



U.S. Securities and
Exchange Commission

SEMI-ANNUAL REPORT TO CONGRESS

Regarding Public and Internal Use of
Machine-Readable Data for
Corporate Disclosures

December 2023

This is a report prepared by staff of the U.S. Securities and Exchange Commission. The Commission has expressed no view regarding any analysis, findings, or conclusions contained herein.

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Introduction

The Financial Data Transparency Act of 2022 (FDTA), which was signed into law on December 23, 2022, as Title LVIII of the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023,¹ requires the Commission to report semi-annually on the public and internal use of machine-readable data for corporate disclosures.² This report is the second such report. The FDTA requires the Commission to submit this report to the Committee on Banking, Housing, and Urban Affairs of the Senate and the Committee on Financial Services of the House of Representatives every 180 days until December 23, 2029, when the provision requiring the report sunsets.³

FDTA Section 5825(b) requires that this report include: (1) an identification of which corporate disclosures required under specified provisions of the securities laws are expressed as machine-readable data and which are not; (2) an analysis of the costs and benefits of the use of machine-readable data in corporate disclosure to investors, markets, the Commission, and issuers; (3) a summary of enforcement actions that result from the use or analysis of machine-readable data collected under the specified statutory provisions; and (4) an analysis of how the Commission uses the machine-readable data it collects.⁴

This report contains the following new information since the last report: additional Commission rulemaking releases adopting or proposing structured data tagging requirements; updated statistics in the analysis of the costs and benefits of the use of machine-readable data; and additional Enforcement actions resulting from the use or analysis of machine-readable data that the Commission collects.

Identification of Corporate Disclosures Expressed as Machine-Readable Data

FDTA Section 5825(b)(2)(A) requires an identification of which corporate disclosures required under Section 7 of the Securities Act of 1933 (the Securities Act),⁵ Section 13 of the Securities Exchange Act of 1934 (the Exchange Act),⁶ and Section 14 of the Exchange Act⁷ are expressed as machine-readable data and which are not. Please refer to the Appendix.

EXISTING MACHINE-READABLE DATA REQUIREMENTS

In 2009, the Commission adopted rules requiring operating companies to provide the information from the financial statements in their registration statements and periodic and current reports using eXtensible Business Reporting Language (XBRL),⁸ which is a machine-readable, structured data language used for standardized reporting of business information, including information relating to the financial performance of companies.⁹ That same year, the Commission similarly required open-end management investment companies (mutual funds) to provide risk/return summary information in their prospectuses in XBRL format.¹⁰

Since that time, the Commission has refined many of its rules by requiring open and freely available, machine-readable standardized formats promulgated by standards organizations or voluntary consensus standards bodies. For instance, in 2018, the Commission adopted amendments requiring the use, on a phased-in basis, of Inline XBRL for operating company financial statement information and fund risk/return summary information.¹¹ Whereas previously filers generated an HTML document of their financial statement information or risk/return summary information and then tagged a copy of the data to create a separate XBRL exhibit, Inline XBRL allows filers to prepare a single document that is both human-readable and machine-readable.¹²

The Commission has adopted rules requiring machine-readable standardized formats for additional collections of information. In 2019, the Commission introduced structured data tagging requirements for certain reporting form cover-page data.¹³ In 2021, the Commission amended most of its fee-bearing forms and schedules to require tagging of information related to filing fee calculation.¹⁴ Also in 2021, the Commission added tagging requirements in Forms 10-K, 20-F, and 40-F pertaining to the auditor and jurisdiction on the audit report signed by the registered public accounting firm.¹⁵ A number of other Commission releases have adopted or proposed structured data tagging requirements for additional collections of information.¹⁶

In addition to requiring XBRL and Inline XBRL for certain filings, the Commission requires some reports and disclosures to be filed in machine-readable eXtensible Markup Language (XML).¹⁷ In other words, certain filings are submitted using data languages that are specific to the particular form being submitted.¹⁸ For such filings, filers are typically provided the option either to submit the filing directly in the relevant custom XML data language, or to manually input the information into a fillable web-based form developed by the Commission that converts the completed form into a custom XML document.¹⁹

Currently, there are 54 forms, schedules, and statements containing disclosures required under Securities Act Section 7, Exchange Act Section 13, or Exchange Act Section 14. About three-quarters (42 of 54) of those forms, schedules, and statements require some machine-readable data, while about one-quarter (12)²⁰ do not require any machine-readable data. Since the last report, the Commission adopted amendments introducing structured data tagging requirements for Forms N-8B-2 and S-6 and for Schedules 13D and 13G (augmenting by four the number of forms, schedules, and statements requiring some machine-readable data).²¹

Analysis of the Costs and Benefits of the Use of Machine-Readable Data

FDTA Section 5825(b)(2)(B) requires an analysis of the costs and benefits of using machine-readable data in corporate disclosure to investors, markets, the Commission, and issuers.²²

BENEFITS

Studies show that machine-readable disclosures benefit investors, markets, and issuers. With respect to investors and, more broadly, to markets, making corporate disclosures machine-readable has decreased information asymmetry between firms and investors by reducing information processing costs, making stock prices more informative (*i.e.*, more reflective of firm-specific information), and reducing market inefficiencies and risks.²³ Machine-readability has enhanced market competition by, for example, reducing insider advantages relative to non-insiders and local investor advantages relative to non-locals.²⁴ The reduction in information processing costs has heightened monitoring of issuers by investors and other external parties (*e.g.*, financial analysts, press) which often helps to inform investors and markets.²⁵ Greater monitoring has driven firms to provide more quantitative disclosure and report earnings in a more consistent manner.²⁶ Such benefits may increase over time as tools for investor use of machine-readable data become more widely available.

Issuers have, in some instances, benefitted from decreased audit fees and increased timeliness of audit and financial reports as a result of machine-readable disclosures.²⁷ Issuers have experienced additional benefits associated with machine-readable disclosures, including: higher liquidity; lower cost of capital; higher return on investment; and improved performance benchmarking and acquisition analysis.²⁸ Finally, machine-readable disclosures have facilitated the Commission's investor protection efforts, enabling staff to analyze large quantities of information in support of risk assessment, rulemaking,

and enforcement activities, including as part of its internally developed structured data applications.²⁹ Freely usable technical validation rules also allow issuers to check for certain errors before the machine-readable data is submitted, which can further streamline the compliance process by reducing Commission staff time that would otherwise be spent pinpointing and communicating the existence of technical errors to issuers, and by reducing issuer time that would otherwise be spent resolving such errors and resubmitting the machine-readable data file.³⁰

COSTS

The cost of machine-readable disclosure largely affects issuers and the Commission, as these parties must, respectively, comply with or mandate and implement machine-readable disclosure requirements. Investors are not bound to use machine-readable versions of corporate disclosures, because the disclosures are human-readable as well.³¹ Furthermore, while commercial XBRL research software is available for a cost, investors and other data users (*e.g.*, financial analysts, asset managers, and academic researchers) can access and download machine-readable corporate disclosures at no cost.³²

Issuers incur compliance costs to apply machine-readable tags to their disclosures or pay a third-party tagging service provider to do so. Compliance costs for new tagging requirements tend to be higher, but generally decline as issuers and service providers gain experience and develop new tools to adapt to the requirements.³³ These compliance costs are likely reduced for those issuers with experience applying tags to their disclosures, whether through other machine-readability requirements or through the use of machine-readable data in their internal enterprise resource planning systems.³⁴ Compliance costs also vary based on the type of issuer, because some types of issuers are subject to more extensive tagging requirements than other types of issuers. For example, business development companies (BDCs) and registered closed-end funds both are subject to Form N-2 prospectus and cover page tagging, but BDCs, because they are registered under the Exchange Act, are also subject to financial statement tagging and thus incur additional tagging compliance costs as compared to registered closed-end funds. Registered closed-end funds are subject to Form N-2 prospectus and cover page tagging, but are not subject to financial statement tagging, and thus incur lower tagging compliance costs than BDCs do.

