

# Eurofiling XBRL 2018 Week

10th anniversary of  
**XBRL EUROPE**



## CALCULATION 2.0

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includes contributions by  
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Warsaw, 30 June 2018



# OVERVIEW

## XBRL 2.1

- Calculation intended to validate numeric facts
- Restriction to facts c-equal + other restrictive conditions.

## Calculation has become a declarative model

- Summation and breakdown between concepts
- Reference for conditions to validate instance facts

## Use of calculation has evolved

- Distinction between modeling and validation
- Model changes from any prior balances in time intervals, and
- Model aggregated numeric facts across dimensions

## Properties are needed on calculation specifications



# USE CASES

## For consumers

- Concept models identify aggregation and breakdown
- Used to select right concept, not double-count data
- Reliably calculate summarized values
- Validate correctness of reported facts

## For preparers

- Select right concepts for data
- Validate accuracy of reports



# CALCULATION PROPERTIES

On all, some, or specific calculation relationship networks

- Deduplication
  - Ignore, sum or take {most, least} accurate
- Rounding
  - To identify duplicates and to sum
  - Half {away from zero, to even} or interval arithmetic
- Validation
  - None or {complete, incomplete} fact set
- Insignificant axes
  - Specify axes which do not participate in disaggregation
- Filtering based on aspect values
  - Multiple aspect filters (e.g. legal entity & date period)



# SUMMATION ITEM RELATIONS

Augment XBRL 2.1 summation-item relationship with calculation properties

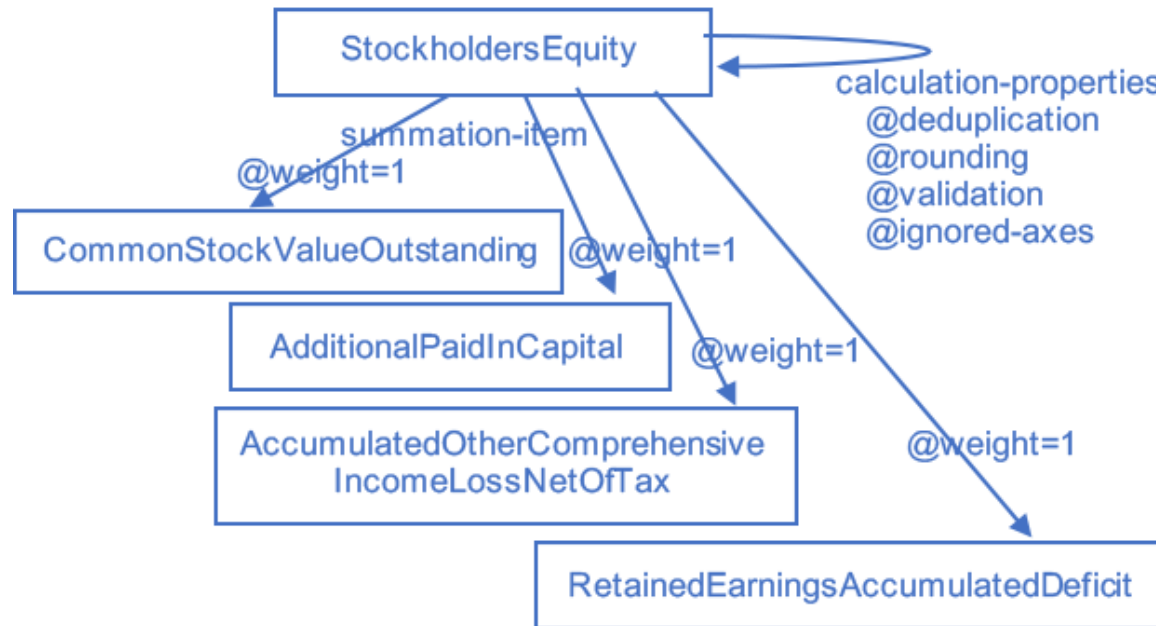
Fact validation:

- Calc 2 features properties specifying:
  - Deduplication
  - Rounding
  - Validation (none, complete, incomplete fact set)
  - Ignoring of designated axes
  - Aspect filtering



# SUMMATION PROTOTYPE

CommonStockValueOutstanding	600
AdditionalPaidInCapital	100
AccumulatedOtherComprehensiveIncomeLossNetOfTax	50
RetainedEarningsAccumulatedDeficit	200
StockholdersEquity	950





# BALANCE-CHANGES RELATIONSHIPS

Roll forward requirements for various balances

- Use case: fixed asset balance shows beginning balance, additions and disposals during the period, and an ending balance.

