

Daily Valuation of Alternative Assets in DC Plans

A Framework for Plan Sponsors and Industry Stakeholders

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DCALTA

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Alternatives Association

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Letter from DCALTA



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At the end of the second quarter 2020, employer-sponsored U.S. defined contribution (DC) plans contained \$8.9T in assets, including \$6.3T in 401(k) plans and \$1.1T in 403(b) plans.¹ In contrast to the rapid growth of alternative investments by institutional investors and broad adoption by defined benefit plans, DC plans have **largely foregone the diversification and return potential of alternatives** because of technical and legal uncertainties, arising in part from ERISA² conditions. On June 3, 2020, the Department of Labor published an information letter that provides clarity on important ERISA issues for DC plan sponsors seeking to offer the benefits of alternative assets to their participants.

With this legal foundation now established, DCALTA has focused on the critical operational topics to be addressed by DC plan sponsors planning to incorporate alternatives. To assist plan fiduciaries and practitioners, we will be releasing a series of whitepapers exploring these issues. Our first, this paper, sets out a detailed operational framework for the **daily valuation of private assets**. Using an existing approach, we describe a robust and scalable daily valuation procedure that can help meet both legal and operational requirements of plan sponsors.

DCALTA's mission is to **enhance and secure participant outcomes** through education, research, and advocacy on the benefits of including private equity and other alternative investments within a defined contribution framework. Our members represent every aspect of the U.S. retirement investment ecosystem, and we seek to be the industry's collective voice on both policy and operational topics. These whitepapers are designed to facilitate plan sponsors and other constituents move toward inclusion of alternatives in DC plans with greater technical certainty.



DCALTA

ENHANCING RETIREMENT OUTCOMES

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The positions stated in this document are those of DCALTA and may not be the positions of the individuals or organizations listed above.

About DCALTA

DCALTA seeks to enhance the retirement security of DC plan participants by the inclusion of alternative assets:

- As a modest allocation within a long term focused, multi-asset fund option on a DC plan menu.
- Through a well-diversified portfolio of alternative assets.
- Professionally managed within a prudent structure designed for the needs of DC plan participants.

Executive Summary

Numerous studies have shown the inclusion of a diversified portfolio of private assets within a long term focused, multi-asset fund option offered by U.S. defined contribution plans can materially improve the retirement security of those participants.³ However, operational considerations, including daily valuation of private assets, have often limited the utilization of private assets in defined contribution plans. Those considerations have been addressed in other developed countries⁴ and, as contemplated herein, can be addressed in the U.S. context using currently accepted methods and a practical framework. This paper describes one framework that offers a robust, scalable operational procedure for creating daily prices of private assets within DC plans.

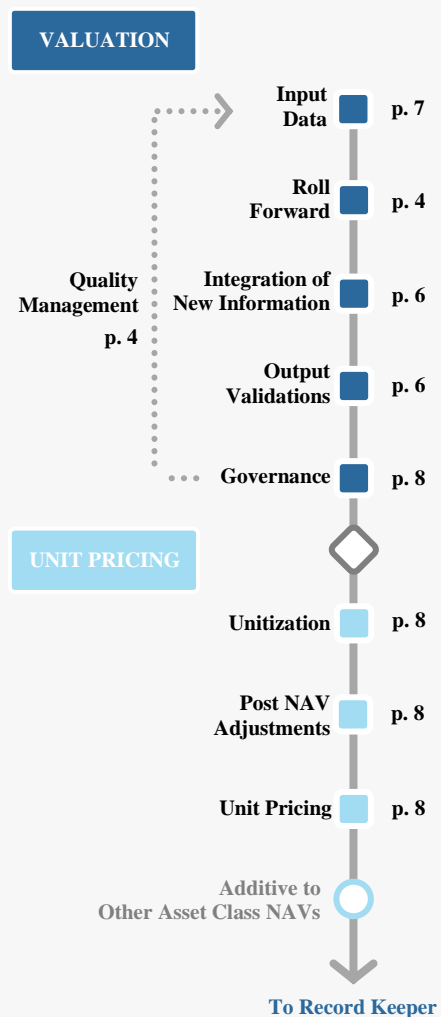
We suggest a framework composed of **procedural, quality management, and governance** components. We further suggest specific positions on key pillars within each of the components to explain that:

- Daily valuation and pricing can be achieved using an existing approach and in accordance with accounting and legal requirements.
- Technical issues such as reporting lag, valuation accuracy, and dilutive effects can be handled systematically and fairly.
- Existing audit pathways remain intact, i.e. valuation remains tethered to the NAV reported by the direct manager.

Recognizing that each investment structure may be unique, practitioners can adopt the framework to help inform and/or evaluate valuation procedures that best meet their unique conditions.

We have attempted to create a useful reference for both operations staff and ERISA domain specialists. The diagram at right shows key components of the daily procedure, grouped according to either 'valuation' or 'unit pricing'. While the paper may be read from start to finish, the reader may also use the page numbers in Figure 1 to proceed directly to the component of their interest. We have also included a glossary of terms at the end of the paper, as well as definitions of key words in the body of the text.