With respect to the magnitude of these compliance costs, an American Institute of Certified Public Accountants survey of 1,032 smaller reporting companies in 2018 found a median cost of \$2,500 per year for fully outsourced XBRL creation and filing.³⁵ A separate survey of 139 Nasdaq-listed issuers and other responding companies in 2018 found higher XBRL compliance costs, including a median XBRL compliance cost of \$7,500 per Form 10-Q.³⁶

The discrepancy may be due to Nasdaq-listed companies generally having longer, more detailed and complex financial statements than smaller reporting companies, resulting in more time and effort needed to tag discrete disclosures (such as numbers, blocks of narrative text, checkboxes, etc.) and ultimately increased compliance costs.³⁷

Both surveys were conducted before the compliance dates for the Commission's transition from XBRL to Inline XBRL and before the implementation of cover page and other tagging requirements for periodic reports. For the purposes of the Paperwork Reduction Act, Commission staff estimated in the Inline XBRL Filing of Tagged Data Adopting Release, that the effect of using Inline XBRL rather than XBRL to tag financial statements would be to reduce the existing aggregate average internal burden of 56 hours per response for reporting companies by 2 hours during each of the first three years of the Inline XBRL requirements, and increase the aggregate average out-of-pocket cost to \$6,175 per response.³⁸ In 2022, Commission staff updated this burden estimate to 53 hours per response, while noting that the actual burdens will likely vary among individual companies based on the size of their organization.³⁹

In 2023, the Commission stated in a proposed rule release that, based on the staff's understanding of third-party structured data compliance pricing, smaller filers typically pay between \$1,500 and \$5,000 per year for third-party structured data compliance services and/or software, while larger filers typically pay between \$5,000 and \$30,000 per year for such services and/or software.⁴⁰ The Commission also cited a number of factors that affect the cost of compliance, including the particular filing or submission on which structured data is required, the number of data points to be structured, the size of the entity providing the data, the industry to which the entity belongs, the number of individual users of the structured data compliance software, the extent to which the structuring is fully outsourced, and others.⁴¹

The Commission incurs costs to develop taxonomies and schemas for new structured disclosures and to set up the infrastructure for structured data intake, validation, publication, and use. This includes the cost of updating the Commission's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) filing system, the integration of new structured data into databases and internal applications, and the publication of structured datasets. Such costs can vary based on the volume, complexity, and novelty of new structured disclosure requirements. For example, rules which add a limited number of newly tagged disclosures to already tagged disclosure forms will generally entail less implementation time and cost than rules which add a significant number of newly tagged disclosures to disclosure forms that were previously untagged. The Commission also incurs

costs to update taxonomies and schemas and the related EDGAR intake and validation functions on a periodic basis.

Summary of Enforcement Actions Resulting from the Use or Analysis of the Machine-Readable Data That the Commission Collects

The availability of machine-readable data that has been submitted to the Commission has enabled staff in the Division of Enforcement (Enforcement) to perform more efficient analyses of individual issuers' disclosures and accounting practices and more sophisticated analyses of disclosures and accounting practices across wide-ranging cross-sections of issuers. Both types of analyses, together with traditional investigative tools, have resulted in the filing of actions against issuers and related individuals alleging various types of misconduct that violated the federal securities laws. Without the use or analysis of machine-readable data, the alleged violations would have been significantly more difficult to detect and pursue in a cost-effective or timely manner.

Enforcement utilized risk-based data analytics to uncover potential accounting-related disclosure irregularities caused by, among other things, earnings management practices. Machine-readable data enabled Enforcement staff to review the financial data of thousands of public issuers in order to detect indicia of earnings management or other types of financial misconduct. The initiative resulted in charges against six public companies and several related individuals during the last four years for violations of the federal securities laws for engaging in certain practices that gave the appearance of meeting or exceeding consensus earnings-per-share (EPS) estimates.⁴²

Enforcement used and analyzed machine-readable data during the underlying investigation of one other action brought in 2023, a settled action against a Colombian conglomerate, Grupo Aval Acciones y Valores S.A., and its bank subsidiary, Corporación Financiera Colombiana S.A. (Corficolombiana), for violations of the federal securities laws and the Foreign Corrupt Practices Act, finding that Corficolombiana bribed government officials in Colombia to win an extension to a contract.⁴³

Analysis of How the Commission's Staff Uses the Machine-Readable Data That the Commission Collects

CURRENT APPLICATIONS USED TO ANALYZE MACHINE-READABLE DATA

The Commission's staff uses several applications to analyze machine-readable data. The following applications are internally developed and available to Commission staff:

- Filer Profile provides instant access to certain key data points, such as financial data, audit-related information, and other data for operating companies. It highlights potentially high-risk data points or topic areas and facilitates further analysis via links to data sources. Additionally, Filer Profile allows users to identify quickly specific areas and topics of interest.
- Financial Statement Query Viewer (FSQV) offers users a convenient means of comparing machine-readable financial statement data (including notes and schedules), cover-page data, and certain executive compensation data for operating companies and BDCs, as well as cover-page data and certain prospectus data for registered closed-end funds and BDCs. FSQV facilitates comparative data analyses across multiple filings and periods. In FSQV, users can query tagged narrative or numeric disclosures. FSQV has various features, such as the ability to track a filer's changes in footnotes across reporting periods and share queries with other users.
- iView leverages the open-source, freely and publicly available Inline XBRL Viewer. iView includes various filters and query capabilities, such as the identification of disclosures with custom tags (*i.e.*, filers creating tags instead of using standard tags) and the sorting of machine-readable data by scale (*e.g.*, amounts in thousands, millions, or billions). iView also offers time-series charting and benchmark analyses for numeric values and tracking changes in narrative disclosures.

CURRENT DIVISION USES OF MACHINE-READABLE DATA

Division of Corporation Finance (Corporation Finance) staff uses machine-readable data in a variety of ways:

- Corporation Finance staff uses machine-readable data to help identify issuers that are subject to the disclosure and submission requirements of, and potentially subject to a trading prohibition under, the Holding Foreign Companies Accountable Act (Commission-Identified Issuers).⁴⁴ Specifically, the staff uses data in Forms 10-K, 20-F and 40-F identifying the auditor (or auditors) who provided opinions related to the financial statements presented in the issuer's annual report, the location where the auditor's report has been issued, and the Public Company Accounting Oversight Board (PCAOB) ID Number(s) of the audit firm(s) or branch(es) providing the opinion(s).
- Corporation Finance staff uses several items of machine-readable data that appear on the cover pages of registrants' annual reports (Forms 10-K, 20-F, and 40-F) to identify, count, sort, compare, and analyze registrants and their disclosures (*e.g.*, to identify more readily and accurately issuers that are listed on a specific exchange or that have identified themselves as well-known seasoned issuers).
- Corporation Finance staff and Division of Economic and Risk Analysis (DERA) staff review machine-readable financial statement information contained in filings under Commission rules. In connection with these reviews, the staff has issued comment letters to some individual issuers regarding the Inline XBRL tagging requirements. The staff has also used its findings to publish observations on data quality and analyses of custom tags. On September 7, 2023, Corporation Finance published a sample letter to companies regarding their XBRL disclosures.⁴⁵ The letter includes sample comments that, depending on the particular facts and circumstances, and type of filing under review, Corporation Finance staff may issue to certain companies.
- Corporation Finance staff uses machine-readable data to make preliminary assessments of compliance with the Commission's recently adopted pay-versus-performance disclosure requirements.

Division of Investment Management (Investment Management) staff also uses machine-readable data in a variety of ways:

- Investment Management staff uses machine-readable data for fund disclosures to readily detect errors and inconsistencies within filings and to identify funds with particular characteristics or disclosures, as well as funds with certain holdings, exposures or risk parameters.⁴⁶ The ability to scan across the industry for funds with certain disclosures and characteristics enhances Investment Management’s disclosure review program,⁴⁷ informs staff recommendations for Commission rulemakings and other policy initiatives, and supports the staff’s coordination with other federal agencies.
- Structured data analysis may also better enable Investment Management staff to identify fund data errors. When Investment Management staff identified common errors as a result of its use of structured data, the staff published information highlighting common tagging issues to facilitate more accurate fund disclosure.⁴⁸
- Investment Management staff has also used machine-readable information regarding fund holdings, among other data, to evaluate fund compliance with the federal securities laws and to identify trends and risks faced by the fund industry. This information can be shared with the Divisions of Examinations and/or Enforcement when it suggests non-compliance with law or other heightened risks.

Other Divisions and Offices use machine-readable data in similar ways:

- Office of the Chief Accountant (OCA) staff uses the Commission’s analytical applications, including FSQV, iView, and others, to perform searches based on key words and XBRL tagging. OCA staff uses the output of these searches to conduct research for accounting consultations, information gathering relevant to accounting standard-setting projects and requests from other regulators, and the preparation of responses to specific data requests regarding registrants’ accounting application. OCA staff additionally uses the outputs in researching the identification of independent auditors concentrated in specific industries, identifying issuers subject to the Holding Foreign Companies Accountable Act, and supporting Enforcement on auditor-related matters.