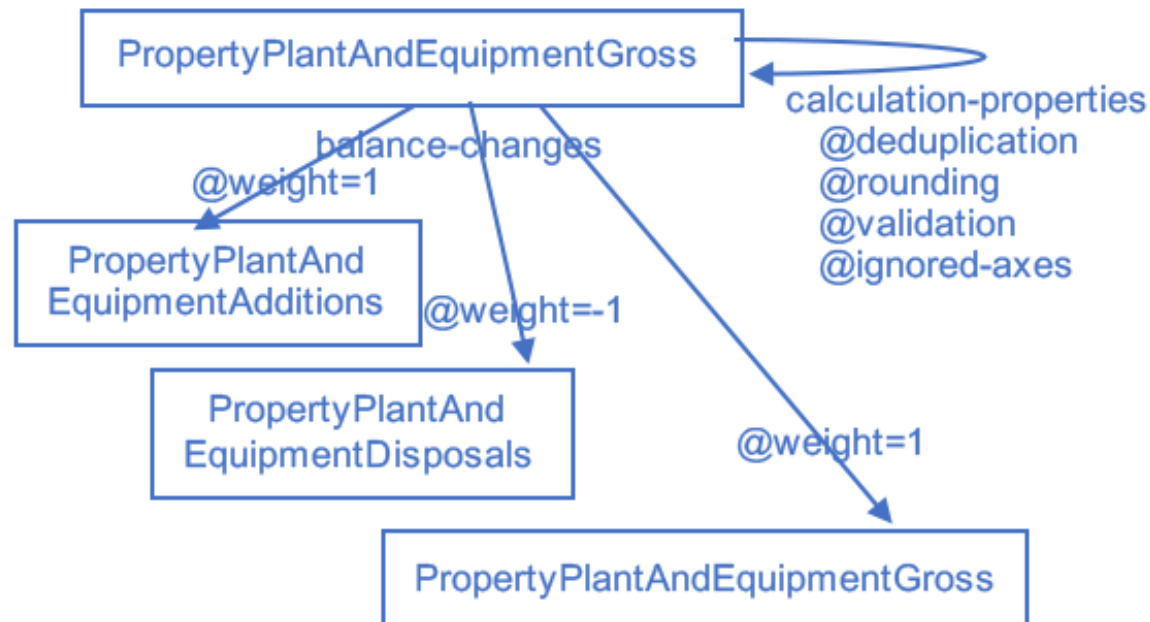
Identifies time intervals which have an ending balance and contributing changes and beginning balance(s).

PropertyPlantAndEquipmentGross	100	12/31/2015
PropertyPlantAndEquipmentAdditions	500	1/1-12/31/2016
PropertyPlantAndEquipmentDisposals	50	1/1-12/31/2016
PropertyPlantAndEquipmentGross	550	12/31/2016



