reports, comment letters and interviews. In summary:
- (a) the effects of transition to IFRS 15 on reported numbers varied across entities;
 - (b) around half of the examined entities disclosed material impact from the implementation of IFRS 15; and
 - (c) the length of entities' revenue-related disclosures increased after the implementation of IFRS 15.
5. One published paper based on surveys of preparers examined the implementation process of Australian Accounting Standard AASB 15 *Revenues from Contracts with*

Customers (AASB 15) and three working papers examined the implementation of Topic 606.¹ The findings were:

- (a) in the paper on the implementation of AASB 15:
 - (i) the progress in implementing AASB 15 varied across entities at the end of the year before the effective date of AASB 15;
 - (ii) there was variation in preparers' responses about the cost of implementing AASB 15; and
 - (iii) preparers were concerned about potential effects resulting from the disclosures required by AASB 15—including disclosing information to competitors and increased scrutiny by external stakeholders.
- (b) in the papers on the implementation of Topic 606:
 - (i) after the implementation of Topic 606 the average length of a revenue recognition cycle decreased;
 - (ii) entities incorporated Topic 606 terminology in their sales contracts to make the implementation of Topic 606 easier; and
 - (iii) entities' choice between the retrospective and the modified retrospective transition method varied with entity-specific characteristics, industry and costs of compliance with the revenue recognition requirements.

6. The academic evidence on the comparability and predictive ability of revenue for future earnings is based on one Chinese-based and two Topic 606-based empirical papers. These papers are generally in agreement that the quality of revenue and the comparability of revenue information increased after the implementation of the revenue recognition model although the findings of one Topic 606-based paper suggest that comparability was reduced for entities with previous industry-specific guidance.

¹ In Australia IFRS 15 is adopted in full and referred to as AASB 15. AASB 15 was issued by the Australian Accounting Standards Board in December 2014 and replaces all revenue recognition requirements, including those as set out in Australian Accounting Standard AASB 118 *Revenue*.

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7. There is no empirical evidence on how the application of IFRS 15 has affected analysts' ability to forecast entities' revenue. However, there is evidence on this topic relevant to Topic 606:
 - (a) two papers showed that analyst revenue forecast accuracy increased and revenue forecast dispersion decreased suggesting that the usefulness of revenue information increased after the implementation of Topic 606;
 - (b) another two papers showed the opposite effect—analyst revenue forecasts became less accurate and analyst disagreement increased which, in the authors' views, reflected analysts' needing to get familiar with the requirements of the new standard;² and
 - (c) another paper showed that the decrease in analyst forecast accuracy after the implementation of Topic 606 dissipated over time while the increase in analyst forecast dispersion persisted. The decrease in analyst forecast accuracy and increase in dispersion were smaller for entities applying the retrospective method.
 8. Research examining the overall market reaction to Topic 606 found that the positive association between share returns and earnings or revenue increased after the implementation of Topic 606 suggesting that revenue information became more useful. This effect was strongest for entities that applied the retrospective method.
 9. Two academic papers using US data on the application of Topic 606 examined if managerial judgement required by Topic 606 affected the amount and timing of revenue. The findings were that managers used the judgement on application of the revenue recognition model opportunistically.
 10. Researchers examined whether the characteristics of entities with principal or agent considerations were different from the characteristics of other entities and whether the

² These mixed findings may be due to the sensitivity of the analyses to choices made by the researchers like sample size and type and empirical model specification. Although the results reported in these working papers may change before their publication, these papers have been included in this review because they may be relevant to the PIR.

implementation of Topic 606 influenced these entities' compliance risk, audit fees, revenue quality and the processing of these entities' revenue information by financial statement users. The study found evidence that after the implementation of Topic 606 the compliance and audit risk of these entities decreased, and the higher analyst forecast errors associated with entities with principal or agent considerations remained unchanged.

11. An academic paper focusing on revenue disaggregation showed that Topic 606 led to increased decision-usefulness of revenue information. These benefits were primarily present when:
 - (a) disaggregation was accompanied by detailed qualitative disclosures;
 - (b) the categories used for disaggregation were comparable with those of other entities in the industry; and
 - (c) the granularity of segment information was low.
12. An empirical paper provided evidence that Topic 606 led to higher innovation by entities in the life sciences industry through an increase in investment resulting from increased transparency of revenue recognition and lower information asymmetry between managers and investors.