- The tagging requirements of filing fee-related information, adopted in 2021,⁴⁹ will enable EDGAR to determine automatically in many cases whether a registrant’s filing fee calculations have been performed correctly. Filings that use the SEC’s optional fee-tagging tool and test filings that do not pass specific validation tests will be flagged before the related live filing is filed. This will allow filers to correct any filing fee calculation errors without needing to wait for Commission staff to verify the calculations manually, and without having to subsequently revise an already-filed document and adjust any fees owed due to an erroneous calculation.

Public Use of the Machine-Readable Data That the Commission Collects

FDTA Section 5825(b)(2)(1) requires a report regarding the “public . . . use of machine-readable data for corporate disclosures.”⁵⁰ Users of machine-readable corporate disclosures include institutional investors,⁵¹ asset managers,⁵² issuers,⁵³ financial analysts and research firms,⁵⁴ individual investors,⁵⁵ data aggregators,⁵⁶ the financial press,⁵⁷ other regulators,⁵⁸ and academics.⁵⁹ For example, academic studies indicate that the implementation of XBRL data requirements appears to be correlated with increased forecast accuracy by financial analysts.⁶⁰ Also, financial academics have used XBRL data to study topics such as financial reporting complexity and dual-class voting structures.⁶¹ Further, staff members of the Financial Accounting Standards Board (FASB) have used XBRL data to complete more than 200 research projects over the past several years.⁶² Public users retrieve XBRL data by downloading them from individual Commission filings and from aggregated datasets that Commission staff compiles from individual Commission filings and makes available on the Commission’s website.⁶³

Financial analysts and press also use data from Commission filings that are in a custom XML, such as data from Form 13F (quarterly equity holdings reports filed by large institutional investment managers).⁶⁴ For example, since August 2022 (when the Form 13F datasets first became available), there have been over 158,000 Form 13F dataset downloads.⁶⁵

Conclusion

The FDTA’s directives coincide with internal Commission and staff efforts⁶⁶ to improve the management and use of data across the agency, consistent with other statutory directives⁶⁷ as well as overall strategic goals to work more efficiently.

Appendix

FDTA Section 5825(b)(2)(A) requires an identification of which corporate disclosures required under Securities Act Section 7 and Exchange Act Sections 13 and 14 are expressed as machine-readable data and which are not. The Commission collects these disclosures via the submission of forms and schedules through the EDGAR System. This Appendix identifies the disclosures expressed in a machine-readable format on an individual form, schedule, and statement basis. All other required disclosures in these filings are submitted in a non-machine readable format. The Appendix also identifies the forms, schedules, or statements that do not collect any machine-readable information. It does not include other collections of information with machine-readable data that are not required under these statutory provisions.

The Commission's requirement to file information tagged in XBRL (Inline XBRL, except where noted) is implemented primarily through Rule 405 of Regulation S-T. Rule 405 addresses the obligation to tag financial statements⁶⁸ and disclosure regarding pay-versus-performance, action to recover erroneously awarded compensation, insider trading arrangements and policies, and policies and practices related to the grant of certain equity awards close in time to the release of material non-public information. Rule 405 also addresses the obligation to tag certain fund prospectus, semi-annual report, and annual report disclosures in Forms N-1A, N-2, N-3, N-4, N-6, N-8B-2, S-6, and N-CSR. Rule 406 of Regulation S-T addresses the obligation to tag the cover page of Forms 10-K, 10-Q, 8-K, 20-F, and 40-F. Rule 408 of Regulation S-T addresses the obligation to tag the filing fee exhibit for registration statements and related fee-bearing prospectus supplements (excluding SF-1, SF-3, S-20, Schedule B, F-6, F-7, F-8 and F-80), fee-bearing Schedules 14A, 14C, 13E-3, 13E-4F, TO, and 14D-1F, and statements under Rule 13e-1 (phase-in begins in 2024). The information in this Appendix is as of November 17, 2023.

CORPORATE DISCLOSURES IN FORMS AND SCHEDULES UNDER SECURITIES ACT SECTION 7

Securities Act Registration Statements⁶⁹

Form S-1

- Financial statements must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Form S-3

- Financial statements must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Form S-4

- Financial statements must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Form S-8

- Filing fee exhibits must be tagged in Inline XBRL.

Form S-11

- Financial statements must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Form F-1

- Financial statements must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Form F-3

- Financial statements must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Form F-4

- Financial statements must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Form F-10

- Financial statements must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Form SF-1/SF-3 (registration forms used by certain types of asset-backed issuers)

- If an asset-backed issuer registrant's asset pool includes residential mortgages, commercial mortgages, automobile loans, automobile leases, debt securities or re-securitizations of asset-backed securities, certain asset-level information⁷⁰ is required to be filed under cover of Form ABS-EE in XML format.⁷¹ The initial asset-level disclosure filing is incorporated by reference into the relevant registration statement filing or related prospectus filing.
- Filing fee exhibits are not required to be tagged, but may be tagged, in Inline XBRL.

No machine-readable data is required in Forms F-6, F-7, F-8 and F-80 (registration statements available only to a registrant that is incorporated or organized under the laws of Canada or any Canadian province or territory and meets certain other conditions).

No machine-readable data is required in Form S-20 (used to register standardized options under the Securities Act if specified conditions are met) or in Schedule B (a registration statement available only to a registrant that is a foreign government).

CORPORATE DISCLOSURES IN FORMS, SCHEDULES, AND STATEMENTS UNDER EXCHANGE ACT SECTION 13

Form 10-K

- Cover page information (e.g., company name, form type, filer size, public float, ticker symbol) must be tagged in Inline XBRL.
- Financial statements must be tagged in Inline XBRL.
- The identity of the auditor (or auditors) who have provided opinions related to the financial statements presented in the registrant's annual report, the location where the auditor's report has been issued, and the PCAOB ID Number(s) of the audit firm(s) or branch(es) providing the opinion(s) must be tagged in Inline XBRL.
- Disclosure required by Item 106 of Regulation S-K (registrant's cybersecurity risk management, strategy, and governance).

- Disclosure required by Item 402(w) of Regulation S-K (registrant’s action to recover erroneously awarded compensation) must be tagged in Inline XBRL.
- Disclosure required by Item 402(x) of Regulation S-K (registrant’s policies and practices related to the grant of certain equity awards close in time to the release of material non-public information) must be tagged in Inline XBRL.
- Disclosure required by Item 408(a), (b)(1) and (d)⁷² of Regulation S-K (registrant’s insider trading arrangements and policies) must be tagged in Inline XBRL.
- Disclosure required by Item 601(b)(26) and Item 703 of Regulation S-K (purchases of equity securities by registrant and affiliated purchasers) must be tagged in Inline XBRL.

Form 10-Q

- Cover page information (e.g., company name, form type, filer size, public float, ticker symbol) must be tagged in Inline XBRL.
- Financial statements must be tagged in Inline XBRL.
- Disclosure required by Item 408(a) and (d) of Regulation S-K (registrant’s insider trading arrangements and policies) must be tagged in Inline XBRL.
- Disclosure required by Item 601(b)(26) and Item 703 of Regulation S-K (purchases of equity securities by registrant and affiliated purchasers) must be tagged in Inline XBRL.

Form 11-K

- Financial statements must be tagged in Inline XBRL (beginning in 2025).

Form 20-F

- Cover page information must be tagged in Inline XBRL (when Form 20-F is filed as an annual report).
- Disclosure required by Item 6.F (registrant’s action to recover erroneously awarded compensation) must be tagged in Inline XBRL.
- Disclosure required by Item 16E (purchases of equity securities by registrant and affiliated purchasers) must be tagged in Inline XBRL.
- Disclosure required by Item 16J (insider trading policies).
- Disclosure required by Item 16K (registrant’s cybersecurity risk management, strategy, and governance).
- Financial statements must be tagged in Inline XBRL.

- The identity of the auditor (or auditors) who have provided opinions related to the financial statements presented in the registrant’s annual report, the location where the auditor’s report has been issued, and the PCAOB ID Number(s) of the audit firm(s) or branch(es) providing the opinion(s) must be tagged in Inline XBRL

Form 40-F

- Cover page information must be tagged in Inline XBRL (when Form 40-F is filed as an annual report).
- Disclosure required by General Instruction B, paragraph (19) (registrant’s action to recover erroneously awarded compensation) must be tagged in Inline XBRL.
- Financial statements must be tagged in Inline XBRL.
- The identity of the auditor (or auditors) who have provided opinions related to the financial statements presented in the registrant’s annual report, the location where the auditor’s report has been issued, and the PCAOB ID Number(s) of the audit firm(s) or branch(es) providing the opinion(s), must be tagged in Inline XBRL.

Form ABS-EE

- The information in Form ABS-EE must be filed in XML format.