# BALANCE-CHANGES PROTOTYPE

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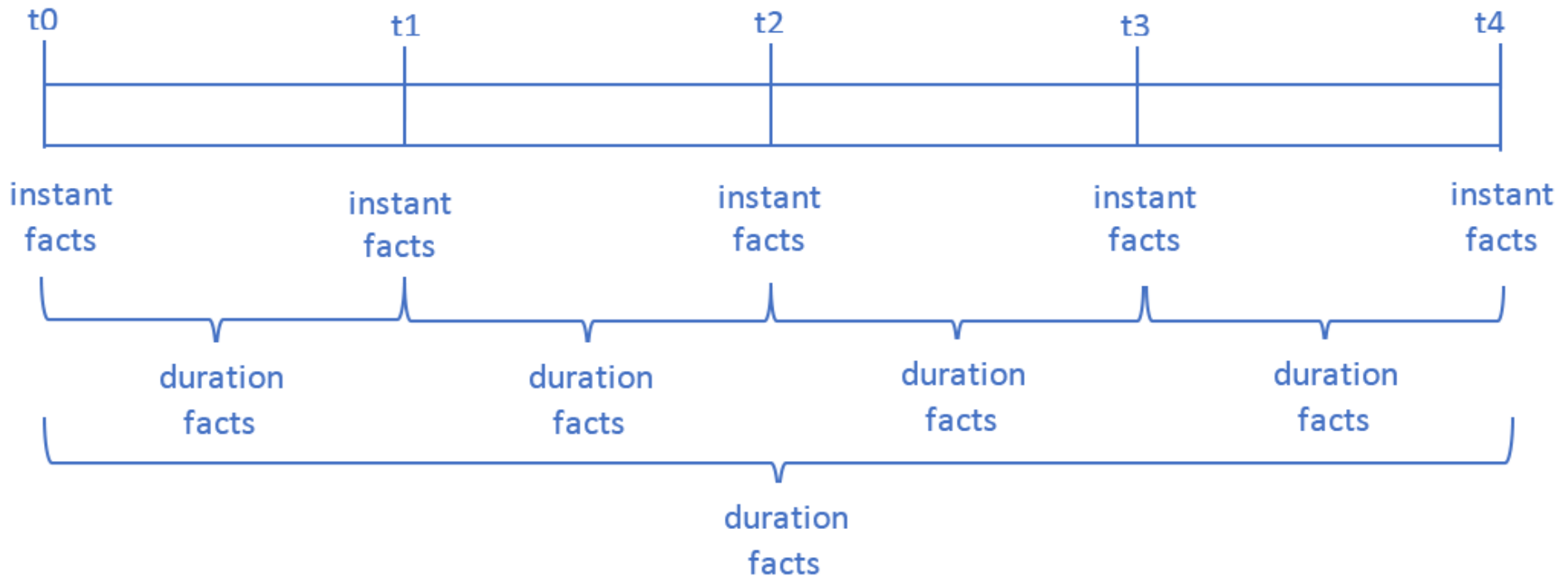




# FACT VALIDATION

Sum the roll forwards of an instance document

- Illustration:
  - instant facts at t1 matching duration facts ending at t1, starting at t0, and instant facts at t0
  - instant facts at t2 matching duration facts ending at t2, starting at t1, and instant facts at t1





# DIMENSIONAL AGGREGATION

Specify models of dimensionally aggregated breakdowns

- Single-valued and multi-valued dimensions
- Totals modeled by short-hand
  - Explicit-dimension totals (dimension-default)
  - Typed-dimension xsi:nil or usable domain head-member of tree (multi-value)

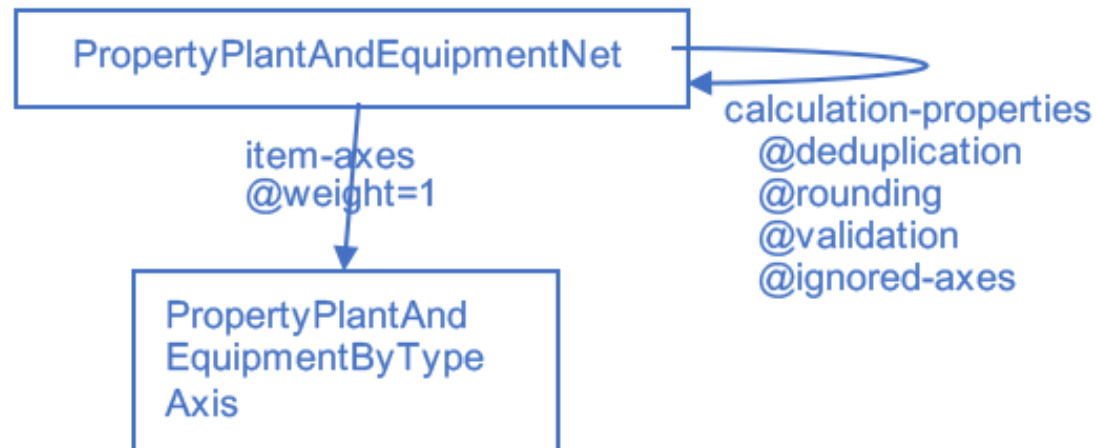
Use case: Pension plan obligations dimensionally aggregated by plan:

