

IVSC PERSPECTIVES PAPER

VALUING DATA

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The IVSC issues Perspectives Papers from time to time, which focus on pertinent valuation topics and emerging issues. Perspectives Papers serve a number of purposes: they initiate and foster debate on valuation topics as they relate to the International Valuation Standards (IVS); they provide contextual information on a topic from the perspective of the standard setter; and they support the valuation community in their application of IVS through guidance and case studies. Perspectives Papers are complementary to the IVS and do not replace or supersede the standards. Valuers have a responsibility to read and follow the standards

SUMMARY



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This Paper will show how:

- Data is central to the functioning to the modern economy and to all businesses today.
- The value of data as an asset is driven, and how data acquires value by informing economic decisions.
- Artificial Intelligence constitutes a step change in valuation practice, and data has a lifecycle; both phenomena make valuations challenging.
- Monetisation of data must be balanced by its protection, and which factors impact on data valuation.
- Data is often commingled with other intangible assets, with consequences for financial reporting and valuation.
- International Valuation Standards (IVS) are an appropriate framework through which to apprehend the valuation of data.
- Enhanced disclosures around the costs incurred by businesses to accumulate and exploit data would greatly enhance the ability to value data.

Of Things Unknown and Nearly Hidden: Valuing Data as an Asset

INTRODUCTION

All businesses have data, and the accumulation, processing, management, and exploitation of data have fuelled innovative business models. The harnessing of data has also profoundly affected well-established industries, either through the emergence of new actors, such as Amazon in retail, or the transformation of existing processes, such as the achievements of engineering groups like Siemens in manufacturing.

The acceleration of developments in the field of Artificial Intelligence (AI) have given even more relevance to the issue. Datasets of all types are being exploited and serve as the basis for advances in many fields. Large Language Models (LLMs) are just one example of such domains.

The use of the word “data” for valuations can be misleading. The IVS Glossary defines data as “quantitative and qualitative information available to the valuer”. This paper does not address data as it is narrowly understood in the Standards. Rather, it specifically examines data as an asset that is accumulated,

managed, deployed, and exploited by businesses in their operations. This asset might or might not be recognised in financial statements. Its economic value certainly decays and does so at a speed that might be different from any measure of amortisation in those same financial statements.

Data as an economic asset poses both accounting and valuation challenges similar to those affecting other intangible assets. Most intangible assets, such as brands, customer relationships and data, are combined with other assets, and are often not monetised directly. While IVS can accommodate all assets and liabilities, specific valuation standards for data assets are emerging. For instance, the China Appraisal Society has published valuation guidance for data, in force since 1 October 2023.

This paper examines what is meant by data as an asset; how it acquires and eventually loses value; explores how it is accounted for under selected current accounting standards; and





what valuation professionals should keep in mind when valuing data.

DEFINING DATA AS AN ASSET

Laura Veldkamp, an American economist, and a professor of Finance at Columbia Business School, defines data as *“observations that have been converted into a digital form that can be stored, transmitted or processed and from which knowledge can be drawn.”*¹ Data is an economic asset. For businesses, data is often a byproduct of economic activity²: raw observations are transformed into structured data

through the labour of a data manager. Structured data becomes knowledge through the labour of an analyst. Finally, structured data informs decisions, by the business or by its customers.

Data gains value when deployed by businesses alongside other intangible assets; for example, customer data allows a brand to have more impact. Accumulating, storing observations, and transforming them into data and then knowledge, all have an associated cost. However, not every individual decision informed by knowledge emanating from transformed data creates value. Rather, value comes from the marginal improvement in the