Fig. 1: Valuation and Pricing Procedure and Document Reference



DCALTA Positions:

- 1 The accounting roll forward procedure can help satisfy, at least in principal, legal and accounting requirements applicable to daily indirect valuation, provided it demonstrates certain qualities and capabilities discussed in DCALTA Positions 2 and 4.
- 2 Indirect valuations can often work best when anchored to direct valuations, making direct valuations the quality proxy of the indirect valuation approach.
- 3 The market adjustment component can be informed by market proxies, modeled behavior, or a combination of both using well-established techniques.
- 4a The indirect valuation procedure strives for accuracy, evaluated by retrospective comparative analysis of indirect valuations and subsequently reported direct valuations, using robust statistical techniques.
- 4b Continuous improvement optimizes the reliability of the indirect valuation procedure.
- 4c Automation can contribute to the performance of the indirect valuation procedure.
- 5 Where input data are received on a lagged basis, the quantities may be systematically adjusted, consistent with the indirect valuation procedure, to be contemporaneous.
- 6 The daily indirect valuation procedure may integrate new information on the same day it is received and validated.
- 7 The data framework can permit the indirect valuation procedure to work with characteristically non-uniform input data.
- 8 Daily forward pricing can serve as a suitable pricing model for private assets in a daily dealing environment.
- 9 Mechanisms used in the mutual fund industry to limit dilutive effects and promote fairness may be equally effective in the valuation and pricing of alternatives in DC plans.
- 10 Traceability from key data inputs to valuation and pricing outputs, sufficient to establish an auditable path, is a primary artifact of the procedure.
- 11 System controls, consistently applied, can help provide reasonable assurance to auditors of the integrity and satisfactory functioning of the daily procedure.

Valuation Procedures in the Investment Value Chain

We begin by distinguishing between the valuation procedures performed by different entities in the investment value chain (see Figure 2) to provide conceptual bookends to the daily valuation procedure.

Direct Valuation

Produced using Direct Inputs

Direct managers are those closest to the asset, with the responsibility and best available information to value the asset and its various securities, including observable and unobservable idiosyncratic (specific to that asset) inputs. The valuation that direct managers perform is herein called a **direct valuation**. Direct valuations may be summed by the direct manager, and various fees (including performance fees) applied to produce a direct net asset value (NAV) of the asset or fund.

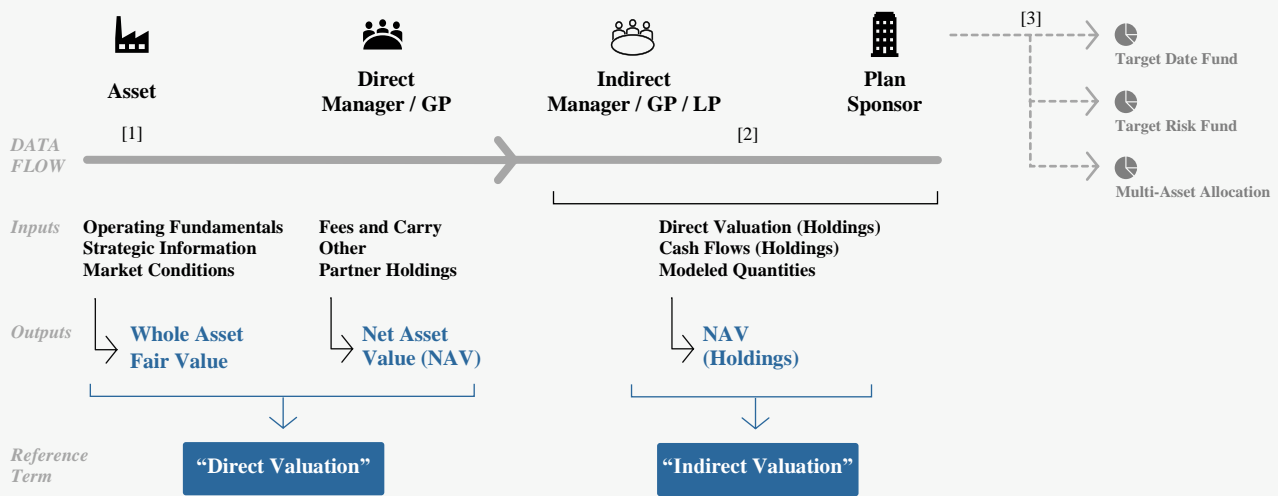
Indirect Valuation

Produced using Indirect Inputs

Downstream or indirect managers, including funds of funds, LPs, and plan sponsors, receive limited and varied information about the assets, typically on a lagged basis. To increase valuation frequency, indirect managers may instead use a mix of observed quantities (e.g. cash flows) and modeled quantities (e.g. market proxies) to derive a change in value from a previously reported direct NAV. The key defining feature of an **indirect valuation** is that it is generally not privy to contemporaneous, idiosyncratic changes in the underlying assets. However, should contemporaneous, idiosyncratic information be known (e.g. a stock price) or knowable (e.g. guidance from the direct manager), accounting standards require its inclusion in the indirect valuation procedure.

Since we advocate for a private asset portfolio that is diversified on all relevant metrics, particularly by the manager of the underlying enterprises, the approach we describe contemplates an indirect manager being responsible for valuing the assets of numerous direct managers. With appropriate due diligence and ongoing monitoring, indirect valuation does not require the active cooperation of direct managers on a contemporaneous basis. For this reason and despite its limitations, indirect valuation is already widely practiced by indirect managers who, like DC plan sponsors, may seek more frequent and/or timely portfolio valuations than those regularly disseminated by direct managers. In the U.S., timely reporting by certain indirect managers often relies on indirect valuations, which may also receive auditor sign-off. Given that indirect valuations have broad acceptance among operations personnel and auditors, we anticipate that the industry will commence daily valuations using an indirect valuation approach.