	Total	RetirementPlanNameAxis		
		PlanA Member	PlanB Member	PlanC Member
DefinedBenefitPlanBenefitObligation	800	100	200	50



# DIMENSIONAL AGGREGATION PROTOTYPE

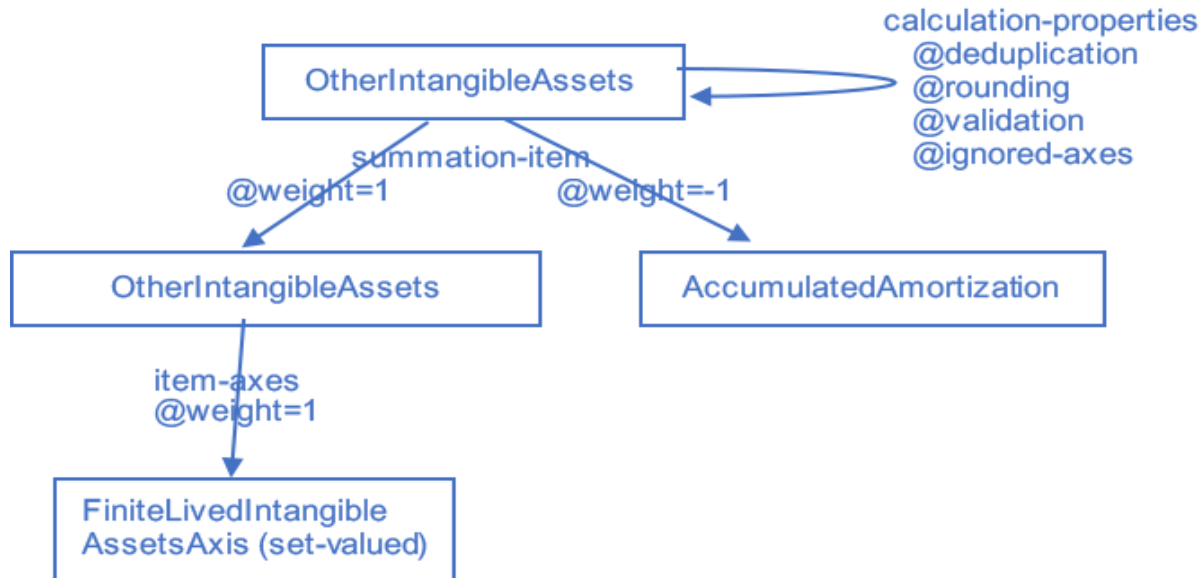
	Total	PropertyPlantAnd EquipmentByType Axis/LandMember	PropertyPlantAnd EquipmentByType Axis/BuildingMember	PropertyPlantAnd EquipmentByType Axis/EquipmentMember
PropertyPlantAnd EquipmentNet	800	100	200	500





# SET-VALUED DIMENSION PROTOTYPE

	March 31, 2017
Capitalized software development costs	\$ 7,005
Patents and copyrights	4,694
Non-compete	4,100
Customer relationships	3,800
Gross Other intangible assets	19,599
Less: Accumulated amortization	12,679
Other Intangible Assets	\$ 6,920



Other Intangible Assets is a single concept, with the Finite Lived Intangible Assets set valued dimension having breakdown facts for capitalized software development tools (a single value member), for patents and copyrights (set of two values, patent and copyrights, outlined on the figure), for non-compete (single value member), and for customer relationships (single value member). The total (xsi:nil member) sums with - accumulated amortization to other intangible assets.



