Epic: Validation of Security Prices

Risk Assessment of Fundamental Data: Improving the Traditional NAV Validation Process

The traditional approach to NAV validation compares various **check values**, associated with the components of the fund valuation, against fixed tolerances.

This approach is often sub-optimal because it doesn't always assess the validity of a check value against historically available data, or changes to independent variables (external factors) that are usually associated with corresponding movements in check values.

The traditional NAV validation approach can be greatly improved by introducing an additional risk-assessment process to the overall validation of data. This risk-assessment approach will incorporate a much larger set of data when assessing the validity of a check value while generating a 'risk number' to each check value, and highlighting any data anomalies which may result in NAV errors.

Once the risk assessment process has been carried out and risk numbers have been assigned to validated security prices, this will allow:

1. The auto clearance of false-positive exceptions which are raised using tolerance-based NAV Validation.
    - For example, a security price movement may be outside tolerance and therefore generate an exception, however, the additional risk assessment approach has highlighted that the price is highly correlated to Security X which has had a verified large price movement. i.e. assigning a low risk number to the check value (security price)
2. The identification of false-negative exceptions which are raised using tolerance-based NAV Validation.
    - For example, when a check value is within tolerance, however, the additional risk assessment approach has highlighted that the check value has a high risk number i.e. indicating a high probability that the value is incorrect and therefore should have generated an exception.

Notes

The below set of User Stories will focus upon the validation of individual security prices, by applying an additional risk-based validation process that analyses the wider set of available data, when determining the accuracy of each security price.

In general, security prices require validation in the following situations:

- Validating security prices used for the Expected NAV generation process (Oversight)
- Validating security prices included in the holdings file provided by the outsourced service provider. (Oversight)
- Validating security prices included in the holdings file provided by in-house fund accounting. (NAV Control)

Once other types of fundamental data are included, the risk-based approach will overlay the generated risk numbers against various components of a fund to derive an overall fund-level risk and display the results within a pControl dashboard. (the risk numbers will be weighted based upon, for example, the size of the holding and therefore impact on the NAV). This will allow end-users to focus upon funds with a higher chance of NAV error. Fund Level risk numbers will adjust dynamically during the day as data is verified.

User Story #1.1 – Reliable Expected Price Generation (Oversight)- Complete Security Prices - missing security prices functionality

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want to be confident that a **complete set of security prices is available** to feed the Daily Expected NAV generation process
so that <some reason>	So that the Expected NAV is generated accurately and reduces the number of false-positive expectations when running actual versus expected type validations; allowing me to correctly validate the NAV provided by our third-party administrator.

I know its complete when **<acceptance criteria>**	1. pControl will **highlight missing security prices** that are required, before the completion of the Expected NAV process • the prices needed for today's expected pricing process (today's prices are provided in U175) are based upon the holdings from the previous day (U100) • Where missing security prices are defined for Fund Entities using [ERM003] Holdings - Security Repricing as part of their Expected Pricing Methodology as the below • For each selected ERM003 Category Code, any Asset Codes that are present in the Previous Day validated U100: Investment Holdings records for the Fund Entity, that do not have a corresponding validated Current Day U175: Security Prices record, where U175 Price Run Type= Security Repricing Price Run Type (AP_PR_SEC_PRICE_RUN_TYPE) • Any missing security price records, which are required for the Expected NAV process, are highlighted by the fund level status from the Expected Prices Calculated section of the Fund Overview, before the completion of the Expected NAV process. 2. a new **data load attribute** is available from the entity template. This will be a boolean attribute that sets all U175 records required for the expected pricing process as mandatory if set to True. • If all required security price records are not provided, and the security prices data load is set to mandatory, then the Expected NAV process will wait
examples	• there are no exception messages generated during the expected pricing process related to missing security prices (shown from P606) th at haven't already been highlighted before the completion of the Expected NAV process • no actual versus expected validation false-positive exception results have been generated which relate to missing security prices not previously identified

User Story #1.2 – Reliable Expected Price Generation (Oversight)- Complete Security Prices (U175) - user workflow

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want a dedicated user workflow to manage any prices highlighted by the missing security prices functionality (User Story #1.1)
so that <some reason>	So that I can decide whether to stale the missing security prices, manually update the missing security prices, or request security prices from an interface to a market data provider.
I know its complete when **<acceptance criteria>**	1. If missing security prices are highlighted from the Expected Prices Calculated section of the Fund Overview • drill down is available into the missing security price records • each record will display the previously available security price and date, and related price source 2. From the missing security price records, user workflow is available from a right-click menu which will allow the user to • stale the missing security prices • manually update the missing security prices • request security prices from an interface to a market data provider
examples	

User Story #2.1 – Reliable Expected Price Generation (Oversight)- Accurate Security Prices functionality

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want to be confident that the **security prices** provided for the Daily Expected NAV generation process **are accurate**, which is accomplished by risk approach leveraging historical data (complementary to traditional, fixed tolerance approach)
so that <some reason>	So that the Expected NAV is generated accurately and reduces the number of false-positive expectations when running actual versus expected type validations; allowing me to correctly validate the NAV provided by our third-party administrator.