Detailed research findings

13. This section provides more detailed information about the academic research findings summarised in the key messages section of this paper. Specifically, it summarises findings on the following areas:
 - (a) [the effects of transition to IFRS 15 on entities' financial statements;](#)
 - (b) [implementation of the revenue recognition requirements;](#)
 - (c) [the usefulness of revenue information for users' decisions;](#)
 - (d) [investigations of revenue management;](#) and
 - (e) [other topics.](#)

A. The effects of transition to IFRS 15 on entities' financial statements

14. One academic study examined the effect of transition from IAS 11 *Construction Contracts* to IFRS 15 on construction entities' financial statements in the year of IFRS 15 implementation.³ The researchers analysed the disclosures in the notes to financial statements using a sample of 68 entities from 18 countries (three Canadian, three Chinese, three Australian and 59 European entities) in the year of implementation of IFRS 15. The findings were:
- (a) areas of changes in the financial statements:
 - (i) *reclassifications of items in the financial statements*, for example:
 1. some entities changed the classification of uninstalled materials and presented them as a contract asset; prior to IFRS 15, uninstalled materials had been classified as inventory;
 2. some entities recognised advances received from customers as part of contract liabilities; prior to IFRS 15, these entities accounted for the advances as separate liabilities;
 3. some entities that had previously accounted for onerous contracts as separate liabilities stopped doing so and some entities that previously had not accounted for onerous contracts as separate liabilities started doing so; and
 4. some companies changed their presentation of part-exchange transactions.
 - (ii) *contract modifications*—35% of the sample entities disclosed that they applied the 'high probability criterion' in contract modifications.
 - (iii) *identifying performance obligations*—26% of the sample mentioned re-evaluating their approaches to identifying performance obligations in their reports. Some entities split previously single performance obligations into multiple performance obligations and some entities

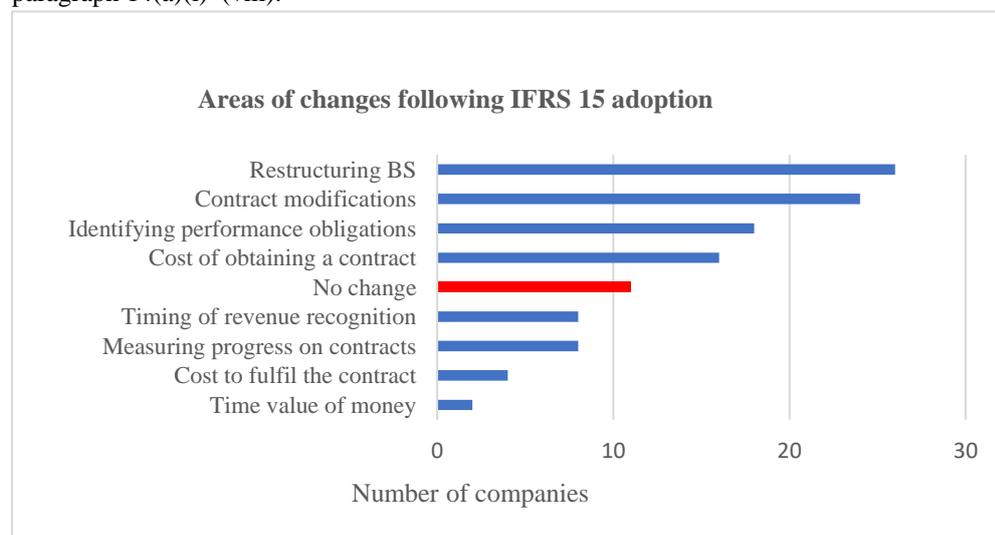
³ Krupova, L., and Partac, M. (2022), 'Impact of IFRS 15 *Revenue from Contracts with Customers* on the construction industry', working paper.

merged previously multiple performance obligations into single performance obligation.

- (iv) *costs of obtaining a contract*—25% of the entities disclosed changes related to costs of obtaining a contract and said that they capitalised only incremental costs of obtaining a contract; prior to IFRS 15 these entities had fully capitalised these costs.
- (v) *costs to fulfil a contract*—6% of the entities mentioned that they changed how they account for costs to fulfil a contract but did not provide further details.
- (vi) *timing of revenue recognition*—12% of the entities mentioned a change in the timing of revenue recognition. Some of these entities had previously recognised revenue over time and started recognising revenue at a point in time; other entities, mostly in the residential property development sector, started recognising revenue over time from previously recognising it at a point in time.
- (vii) *measuring progress on contracts*—12% of the entities disclosed that they changed the measurement of progress on contracts; the most prevalent method for measuring progress on construction contracts after implementation of IFRS 15 was cost-to-cost method.