1. Statistics Canada, “Measuring investment in data, databases, and data science: Conceptual framework”, 24 June 2019.

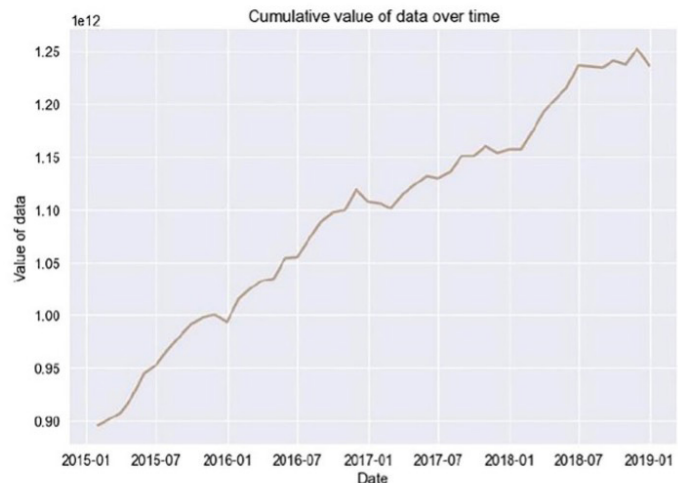
2. Laura Veldkamp, Valuing Data as an Asset, *Review of Finance*, 2023, 27(5), 1545-1562. <https://doi.org/10.1093/rof/rfac073>

probabilities of commercial success, such as frequency of purchase or basket size over multiple transactions.

Finally, in this paper we deal with data as a private good, used in a business context. Weather data, and even basic financial data, are made available to the public free of charge, as a public good. While value leaks from the private to the public domain, this paper does not examine the value of “societal” goods and externalities.

WHY DOES DATA HAVE VALUE?

Economists have tried to evaluate the aggregate value of data. A conservative approach focusing on the amplitude of inputs estimates that the value of data amounted to US\$1.25trn in 2018 in the United States alone. This calculation includes IT expenditure, labour, and complementary inputs. The value of data is growing because the quantum of data collected is increasing, because more businesses are allocating labour to it, and because the exploitation of the data is improving³.



Estimated value of the aggregate stock of data, in hundreds of billions of current US dollars⁴, 2015–2018 (Abis and Veldkamp, 2022).

In Veldkamp’s framework, data acquires value within a business through the improvement of operations. These improvements fall into four broad categories⁵:

- Data allows a business to raise profits by optimising operations, from the assortment of goods and services it will offer, to streamlined logistics.
- Data allows the accumulation of market power, whereby the “winners take most”.
- Data enables innovation and in doing so, generates more data, even if the innovation fails.
- Since data improves decision-making and allows more informed predictions about future outcomes, it reduces risk. However, the econometric framework has a slightly different perspective to the valuation framework. In the econometric framework, value accrues to the economic agent, in this case businesses. Valuing data as an asset (as opposed to valuing a business

3. Veldkamp, Ibid, section 3.5 and Abis, S. and Veldkamp, L. (2022): The changing economics of knowledge production.

4. Abis, Simona and Veldkamp, Laura, The Changing Economics of Knowledge Production Available at SSRN: <https://ssrn.com/abstract=3570130>

5. Veldkamp, ibid.

that has data) requires that value accrues to the asset specifically. Data does not just have value in its internal use for a business; data also has value as a standalone asset that could conceivably be separated and sold, or exploited alone, or in combination with other assets.

THE LIFE CYCLE OF DATA VALUE

Like other assets, data has a lifecycle that affects its value over time. Since data is a byproduct of economic activity, the accumulation of data creates a “feedback loop” where more data informs more efficiency by improving productivity, which attracts more transactions. This in turn allows the business to generate more data.

The value of data is revealed by the quality of its transformation into knowledge, through a mix of computing power (tangible assets), recurring operating expenses (electricity, labour), technology, and human capital (the latter both intangible assets). More data can improve productivity, which attracts more transactions, which in turn generates more data, enabling improvements in technology and human capital and making data more valuable.

As new data is collected, the relevance of earlier data may decay, either because it is not timely, or because it has been superseded by newer data. The rate of economic depreciation itself is not constant

and might accelerate or decelerate.