Fig. 2: Valuation in the Private Market’s Chain of Intermediation or “Value Chain”



[1] The asset may be a going concern, a real asset (property, infrastructure, etc.), or security (e.g. equity, debt, royalty, warrant, etc.).
 [2] The components of the value chain vary in terms of how they are nested (e.g. multiple levels of indirect managers, or none), and by the level at which the indirect valuation is performed, i.e. the plan sponsor or the indirect manager.
 [3] The private portfolio may be contained in various balanced fund types, such as a target date fund, a target risk fund, or a multi-asset allocation portfolio.

1. Indirect Valuation Procedure

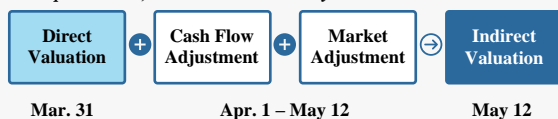
Approach

While there may be other suitable indirect valuation approaches, the most widely used in the U.S. is an **accounting roll forward** (also called “now-casting”). In the absence of idiosyncratic information (known or knowable) that would materially impact an asset’s value⁵, the procedure makes adjustments to the most recently reported direct valuation to estimate a contemporaneous indirect valuation. Because the issue being addressed is *timing* of the reported valuation, accounting standards provide for a practical expedient – like the roll forward adjustment – to be employed in lieu of more frequent direct valuation reporting.

Roll forward adjustments conventionally fall into two main components: cash flow adjustments and market adjustments, as shown in Figure 3, although the procedure is extensible to other adjustments, such as those for currency, tax, and asset-specific or manager-specific information.

Fig. 3: Accounting Roll Forward (Base Components)

Example Fund A, measurement date May 12:



In this example, the most recent Direct Valuation for Fund A has a measurement date of Mar. 31. The contemporaneous date is May 12. The interim period is called the roll forward period. Cash flows recorded during the roll forward period are netted and added to the Direct Valuation. Movement of the market proxy during the roll forward period is calculated and added to the cash adjusted value. The resulting quantity is the indirect valuation for May 12.

The typical roll forward procedure used in monthly or other environments can be refined by technological upgrades (including to the benchmarking technology) and modern quality assurance methods⁶ to meet a daily valuation.

DCALTA Position 1:

The accounting roll forward procedure can help satisfy, at least in principal, legal and accounting requirements applicable to daily indirect valuation, provided it demonstrates certain qualities and capabilities discussed in DCALTA Positions 2 and 4.

As noted in Figure 3, the procedure’s starting point is the last reported direct valuation. This anchors the indirect valuation to the direct valuation, and therefore to the idiosyncratic and other inputs as appraised by the direct manager that are typically not observable by the indirect valuation procedure.

DCALTA Position 2:

Indirect valuations can often work best when anchored to direct valuations, making direct valuations the quality proxy of the indirect valuation approach.

This position is predicated on the reality that direct managers,

being closest to the asset, are usually in a position to consider both idiosyncratic and market factors and can therefore provide the most reliable fair value estimation in accordance with FASB ASC Topic 820. The accounting literature similarly focuses on indirect managers being able to rely on the direct valuations of direct managers as a practical expedient, provided certain conditions are met.⁷ Given that direct valuations are reported well after the period end, i.e. on a lagged basis, the indirect valuation strives to be predictive of the forthcoming direct valuation. Consistent with this theory, the forthcoming direct valuation is the quality proxy of the indirect valuation procedure.

On practical grounds, anchoring the indirect valuation to the direct valuation greatly simplifies the audit process for the indirect manager. First, audit pathways already trace back to the accounting statements provided by the direct manager. Second, the direct valuation provides a definitive and independently produced quality proxy that is readily available and verifiable by the auditor. A retrospective statistical analysis each reporting period of how accurately the procedure predicted direct valuations indicates the reliability of the procedure – important for the auditor to sign off on valuations for which there is no quality proxy (i.e. the days between direct manager reports). See Position 4 for discussion on reliability.

This position does not preclude indirect managers from validating indirect valuations prior to publication (and pricing), nor does it preclude indirect managers from making adjustments in accordance with established board, investment/operations committee or other organizational controls.

DCALTA Position 3:

The market adjustment component can be informed by market proxies, modeled behavior, or a combination of both using well-established techniques.

The market adjustment component is a well-established technique that imposes a positive or negative multiplier or factor to the cash adjusted quantity of each fund in the portfolio. It is acceptable that the methodology to derive this factor differs between funds and even among assets within those funds. For instance, factors applied to private technology companies may be informed by a technology stocks index, whereas private infrastructure holdings may be better tracked using a custom model. Adequate tracking is primarily a function of benchmark or model specificity to the private asset, which back testing may be used to monitor (discussed further in DCALTA Positions 4(a) and 4(b)). Once the methodology is codified, the required data inputs are readily incorporated into the daily procedure.