- (viii) *time value of money*—3% of the entities mentioned changes related to the time value of money.⁴
- (b) the change in retained earnings resulting from IFRS 15 implementation, scaled by total equity in the year before implementation, was:
 - (i) positive (increase in equity) for 9% of the entities, most of which were residential property development companies; the range of increase was from 0.07% to 7.36%;
 - (ii) negative (decrease in equity) for 60% of the entities; for 19% of the entities the decrease was more than 10%; and
 - (iii) zero (no change in equity) for 31% of the entities.
- (c) key audit matters:
 - (i) 77% of entities' audit reports included key audit matters about revenue;
 - (ii) 28% of entities' audit reports included key audit matters about revenue with information about IFRS 15 adoption;
 - (iii) 9% of entities' audit reports included IFRS 15 in a separate heading in key audit matters; and

⁴ The graph shows the number of entities that experienced the IFRS 15 implementation effects described in paragraph 14(a)(i)–(viii).



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- (iv) the documented frequency of key audit matters related to revenue in this sample was higher than that for a multi-industry sample examined by another academic paper.
 - (d) two-thirds of the entities applied the modified retrospective method and one third applied the retrospective method.
 - (e) many entities used the IFRS 15 terminology for recognising a net contract position in their balance sheets but terminology for recognising a net contract position varied across entities.
 - (f) in the authors' view, the impact of the application of IFRS 15 varied across entities.
15. Additional evidence on the effects of transition to IFRS 15 on entities' financial statements, disclosures and implementation costs is based on a review of the annual reports of 48 entities from the STOXX Europe 50 index in 2018, analysis of comment letters from STOXX Europe 50 entities to the IASB's 2011 revenue exposure draft and interviews with a preparer, a Big Four firm advisor on implementing IFRS 15 and an auditor from another Big Four firm⁵. The researchers' findings are:
- (a) recognition and measurement changes:
 - (i) 48% of the entities disclosed immaterial effects of implementing IFRS 15.
 - (ii) the effects of transition to IFRS 15 on reported numbers varied across companies. The authors' findings on these effects are summarised in this table:

⁵ Napier, C. J., and C. Stadler. (2020). 'The real effects of a new accounting standard: The case of IFRS 15 Revenue from Contracts with Customers'. *Accounting and Business Research* 50 (5): 474-503.

Effects of implementing IFRS 15 on entities' financial statements ⁶	Mean	Median	Min	Max	Number of entities for which change is:		
					>0	=0	<0
Change in retained earnings (difference between retained earnings applying IAS 11/IAS 18 and retained earnings applying IFRS 15 on adoption)/shareholders' equity applying IFRS 15	1.88%	0.05%	0%	57.31%	11	17	20
Change in revenue (difference between revenue applying IAS 11/IAS 18 and revenue applying IFRS 15)/revenue applying IFRS 15	0.72%	0%	0%	13.12%	5	33	10
Change in profit (difference between profit applying IAS 11/IAS 18 and profit applying IFRS 15)/revenue applying IFRS 15	0.16%	0%	0%	1.61%	4	38	6

(b) disclosures:

- (i) 38% of the entities provided a separate revenue note in the year of IFRS 15 implementation; only 25% of entities provided a separate note on revenue in the year before implementation of IFRS 15;
- (ii) IFRS 15 disclosures were often included in the segment reporting note; and
- (iii) the length of the revenue disclosure in the year of IFRS 15 implementation was approximately $\frac{3}{4}$ of a page compared to $\frac{1}{4}$ of a page in the previous year.

(c) implementation and application costs:

- (i) based on one interview, one comment letter and three disclosure examples, the entities that were interviewed or that commented or whose disclosures were examined by the researchers reported they had

⁶ The ratios are measured either for 2018, or for 2016 or 2017 when entities chose the retrospective transition method. IFRS 15 replaced the IASB's previous standard on revenue recognition IAS 18 *Revenue* from 1 January 2018.

to update existing accounting information systems to provide the information required by IFRS 15; and

- (ii) based on one comment letter and two interviews, the entities that commented or that were interviewed reported they made minor contractual changes to enable them to continue applying previous accounting policies—for example, related to long-term contracts or contracts with multiple performance obligations.