Saying that “data is the new oil” has become a commonplace. It is, however, a relevant analogy. The initial expectations for oil fields in the North Sea were that only about 20-40% of oil would be recovered⁶. Technological progress allowed those rates to be much higher, and for the reserves to be revised upwards. Initial estimates were doubly wrong: oil companies succeeded in extracting a higher proportion of much larger reserves of oil in place than had been initially expected.

Extending the analogy to data as an asset, Artificial Intelligence (AI) might turn out to be a quantum leap because it allows more productivity and higher returns in the exploitation of data. The inclusion of further datasets changes both the value of existing data by superseding it or illuminating it, and the trajectory in the evolution of algorithms and technology that exploit data. These characteristics could conceivably increase the instability of the value of data as an asset.

6. Michele Fioretti, Alessandro Iaria, Aljoscha Janssen, Robert K.Perrons, Clément Mazet-Sonilhac. Innovation Begets Innovation and Concentration : the Case of Upstream Oil & Gas in the North Sea. 2022. Available at SSRN: <https://ssrn.com/abstract=4120800>



DATA PRIVACY AND THE NEGATIVE VALUE OF LEAKS

Data privacy has become a major concern. This has prompted both private initiatives and the implementation of legislative and regulatory frameworks.

Both ongoing restrictions around data privacy and prioritising the prevention of catastrophic leaks impose baseline costs on the management of data as an asset. These costs take two forms - direct costs incurred to manage the risk, and the indirect costs stemming from lower efficiency in the exploitation of the data.

Data privacy requirements and measures to prevent data leaks impose several costs:

- A known recurring cost incurred to prevent the leak and mitigate its consequences.
- An opportunity cost that is difficult to quantify. This cost is theoretically the difference between the value of the information without restrictions and the value of the information with privacy restrictions.
- The ongoing, incompressible residual risk of a catastrophic negative event on a highly uncertain amplitude imposes a cost that remains difficult to measure.

Finally, it is worth repeating that the imposition of these costs affects the valuation of the business, and of the (data) asset, or both, depending on what the valuer is trying to measure.

THE MONETISATION OF DATA

Data acquires utility, and by extension, value by being transformed into knowledge. Data becomes monetised both directly and indirectly.

Businesses specialising in the direct sale of financial data have been some of the most emblematic successes of the past 15 years. They have often enjoyed a growth in demand, an expansion of the range of value-added services drawing on technology and human capital, and significant pricing power.

Morgan Stanley Capital International Inc (MSCI) is one example of such a company in the business of selling data. “Data” does not appear on its balance sheet⁷. But “databases” appear in the balance



sheet of Experian, the consumer credit reporting company. They amount to a net asset of US\$ 468m within intangible assets of US\$2.3bn and balance sheet assets totalling US\$10.9bn⁸.

However, data is mostly embedded in a service. Alphabet Inc epitomises this phenomenon. The sale of data permeates all aspects of the behemoth's US\$282bn revenues⁹. However, data does not appear on its balance sheet at all¹⁰.

Most companies use data to inform their own business decisions and to enhance their income streams. Albertsons Companies Inc¹¹, a retailer, uses data to optimise its merchandising in stores. It also monetises the data it accumulates through a subsidiary, AMC.

The revenues of AMC are not disclosed but are described as “a robust digital marketing platform that reaches (our) extensive customer network and leverages our strong market share, especially in the (...) markets where we hold a #1 or #2 share position.” The latter part of this statement implies that the value of data is unevenly distributed across geographical segments.

The value of data is sometimes so deeply embedded in businesses' operations that it is inseparable from overall corporate revenues. For instance, some retailers grant discounts to customers who provide their personal data¹². The cost of data accumulated by the vendor is implicit. From an analytical perspective, the challenge comes from the fact that a

7. MSCI Inc 2022 Annual report. In fact, Intangible assets only account for 11% of the balance sheet assets and the word “intangible” appears eight times in the 2022 annual report. Goodwill accounts for 44% of balance sheet assets.

