Expressing business checks
- BCDL -
Business Checks
Description Language

_____

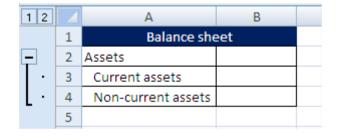Eric JARRY – Banque de France for ACPR

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Agenda

- Expressions of business checks

  - Form-centric

  - Data-centric

- Principles of BCDL

- Business checks feed-back

Example of a business check

- Assets (amount) must be the aggregation of current assets and non-curret assets

- This could be expressed as an arithmetic expression

- Business experts see the world through spreadsheets
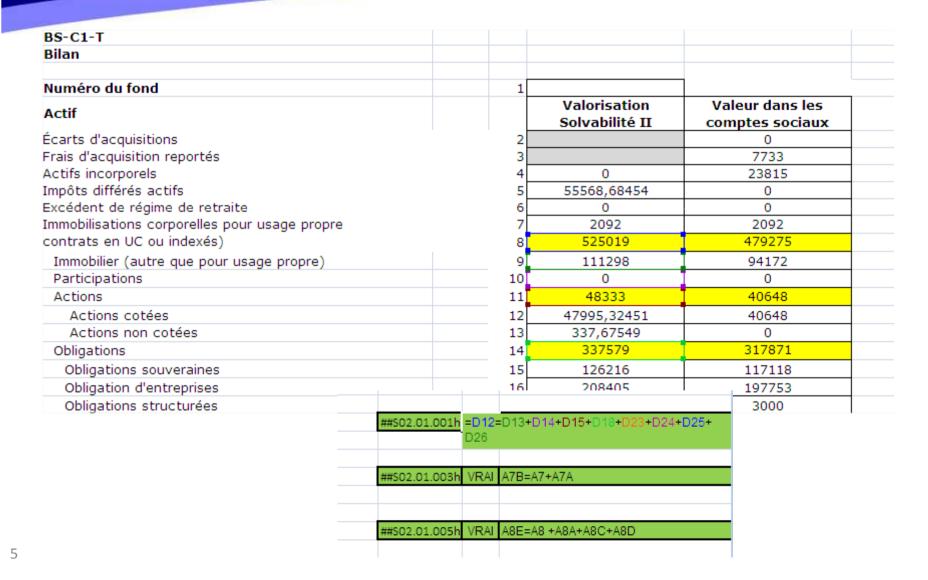
  => Reporting units expressed via « templates »

Using actual Excel formulas

D12 | =D13+D14+D15+D18+D23+D24+D25+D26

	A	B	C	Valorisation Solvabilité II	Valeur dans les comptes sociaux
1	BS-C1-T				
2	Bilan				
3					
4	Numéro du fond		1		
5	Actif			Valorisation Solvabilité II	Valeur dans les comptes sociaux
6	Écarts d'acquisitions		2		0
7	Frais d'acquisition reportés		3		7733
8	Actifs incorporels		4	0	23815
9	Impôts différés actifs		5	55568,68454	0
10	Excédent de régime de retraite		6	0	0
11	Immobilisations corporelles pour usage propre		7	2092	2092
12	contrats en UC ou indexés)		8	525019	479275
13	Immobilier (autre que pour usage propre)		9	111298	94172
14	Participations		10	0	0
15	Actions		11	48333	40648
16	Actions cotées		12	47995,32451	40648
17	Actions non cotées		13	337,67549	0
18	Obligations		14	337579	317871
19	Obligations souveraines		15	126216	117118
20	Obligation d'entreprises		16	208405	197753
21	Obligations structurées		17	2958	3000
22	Titres garantis		18	0	0
23	Fonds d'investissement		19	27809	26584
24	Produits dérivés		20	0	0
25	Dépôts autres que ceux assimilables à de la trésorerie		21	0	0
26	Autres placements		22	0	0
27	Placements en représentation de contrats en UC ou indexés		23	0	0
28	Prêts et prêts hypothécaires		24	0	0

4

BS-C1-T
Bilan

		Valorisation Solvabilité II	Valeur dans les comptes sociaux
Numéro du fond	1		
Actif			
Écarts d'acquisitions	2		0
Frais d'acquisition reportés	3		7733
Actifs incorporels	4	0	23815
Impôts différés actifs	5	55568,68454	0
Excédent de régime de retraite	6	0	0
Immobilisations corporelles pour usage propre	7	2092	2092
contrats en UC ou indexés)	8	525019	479275
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Obligations	14	337579	317871
Obligations souveraines	15	126216	117118
Obligation d'entreprises	16	208405	197753
Obligations structurées			3000