B. Implementation of the revenue recognition requirements

16. Researchers examined the implementation of AASB 15 *Revenue from Contracts with Customers* in Australia through a survey of 143 preparers about their preparedness for the implementation of AASB 15 in the last quarter of 2017.⁷ The sample included entities with varying size and a wide range of auditors. The findings were:⁸

- (a) the progress in implementing AASB 15 varied across entities—for example:
 - (i) 11.2% of the entities had completed an initial determination of the potential impacts of IFRS 15 implementation while 4.3% of the entities had not started such initial assessment; and
 - (ii) 18.2% (33.6%) of respondents said they were going to apply the retrospective (modified retrospective) transition method while 21.7% of respondents said that they had not yet decided what transition method to use; the rest of the respondents said they were currently assessing the transition method.
- (b) there was variation in preparers' responses about the cost of implementing AASB 15—for example 65.1% (54.6%) of the entities expected that the implementation would have an impact on their information technology (sales) functions. However, in the researchers' view, the respondents' expectations of additional costs related to the implementation of AASB 15

⁷ AASB 15 had an effective date of 1 January 2018. This effective date had been deferred from 1 January 2017.

⁸ Davern, M., Gyles, N., Potter, B., and Yang, V. (2019). 'Implementing AASB 15 *Revenue from contracts with customers*: the preparer perspective.' *Accounting Research Journal*, 32(1), 50-67.

were based on a need to update and improve the business rather than on implementation of a new accounting standard.

- (c) preparers were concerned about potential effects resulting from the disclosures required by AASB 15—for example:
 - (i) 54.6% of respondents said that the disclosures would be useful to competitors; and
 - (ii) 59.5% of respondents expected that their entity would be subject to greater scrutiny from external stakeholders.
- (d) in the researchers' view:
 - (i) there was little benefit in lobbying to extend effective dates for new standards as the survey results indicated that entities had not progressed in implementing AASB 15 in the additional time provided by extending the effective date of IFRS 15/AASB 15 by a year;
 - (ii) standard-setters should emphasise the benefits to entities from implementing a new accounting standard such as improved management of the business; and
 - (iii) preparers adopt a more pragmatic view of compliance with the requirements of a new standard than standard-setters—they assess it by benchmarking to their competitors.

17. Additional evidence on the implementation of the revenue recognition requirements is based on academic studies examining Topic 606.

18. Based on an academic survey of 60 managers, chief financial officers (CFOs) and accounting supervisors employed in construction entities, researchers examined what factors influenced the outcomes of Topic 606 implementation where the outcomes were assessed based on the survey responses. The findings were that the success of Topic 606 implementation depended on:⁹

⁹ Tafon, C., Sullivan, G., Self, S., and Sullivan, A. (2022). 'Implementation Critical Success Factors and Accounting Standard Codification Topic 606 Implementation Dynamics: A Correlational Study', working paper.

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- (a) the implementation environment within the organisation (for example, whether implementation leaders clearly communicated the expectations and importance of the implementation; whether the implementation of Topic 606 was a priority for the organisation; and whether employees were helpful or hostile towards the implementation); and
- (b) the entities' absorptive capacity—the organisation's ability to acquire, assimilate and use new knowledge.
19. Another academic paper examined whether the length of entities' revenue cycles changed after the implementation of Topic 606 using a sample of 2,226 US entities during 2013–2020.¹⁰ The researchers estimated entities' revenue cycles based on 239 industry-specific time-varying factors and mapped them to entities' revenues, estimating the fraction of revenue recognised in period *t* and period *t*+1 in response to a business shock (related to demand, economic developments, etc.) in period *t*. The findings were that after the implementation of Topic 606:
- (a) the length of an average entity's revenue cycle decreased from 24 to 18.7 months—relative to a dollar of revenue recognized in the current year, an average 100 cents of revenue were recognized in the following year before the implementation of Topic 606, and 56 cents were recognised in period *t*+1 after Topic 606's implementation¹¹;
- (b) entities in industries with long revenue cycles (for example, energy, real estate, automobile supply chains) reduced their revenue cycle from 28.8 to 14.7 months;
- (c) entities in industries with short revenue cycles (for example, consumer goods) shortened their revenue cycle from 19.6 to 19.1 months; and

¹⁰ Ali, W., and Tseng, A. (2022). 'The Effects of ASC 606 on Revenue Recognition', working paper.