Quality Management

As previously noted, there are important provisos as to the acceptability of the indirect valuation procedure informing a

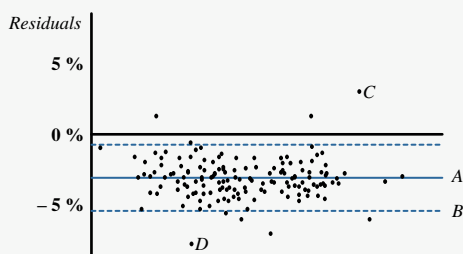
daily price. The thrust of these provisos is ensuring a quality standard is measured and met. We discuss here three elements of quality – (a) accuracy, (b) reliability, and (c) automation – that in combination ensure the indirect valuation procedure can scale to the daily environment.

DCALTA Position 4(a):

The indirect valuation procedure strives for accuracy, evaluated by retrospective comparative analysis of indirect valuations and subsequently reported direct valuations, using robust statistical techniques.

While accuracy metrics such as those shown in Figure 4 do not constitute an exhaustive or definitive list, they provide a baseline for indirect managers to reference in implementation. The procedure strives for accuracy for several reasons. First, it seeks to minimize NAV–price mismatch and its dilutive effect on participants. Second, larger accounting adjustments (due to inaccuracy) drive up the product’s price dispersion and reported volatility. Third, valuation accuracy is arguably a base expectation of plan participants.

Fig. 4: Illustrative Analysis of Indirect Valuation Residuals*



* Each residual (graphically, a dot) represents a fund within a portfolio. The 0% line represents Direct Valuations (the quality proxy). The residuals show the percent difference between the Indirect Valuation and the subsequently reported Direct Valuation for each fund.

[A] Median Difference: indicates systematic bias within the procedural components (usually stemming from market adjustment). In the example shown, the residuals are mostly negative, indicating the procedure has a negative bias, i.e. underestimates valuation.

[B] Mean Difference: is the average difference between the residuals and the quality proxy. As an average, it is sensitive to the size of outliers, i.e. unpredicted large deviations in NAV, such as [C] and [D]. Therefore, it is an important indicator of NAV staleness. Other approaches (not discussed herein) may be taken to improve the mean.

Note that a coarse sampling of funds [C] and [D] would reveal relatively little about the shape of the distribution nor the size of other residuals, and as such, makes it unlikely the procedure would be materially enhanced. Therefore, more rigorous statistical analysis, such as described here, is recommended to achieve desired outcomes.

Conventionally, the accuracy of the indirect valuation procedure is assessed by a retrospective single-period comparative analysis focusing on (i) the difference between the portfolio NAV of direct and indirect methods; and (ii) the difference between direct and indirect NAVs of sampled single assets. While this coarse testing quantifies the size of the accounting adjustment, it does not look for *reliable*

accuracy. As a predictive procedure, the indirect valuation procedure ideally incorporates – and learns from – rigorous testing of parameters, assumptions, and outcomes from one period to the next. In the Figure 4 example, the quality metrics would reveal systematic bias possibly attributable to a less efficacious market adjustment methodology that – after detection by rigorous statistical analysis – may be enhanced.

Outliers are also readily identifiable in residuals analyses, e.g. C and D in Figure 4, and in quality-managed procedures are usually sourced to insufficient inputs. Examples include private holdings going public, revaluations (without cash flows), and transactions coinciding with period end. Enhancements to procedural accuracy may therefore focus on the methodologies of roll forward base components (Figure 3), or on other components of the valuation procedure (Figure 1), including the quality and scope of the input data. In lieu of full digital data flow, the procedure may consider reporting platforms with direct managers that support perhaps monthly and/or event-driven data flow. Event-driven data would include specific details often found in a capital call or distribution notice provided by a direct manager, as well as notice of non-cash flow events such as revaluations.

Last, it should be noted that the retrospective analysis is not done for the sole purpose of satisfying an audit. Consistent with ISO quality management principles, the goal of retrospective testing of valuation accuracy is to drive continuous improvement.

DCALTA Position 4(b):

Continuous improvement optimizes the reliability of the indirect valuation procedure.

Reliability is demonstrated when bias is close to zero with stable or tightening residuals, tested over multiple prior periods. (Intuitively, this means that when rolled-forward valuations do not match the direct valuations that are ultimately received, the differences do not tend to be in one direction or the other, and their size remains stable or gets smaller over time). It is an important measure for the indirect valuation procedure because output accuracy can only be assessed against direct valuations on a relatively infrequent basis, usually quarterly. For the many estimates without a quality proxy, the valuation procedure needs to perform predictably.

Continuous improvement involves an iterative cycle of testing and enhancements to the procedure. A procedure that is improving should demonstrate quality metrics approaching zero (e.g. zero difference, zero bias, and zero dispersion). In reality, the limitations of the roll forward procedure itself make zero deviation or variability an unrealizable goal. For instance, the indirect valuation procedure cannot detect substantial re-appraisals without

indicative cash flows during the roll forward period. Some variability will necessarily need to be tolerated; a test log of prior iterations over multiple periods is preferable to develop a portfolio-specific definition of acceptable variation rather than implementing a set of arbitrary quality thresholds.

A continuous improvement approach also detects instances of declining or underperformance, as may be observed in times of high market volatility for instance. Since portfolio and market factors are continuously evolving, methodological accuracy is not a static state. Accuracy requires active maintenance – additional modeling and iterative testing – provided by a continuous improvement approach.