Form 8-K

- Cover page information must be tagged in Inline XBRL.
- Disclosure required by Item 1.05 (disclosure of material cybersecurity incidents).
- Financial statements must be tagged in Inline XBRL (when the form includes audited annual financial statements that are a revised version of financial statements that previously were filed with the Commission).

Form 6-K

- Disclosure required by General Instruction B (disclosure of material cybersecurity incidents).
- Financial statements must be tagged in Inline XBRL (when the form includes audited annual financial statements that are a revised version of financial statements that previously were filed with the Commission, or current interim financial statements are included pursuant to the nine-month updating requirement of Item 8.A.5 of Form 20-F).

Form F-SR

- Purchases of equity securities by registrant and affiliated purchasers must be tagged in Inline XBRL.

Form SD

- Information included in the Resource Extraction Issuer Disclosure Report (Exhibit 2.01) must be filed in XBRL.

Form 10-D

- ABS issuers generally are required to file standard Exchange Act filings, including Forms 10-K and 8-K. Additionally, ABS issuers are required to file ongoing reports (typically monthly) on Form 10-D, which include the distribution report sent to the holders of the ABS. If the issuer's asset pool includes residential mortgages, commercial mortgages, automobile loans, automobile leases, debt securities or re-securitizations of asset-backed securities, Form 10-D must also incorporate by reference the current asset-level disclosure filing on Form ABS-EE, which must be filed in XML format.

Schedules 13D and 13G

- The information in Schedules 13D and 13G must be filed in XML format.

Schedules 13E-3 and 13E-4F and Statements under Rule 13e-1

- Filing fee exhibits must be tagged in Inline XBRL.

No machine-readable data is required in Form 18-K (annual report form used by foreign governments or political subdivisions of foreign governments with securities listed on a United States exchange).

Exchange Act Section 13(n) requires Security-Based Swap Data Repositories to file registration statements (Form SDR). Commission Rules 13n-1(b) and 13n-11(f)(5) require entities to file Form SDR and all amendments “electronically in a tagged data format.” The Commission has stated that for a period of four years following Regulation SBSR’s Compliance Date 1, “an entity submitting an application to register would not need to comply with the requirement in Rule 13n-1(b) and Rule 13n-11(f)(5) to file Form SDR and all amendments ‘electronically in a tagged data format’ but instead would be able to submit such documents to the Commission electronically as portable document format (PDF) files, consistent with the CFTC SDR application procedures under Part 49.3(a)(1).775.”⁷³

CORPORATE DISCLOSURES IN SCHEDULES UNDER EXCHANGE ACT SECTION 14

Schedules 14A/14C

- Disclosure required by Item 402(v) of Regulation S-K (pay versus performance) must be tagged in Inline XBRL.
- Disclosure required by Item 402(w) of Regulation S-K (registrant’s action to recover erroneously awarded compensation) must be tagged in Inline XBRL.
- Disclosure required by Item 402(x) of Regulation S-K (registrant’s policies and practices related to the grant of certain equity awards close in time to the release of material non-public information) must be tagged in Inline XBRL.
- Disclosure required by Item 408(b)(1) of Regulation S-K (registrant’s insider trading arrangements and policies) must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Schedules T0 and 14D-1F

- Filing fee exhibits must be tagged in Inline XBRL.

No machine-readable data is required in Schedules 14D-9, 14D-9F, or 14N.

Fund Structured Data Requirements

Specific forms govern the disclosures made by mutual funds, exchange-traded funds (ETFs), money market funds, variable insurance products, closed-end funds and BDCs (together, funds). Funds are subject to a number of disclosure requirements, several of which are required to be machine-readable. Institutional investment managers are also required to periodically disclose certain holdings. The list below provides a complete list of such machine-readable disclosure requirements for these entities.

List of Machine-Readable Fund Disclosures under Securities Act Section 7 and Exchange Act Sections 13 and 14

FUND DISCLOSURES IN FORMS UNDER SECURITIES ACT SECTION 7

Securities Act Registration Statements

Form N-1A

- Items 2 through 4 of Form N-1A must be tagged in Inline XBRL. (Mutual funds and ETFs are required to tag their investment objectives including how terms used in fund names are defined, fee tables, principal strategies, principal risks, and performance information.)

Form N-2

- Cover page of Form N-2 must be tagged in Inline XBRL.
- Items 3.1, 4.3, 8.2.b, 8.2.d, 8.3.a, 8.3.b, 8.5.b, 8.5.c, 8.5.e, 10.1.a-d, 10.2.a-c, 10.2.e, 10.3, and 10.5 of Form N-2 must be tagged in Inline XBRL. (Closed-end funds and BDCs are required to tag their fee table, senior securities table, investment objectives and policies including how terms used in fund names are defined, risk factors, share price data, and capital stock, long-term debt and other securities. This information may be tagged in the prospectus or in periodic reports.)
- Filing fee exhibits must be tagged in Inline XBRL. (Closed-end funds that are not interval funds are required to tag their filing fee exhibits.)

Form N-3

- Items 2, 4, 5, 11, 18, and 19 of Form N-3 for contracts available to new investors must be tagged in Inline XBRL. (Variable insurance contracts are required to tag their key information table, fee table, principal risks, information about benefits, and investment options.)

Form N-4

- Items 2, 4, 5, 10, and 17 of Form N-4 for contracts available to new investors must be tagged in Inline XBRL. (Variable insurance contracts are required to tag their key information table, fee table, principal risks, information about benefits, and investment options.)

Form N-6

- Items 2, 4, 5, 10, 11, and 18 of Form N-6 for contracts available to new investors must be tagged in Inline XBRL. (Variable insurance contracts are required to tag their key information table, fee table, principal risks, information about benefits, and investment options.)

Form N-14

- Filing fee exhibits must be tagged in Inline XBRL. (Closed-end funds that are not interval funds are required to tag their filing fee exhibits.)

Forms N-8B-2 and S-6

- Information provided in response to Instruction 2 to Item 11 of Form N-8B-2 must be tagged in Inline XBRL. Form S-6 incorporates the disclosure and tagging requirements of Form N-8B-2. (Unit investment trusts registering on Forms N-8B-2 and S-6 are required to tag how terms used in fund names are defined.)

No machine-readable data is required in Form N-5.

FUND DISCLOSURES IN FORMS UNDER EXCHANGE ACT SECTION 13

Form N-CSR

- Item 27A of Form N-1A is required to be tagged in Inline XBRL. (Mutual funds and ETFs are required to tag their shareholder reports, which includes fee, performance, holdings, material changes and other specified fund information.) Note: The compliance date is July 24, 2024.
- Items 3.1, 4.3, 8.2.b, 8.2.d, 8.3.a, 8.3.b, 8.5.b, 8.5.c, 8.5.e, 10.1.a-d, 10.2.a-c, 10.2.e, 10.3, and 10.5 of Form N-2 must be tagged in Inline XBRL. (Closed-end funds are required to tag their fee table, senior securities table, investment objectives and policies, risk factors, share price data, and capital stock, long-term debt and other securities. This information may be tagged in the N-CSR filing to the extent this information is included.)
- Item 14 of Form N-CSR will be required to be tagged in Inline XBRL. (Listed closed-end funds are required to disclose certain share repurchase information.) The compliance date commences with the Form N-CSR that covers the first six-month period that begins on or after January 1, 2024.

- Item 18 of Form N-CSR is required to be tagged in Inline XBRL. (Internally managed closed-end funds are required to tag disclosure related to the recovery of erroneously awarded compensation.) Note: The compliance date is dependent on exchanges updating their listing requirements.

Form N-CEN

- Form N-CEN must be filed in XML format. (Form N-CEN provides annual census information or nearly all registered investment companies. The filing of N-CEN satisfies Exchange Act reporting obligations for unit investment trusts.)