¹¹ A key assumption in the paper is that the revenue generating cycle spans two reporting periods whereby a business shock occurs in period *t* and managers decide the quantity and selling price for period *t*. The accounting policy applied in period *t* determines how much revenue the entity recognises in period *t* and period *t*+1.

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- (d) based on a sub-sample of 758 sales contracts identified in 109 entities' SEC filings during 2014–2020, entities incorporated Topic 606 terminology in their sales contracts (for example, performance obligation, rights, obligations, etc.). In the researchers' view, this finding validates practitioners' claims that entities modified their sales contracts with customers to make the implementation of Topic 606 easier.
20. Other researchers examined the costs of transition to Topic 606 for a sample of 3,019 US entities with a focus on entities that applied the modified retrospective method.¹² Some of the descriptive data they provide is summarised below:
- (a) transition effects on entities' financial statements:
- (i) the average cumulative adjustment to beginning retained earnings was 2.7% of entities' market capitalisation;
 - (ii) the average revenue adjustment was 2.3% of entities' market capitalisation;
 - (iii) the average adjustment to net income was 0.6% of entities' market capitalisation; and
 - (iv) 68% of entities mentioned the absence of material impact from the adoption of Topic 606.
- (b) transition method:
- (i) 88.5% of entities chose the modified retrospective method, 11.5% chose the retrospective method; and
 - (ii) larger entities, entities that filed annual filings later in time, entities with a material impact, and late adopters were more likely to select the modified retrospective method.
- (c) most significantly affected industries were computers (27.6% of entities materially affected), fabricated products (18.2%), communication (18.1%), business services (17.9%) and electronic equipment (17.8%).

¹² Chau, J. (2022). 'Transitioning to new Accounting Standard: Evidence from ASC 606', working paper.

- (d) industries with the highest adoption rates of the retrospective method were agriculture (27.8%), restaurants, hotels, motels (25.9%), textiles (25%), business supplies (23.5%), and food products (22.9%). In a few industries such as shipping containers and fabricated products, 100% of the firms selected the modified retrospective method.
- (e) entities with larger sizes and more lags between 10-K filing dates and fiscal year-end dates were more likely to choose the modified retrospective method while entities without material impact were more likely to choose the retrospective method. In the authors' view, entities with higher compliance costs were more likely to seek relief options applying the modified retrospective method.

C. The usefulness of revenue information for users' decisions

21. One paper compared 185 Chinese entities listed in Hong Kong that were required to implement Chinese Accounting Standards for Business Enterprises 14 *Revenue* (CAS 14) from 1 January 2018 with 3,197 Chinese entities listed in mainland China that were not required to implement CAS 14 until 1 January 2020.^{13,14} Focusing on the period 2016–2019, the researchers found that in the first two years after CAS 14 implementation, relative to the two years before implementation and compared to the entities that had not yet implemented CAS 14, the entities listed in Hong Kong experienced:
 - (a) an improvement in the predictive ability of revenue for future earnings;¹⁵ and

¹³ Chen et al. (2022), 'The impact of IFRS 15 on revenue quality and accounting comparability. Evidence from a quasi-natural experiment in China', working paper.

¹⁴ CAS 14 is substantially converged with IFRS 15. In July 2017, the Ministry of Finance released the New Accounting Standards for Business Enterprises No.14 – Revenue (CAS 14), to bring the new CAS 14 in line with IFRS 15 published by the IASB in April 2014.

¹⁵ The researchers measured the predictive ability of revenue for future earnings by estimating the association between return on assets in year t+1 and revenue (and expenses) in year t after controlling for expenses, year- and industry-specific factors.

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- (b) an increase in the comparability of information with other entities.¹⁶
22. The rest of the evidence in this section is US-based and concerns the implementation of Topic 606. The findings are:
- (a) using a sample of 348,019 10-K filings of 2,691 US entities during 2012–2019:¹⁷
- (i) comparability of revenue information between entities from different industries increased by 2% (relative to the mean value of the revenue comparability measure). Revenue comparability was measured by pairwise cosine similarity of pairs of entities' revenue recognition disclosures in 10-K filings.
 - (ii) comparability of revenue information between entities in the same industry decreased by 2.4%. In the authors' view, the increase in cross-industry revenue comparability and the decrease in within-industry revenue comparability was the result of the principles-based guidance of Topic 606 and replacing the industry-specific guidance before Topic 606.
 - (iii) the comparability of revenue information decreased by 8% for entities in industries for which there was industry-specific revenue guidance before the implementation of Topic 606.
 - (iv) the likelihood of analysts following pairs of entities with more comparable revenue information increased by 11%. In the researchers' view, analysts' information processing costs decrease when they follow entities with comparable revenue policies.
- (b) based on a sample of 218 entities in the software industry that were expected to be significantly impacted by Topic 606 and 196 control entities in the electronic computer industry that had previously applied revenue recognition requirements with some similar aspects to Topic 606 and

¹⁶ The authors measured comparability by the association between accounting amounts (revenue, earnings and the book value of equity) and economic outputs (share price, return, and future operating cash flow).