##S02.01.001h	=D12=D13+D14+D15+D18+D23+D24+D25+D26	
##S02.01.003h	VRAI	A7B=A7+A7A
##S02.01.005h	VRAI	A8E=A8 +A8A+A8C+A8D

Using pseudo formulas

Balance sheet

Assets	Solvency II value	Statutory accounts valuation basis
Goodwill		AS1
Deferred acquisition costs		AS24
Other intangible assets	A2	AS2
Deferred tax assets	A26	AS26
Pension benefit surplus	A25B	AS25B
Property, plant & equipement held for own use	A3	AS3
Investments (other than assets held for unit-linked funds)	$A4 = A5+A6+A7+A7A+A8+A8A+A8C+A8D+A9+A10A+A10B+A11+A14$	$AS4 = AS5+AS6+AS7+AS7A+AS8+AS8A+AS8C+AS8D+AS9+AS10A+AS10B+AS11+AS14$
Property (other than own use)	A5	AS5
Participations	A6	AS6
Equities - listed	A7	AS7
Equities - unlisted	A7A	AS7A
Government Bonds	A8	AS8
Corporate Bonds	A8A	AS8A
Structured notes	A8C	AS8C
Collateralised securities	A8D	AS8D
Investment funds	A9	AS9
Derivatives	A10A	AS10A
Deposits other than cash equivalents	A10B	AS10B
Loans & mortgages (except loans on policies)	A14	AS14
Other investments	A11	AS11
Assets held for unit-linked & index-linked	A12	AS12
Loans on policies	A14A	AS14A

Using cell pseudo coordinates

BANQUE DE FRANCE
EUROSYSTÈME

SURFI
- old

Controles CLIENT_RE vs SITUATION

Template	Activity	Money	Sheets	Lines	Columns		Template	Activity	Money	Sheets	Operator	Lines	Columns
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE ACTIF	1	9	=	SITUATION	France	Euros	Actif		2.1	2
				2	9								
				3	9								
				4	9								
				5	9								
				6	9								
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE ACTIF	7	9	=	SITUATION	France	Euros	Actif		2.2	2
			CLIENTELE FINANCIERE	1.1	1								
					2								
					3								
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE ACTIF	8	9	=	SITUATION	France	Euros	Actif		2.4	2
			CLIENTELE FINANCIERE	1.3	1								
					2								
					3								
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE ACTIF	9	9	=	SITUATION	France	Euros	Actif		2.5	2
			CLIENTELE FINANCIERE	1.4	1								
					2								
					3								
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE ACTIF	10	9	=	SITUATION	France	Euros	Actif	-	2.7	2
			CLIENTELE FINANCIERE	1.5	1							2.8	2
					2								
					3								
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE ACTIF	11.1	9	<=	SITUATION	France	Euros	Actif		4.1	2
				11.2	9								
			CLIENTELE FINANCIERE	1.6	1								
					2								
					3								
				1.7	3								
ITB_RESID	France	Euros	Opérations financ EC résid,	1.7	1								
					2								
				1.8	1								
					2								
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE PASSIF	4	9	<=	SITUATION	France	Euros	Passif		2.5	1
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE PASSIF	5	9	<=	SITUATION	France	Euros	Passif		2.6	1
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE PASSIF	6	9	<=	SITUATION	France	Euros	Passif		2.7	1
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE PASSIF	7	9	<=	SITUATION	France	Euros	Passif		2.8	1
CLIENT_RE	France	Euros	CLIENTELE NON FINANCIERE PASSIF	8	9	<=	SITUATION	France	Euros	Passif		2.9	1
				9	9								