**DCALTA Position 4(c):
Automation can contribute to the performance of the indirect valuation procedure.**

Automation is the codification of the underlying component methodologies and their execution in ordered sequence, including the process by which the input data is readied. With appropriate system controls (see Position 11), the procedure – or aspects thereof – may be designed to run without dependency on human input. By this definition, automation can also enhance the consistency of the output valuation. In the production environment, automation maintains procedural consistency even with tight timelines and overnight throughput. For example, indirect valuation is a multi-stage procedure involving the processing of daily market information and potentially advanced indexing techniques; it could be prohibitively slow and expensive if attempted manually. In the non-production environment,

automation supercharges the iterative approach for rapid development and testing of customized methodologies that are more accurate.

A scalable indirect valuation procedure is one that maintains quality – primarily accuracy, reliability, and automaticity – in the daily environment. While there may be other quality metrics (this list is not intended to be exhaustive), these three elements are generally descriptive of a scalable valuation procedure for indirect managers.

Output Validations

Output validations are a form of quality assurance that is performed post roll forward, ranging in scope from simple sanity checks to an implementation-specific library of technical, policy, audit, and other compliance type tests. An example of a simple validation is a comparison of today’s NAV to yesterday’s NAV. In line with Position 4(c), validations may be automated and satisfactorily completed prior to publishing the NAVs.

Systematic Integration of New Information

New information from direct managers flows through the value chain (see Figure 2) every day. This includes data informative to the roll forward procedure, predominantly cash flows and most recently reported direct valuations. Data that is received contemporaneously, e.g. cash flows, may be incorporated in the day’s calculation without requiring any time-based adjustment. However, data that are received on a lagged basis require a time-based or roll forward adjustment.

Fig. 5: Conceptual Example of Systematic Integration of New Information

This example is from the viewpoint of the indirect manager, looking at the indirect valuation of its holdings in Fund A, with an end-of-day cutoff.

The **Direct NAV** quantities refer to the most recently reported direct NAV. Therefore, the 11/08 indirect valuation is still anchored to (rolling forward from) the 6/30 direct NAV of \$100m.

The **Indirect NAV** quantities step through the daily roll forward components of cash adjustment and market adjustment, resulting in the **Published NAV** in column [F].

In our example, the integration quantities (columns [D] and [E]) are applied to the cash- and market-adjusted quantity at the end of the day. Using this approach, the daily **Published NAV** equals the following day’s **Start NAV**.

Integrating the New Direct Valuation

- The Published NAV on 9/30 is \$120m.
- The 9/30 Direct NAV is \$110m, ingested on 11/09, i.e. ~6 weeks lagged.
- The unadjusted difference between the published NAV on 9/30 and the subsequently reported direct NAV is -\$10m.
- The roll forward adjusted difference is -\$10.51m.
- The roll forward adjusted difference is added to the 11/09 Indirect NAV quantities.
- The 11/09 Published NAV is now anchored to 9/30 Direct NAV.

Daily Indirect Valuation of Fund A

Date	Direct NAV Quantities (\$m)			Indirect NAV Quantities (\$m)				Integration Quantities (\$m)			Published NAV (\$m)
	[H] Ref. NAV (\$m)	Ref. Date	[A] Start NAV (\$m)	[B] Cash Adj. (\$m)	[G] Market Adj. (%)	[C] Market Adj. (\$m)	[D] NAV Diff. (\$m)	[E] Roll Fwd Adj. (\$m)	[F]		
9/30	100.00	6/30	120.00	-	-	-				120.00	
***			***							***	
11/08	100.00	6/30	120.00	25.00	3.0	4.35				149.35	
11/09	110.00	9/30	149.35	-	2.0	2.99	-10.00	-0.51		141.83	
11/10	110.00	9/30	141.83	-15.00	-1.0	-1.27				125.56	

The 9/30 Direct NAV is received on 11/09 and integrated systematically into the daily Published NAVs on the same day it is ingested.

$F = A + B + C + D + E$ $C = G * (A + B)$ $D = H_{BLUE} - F_{BLUE}$
 $E =$ (See Table 1)

DCALTA Position 5:

Where input data are received on a lagged basis, the quantities may be systematically adjusted, consistent with the indirect valuation procedure, to be contemporaneous.

A market adjustment methodology may also be applied to the difference between a previously published *indirect* valuation and a subsequently received lagged *direct* valuation. This adjusts the published NAV to equal exactly the direct valuation rolled forward to the current date (see Figure 5). This adjustment helps avoid (a) overwriting previously published indirect valuations (and which may have informed individual participant investing decisions); and (b) misstating contemporaneous valuations via an inconsistently applied procedure. A correctly applied roll forward adjustment helps allow the indirect manager’s valuation record to be closed daily, to systematically lock in previously recorded procedural quantities and outputs.

DCALTA Position 6:

The daily indirect valuation procedure may integrate new information on the same day it is received and validated.

In implementation, a systematic integration mechanism (described in Figure 5) is an integral part of the daily procedure. Its same-day approach can help ensure that best available information is passed through to participants in a rigorous, consistent, and timely manner – important to avoid build-up of information that could potentially widen NAV-price mismatch, albeit unintentionally. Asynchronous reporting by direct managers also means that daily integration spreads fund-level quarterly adjustments over time, so that at the portfolio level, the impact of quarterly adjustments on pricing is mitigated.

Input Data

Inputs may vary according to the design and methodological components of the procedure implemented. Generally, and to serve as a helpful point of reference only, data required for a typical roll forward procedure is itemized in Figure 6.