¹⁷ Tillet, A. (2022). 'Revenue recognition comparability and analysts' disclosure processing costs', working paper.

therefore were not expected to be significantly affected, after the implementation of Topic 606:^{18,19}

- (i) comparability of financial statement information increased for entities in the software industry but not for entities in the computer industry;²⁰ and
- (ii) earnings informativeness—the association between share returns and earnings—increased for software entities but not for computer entities.

In the researchers' view, controlling for comparability and pre-existing accounting differences is important when assessing the financial reporting effects of accounting standards.

- 23. There is no empirical evidence on how the application of IFRS 15 has affected analysts' ability to forecast revenues. The evidence on this topic is based on five empirical papers relevant to Topic 606.
- 24. Using a sample of 1,678 Russell 3000 entities' quarterly observations during 2017–2018 and comparing entities that applied the standard retrospectively and disclosed material impact with entities that did not apply Topic 606 retrospectively and were not significantly affected, researchers found that post-implementation for the entities that applied Topic 606 retrospectively:²¹
 - (a) analysts' revenue forecasts became more accurate by 3.7% and analysts' revenue forecast dispersion decreased by 1.7%;
 - (b) share price liquidity increased;

¹⁸ The electronic computer entities applied ASU 2009-13/14 before Topic 606. ASU 2009-13/14 had similar requirements for entities selling tangible products with multiple deliverables to the requirements in Topic 606.

¹⁹ Choi, D., Kim, S., and Wang, X. (2022). 'Heterogeneity in the financial reporting effects of ASC 606 adoptions: Evidence from the industry focused approach', working paper.

²⁰ Comparability is tested using a similar measure to the one described in footnote 16.

²¹ Ferreira, P., Jeong, J., and Landsman, W. (2022). 'The Effects of ASC 606 Retrospective Adoption on a Firm's Information Environment', working paper.

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- (c) analysts used less ambiguous language, measured by the number of uncertainty-related words, in conference calls suggesting reduction in analyst uncertainty; and
 - (d) revenue informativeness—the association between earnings announcement returns and revenue surprises—increased²².
25. Further evidence on the adoption of Topic 606 leading to improvement in the usefulness of revenue information was provided by an academic paper that examined a sample of S&P 500 entities in non-regulated industries in the year before and the year after implementation of Topic 606.²³ The findings were:
- (a) analyst revenue forecast accuracy increased by 8% and revenue forecast dispersion decreased by 12% after the implementation of Topic 606 for entities that were materially impacted; and
 - (b) analyst forecast accuracy increased by 5% and revenue forecast dispersion decreased by 11% after the implementation of Topic 606 for entities that increased revenue disaggregation disclosures.
26. Contrary to the findings of the academic papers summarised in paragraphs 24 and 25, the conclusion of another academic paper was that the implementation of Topic 606 did not lead to improvement in the usefulness of revenue information to analysts.²⁴ Examining a sample of 3,357 entities in the period 2017–2019, the researchers found that after the implementation of Topic 606:
- (a) analysts' ability to predict revenue in the first year of implementation of the standard decreased;

²² Revenue surprises are measured as the difference between reported revenue and the median analyst revenue forecast before the earnings announcement, scaled by reported revenue.

²³ Goldman, N., Liu, B., and Zhang, Y. (2022). 'The new revenue recognition standard ASC 606 and the properties of analyst revenue forecast', working paper.

²⁴ Billings, B., Mauler, L., and Tillet, A. (2022). 'Revenue predictability, information asymmetry, and firms' disclosure environment: Evidence from the adoption of ASC 606', working paper.