# MIXED USE CASES

Some cases must aggregate, impute subtotal, and then sum:

		StatementClassOfStockAxis	
		CommonClassA Member	CommonClassB Member
	12/31	Class A	Class B
CommonStockValueOutstanding		100	500
AdditionalPaidInCapital	100		
AccumulatedOtherComprehensiveIncome LossNetOfTax	50		
RetainedEarningsAccumulatedDeficit	200		
StockholdersEquity	950		



# MIXED USE CASE, A SATELLITE FILING

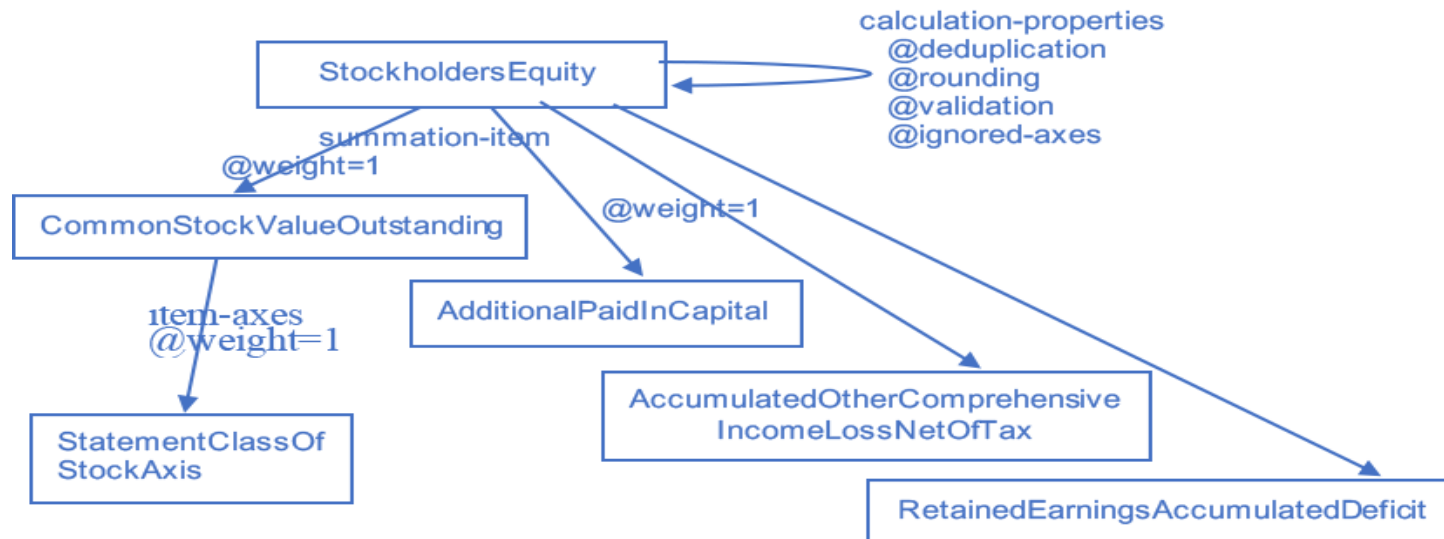
This filing aggregates satellite and non-satellite breakdown of Property, Plant and Equipment into Assets with an imputed dimensional-breakdown total:

Primary Items	Property, Plant and Equipment, Type [Domain]	Property Plant And Equipment Satellites [Member]	Property Plant And Equipment Excluding Satellites [Member]
<b>Statement of Financial Position [Abstract]</b>			
<b>Statement [Table]</b>			
<b>Statement [Line Items]</b>			
<b>ASSETS</b>			
<b>Current assets:</b>			
Cash and cash equivalents	\$161,821,000		
Accounts receivable, net	\$228,037,000		
Inventories	\$182,059,000		
Prepaid expenses and other current assets	\$76,356,000		
Total current assets	\$648,273,000		
Property and equipment, net		\$1,194,824,000	\$659,153,000
Other acquired intangible assets, net	\$33,862,000		
Goodwill	\$120,682,000		
Other assets	\$658,813,000		
Total assets	\$3,315,607,000		