Form 10-K (Only for BDCs)

- Cover page information (e.g., company name, form type, filer size, public float, ticker symbol) must be tagged in Inline XBRL.
- Items 3.1, 4.3, 8.2.b, 8.2.d, 8.3.a, 8.3.b, 8.5.b, 8.5.c, 8.5.e, 10.1.a-d, 10.2.a-c, 10.2.e, 10.3, and 10.5 of Form N-2 must be tagged in Inline XBRL. (BDCs are required to tag their fee table, senior securities table, investment objectives and policies, risk factors, share price data, and capital stock, long-term debt and other securities. This information may be tagged in the 10-K to the extent this information is included in the Exchange Act report.)
- Financial statements and schedules listing various BDC investments must be tagged in Inline XBRL.
- The identity of the auditor (or auditors) who have provided opinions related to the financial statements presented in the registrant's annual report, the location where the auditor's report has been issued, and the PCAOB ID Number(s) of the audit firm(s) or branch(es) providing the opinion(s) must be tagged in Inline XBRL.
- Disclosure required by Item 106 of Regulation S-K (registrant's cybersecurity risk management, strategy, and governance) must be tagged in Inline XBRL.
- Disclosure required by Item 402(w) of Regulation S-K (registrant's action to recover erroneously awarded compensation) must be tagged in Inline XBRL.
- Disclosure required by Item 402(x) of Regulation S-K (registrant's policies and practices related to the grant of certain equity awards close in time to the release of material non-public information) must be tagged in Inline XBRL.
- Disclosure required by Item 408(a), 408(b)(1), and 408(d) of Regulation S-K (registrant's insider trading arrangements and policies) must be tagged in Inline XBRL.
- Disclosure required by Items 601(b)(26) and 703 of Regulation S-K (registrant's share repurchases) must be tagged in Inline XBRL.

Form 10-Q (Only for BDCs)

- Cover page information must be tagged in Inline XBRL.
- Items 3.1, 4.3, 8.2.b, 8.2.d, 8.3.a, 8.3.b, 8.5.b, 8.5.c, 8.5.e, 10.1.a-d, 10.2.a-c, 10.2.e, 10.3, and 10.5 of Form N-2 must be tagged in Inline XBRL. (BDCs are required to tag their fee table, senior securities table, investment objectives and policies, risk factors, share price data, and capital stock, long-term debt and other securities. This information may be tagged in the 10-Q to the extent this information is updated in the Exchange Act report.)
- Financial statements must be tagged in Inline XBRL.
- Disclosure required by Item 408(a) and 408(d) of Regulation S-K (registrant's insider trading arrangements and policies) must be tagged in Inline XBRL.
- Disclosure required by Items 601(b)(26) and 703 of Regulation S-K (registrant's share repurchases) must be tagged in Inline XBRL.

Form 8-K (Only for BDCs and is optional for registered closed-end funds)

- Cover page information must be tagged in Inline XBRL.
- Items 3.1, 4.3, 8.2.b, 8.2.d, 8.3.a, 8.3.b, 8.5.b, 8.5.c, 8.5.e, 10.1.a-d, 10.2.a-c, 10.2.e, 10.3, and 10.5 of Form N-2 must be tagged in Inline XBRL. (BDCs are required to tag their fee table, senior securities table, investment objectives and policies, risk factors, share price data, and capital stock, long-term debt and other securities. This information may be tagged in the 8-K to the extent this information is updated in the Exchange Act report.)
- Disclosure required by Item 1.05 of Form 8-K (disclosure of material cybersecurity incidents) must be tagged in Inline XBRL.
- Financial statements must be tagged in Inline XBRL (when the form includes audited annual financial statements that are a revised version of financial statements that previously were filed with the Commission).

Form 13F

- Form 13F must be filed in XML format. (Form 13F is a quarterly report of certain holdings required of all institutions with equity assets of \$100 million or more. This includes investment advisers, banks, insurance companies, broker-dealers, pension funds, and corporations.)

FUND DISCLOSURES IN SCHEDULES UNDER EXCHANGE ACT SECTION 14

Schedules 14A/14C

- For BDCs, disclosure required by Item 402(v) of Regulation S-K (pay versus performance) must be tagged in Inline XBRL.
- For BDCs, disclosure required by Item 402(w) of Regulation S-K (registrant's action to recover erroneously awarded compensation) must be tagged in Inline XBRL.
- For BDCs, disclosure required by Item 402(x) of Regulation S-K (registrant's policies and practices related to the grant of certain equity awards close in time to the release of material non-public information) must be tagged in Inline XBRL.
- For BDCs, disclosure required by Item 408(b)(1) of Regulation S-K (registrant's insider trading arrangements and policies) must be tagged in Inline XBRL.
- Filing fee exhibits must be tagged in Inline XBRL.

Endnotes

- 1 See James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, P.L. 117-263 (2022).
- 2 See FDTA Section 5825(b).
- 3 See FDTA Section 5825(c) (“Beginning on the date that is 7 years after the date of enactment of this Act, this section shall have no force or effect.”).
- 4 See FDTA Section 5825(b)(2). A separate provision of the FDTA indicates that the term “machine-readable,” when used with respect to data, means data in a format that can be easily processed by a computer without human intervention while ensuring no semantic meaning is lost. See FDTA Section 5811 (providing that the term “machine-readable” shall have the meaning given in 44 U.S.C. 3502(18)).
- 5 15 U.S.C. 77g.
- 6 15 U.S.C. 78m.
- 7 15 U.S.C. 78n.
- 8 See Interactive Data to Improve Financial Reporting, Release No. 33-9002 (Jan. 30, 2009) (adopting release) [74 FR 6776 (Feb. 9, 2009)] (“Interactive Data to Improve Financial Reporting”) as corrected by Interactive Data to Improve Financial Reporting, Release No. 33-9002A [74 FR 15666 (Apr. 7, 2009)].
- 9 See Interactive Data to Improve Financial Reporting, *supra* note 8, at 6778 (describing how financial reporting in XBRL involves the use of standard tags that cover “financial concepts that can be read and understood by software applications”). See also XBRL: *What Is It? Why the FASB? Who Uses It?*, FASB.org (Apr. 1, 2021), available at [https://www.fasb.org/Page/ShowPdf?path=FASB_in_Focus--XBRL_\(4-21\).pdf](https://www.fasb.org/Page/ShowPdf?path=FASB_in_Focus--XBRL_(4-21).pdf) (“[XBRL] is the open international standard for digital business reporting. XBRL is used to deliver human-readable financial statements in a machine-readable, structured data format.”).
- 10 See Interactive Data for Mutual Fund Risk/Return Summary, Release No. 33-9006 (Feb. 11, 2009) (adopting release) [74 FR 7747 (Feb. 19, 2009)] as corrected by Interactive Data for Mutual Fund Risk/Return Summary; Correction, Release No. 33-9006A [74 FR 21255 (May 7, 2009)].
- 11 See Inline XBRL Filing of Tagged Data, Release No. 33-10514 (Jun. 28, 2018) (adopting release) [83 FR 40846 (Aug. 16, 2018)] (“Inline XBRL Filing of Tagged Data Adopting Release”).
- 12 See Inline XBRL Filing of Tagged Data Adopting Release, *supra* note 11, at Section III.A.1.a. Structured data is data that is tagged to make it machine-readable.
- 13 FAST Act Modernization and Simplification of Regulation S-K, Release No. 33-10618 (Mar. 20, 2019) (adopting release) [84 FR 12674 (Apr. 2, 2019)] as corrected by FAST Act Modernization and Simplification of Regulation S-K; Correction, Release No. 33-10618A [84 FR 39966 (Aug. 13, 2019)].
- 14 See Filing Fee Disclosure and Payment Methods Modernization, Release No. 33-10997 (Oct. 13, 2021) (adopting release) [86 FR 70166 (Dec. 9, 2021)] (“Filing Fee Disclosure and Payment Methods Modernization Adopting Release”).
- 15 See Holding Foreign Companies Accountable Act Disclosure, Release No. 34-93701 (Dec. 2, 2021) (adopting release) [86 FR 70027 (Dec. 9, 2021)].
- 16 See, e.g., Modernization of Beneficial Ownership Reporting, Release No. 33-11253 (Oct. 10, 2023) (adopting release) [88 FR 76896 (Nov. 7, 2023)] (“Beneficial Ownership Reporting Adopting Release”); Investment Company Names, Release No. 33-11238 (Sep. 20, 2023) (adopting release) [88 FR 70436 (Oct. 11, 2023)]; Cybersecurity Risk Management, Strategy, Governance, and Incident Disclosure, Release No. 33-11216 (Jul. 26, 2023) (adopting release) [88 FR 51896 (Aug. 4, 2023)]; Money Market Fund Reforms, Release No. 33-11211 (Jul. 12, 2023) (adopting release) [88 FR 51404 (Aug. 3, 2023)] (“Money Market Fund Reform Adopting Release”); Share Repurchase Disclosure Modernization, Release No. 34-97424 (May 3, 2023) (adopting release) [88 FR 36002 (Jun. 1, 2023)] (“Repurchase Rule”); Insider Trading Arrangements and Related Disclosures, Release No. 33-11138 (Dec. 14, 2022) (adopting release) [87 FR 80362 (Dec. 29, 2022)]; Enhanced Reporting of Proxy Votes by Registered Management Investment Companies; Reporting of Executive Compensation Votes by Institutional Investment Managers, Release No. 33-11131 (Nov. 2, 2022) (adopting release) [87 FR 78770 (Dec. 22, 2022)] (“Enhanced Reporting of Proxy Votes Adopting Release”); Short Position and Short Activity Reporting by Institutional Investment Managers, Release No. 34-98738 (Oct. 13, 2023) (adopting release) [88 FR 75100 (Nov. 1, 2023)] (“Short Reporting Adopting Release”); see also *Standard Taxonomies*, SEC. & EXCH. COMM’N (last modified Apr. 6, 2023), available at <https://www.sec.gov/info/edgar/edgartaxonomies> (providing information on the current taxonomies supported by the Commission’s Interactive Data program).