8. Experian, Annual report 2023, p. 164

9. Alphabet Inc 2022 Annual Report.

10. Alphabet Inc 2022 Annual Report. Note 9, p. 71. Intangible assets are broken down into “Patents and developed Technology”, “Customer Relationships” and “Trade Names and other”. In total, intangible assets account for US\$1.4bn (net) of the total US\$359bn assets, ie, 0.4% of total as of 31 December 2022.

11. Albertsons Companies, Inc. Annual Report 2022 (p. 10): “We maintain price competitiveness through systematic, selective and thoughtful price investment to drive customer traffic and basket size. We also use our loyalty program to target promotional activity and improve our customers' experience. This includes leveraging customer and transaction information with data driven analytics to provide both personalized deals and digital coupons, as well as gas and grocery rewards. We have more than 34 million members currently enrolled in our loyalty program. We have achieved significant success with active participants in our loyalty program, which drives higher sales and customer retention. We have recently deployed and are continuing to refine cloud-based enterprise solutions to quickly process proprietary customer, product and transaction data and efficiently provide our local managers with targeted marketing strategies for customers in their communities. In addition, we use data analytics to optimize shelf assortment and space in our stores by continually and systematically reviewing the performance of each product. In digital, we capitalize on our rich and proprietary data under Albertsons Media Collective (“AMC”). AMC offers new and existing business partners a robust digital marketing platform that reaches our extensive customer network and leverages our strong market share, especially in the 69% of markets where we hold a #1 or #2 share position. We believe AMC will be a contributor to our growth and profit driver in the future.”

12. Veldkamp, Ibid



directly and accounted for as an intangible asset is geophysical data. Geophysical survey companies collect data as part of a contract for one oil company and then sell onwards to other parties. The outlays incurred for the physical survey and the subsequent treatment of the data are capitalised. In the case of PGS ASA, a Norwegian company, the “multiclient library” accounts for US\$300m of the US\$1.95bn of assets on the balance sheet. Thus, the realised value of the data is contingent on companies’ exploration budgets, themselves a derivative of the price of oil^{13, 14}.

fraction of those sales would likely have happened anyhow. Some customers are indifferent to giving their data. Inferring the value of the data asset depends on having a baseline estimate of the marginal price elasticity of a diverse basket of goods that may or may not have been purchased because of the existence of the discount.

Another example of data being sold

ACCOUNTING FOR DATA AS AN ASSET

The recognition and measurement of data in financial statements remains subject to debate. The general accounting principle is that self-generated intangible assets cannot be capitalised. For that reason, large technology companies seem to have no, or very little, data on their balance

13. PGS ASA Annual report 2022.

14. PGS annual report 2022:

“The MultiClient library consists of seismic data surveys which are licensed to customers on a non-exclusive basis. Costs directly incurred in acquiring imaging and otherwise completing seismic surveys are capitalized to the MultiClient library. Costs incurred while relocating or “steaming” a vessel or crew from one location to another and borrowing costs incurred during the acquisition and imaging phases of the survey are also capitalized to the MultiClient library.

A project remains in surveys-in-progress until imaging is complete which may be some months or up to more than a year after data acquisition ends, at which point it is transferred to completed surveys.

The Company records the costs incurred on the MultiClient library in a manner consistent with its capital investment and operating decision analysis, which generally results in each survey in the MultiClient library being recorded and evaluated separately. The cost of projects within the same political regime, with similar geological traits and that are marketed collectively are recorded and evaluated as a group by year of completion.

Straight-line amortisation - Upon completion of a survey, straight-line amortisation commences over its estimated useful life which is generally over a period of 4 years from the date it is transferred to completed surveys.