I know its complete when **<acceptance criteria>**	1. For Fund Entities using [ERM003] Holdings - Security Repricing as part of their Expected Pricing Methodology, any potentially inaccurate security prices will be highlighted, based upon a **risk assessment** of available data. • potentially inaccurate security prices will be highlighted before the completion of the Expected NAV process from the Expected Prices Calculated section of the Fund Overview • potentially Inaccurate security prices will be identified through the risk assessment of available data (including time series data). i. e. not using the traditional tolerance comparison approach • the risk assessment is data-driven (via 'White-Box') and will use a variety of methods (TBD) to assess the validity of the security price/ security price movement. e.g. standard deviation, correlation with benchmarks, correlation with other security prices, the impact of other factors such as changes in exchange rates, relevant news events, etc. 2. The risk assessment of U175 security prices will generate a **risk number** for each security price • this risk number corresponds to a level of certainty/ probability that the price is accurate. E.g. 0= Highly certain price is accurate, 5= Data anomaly 3. **An explanation of risk assessment** is provided along with each risk number, allowing users to understand the results of the risk assessment process • E.g. Price movement > 6-month standard deviation
examples	• the number of actual versus expected validation false-positive exception results is low and not related to inaccurate security prices • if prices are inaccurate, they will be previously identified as part of the risk assessment process (high risk numbers)

User Story #2.2- Reliable Expected Price Generation (Oversight)- Accurate Security Prices functionality - user workflow

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want a dedicated user workflow to manage any prices, which are required for the expected pricing process, assigned high risk numbers (User Story #2.1)
so that <some reason>	So that I can decide whether to accept the current security price, manually update the security prices, or request security prices from an interface to a market data provider.
I know its complete when **<acceptance criteria>**	1. If 'high risk' security prices are highlighted from the Expected Prices Calculated section of the Fund Overview • drill down is available into the 'high risk' security price records • each record will display the previous and current security price, and related price source 2. From the 'high risk' security price records, user workflow is available from a right-click menu which will allow the user to • accept the 'high risk' security prices • manually update the 'high risk' security prices • request security prices from an interface to a market data provider
examples	

User Story #3.1 – Accurate Fund Administrator Provided NAV (Oversight)- Validate Accuracy of Security Prices (U100)

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want to accurately assess the security prices provided by my fund administrator
so that <some reason>	So that I am able to confidently validate the fund administrator-provided NAVs.

I know its complete when **<acceptance criteria>**	1. For each security price provided in the U100: Investment Holding file, any potentially inaccurate security prices will be highlighted, based upon a risk assessment of available data • potentially inaccurate security prices will be highlighted as part of the NAV oversight process • potentially Inaccurate security prices will be identified through the risk assessment of available data (including time series data). i. e. not using the traditional tolerance comparison approach • the risk assessment is data-driven (via 'White-Box') and will use a variety of methods (TBD) to assess the validity of the security price/ security price movement. e.g. standard deviation, correlation with benchmarks, correlation with other security prices, the impact of other factors such as changes in exchange rates, etc. 2. The risk assessment of U100 security prices will generate a risk number for each price, which corresponds to the level of certainty/ probability that the price is accurate. E.g. 0= Highly certain price is accurate, 5= Data anomaly 3. The Exceptions Validated section of the Fund Overview will highlight: • security price exceptions will be highlighted as a potential false positive exception if the security price risk number is less than X • security price validations that are in a validated state will be highlighted as a potential false negative if the security price risk number is greater than X 4. For any security price-related validations, this risk number will be displayed in the validation result (A99). • In addition, an **explanation of risk assessment** is provided with the exception result, allowing users to understand the results of the risk assessment process • E.g. Price movement > 6-month standard deviation 5. Drill down is provided into the holding records (A03) to display the associated risk numbers/ additional information provided relating to the risk assessment of holding prices.
examples	• The number of oversight validation false-positive exception results is low and not related to inaccurate security prices not previously identified as part of the risk assessment process (high risk numbers).