- 17 See, e.g., Short Reporting Adopting Release, *supra* note 16 (Section II.A.4.b discussing decision to adopt custom XML as Form SHO reporting language); Beneficial Ownership Reporting Adopting Release, *supra* note 16 (Section II.F discussing decision to adopt custom XML as Schedule 13D and Schedule 13G reporting language); Money Market Fund Reform Adopting Release, *supra* note 16 (Section II.F.1.b discussing decision to adopt custom XML as Form N-CR reporting language); Enhanced Reporting of Proxy Votes Adopting Release, *supra* note 16 (Section II.G. discussing decision to adopt custom XML as Form N-PX reporting data language); Electronic Submission of Orders Under the Advisers Act and the Investment Company Act, Confidential Treatment Requests for Filings on Form 13F, and Form ADV-NR; Amendments to Form 13F, Release No. 34-95148 [87 FR 38943 (Jun. 30, 2022)] (Section IV.B. stating that fund managers submit Form 13F on EDGAR in a custom XML structured data language created specifically for Form 13F).
- 18 See *Current EDGAR Technical Specifications*, SEC. & EXCH. COMM'N (last modified Sep. 18, 2023), available at <https://www.sec.gov/edgar/filer-information/current-edgar-technical-specifications>.
- 19 See EDGAR FILER MANUAL, VOLUME II, ch. 8-9 (Version 67, Sep. 2023), SEC. & EXCH. COMM'N, available at <https://www.sec.gov/edgar/filermanual>.
- 20 Including Form SDR discussed in the Appendix at A-5.
- 21 Investment Company Names, Release No. 33-11238 (Sep. 20, 2023) (adopting release for amendments to Forms N-8B-2 and S-6) [88 FR 70436 (Oct. 27, 2023)]; Modernization of Beneficial Ownership Reporting, *supra* note 16 (adopting release for amendments to Schedules 13D and 13G).
- 22 See FDTA Section 5825(b).
- 23 See, e.g., Xin Luo et al., *Initial Evidence on the Market Impact of the iXBRL Adoption*, 37 ACCT. HORIZONS 143 (2021); Yuyun Huang et al., *Information Processing Costs and Stock Price Informativeness: Evidence from the XBRL Mandate*, 46 AUSTL. J. MGMT. 110 (2021); Ju-Chun Yen & Tawei Wang, *The Association Between XBRL Adoption and Market Reactions to Earnings Surprises*, 29 J. Info. Sys. 51 (2015); Yi Dong et al., *Does Information-Processing Cost Affect Firm-Specific Information Acquisition? Evidence from XBRL Adoption*, 51 J. FIN. & QUANTITATIVE ANALYSIS 435 (2016); Yanan Zhang et al., *XBRL Adoption and Expected Crash Risk*, 38 J. ACCT. & PUB. POL'Y 31 (2019); Jap Efendi et al., *Do XBRL Filings Enhance Informational Efficiency? Early Evidence from Post-earnings Announcement Drift*, 67 J. BUS. RSCH. 1099 (2014). See also J. Efrim Boritz & Won Gyun No, *How Significant Are the Differences in Financial Data Provided by Key Data Sources? A Comparison of XBRL, Compustat, Yahoo! Finance, and Google Finance*, 34 J. INFO. SYS. 47 (2020); Raunaq S. Pungaliya & Yanbo Wang, *Machine Invasion: Automation in Information Acquisition and the Cross-Section of Stock Returns*, 64 J. FIN. MARKETS. (2023); Marcin Jaskowski & Daniel Rettl, *Information Acquisition Costs and Credit Spreads*, 149 J. BANKING FIN. (2023).
- 24 See, e.g., Yuyun Huang et al., *Insider Profitability and Public Information: Evidence from the XBRL Mandate* (Sep. 17, 2019), available at SSRN: <http://dx.doi.org/10.2139/ssrn.3455105>; Bing Li et al., *The Impact of XBRL Adoption on Local Bias: Evidence from Mandated US Filers*, 39 J. ACCT. & PUB. POL'Y 106767 (2020). See also Jeong-Bon Kim et al., *Information-Processing Costs and Breadth of Ownership*, 36 CONTEMP. ACCT. RSCH. 2408 (2019); Nilabhra Bhattacharya et al., *Leveling the Playing Field Between Large and Small Institutions: Evidence from the SEC's XBRL Mandate*, 93 ACCT. REV. 51 (2018); but see Elizabeth Blankespoor et al., *Initial Evidence on the Market Impact of the XBRL Mandate*, 19 REV. ACCT. STUD. 1468 (2014).
- 25 See, e.g., Andrew J. Felo et al., *Can XBRL Detailed Tagging of Footnotes Improve Financial Analysts' Information Environment?* 28 INT'L J. ACCT. INFO. SYS. 45 (2018) ("XBRL Detailed Tagging of Footnotes"); Marcus Kirk et al., *From Print to Practice: XBRL Extension Use and Analyst Forecast Properties* (Aug. 18, 2016), available at SSRN: <http://dx.doi.org/10.2139/ssrn.2826159>; Chunhui Liu et al., *XBRL's Impact on Analyst Forecast Behavior: An Empirical Study*, 33 J. ACCT. & PUB. POL'Y 69 (2014); but see Sherwood Lane Lambert et al., *Analysts' Forecasts Timeliness and Accuracy Post-XBRL*, 27 INT'L J. ACCT. & INFO. MGMT. 151 (2019). See also Alastair Lawrence et al., *Investor Demand for Sell-Side Research*, 92 ACCT. REV. 123 (2017).