Accelerated amortisation - Following the adoption of the straight-line amortisation policy for completed surveys, recognition of impairment of library may be necessary in the event that sales on a completed survey are realised disproportionately sooner within that survey’s 4-year useful life.

Further, when a project is completed and after pre-funding revenue is recognised, recognition of impairment may be necessary in the event the present value of expected Late Sales is lower than the capitalised cost of the project.

This accelerated amortisation is included in “Amortization and impairment of MultiClient library” in the consolidated statements of profit and loss and specified in note 8.

Impairment of MultiClient library - The Company updates its sales forecast for each survey at each year-end and when an impairment indicator is deemed to exist. In the event the net book value of survey exceeds its net present value of estimated future cash flows an impairment is recorded in the amount of the excess. This impairment is included in “Amortization and impairment of MultiClient library” in the condensed consolidated statements of profit and loss and specified in note 8.”



sheets. In contrast, companies steeped in oil exploration, as in the case above, actively capitalise the costs incurred in acquiring it. In financial reporting, data is not explicitly listed within IAS 38 (Intangible Assets) and the standard generally leans towards expensing any cost incurred, not capitalising it.

In the US, FASB ASC Topic 805 Business Combinations provides for the possibility of accounting for data (or related intangibles) as an asset on the balance sheet as part of business combinations. Given the diversity of what constitutes “data”, the separability of data as an asset is often an issue.

The future economic benefits of a standalone “data” asset can also be uncertain, for two reasons:

- Much of the economic benefit derives from its use and interplay with other assets; for instance, customer lists.
- The rate of decay in usefulness of data is difficult to ascertain or estimate. For example, a given satellite image collected by Planet Labs and Maxar loses much of its value as it is replaced by a new one. However, a dataset showing an evolution through time by multiple readings can retain its value.

These practical limitations are consistent with more conceptual¹⁵ issues around the recognition of data as an asset. The IFRS Conceptual Framework for Financial Reporting acknowledges that under “limited circumstances” the level of uncertainty around the measurement of an asset can be so high as to render the recognition of the asset unjustified. Additionally, the

15. Conceptual Framework for Financial Reporting, International Accounting Standards Board, September 2010, revised March 2018.



conceptual framework admits that the recognition of an asset requires the consideration of “whether related assets (...) are recognised.”(emphasis ours)

In conclusion, the future evolution of the accounting model for data as an asset within financial statements is intricately linked to the outcome of the debate around the recognition of internally-generated intangible assets. The issue is beyond the scope of this Perspective Paper.

VALUATION OF DATA FOR PURPOSES OTHER THAN FINANCIAL REPORTING

IVS contain standards for valuation of intangible assets, which also include the valuation of data, both for financial reporting purposes and other intended uses.

For example, the emergence of data as an asset has consequences in taxation. Companies sometimes transfer customer data assets to lower-tax jurisdictions. Thus, controversies arise around the contribution of relocated data to a new business and the rate of decay in the value of the data transferred.

The occurrence of leaks and their costly and potentially catastrophic outcomes require the valuation of data when calculating damages in the context of litigation. While not a subject of litigation, Experian’s

pre-emptive assessment of strategic risks for the company models a “severe but plausible” scenario of “data loss/misuse” costing the company US\$1.3bn over three years.

USING IVS FOR THE VALUATION OF DATA

IVS provide a framework for the valuation of intangible assets. Any of the three principal valuation approaches might be appropriate to value data as an asset:

a. MARKET APPROACH

Under the market approach, the value of an intangible asset is determined by reference to market activity. Some data is traded directly and can provide the basis for valuation. Businesses are sometimes compared using measures derived from broad estimates of the amount of data controlled. This has been the case for social network companies.