User Story #3.2 - Accurate Fund Administrator Provided NAV (Oversight)- Validate Accuracy of Security Prices (U100)- user workflow for false-positives

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want a dedicated user workflow to manage security price exceptions that have been assigned low risk numbers i.e. potential false-positive exceptions (User Story #3.1)
so that <some reason>	So that I can decide whether to either manually or automatically clear the security price exceptions associated with low risk numbers
I know its complete when **<acceptance criteria>**	1. Manual user workflow is available as a right-click option from a security price exception • Manually accept the exception clearance suggestion i.e. low risk assessment • Reject exception clearance suggestion • Run Auto Exception Clearance Processing using Bloomberg price feed 2. Automated workflow is available to automatically clear security price exceptions with assigned low risk numbers • a new attribute is available from the security price validation template to allow auto clearance based if the security risk number is less than X
examples	• Security price validations: [HLD113] - Asset Price Movement Check, [HLD003] - Zero Market Price Check, [HLD050] - Market Price Date Check, [HLD003] - Zero Market Price Check, [SEC006] - Product Zero Price Movement, [SEC005] - Product Stale Price Check

User Story #3.3 - Accurate Fund Administrator Provided NAV (Oversight)- Validate Accuracy of Security Prices (U100)- user workflow for false negatives

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want a dedicated user workflow to manage security price validations with risk assessment type exceptions (i.e. tolerance based security price validations with corresponding high risk numbers assigned to the security price i.e. potential false-negative exceptions (User Story #3.1)

so that <some reason>	So that I can decide whether to either manually or automatically generate security price exceptions associated with high risk numbers

I know its complete when
 	
<acceptance criteria>
	1. Manual user workflow is available as a right-click option from a security price risk assessment type exception
	   • Manually accept the exception suggestion i.e. high risk assessment
	   • Reject exception suggestion
	   • Run Auto Exception Clearance Processing using Bloomberg price feed
	2. Automated workflow is available to automatically generate security price exceptions with assigned high risk numbers
	   • a new attribute is available from the security price validation template to allow exceptions to be generated if the security risk number is greater than X

examples	• Security price validations: [HLD113] - Asset Price Movement Check, [HLD003] - Zero Market Price Check, [HLD050] - Market Price Date Check, [HLD003] - Zero Market Price Check, [SEC006] - Product Zero Price Movement, [SEC005] - Product Stale Price Check

User Story – Single Level Exception Auto Clearance - Security Price Validations

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want a solution that can automatically clear/ or suggest the clearance of false-positive exception results which relate to the validation of security prices, once the price has been verified using a risk-assessment based approach
so that <some reason>	So that I can focus upon true exceptions results

I know its complete when
 	
<acceptance criteria>
	• Security price validation results are compared to the risk numbers generated from the risk assessment process i.e. each security price validation will have a corresponding risk number that represents the certainty/ probability that the price is accurate. E.g. 0= Highly certain price is accurate, 5= Data anomaly
	   • This information is provided from the Exception View/ Exception Details, as well as from the exception analysis views.
	• For security price validation exceptions, if the corresponding risk number for the security price is low (high certainty that the security price is correct), then pControl can either suggest that the exception can be cleared, or auto-clear the exception.
	• Any exceptions that are auto cleared as part of the risk assessment process will have exception comments automatically populated with the risk assessment number and related explanation.
	• User workflow is provided to manage suggested exception clearance For example,
	   • Manually accept the exception clearance suggestion
	   • Reject exception clearance suggestion
	   • Run Auto Exception Clearance Processing using Bloomberg price feed

examples	• Security price validations: [HLD113] - Asset Price Movement Check, [HLD003] - Zero Market Price Check, [HLD050] - Market Price Date Check, [HLD003] - Zero Market Price Check, [SEC006] - Product Zero Price Movement, [SEC005] - Product Stale Price Check

User Story – Identification of False Negative Exceptions - Security Price Validations

As a <persona>	As a valuation analyst working in the oversight team of an asset management firm
I want to <some task>	I want a solution that can highlight any potentially false-negative results which relate to the validation of security prices, once the price has been verified using a risk-assessment based approach
so that <some reason>	So that all true exceptions can be addressed as part of the exception management process.

I know its complete when
 	
<acceptance criteria>
	• Security price validation results are compared to the risk numbers generated from the risk assessment process i.e. each security price validation will have a corresponding risk number that represents the certainty/ probability that the price is accurate. E.g. 0= Highly certain price is accurate, 5= Data anomaly
	  • This information is provided from the Exception View/ Exception Details, as well as from the exception analysis views.
	• For security price validations that have passed, if the corresponding risk number for the security price is high (low certainty that the security price is correct), then pControl can either suggest that the validation result should be an exception or automatically change the validation result to exception.
	• Any exceptions that are auto-generated as part of the risk assessment process will have exception comments automatically populated with the risk assessment number and related explanation.
	• User workflow is provided to manage suggested exception clearance For example,
	  • Manually accept the exception result suggested by the risk assessment process
	  • Reject exception result suggested by the risk assessment process
	  • Run Auto Exception Clearance Processing using Bloomberg price feed

examples	• Security price validations: [HLD113] - Asset Price Movement Check, [HLD003] - Zero Market Price Check, [HLD050] - Market Price Date Check, [HLD003] - Zero Market Price Check, [SEC006] - Product Zero Price Movement, [SEC005] - Product Stale Price Check