DCALTA Position 7:

The data framework permits the indirect valuation procedure to work with characteristically non-uniform input data.

This position furthers procedural orientation to accuracy (DCALTA Position 4(a)) and makes practical the desire to use best point-in-time information.

Indirect managers may also wish to supplement input data with product-related descriptors. These additional data help enable automated aggregations of funds from whole pool to sub-pools, and for unitization to be applied to either the whole pool or specified sub-pools.

The output published NAV completes the indirect valuation procedure and initiates the pricing procedure.

Fig. 6: Indicative Input Data

- Last Reported Direct Valuation**
 - Fund NAV
 - Holdings Valuation/s
 - Last Measurement Date^[2]
 - Fund Identifier^[1]
 - Holdings Identifiers
- Cash Flow Data**
 - Currency
 - Call / Distribution
 - Attribution (to enterprise)
 - Date
 - Flow Description^[3]
 - Carry Provisions
- Market Adjustment Data (each holding)**
 - Industry / GICS code
 - Security Description^[4]
 - Stock Ticker (if public)
 - Domicile (region)

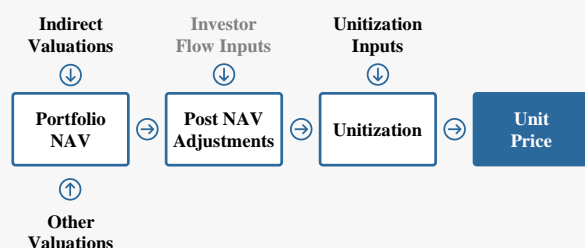
Notes

1. Also commonly referred to as system identities, these unique alphanumeric codes allow data to tie together consistently through time, e.g. a held enterprise may change its name numerous times but data such as cash flows and valuations can still be tied to it.
2. Measurement Date specifies the date the valuation applies to, rather than the day it was produced or reported.
3. Descriptions allow cash flows that do not impact valuation, such as ordinary income or management fee, to be identified and excluded from the value adjustment process.
4. Descriptions allow security types, such as warrants or royalties, to be identified and excluded from inappropriate equity-style market adjustments.

2. Pricing Procedure

In certain situations, indirect managers and plan sponsors may want to use the NAV as the sole basis for determining the price at which plan participants may make deposits to and withdrawals from the plan. Other methods of determining pricing for liquidity may also be possible. Under the method discussed herein, the unit price of a private asset portfolio or sleeve is additive to the unit price of the plan’s other asset classes. The plan’s unit price is posted at or by a designated time each day.

Fig. 7: Unit Pricing (Base Components)



The portfolio NAV is composed of indirect valuations plus “other valuations” of certain assets where (i) direct valuations are available, and/or (ii) observable inputs are available, e.g. priced assets (auctions, publicly traded assets) in accordance with the definition of “current net asset value” (Investment Company Act 1940, § 270.2a-4).

Investor Flow Inputs are inputs to a swing pricing mechanism (see DCALTA Position 9), which is optional at the time of writing and therefore shown in gray.

Approach

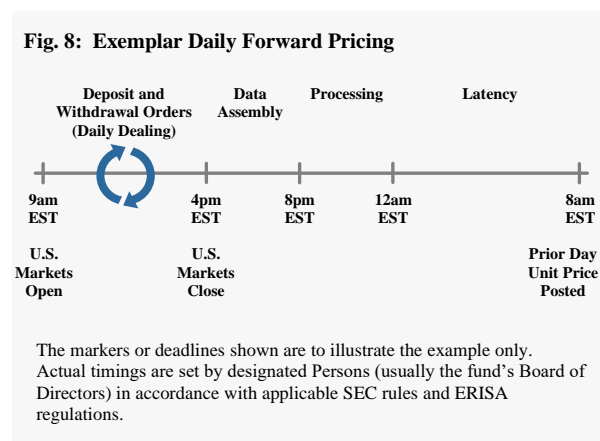
The portfolio NAV is summed from indirect valuations and any ‘other valuations’ (described in Figure 7) such that each asset in the portfolio is valued synchronously. The portfolio NAV is adjusted according to policy then unitized according to participant dealing activity. Unit price is derived by dividing the adjusted NAV by the number of units. The unit price then becomes an additive quantity to the unit price of other asset classes (if unitized separately), which altogether comprise the posted unit price of the plan.

Unitization

Unitization may be applied to a whole pool of private assets, or to sub-aggregations thereof. Indirect managers may find various operational and commercial benefits to unitizing sub-aggregations, to obtain a clear segregation of certain assets, investment fees, and participants.

Pricing Model

Achieving pricing model uniformity across a given plan would imply that, in most cases in the U.S., the model adopted for pricing private assets is expected to be daily forward pricing, as shown in Figure 8. A more-frequent-than-daily pricing model is not contemplated herein. Daily forward pricing means deposit and withdrawal orders are priced according to the end-of-day NAV, i.e. after they are placed, which is inclusive of best point-in-time information.



DCALTA Position 8:

Daily forward pricing is a suitable pricing model for private assets in a daily dealing environment.