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- (b) information asymmetry, measured by bid-ask spread and share price volatility, increased. In addition, the researchers found that:
- (i) the decrease in analyst forecast accuracy explained 8% of the increase in information asymmetry; and
 - (ii) the increase in information asymmetry was influenced by the complexity of the expanded disclosures required by Topic 606 implementation—there was evidence of positive association between information asymmetry and complexity of the expanded disclosures; and
- (c) entities that issued voluntary revenue forecasts experienced a lower decline in revenue predictability and a lower increase in information asymmetry.
27. Similar evidence to the evidence described in paragraph 26 was provided by researchers who examined the impact of Topic 606 adoption on the cost of debt for a sample of Russell 3000 entities in the period 2016–2019 and also showed that analyst revenue forecast accuracy decreased and revenue forecast consensus (the inverse of forecast dispersion) decreased for significantly affected entities.²⁵ In the researchers' view, earnings uncertainty increased after the implementation of Topic 606. Their findings on the cost of debt were:
- (a) after the implementation of Topic 606 debt covenants were used less in debt contracts when the borrowers were entities significantly affected by Topic 606.
 - (b) the cost of debt increased after the implementation of Topic 606 by 6.5%/22 basis points.
 - (c) the increased cost of debt dissipated over time. In the researchers' view, this temporary increase in the cost of debt was reflective of debt markets learning and adapting to new standards.

²⁵ Sadka, G., Lee, K. and Lee, S. (2022). 'Impact of ASC 606 on the cost of debt: Lessons for principles-based accounting standards', working paper.

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28. Further insights to the mixed evidence summarised in paragraphs 24–27 is provided by an academic paper that showed that after the implementation of Topic 606:²⁶
- (a) the initial decrease in analyst revenue forecast accuracy dissipated after the second quarter following the implementation of Topic 606 reflecting, in the authors' view, analysts' needing to get familiar with the requirements of the new standard;
 - (b) the initial increase in analyst forecast dispersion persisted after the second quarter following the implementation of Topic 606;
 - (c) the decrease in analyst forecast accuracy and increase in dispersion were smaller for entities applying the retrospective method; and
 - (d) investors reacted more strongly to revenue surprises (and expense surprises) of significantly affected entities—this effect also dissipated over time and was stronger for entities that applied the retrospective method.

D. Investigations of revenue management

29. Two academic papers using US data on the application of Topic 606 examined if managerial judgement on application of the Topic 606 revenue recognition model affected the amount and timing of revenue. The findings were:
- (a) based on a sample of 1,543 Russel 3000 entities during 2017–2020:²⁷
 - (i) significantly affected entities reported higher growth in revenue after the implementation of Topic 606 but did not report higher growth in cost of goods sold compared to entities that were not significantly affected. In the researchers' view, the increase in revenue growth was likely driven by managerial discretion in reporting revenues and not by actual

²⁶ Hao, J. and Pham, V. T. (2022). 'The ASC 606 standard, revenue informativeness and analysts forecast quality', *Accounting & Finance*, Forthcoming

²⁷ Castro, A., Erdogan, S., and Folsom, D. (2022). 'Discretion in revenue recognition after ASC 606', working paper.

- increases in deliveries to customers that should result in concurrent increases in the cost of goods sold.²⁸
- (ii) significantly affected entities reported lower changes in deferred revenue after the implementation of Topic 606. In the authors' view, increases in changes of revenue and concurrent decreases in deferred revenue changes suggested that significantly affected entities used managerial discretion to alter the timing and amounts of recognised revenues after the implementation of Topic 606.
 - (iii) significantly affected entities were more likely to meet or beat analyst earnings targets after the implementation of Topic 606. In the researchers' view, managers used the discretion in revenue recognition opportunistically. However:
 - (iv) the association between returns and earnings of significantly affected entities increased after the implementation of Topic 606. In the authors' view, the standard change resulted in more informative earnings for the most affected entities.
- (a) using a sample of 1,271 US entities during 2016–2019 to examine whether managerial discretion on application of the revenue recognition model has resulted in revenue management:^{29,30}
- (i) entities with incentives to manage revenues (identified in the academic literature as entities that meet or beat the most recent consensus revenue analyst forecast by two cents or less) were more likely to report higher levels of discretionary revenues, measured as the unexplained portion of accrued receivables after controlling for other factors such as changes in revenues, gross margin, entity size and other. In the researchers' view,

²⁸ When the researchers referred to managerial discretion in recognising revenue, they did not refer specifically nor measure empirically where discretion is exercised in any of the five steps of the revenue recognition model.

²⁹ Hubbard, B. (2022). 'The Impact of ASC 606 and Firm Characteristics on Revenue Manipulation', working paper.