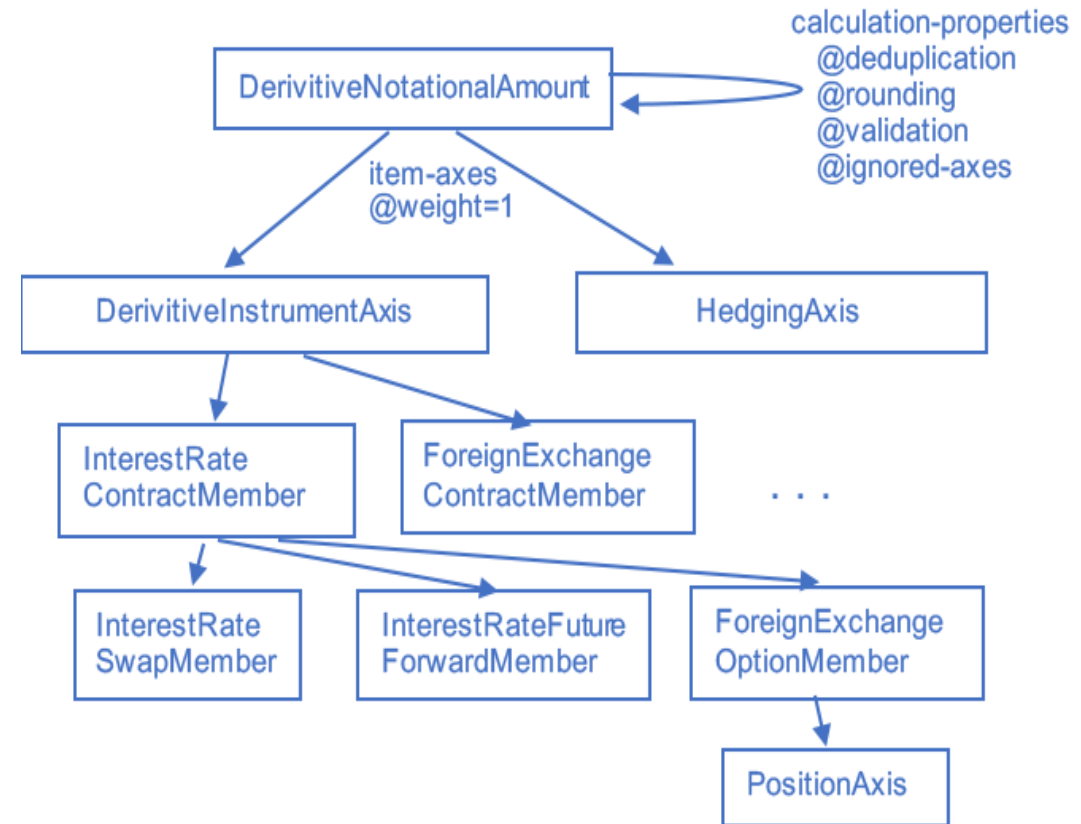
# MIXED USE CASE PROTOTYPE

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# NESTED AXES PROTOTYPE

			Designated as	Other derivative instruments	
			hedging instruments	Trading derivatives	Management hedges
			December 31, 2017	December 31, 2017	December 31, 2017
		in millions of dollars			
		<b>Interest rate contracts</b>			
A3:M9		Swaps	\$ 160,000	\$ 28,000,000	\$ 100,000
A3:ExM10		Futures and forwards	-	3,500,000	43,000
A3:ExM11	A2:M4	Written options	-	3,870,000	16,000
	A2:M5	Purchased options	-	3,888,000	7,000
		<b>Total interest rate contract notional</b>	\$ 160,000	\$ 39,258,000	\$ 166,000
		<b>Foreign exchange contracts</b>			
A3:M12		Swaps	\$ 27,000	\$ 1,100,000	\$ 22,000
A3:ExM13		Futures and forwards	55,000	3,100,000	31,000
A3:M14	A2:M4	Written options	4,000	590,000	190
	A2:M5	Purchased options	39,000	593,000	53
		<b>Total foreign exchange contract notional</b>	\$ 125,000	\$ 5,383,000	\$ 53,243
		<b>Equity contracts</b>			
A3:M16		Swaps	\$ -	\$ 86,000	\$ -
A3:ExM17		Futures and forwards	-	12,000	-
A3:M18	A2:M4	Written options	-	552,000	-
	A2:M5	Purchased options	-	509,000	-
		<b>Total equity contract notional</b>	\$ -	\$ 1,159,000	\$ -
		<b>Credit derivatives</b>			
A3:ExM19	A2:M4	Protection sold	\$ -	\$ 1,300,000	\$ -
	A2:M5	Protection purchased	4,000	1,400,000	21,000
A3:M8		<b>Total credit derivatives</b>	\$ 4,000	\$ 2,700,000	\$ 21,000
		<b>Total derivative notional</b>	\$ 289,000	\$ 48,500,000	\$ 240,243