Unitized alternatives funds (for institutional investors) may have long ‘dealing’ periods of a month or quarter that make the timing of allocations more impactful, i.e. beginning or end of period. By shrinking the frequency to a day, however, such issues become moot and the pricing of DC plans may follow a similar apparatus to mutual funds, e.g. daily dealing cutoffs and procedural deadlines, with the intent of promoting fairness and rigor. Daily forward pricing is made standard in the U.S. mutual fund industry by certain sections of the

Investment Company Act of 1940⁸, with the aim of limiting – in theory at least – the potentially dilutive effects of NAV-price mismatch and other issues. Dilutive effects are of equal concern in the pricing of private asset portfolios, and their management may be informed to some extent by the mutual fund operational experience.

DCALTA Position 9:

Mechanisms used in the mutual fund industry that limit dilutive effects and promote fairness may be equally effective in the valuation and pricing of alternatives in DC plans.

Post NAV Adjustments

Post NAV adjustments are made for a variety of reasons including fees, corporate actions, taxes, etc. In 2018, the SEC amended the forward pricing rule to allow for adjustments that minimize dilution and liquidity stress. Called swing pricing, the mechanism works to apportion transaction costs to those entering or exiting the fund. We mention it here in acknowledgement that some indirect managers may seek to implement swing pricing on DC plans that include private assets. The execution of the swing and other adjustments (“adjusted NAVs”) can be applied to the combined plan assets or separately to the private asset portfolio (using the same factors) depending on the operational set up of the indirect manager.

3. Governance

As outlined throughout this paper, daily valuation and pricing of private assets is a multi-stage process under tight timelines and regulatory scrutiny. Its adequate performance requires appropriate governance.

Procedural Outputs, Artifacts, System Controls

The main outputs of the indirect valuation and pricing procedure are, respectively, the daily portfolio NAV, the adjusted NAV, and unit price. Generally, these outputs would be used and archived by existing record-keeping processes. However, numerous intraprocedural quantities are needed to make traceability of output values back to key input data possible. For audit purposes then, daily intraprocedural quantities (e.g. cash adjustments, proxy adjustments, integration quantities, etc.) may be considered an essential artifact of the indirect valuation procedure. The exact specification of the daily artifact and its archiving should, we believe, be agreed upon by the indirect manager and its auditor in compliance with applicable law and accounting principles.

DCALTA Position 10:

Traceability from key data inputs to valuation and pricing outputs, sufficient to establish an auditable path, is a primary artifact of the procedure.

In addition to an audit path, system controls are also used to monitor and ensure the functioning of the procedure itself. The system embodies the indirect valuation procedure as well as its quality assurance, data flow, and system controls. In an automated procedure, controls are indicated for monitoring of operational issues such as data integrity, data security, data handling, exception handling, change management, and so on. For example, even small discrepancies in computed values (such as integration values in Figure 5) may be the result of a break in underlying logic, coding error, or data quality. Discordant outputs or outputs that do not ‘tie out’ exactly may therefore be used by the system to identify issues and trigger handling processes, i.e. a system control.

System controls may also be instituted for compliance with service levels, such as the timely receipt and processing of data, and posting a daily unit price. System controls for service levels may employ log files, escalation paths, exception handling, etc. The principle of system controls is to ensure daily function is as intended, and they may be audited in much the same way that compliance with other financial governance policies is monitored.

DCALTA Position 11:
System controls, appropriately designed and consistently applied, can help provide reasonable assurance of the processing integrity and satisfactory functioning of the daily procedure.

Conclusions

Whether implementing a daily valuation process using internal teams or a specialist solution provider, the DCALTA positions are intended to guide indirect managers and the broader reporting ecosystem in their efforts to implement a scalable and appropriately robust solution under ERISA. Beyond matters of compliance, we believe the DCALTA positions provide a practical framework for valuation that allows indirect managers to meet the product needs of the American retiree.

Table 1: Calculation of the Roll Forward Adjustment (from Fig. 5)

Chart A shows the scenario in which the direct valuation for 9/30 was received on 9/30, i.e. no reporting lag. In this scenario, all the market adjustments up to 11/09 sum to \$6.83m, i.e.

$$\Sigma C_{BLUE(CHART A)} = \$4.05m + \$2.78m = \$6.83m$$

Chart B shows the real situation in which the direct valuation for 9/30 was not received on 9/30, and instead an indirect valuation of \$120 was published. In this scenario, all the market adjustments up to 11/09 sum to \$7.34m, i.e.

$$\Sigma C_{BLUE(CHART B)} = \$4.35m + \$2.99m = \$7.34m$$

The \$10m difference between direct and indirect valuation is true on 9/30. Since then, the market has moved, and so it is not true on 11/09. The same proxy adjustment needs to be applied to the \$10m difference, backing out what was already applied, to find the roll forward difference on 11/09, i.e.

$$E_{BLUE} = \Sigma C_{BLUE(CHART A)} - \Sigma C_{BLUE(CHART B)} = \$6.83m - \$7.34m = -\$0.51m$$

For the published NAV on 11/09:

$$\begin{aligned} F &= A + B + C + D + E \\ &= \$149.35m + \$2.99m - \$10.00m - \$0.51m \\ &= \$141.83m \end{aligned}$$

CHART A

Date	Direct NAV Quantities (\$m)		Indirect NAV Quantities (\$m)				Integration Quantities (\$m)		Published NAV (\$m)
	[H] Ref. NAV (\$m)	Ref. Date	[A] Start NAV (\$m)	[B] Cash Adj. (\$m)	[G] Market Adj. (%)	[C] Market Adj. (\$m)	[D] NAV Diff. (\$m)	[E] Roll Fwd Adj. (\$m)	
9/30		9/30	100.00	-	-	-			110.00
***			***						***
11/08		9/30	110.00	25.00	3.0	4.05			139.05
11/09		9/30	139.05	-	2.0	2.78	-	-	141.83
11/10		9/30	141.83	-15.00	-1.0	-1.27			125.56