- 26 See, e.g., Elizabeth Blankespoor, *The Impact of Information Processing Costs on Firm Disclosure Choice: Evidence from the XBRL Mandate*, 57 J. ACCT. RSCH. 919 (2019); Jeong-Bon Ki et al., *Does XBRL Adoption Constrain Earnings Management? Early Evidence from Mandated U.S. Filers*, 36 CONTEMP. ACCT. RSCH. 2610 (2019). See also Steve Yang et al., *The Impact of XBRL on Financial Statement Structural Comparability*, in NETWORK, SMART AND OPEN: THREE KEYWORDS FOR INFORMATION SYSTEMS INNOVATION 193 (Rita Lamboglia et al., ed. 2018); but see Sandip Dhole et al., *Effects of the SEC's XBRL Mandate on Financial Reporting Comparability*, 19 INT'L J. ACCT. INFO. SYS. 29 (2015).
- 27 See, e.g., Yuan George Shan & Indrit Troshani, *Does XBRL Benefit Financial Statement Auditing?* 54 J. COMPUT. INFO. SYS. 11 (2014) (finding XBRL adoption to be negatively associated with audit fees due to its facilitation of the auditing process through enhancement of financial statement transparency); Hui Du & Kean Wu, *XBRL Mandate and Timeliness of Financial Reporting: Do XBRL Filings Take Longer?* 15 J. EMERG. TECH. ACCT. 57 (2018) (finding decreased reporting lags for XBRL filings compared to non-XBRL filings from accelerated and large accelerated filers, but not for non-accelerated filers, and postulating that accelerated and large accelerated filers have updated their computer system to use a systemic accounting ecosystem); Keval Amin et al., *The Effect of the SEC's XBRL Mandate on Audit Report Lags*, 32 ACCT. HORIZONS 1 (2018) (finding decrease in audit report lags and audit fees following the mandatory adoption of XBRL, likely driven at least in part by auditor efficiency gains).
- 28 See Wafa Sassi et al., *The Impact of Mandatory Adoption of XBRL on Firm's Stock Liquidity: A Cross-Country Study*, 19 J. FIN. REPORTING & ACCT. 299 (2021); Chae-Won Ra & Ho-Young Lee, *XBRL Adoption, Information Asymmetry, Cost of Capital, and Reporting Lags*, 10 iBUSINESS, 93 (2018); Syou-Ching Lai et al., *XBRL Adoption and Cost of Debt*, INT'L J. ACCT. & INFO. MGMT. 199 (2015); Tien-shih Hsieh & Jean C. Bedard, *Impact of XBRL on Voluntary Adopters' Financial Reporting Quality and Cost of Equity Capital*, 15 J. EMERGING TECHNOLOGIES IN ACCT. 45 (2018); Xin Cheng et al., *How Does Information Processing Efficiency Relate to Investment Efficiency? Evidence from XBRL Adoption*, 35 J. INFO. SYS. 1 (2021); Olivia Berkman, *XBRL: What are the Benefits*, FEI Daily (Aug. 29, 2019), available at <https://www.financialexecutives.org/FEI-Daily/August-2019/XBRL-What-are-the-Benefits.aspx> (“Berkman, XBRL Benefits”).
- 29 Specific examples of Commission staff usage of machine-readable disclosures are provided in subsequent sections. Other Financial Stability Oversight Council member-agency staff use the Commission's machine-readable data to inform their regulatory efforts. See, e.g., Lei Li and Lucas Epstein, *Investor Base and Prime Money Market Fund Behavior*, FEDS Notes, Washington: Board of Governors of the Federal Reserve System (Apr. 19, 2022), available at <https://doi.org/10.17016/2380-7172.3116> (using custom XML Form N-MFP data to examine the relationship between the investor base and behavior of prime money market funds).
- 30 For example, the Negative Values validation rule can automatically check for instances where negative values are reported for elements that must always be positive or zero. See *Approved Validation Rules*, XBRL US (Nov. 4, 2023), <https://xbrl.us/data-quality/rules-guidance/>; *Negative Values*, XBRL US (last modified Oct. 5, 2023), https://xbrl.us/data-rule/dqc_0015/. See also *EDGAR XBRL Validation Errors*, SEC. & EXCH. COMM'N (last modified Sep. 19, 2023), <https://www.sec.gov/structureddata/edgarvalidationerrors>; *EDGAR XBRL Validation Warnings*, SEC. & EXCH. COMM'N (last modified Sep. 19, 2023), https://www.sec.gov/page/osd_edgarvalidationwarnings.
- 31 Inline XBRL documents are both human-readable and machine-readable. Custom XML documents are rendered into human-readable versions on the Commission's public-facing website, <https://www.sec.gov/edgar/searchedgar/companysearch>.
- 32 See *DERA Data Library*, SEC. & EXCH. COMM'N (last modified Nov. 3, 2023), <https://www.sec.gov/dera/data>; *Structured Disclosure RSS Feeds*, SEC. & EXCH. COMM'N (last modified Mar. 11, 2022), <https://www.sec.gov/structureddata/rss-feeds-submitted-filings>; *Application Programming Interfaces*, SEC. & EXCH. COMM'N (last modified Nov. 9, 2022), <https://www.sec.gov/edgar/sec-api-documentation>.
- 33 See AICPA, *XBRL Costs for Small Companies Have Declined 45% Since 2014* (2018), available at <https://us.aicpa.org/content/dam/aicpa/interestareas/frc/accountingfinancialreporting/xbrl/downloadabledocuments/xbrl-costs-for-small-companies.pdf> (“AICPA, XBRL Costs for Small Companies Have Declined”) (noting a 45% decline in XBRL costs for small companies from 2014 to 2017).

- 34 See F. Guo, X. Luo, P. R. Wheeler, L. Yang, X. Zhao & Y. Zhang, *Enterprise Resource Planning Systems and XBRL Reporting Quality*, 35 J. INFO. SYS. 77-106 (2021).
- 35 See AICPA, *XBRL Costs for Small Companies Have Declined*, *supra* note 33. While the survey did not specify the particular filings covered, XBRL filing requirements for reporting companies at the time of the sample included the XBRL (non-Inline) tagging of quarterly and annual financial statements filed in periodic reports (e.g., Forms 10-Q, 10-K, and 20-F) and registration statements (e.g., Forms S-1, S-3, and F-1) that included a price or price range and were filed after the first 10-Q, 20-F, or 40-F following the company's initial public offering.
- 36 See letter from Nasdaq, Inc. (Mar. 21, 2019), *available at* <https://www.sec.gov/comments/s7-26-18/s72618-5177722-183507.pdf>, Request for Comment on Earnings Releases and Quarterly Reports, Release No. 33-10588 [83 FR 65601 (Dec. 21, 2018)].
- 37 See, e.g., *Electronic Submission of Certain Material Under the Securities Exchange Act of 1934; Amendments Regarding the FOCUS Report*, Release No. 33-11176 (Mar. 22, 2023) (proposing release) [88 FR 23920 (Apr. 18, 2023)] (“Electronic Submission Proposing Release”) (observing a higher number of tagged information in filings from a population of Nasdaq-listed companies than in filings from a population of small companies). See also Bok Baik et al., *Organizational Complexity, Financial Reporting Complexity, and Voluntary Disclosure*, presented at the Am. Acct. Ass'n 2020 Virtual Ann. Meeting and Conf. on Teaching & Learning (Aug. 13, 2020), <https://doi.org/10.26226/morressier.5f0c7d3058e581e69b05d16d> (finding “firm complexity is positively associated with financial reporting complexity holding all else constant”).
- 38 A “response” is a filing that requires Inline XBRL tagging; see *Inline XBRL Filing of Tagged Data Adopting Release*, *supra* note 11, at 40869. These figures represent the costs of tagging financial statements in Inline XBRL (not the costs of switching from XBRL to Inline XBRL) for operating companies subject to financial statement tagging requirements.
- 39 See OMB, *Supporting Statement for the Paperwork Reduction Act Information Collection Submission For Interactive Data: OMB Control Number 3235-0645, Attachment A* (Jun. 6, 2022), *available at* <https://omb.report/icr/202203-3235-001/doc/122014900>.
- 40 See *Electronic Submission Proposing Release*, *supra* note 37, at 23986. Some compliance service providers publicly disclose or advertise pricing information on their websites. See, e.g., EDGAR Filing Services, *ADVANCED COMP. INNOVATIONS, INC.*, <http://www.edgar-services.com/> (last visited Oct. 12, 2023); *COMPSCI RESOURCES*, <https://www.compsciresources.com/pricing> (last visited Oct. 12, 2023). Other compliance service providers do not publicly disclose pricing information on their websites, instead requiring individual pricing consultations.
- 41 See *Electronic Submission Proposing Release*, *supra* note 37, at 23986.
- 42 The six EPS cases covered a wide variety of practices that impacted EPS. See *In re Interface, Inc.*, Release Nos. 33-10854, 34-90018 (Sep. 28, 2020) (settled action) (making unsupported manual accounting adjustments that boosted the company's income); *In re Fulton Fin. Corp.*, Release No. 34-90017 (Sep. 28, 2020) (settled action) (reporting valuation allowances in a manner that was at odds with the valuation methodologies described in the same filings); *In re Healthcare Services Grp., Inc.*, Release Nos. 33-10967, 34-92735 (Aug. 21, 2021) (settled action) (failing to timely accrue and disclose material loss contingencies related to private litigation); *In re Rollins Inc.*, Release Nos. 33-11052, 34-94742 (Apr. 18, 2022) (settled action) (making unsupported reductions in accounting reserves); *Securities and Exchange Commission v. Hutchison*, No. 1:22-cv-02296 (D.D.C. filed Aug. 3, 2022) (litigated action) (alleging that the defendant engaged in the practice of urging subordinates to ship future orders ahead of schedule and report the revenue early, among other things, and failed to disclose this practice to investors) and *In re Surgalign Holdings, Inc.*, Release No. 33-11088 (Aug. 3, 2022) (settled action); and *In re Gentex Corp.*, Release No. 34-96819 (Feb. 7, 2023) (settled action) (reducing an accrual for a performance-based bonus program, among other things).