# @BALANCE-@WEIGHT CONSTRAINT IMPEDIMENT

In 2.1 calc, @balance constrains @weight, generally useful

For calc 2, optional for specific use cases where it's an impediment

Secured borrowings impediment:

<b>L7</b> Total	\$ 82	\$ 37	\$ 22	\$ 15	\$ 156
<b>L8</b> Total borrowings	\$ 450	\$ 491	\$ 335	\$ 70	\$ 1,346
<b>L9</b> Gross amount of recognized liabilities for repurchase agreements and securities lending in footnote X					\$ 1,315
<b>L10</b> Amounts related to agreements not included in offsetting disclosure in footnote X					\$ 31

**Figure 2.1**

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All 3 elements have credit balances:

<b>L8</b>	Secured Borrowings, Gross Including Not Subject to Master Netting Arrangement	Credit	Instant	SecuredBorrowingsGrossIncludingNotSubjectToMasterNettingArrangement
<b>L9</b>	Securities Loaned and Securities Sold under Agreement to Repurchase, Gross Including Not Subject to Master Netting Arrangement	Credit	Instant	SecuritiesLoanedAndSecuritiesSoldUnderAgreementToRepurchaseGrossIncludingNotSubjectToMasterNettingArrangement
<b>L10</b>	Secured Borrowings, Gross, Difference, Amount	Credit	Instant	SecuredBorrowingsGrossDifferenceAmount



# @BALANCE-@WEIGHT CONSTRAINT OPTIONAL

Example of @balance-@constraint impediment

[-] A Goodwill [Roll Forward]
[-] Goodwill, Beginning Balance Debit
[-] Goodwill, Acquired During Period Debit
[-] Goodwill, Impairment Loss Debit
[-] Goodwill, Subsequent Recognition of Deferred Tax Asset
[-] Goodwill, Other Increase (Decrease)
[-] Goodwill, Written off Related to Sale of Business Unit
[+] A Goodwill, Translation and Purchase Accounting Adjustments [Abstract]
[-] Goodwill, Transfers
[-] Goodwill, Period Increase (Decrease), Total
[-] Goodwill, Ending Balance

GoodwillPeriodIncreaseDecrease can't have a @balance

name	label	weight
GoodwillPeriodIncreaseDecrease	Goodwill, Period Increase (Decrease)	
GoodwillAcquiredDuringPeriod	Goodwill, Acquired During Period	1.0
GoodwillImpairmentLoss	Goodwill, Impairment Loss	-1.0
GoodwillWrittenOffRelatedToSaleOfBusinessUnit	Goodwill, Written off Related to Sale	-1.0
GoodwillTranslationAndPurchaseAccountingAdjustments	Goodwill, Translation and Purchase A	1.0
GoodwillSubsequentRecognitionOfDeferredT	Goodwill, Subsequent Recognition of	-1.0
GoodwillOtherIncreaseDecrease	Goodwill, Other Increase (Decrease)	1.0
GoodwillTransfers	Goodwill, Transfers	1.0



# ASPECT FILTERS

Facility for specific calculations like multiple Table LB Filters

Use cases and examples:

- Limit calculations applicability to a given period
  - Allows a calculation for 1 year one way and another year a different way
- Limit calculations applicability to a dimension or aspect
  - Calculation of cashflows differently per LegalEntityAxis members
- Limit calculation applicability to a line item and group of line items.
  - Allow values associated with members on an axis to be added but allow it to be applicable to all line items, selected line items or line items in a given table
- Allow combinations of the above
  - Calculation for parent company member on the LegalEntityAxis for the year ended 2018-12-31.



# CALC 2 STATUS

## Requirements draft

- Please review

## Specification (prototype) draft available (with examples)

- Review for approach
- Review for impact on filer community