CHART B

Date	Direct NAV Quantities (\$m)		Indirect NAV Quantities (\$m)				Integration Quantities (\$m)		Published NAV (\$m)
	[H] Ref. NAV (\$m)	Ref. Date	[A] Start NAV (\$m)	[B] Cash Adj. (\$m)	[G] Market Adj. (%)	[C] Market Adj. (\$m)	[D] NAV Diff. (\$m)	[E] Roll Fwd Adj. (\$m)	
9/30	100.00	6/30	120.00	-	-	-			120.00
***			***						***
11/08	100.00	6/30	120.00	25.00	3.0	4.35			149.35
11/09	110.00	9/30	149.35	-	2.0	2.99	-10.00	-0.51	141.83
11/10	110.00	9/30	141.83	-15.00	-1.0	-1.27			125.56

The published NAV “trues up” to the rolled forward direct valuation exactly on 11/09, the same day the new information is ingested.

Endnotes

1. Investment Company Institute, https://www.ici.org/research/stats/retirement/ret_20_q2
2. Employee Retirement Income Security Act of 1974, as amended.
3. See, for example:
Brown, G., Kuhn, B., and Hu, W. (2019). "Why Defined Contribution Plans Need Private Investments." [online] Institute for Private Capital. Available at: https://docs.wixstatic.com/ugd/1bf9e3_ae0adc6d064c488b821ae80b57eb13f5.pdf [Accessed 22 November 2020].
Antonelli, A. (2018). "The Evolution of Target Date Funds: Using Alternatives to Improve Retirement Plan Outcomes." [online] Georgetown University. Available at: <https://cri.georgetown.edu/wp-content/uploads/2018/06/PolicyReport18-01.pdf> [Accessed 29 October 2020].
4. For example, Australian industry superannuation funds operate in a similar legal framework to U.S. DC plans, and often hold substantial allocations to private assets while supporting daily dealing by their members.
5. This would include, for example, positions that either the direct or indirect manager had intentions to imminently exit.
6. Guimaraes, A., Monk, A., and Porter, S. (2018). "Improving Investment Operations Through Data Science: A Case Study of Innovation in Valuation." *Journal of Portfolio Management*, 45(1).
7. ASC 820-10-15-4
8. Rule 22c-1 under the Investment Company Act [17 CFR 270.22c-1] is known as the "forward pricing" rule. It requires funds, their principal underwriters, and dealers to sell and redeem fund shares at a price based on the current net asset value ("NAV") next computed after receipt of an order to buy or redeem. The rule also requires that funds calculate their NAV at least once a day.

Glossary of Terms

Alternatives and **Alternative Assets**, used interchangeably throughout this writing, mean private market investments, including but not limited to private equity, real estate, infrastructure, and credit.

ASC Topic 820 refers to the accounting standards codification of fair value measurement by the Financial Accounting Standards Board. Formerly known as FASB Statement 157.

Daily Dealing refers to deposits and withdrawals (transactions) made by participants in a defined contribution plan.

Direct Valuation incorporates appraisal of a firm's operating fundamentals, strategic information, and market conditions in accordance with FASB ASC Topic 820.

ERISA stands for Employee Retirement Income Security Act of 1974 (as amended). It is a federal law containing rules that plan sponsors and other fiduciaries must comply with when establishing and operating retirement plans. Company sponsored 401(k) plans and 403(b) plans sponsored by private tax-exempt employers are subject to ERISA.

FASB Financial Accounting Standards Board, which oversees the Accounting Standards Codification (ASC).

Indirect Valuation adjusts a previously reported direct valuation for observable changes in the interim, such as capital flows, currency movement, market change, etc. The defining feature of the indirect valuation is its indifference to operating fundamentals of the measured firm.

Measurement Date refers to the date of the fair valuation (rather than to the date on which the measurement is performed or reported, which may be lagged).

Quality Proxy is a designated data against which the output quality of the procedure may be inferred. In the context of this paper, the designated data is the direct valuation.

Residuals are the deviations of the funds' indirect valuations from the quality proxy (their subsequently reported direct valuations).

Roll Forward is an adjustment made to a valuation quantity that represents changing market conditions over time. The adjustment is usually informed by a market proxy, e.g. an index. However, modeling of factors other than equities prices may be indicated where they better track subsequently reported direct valuations.

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DCALTA welcomes new members.

Founded in 2015, DCALTA is a 501(c) non-profit organization representing the collective voice of the defined contribution retirement savings plan ecosystem. Our 40-plus members include plan sponsors, alternative investment firms, consultants, asset servicers, recordkeepers, technology providers and other stakeholders.

In addition to regular member events, we engage in education, research, and advocacy to:

- Address operational, educational and regulatory matters related to the uptake of alternative investments in DC plans.
- Provide information to the DC plan and Alts communities, including regulators and legislators, without bias.
- Better define how the inclusion of alternative investments in DC plans may contribute to enhanced participant outcomes.
- Advocate for prudent modernization of the relevant laws and regulations through a collective industry voice.

Please visit our website, www.DCALTA.org to learn more about member benefits.