- 43 See *In re Grupo Aval Acciones y Valores S.A. and Corporación Financiera Colombiana S.A.*, Release No. 34-98103 (Aug. 10, 2023) (settled action) (finding that Grupo Aval Acciones y Valores S.A. (“Grupo Aval”) and Corporación Financiera Colombiana S.A. (“Corficolombiana”) violated the internal accounting controls and books and records provisions of the federal securities laws and that Corficolombiana violated the antibribery provisions of the Foreign Corrupt Practices Act and ordering Grupo Aval to pay approximately \$40 million in disgorgement and prejudgment interest. Corficolombiana also agreed to enter into a deferred prosecution agreement with the U.S. Department of Justice and to pay more than \$20 million to settle criminal charges.)
- 44 Information and lists of Commission-Identified Issuers under the Holding Foreign Companies Accountable Act are available on the Commission’s website at <https://www.sec.gov/hfcaa>.
- 45 See Division of Corporation Finance, Sample Letter to Companies Regarding Their XBRL Disclosures, SEC. & EXCH. COMM’N (Sep. 7, 2023), <https://www.sec.gov/corpfin/sample-letter-companies-regarding-their-xbrl-disclosures>.
- 46 See Division of Investment Management, Accounting and Disclosure Information 2019-09, Performance and Fee Issues, SEC. & EXCH. COMM’N (Oct. 2, 2019) (“Investment Management, Accounting and Disclosure Information 2019-09”), <https://www.sec.gov/investment/accounting-and-disclosure-information/performance/adi-2019-09-performance-and-fee-issues>.
- 47 The disclosure review program refers to the staff’s review of fund registration statements, proxy materials, shareholder reports and other disclosures.
- 48 See Investment Management, Accounting and Disclosure Information 2019-09, *supra* note 47.
- 49 See Filing Fee Disclosure and Payment Methods Modernization Adopting Release, *supra* note 14. The Commission opted to phase in the structuring requirements over time but otherwise require compliance upon effectiveness of the rules. For large accelerated filers, the compliance date for the structuring requirements is for filings submitted on or after July 31, 2024. For accelerated filers, certain investment companies that file registration statements on Forms N-2 and N-14, and all other filers, the compliance date for the structuring requirements is for filings submitted on or after July 31, 2025. See *id.* at Section II.A.6.
- 50 See FDTA Section 5825.
- 51 See, e.g., *Who’s Using XBRL Data and Why: Case Studies*, Morgan Stanley Research (Nov. 2017), available at <https://www.calcbench.com/home/pdf?name=MS%20XBRL%20Case%20Study%202011-1-2017.pdf>.
- 52 See, e.g., 2019 Pension Review First Take: Flat to Down, Goldman Sachs Asset Management (2020) (an example of asset manager use of XBRL data), available at https://www.gsam.com/content/dam/gsam/pdfs/common/en/public/articles/2020/2019_Pension_First_Take.pdf?sa=n&rd=n (citing an XBRL research software provider as a data source).
- 53 See Berkman, XBRL Benefits, *supra* note 28.
- 54 See, e.g., *How Third Party Data Providers Use Structured Data and Why; XBRL US, Financial Fundamentals Analysis – What Analysts Can Do with Structured Data*, XBRL US (Mar. 2016), available at <https://xbrl.us/events/analyst-webinar-160323/> (“How Third Party Data Providers Use Structured Data and Why”).
- 55 See, e.g., Paulien Zhu, *The Effect of XBRL on Insider Trading Profitability*, ERASMUS UNIVERSITEIT ROTTERDAM (2018) (noting a decrease in the information gap between insiders and individual investors associated with XBRL requirements).
- 56 See *How Third Party Data Providers Use Structured Data and Why*, *supra* note 55.
- 57 See, e.g., J. Eaglesham, *How Companies Treat Stock Options When Tallying Cash Flow Perplexes Investors*, Wall St. J. (Oct. 7, 2022), available at <https://www.wsj.com/articles/how-companies-treat-stock-options-when-tallying-cash-flow-perplexes-investors-11665098910> (citing an XBRL research software provider as a data source).

- 58 See Investment Management, Accounting and Disclosure Information 2019-09, *supra* note 47.
- 59 See, e.g., R. Hoitash & U. Hoitash, *Measuring Accounting Reporting Complexity with XBRL*, 93 ACCOUNTING REVIEW 259-287 (2018) (“Hoitash & Hoitash, Measuring Accounting Reporting Complexity”).
- 60 See XBRL Detailed Tagging of Footnotes (and related citations), *supra* note 25.
- 61 See Hoitash & Hoitash, *Measuring Accounting Reporting Complexity*, *supra* note 59; Rimona Palas et al., *Does Wedge Size Matter? Financial Reporting Quality and Effective Regulation of Dual-class Firms*. FIN. RES. LETTERS 54 (2023) (using XBRL financial statement data to assess reporting patterns in firms with dual-class share structures).
- 62 *XBRL: What Is It? Why the FASB? Who Uses It?*, FASB.org, available at <https://www.fasb.org/page/PageContent?pageId=/staticpages/what-is-xbrl.html&isstaticpage=true>.
- 63 For example, the Commission’s quarterly XBRL datasets for mutual fund prospectus risk/return summaries garnered over 13,000 page views from September 2022 to September 2023, according to a Google Analytics query of the Commission’s XBRL dataset webpage, which is available at <https://www.sec.gov/dera/data>.
- 64 See, e.g., Sonali Basak, *The Really, Really Rich Are Playing It Safe*, Bloomberg.com (Feb. 17, 2023), available at <https://www.bloomberg.com/news/newsletters/2023-02-17/how-billionaires-invested-in-the-fourth-quarter-of-2022> (example of news media article analyzing 13F data); Travis A. Dyer, *The Demand for Public Information by Local and Non-local Investors: Evidence from Investor-Level Data*, 72 J. ACCT. & ECON. 1 (Aug. 2021); Ron Kaniel & Pingle Wang, *Unmasking Mutual Fund Use During COVID-19 Crisis*, 49 COVID ECON. 172 (Sept. 18, 2020) (example of academic research using custom XML dataset from the Commission’s Form N-PORT).
- 65 Based on Google Analytics results for Form 13F data set downloads between August 1, 2022 and October 11, 2023, accessed on October 12, 2023.
- 66 See, e.g., Press Release, SEC. & EXCH. COMM’N, SEC Publishes FY22-26 Strategic Plan (Nov. 23, 2022), available at <https://www.sec.gov/news/press-release/2022-210>. See also SEC Office of the Chief Data Officer, Data Strategy For Fiscal Years 2022-2026 (Jan. 26, 2023), available at <https://www.sec.gov/files/2022-ocdo-data-strategy-fy2022-2026.pdf>.
- 67 See, e.g., Foundations for Evidence-Based Policymaking Act of 2018, Pub. L. 115-435 (Jan. 14, 2019). Title II of the Foundations for Evidence-Based Policymaking Act of 2018, also known as the Open, Public, Electronic, and Necessary (OPEN) Government Data Act, sets forth a framework for managing government information as a strategic asset at each stage of the information’s life cycle to promote accessibility and usability.
- 68 As used in this report, the reference to financial statements means the face of the financial statements and accompanying footnotes. The face of the financial statements refers to the statement of financial position (balance sheet), income statement, statement of comprehensive income, statement of cash flows, and statement of owners’ equity, as required by Commission regulations. References to the financial statements as required for interactive data reporting include any required schedules to the financial statements, unless otherwise stated.
- 69 Financial statements in Securities Act registration statements are required to be tagged when physically included (i.e., not incorporated by reference) unless the registration statement is for an initial public offering (IPO), in which case, the financial statements are not required to be tagged. See Rule 601(b)(101)(i)(A) and paragraph (101)(a)(i) of Part II - Information Not Required to be Delivered to Offerees or Purchasers of Form F-10.

- 70 See Asset-Backed Securities Disclosure and Registration, Release No. 33-9638 (Sep. 4, 2014) (adopting release) [79 FR 57183 (Sep. 24, 2014)] at Section III. The asset-level item requirements are located in 17 CFR 229.1125. The required asset-level information includes: data points about the payment stream related to a particular asset, such as the contractual terms, scheduled payment amounts, basis for interest rate calculations and whether and how payment terms change over time; data points that allow for an analysis of the collateral related to the asset, such as the geographic location of the property, property valuation data and loan-to-value (“LTV”) ratio; data points about the performance of each asset over time, for example, data about whether an obligor is making payments as scheduled; and data points about the loss mitigation efforts by the servicer to collect amounts past due and the losses that may be passed on to the investors.
- 71 The Commission maintains an XML technical specification that includes rules for validation and permitted response codes for each XML tag. See EDGAR ABS XML Technical Specification (Version 3.0) (Dec. 019, 2022), available at <https://www.sec.gov/info/edgar/specifications/absxml>.
- 72 Phase-in of the tagging requirements of Items 408(d), 601(b)(26) and 703 of Regulation S-K, Item 16E of Form 20-F, Form F-SR, and Item 14 of Form N-CSR begins in 2024. The Repurchase Rule, which includes these tagging requirements, is stayed pending further Commission action. See *In the Matter of Share Repurchase Disclosure Modernization*, Release No. 34-99011 (Nov. 22, 2023).
- 73 See Cross-Border Application of Certain Security-Based Swap Requirements, Release No. 34-87780 (Dec. 18, 2019) (adopting release) [85 FR 6270 (Feb. 4, 2020)].

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