However, these heuristics, or “rules of thumb”, do not usually adequately reflect the exact nature or the earnings power of such data. As such, these benchmarks “should not be given substantial weight unless it can be shown that buyers and sellers place significant reliance on them.¹⁶”

b. COST APPROACH

The costs involved in the accumulation, management, treatment¹⁷, and transformation of data are a crucial consideration for valuation. The high degree of integration of data with other intangible assets and the large

16. IVS 105.30.16 (2022) / IVS 103.A10.16 (2025)

17. Veldkamp, *ibid.*



dispersion of possible outcomes can justify employing the cost approach, especially if the asset is not directly income-generating¹⁸. The instability and difficulty in estimating the rate of economic depreciation of the existing data stock also justify cautiousness in the evaluation of the replacement value of data under the cost approach.

Disclosures of information about outlays incurred for the accumulation, transformation and maintenance of data can also serve as an input for the evaluation of the earnings power of a business, most often using the income approach. A diligent apportionment of these direct and indirect costs allows a more granular allocation of expenses within the context of valuation. This can be important when outlays for data or other intangible assets can be notionally “capitalised” in a valuation to restate margins, invested capital and thus metrics such as Return on Invested Capital (ROIC)¹⁹, ²⁰.

C. INCOME APPROACH

The income approach determines a value indication from the present value of cash flows stemming from an asset. These cash flows are often commingled with those from other assets. It is important to evaluate whether the data being valued is the main value driver or a secondary driver of value creation. This determines whether the valuation of the asset should be based on residual cash flows. If the data is the principal generating asset, then methods such as the Multi-Period Excess Earnings Method (MPEEM) or the with-and-without method may be appropriate.

Other intangible assets, such as technology, might be the main value drivers of a stream of cash flows. In that case, data may be valued with a Relief-from-Royalty method. All things being equal, an indication of value derived from the Relief-from-Royalty method will depend mostly on revenues generated.

18. IVS 105.60.2.b (2022) / IVS 103.40.02(b) (2025)

19. Mauboussin, Michael: *Categorising for Clarity*, 6 October 2021; Michael J. Mauboussin and Dan Callahan, “Intangibles and Earnings: Improving the Usefulness of Financial Statements,” *Consilient Observer: Counterpoint Global Insights*, April 12, 2022; *Return on Invested Capital, How to Calculate ROIC and Handle Common Issues*, 6 October 2022 and *ROIC and Intangible Assets, A Look at How Adjustments for Intangibles Affect ROIC*, 9 November 2022.

20. For example: Hulten, Charles R., “Decoding Microsoft: Intangible Capital as a Source of Company Growth,” NBER Working Paper 15799, March 2010.

CONCLUSION AND NEXT STEPS

The valuation of data as an asset is challenging because data acquires value when transformed and exploited in conjunction with other assets. It is often difficult to separate the contributions of data from other intangible assets when evaluating the earnings power of a business. Conflating or double-counting the value accruing to the business, or to the data as an asset, or to other intangible assets, remains a pitfall. It may also be difficult to find a market in which to sell certain data as a standalone asset.

The unique characteristics of data as an asset increase the importance of abiding to standards and best ethical and professional practices when conducting a valuation. This remains true whether the valuation is for financial reporting as part of a business combination or has a broader intended use.

To produce a reliable, high-quality valuation of a data asset, the valuer requires clear and detailed disclosure about the outlays related to the accumulation, management, treatment, and maintenance of data. Currently, these outlays are amalgamated under “SG&A expenses”. This requirement is distinct from but related to the debate around the recognition of internally-generated intangible assets in financial statements.

Isolating and disclosing the extent of the resources allocated to data would allow the valuer to better value the data as an asset. Circumscribing

these resources would also allow the valuer to infer the efficiency of the business in other domains.

Such disclosures would prompt concerns around the dissemination of commercially sensitive information. These concerns are legitimate but would allow observers to understand how data drives business value.

IVS support a broad range of practices where data can be considered and valued both as individual assets and as important contributors to the value of a business.

The next revision of IVS could conceivably include more explicit references to data as an asset. This topic may well be included in the forthcoming public IVSC agenda consultation as a precursor to changes in the standards.



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