³⁰ Revenue management is the use of managerial discretion to achieve favourable financial reporting results.

entities used the discretion on application of Topic 606 opportunistically.

- (ii) entities with more complex revenue generating processes and shorter revenue recognition cycles were more likely to use managerial discretion on application of the revenue recognition model to manage revenue.

E. Other topics

Principal versus agent considerations

30. One academic paper examined whether the characteristics of entities with principal or agent considerations were different from the characteristics of other entities and whether the implementation of Topic 606 influenced those entities' compliance risk, audit fees, revenue quality and processing of those entities' revenue information by financial statement users.³¹ Using textual analysis of a large sample of SEC filings by US public companies in the period 2010–2020 and examination of the revenue recognition section of filings with principal or agent considerations, the researchers found that entities with principal or agent considerations had:

- (a) higher compliance risk than other entities—higher chance of receiving a comment letter on the entity's annual filings (10-K and 20-F) issued by the SEC's Division of Corporation Finance related to revenue recognition issues than other entities. After the implementation of Topic 606, the compliance risk of these entities decreased.
- (b) higher audit risk than other entities (based on an assumption that higher audit fees are charged to compensate for higher audit risk). After the implementation of Topic 606, the audit risk of these entities decreased.
- (c) entities with principal or agent considerations did not have lower revenue quality than other entities. After the implementation of Topic 606 the

³¹ Du, K., Louis, H., and Wang, S. (2022). 'Principal-versus-agent considerations in revenue recognition', working paper.

revenue quality of entities with principal or agent considerations did not change in comparison to other entities; there was weak evidence that the revenue quality of principals increased.

- (d) investors reacted more to revenue surprises by entities reporting as agents at earnings announcements. After the implementation of Topic 606 there was no evidence of investors' differential reaction to revenue surprises based on companies' principal versus agent classifications.
- (e) entities with principal or agent classifications were associated with lower analyst forecast accuracy. There was no change to this association after the implementation of Topic 606.

Disaggregation

38. Using a sample of 2,603 US entities in the year before and the year of implementation of Topic 606, an academic paper examined whether the disclosure requirements of Topic 606 for revenue disaggregation altered the volume, granularity and the decision-usefulness of revenue information.³² The findings were:

- (a) a 12.5% improvement in analyst revenue forecast accuracy and an 8% reduction in analyst revenue forecasts dispersion for disaggregating entities—in the authors' view, Topic 606 led to increased decision-usefulness of revenue information. However, these findings were subject to the following caveats:
 - (i) the benefits of increased disaggregation only existed for entities with an above-the-median level of qualitative disclosures—the researchers used word count as a proxy for the breadth of the qualitative disclosure;
 - (ii) entities with more comparable disaggregation experienced the benefits of improved forecast accuracy and reduced

³² Hinson, L., Pundrich, G., and Zakota, M. (2022). 'The Decision Usefulness of ASC 606 Revenue Disaggregation', working paper.

dispersion, but those with low comparability did not—the authors measured comparability by the degree of overlap between the disaggregation categories used by an entity and those of its industry peers; and

- (iii) the benefits of disaggregation only existed for entities that had provided a low level of disaggregated information before the implementation of Topic 606.
- (b) in the researchers' view, these results highlighted the importance of comparability, qualitative disclosure, and diminishing returns of disaggregation.

Real effects of revenue recognition on innovation

37. A researcher examined the effect of Topic 606 on investments in research and development (R&D) alliances and innovation.³³ Focusing on a sample of 366 entities in the life sciences industry in 2014–2019, the researcher found that after the implementation of Topic 606 entities with a greater proportion of alliance revenue to total revenue, referred to as alliance revenue-dependent entities:

- (a) had lower bid-ask spreads—in the authors' view, information asymmetry decreased;
- (b) increased their revenue recognition related disclosures;
- (c) reported higher revenues and lower deferred revenues;
- (d) increased their investments in R&D alliances; and
- (e) had higher innovation outcomes, specifically:
 - (i) they increased the number of patent applications; and
 - (ii) the market reaction to these patents and the number of patent citations, were higher the alliance revenue-dependent firms.

³³ Cetin, F. (2022). 'The real effects of accounting on innovation: Evidence from ASC 606', working paper.

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38. In the researcher's view, Topic 606 increased the transparency of revenue recognition, leading to lower information asymmetry between managers and investors and thus allowing for an increase in investment.

Question for the IASB

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1. Do the IASB members have any questions or comments on the academic literature summarised in this paper?