Using cell pseudo coordinates

EBA

ID	Type	T1	T2	Rows	Columns	Sheets	Formula	Hierarc
		Tables used in formu		Formula applies to				
v0002_h	Hierarchy	C 18.00			(060)	(All)	{r011} = +{r210} + {r020}	AP5
v0003_h	Hierarchy	C 23.00			(010;020;030;040		{r010} = +{r080} + {r070} + {r090}	AP5
v0004_h	Hierarchy	C 21.00			(060)	(001;002;003;004;005;006;007;008	{r090} = +{r100} + {r110} + {r120} + {r130}	AP9
v0005_h	Hierarchy	C 23.00			(060)		{r100} = +{r110} + {r120} + {r130} + {r140}	AP9
v0006_h	Hierarchy	C 18.00			(060)	(001;002;003;004;005;006;007;008	{r350} = +{r360} + {r370} + {r380} + {r390}	AP9
v0007_h	Hierarchy	C 22.00			(090)		{r050} = +{r060} + {r070} + {r080} + {r090}	AP9
v0022_h	Hierarchy	C 05.02			(010)		{r040} = +{r060} + {r050} + {r070}	CI1
v0023_h	Hierarchy	C 05.02			(010)		{r110} = +{r130} + {r120} + {r140}	CI1
v0050_h	Hierarchy	F 01.01			(010)		{r300} = +{r310} + {r320}	MC1
v0055_h	Hierarchy	C 21.00			(010;020)	(001;002;003;004;005;006;007;008	{r020} >= +{r021} + {r022}	MC121,MC128
v0057_h	Hierarchy	F 01.03			(010)		{r210} = +{r230} + {r220} + {r215}	MC133
v0058_h	Hierarchy	F 01.03			(010)		{r200} = +{r203} + {r202} + {r204} + {r201}	MC134
v0059_h	Hierarchy	F 01.03			(010)		{r205} = +{r207} + {r206} + {r208} + {r209}	MC135
v0060_h	Hierarchy	F 32.02.a			(010;020;030;040		{r130} = +{r160} + {r150} + {r140} + {r230} + {r220}	MC15
v0061_h	Hierarchy	F 32.01			(010;020;030;060		{r010} = +{r040} + {r030} + {r020} + {r120} + {r100}	MC15
v0062_h	Hierarchy	F 37.00.c					{r180,c190} = +{r010,c190} + {r070,c190}	MC1,MC16
v0064_h	Hierarchy	F 37.00.c					{r340,c190} = +{r190,c190} + {r260,c190}	MC1,MC16
v0067_h	Hierarchy	F 01.01			(010)		{r180} = +{r190} + {r200}	MC1,MC16
v0069_h	Hierarchy	F 01.01			(010)		{r210} = +{r220} + {r230}	MC1,MC16

- XBRL assertions

  - Could not be (reasonably) used by business people

  - Powerful but low level and complex

  - Slow for some assertions => complementary solution(s) may be seeked

- Mapping between business concepts and XBRL / DPM implementation

- Problem of spilling evaluations

- For Business Checks Description Language

- Evolution of LEA (Language to Express Assertions) currently used in French SURFI system

- Used to define EIOPA assertions

- Simple arithmetic language using , as much as possible, business concepts

- Example:

[S.01.02.002h]

Label = Geographical aggregation of assets in Benelux

GlobalFilters = [!RingFencedFunds]

Assertion = Assets[Benelux] = Assets[Belgium] +
Assets[Netherlands] + Assets[Luxembourg]

Each assertion must have

- a code

- a clear label

- Different ways
  - Using labels:
    " Assets" = "Current assets"   + "Non-current assets"
  - or using L3C names:
    Assets = AssetsCurrent + AssetsNonCurrent
  - or, using business codes: E1 = E1A + E1B
  - or, using XML codes: s2md:mi312 = s2md:mi451 + s2mdmi452

- Business concepts must be unambiguously mapped to taxonomy / DPM concepts => problems
  - Non-uniqueness of identification (problem of current DPM with dimension members)
  - Name spaces (XML or Reporting units)
  - Length of business concepts labels

- Tools to write assertions using templates

- Defining aliases

- Default values

- Contextual (reporting unit) naming

- Conversion of codes into labels

```
 3 ⊟ [S.02.01.001h]
 4   Label = Aggregation to: Investments [other than assets held for index-linked and unit-linked funds]
 5   GlobalFilters = [s2c_dim_BL:s2c_LB_x91][s2c_dim_CS:s2c_CS_x26][s2c_dim_VG:s2c_AM_x84,s2c_AM_x80]
 6   Assertion = s2md_met.mi263 = s2md_met.mi265 + s2md_met.mi243 + s2md_met.mi238 + s2md_met.mi213 +
     s2md_met.mi228 + s2md_met.mi224 + s2md_met.mi223 + s2md_met.mi249
 7
 8     - Global filters:
 9       - s2c_dim_CS:s2c_CS_x26 = Consolidation scope : Solo
10       - s2c_dim_VG:s2c_AM_x84 = Valuation general : Statutory accounts
11       - s2c_dim_VG:s2c_AM_x80 = Valuation general : Solvency II
12       - s2c_dim_BL:s2c_LB_x91 = Line of business [general] : Neither unit-linked nor index-linked
13     - Primary items:
14       - mi263 = Metric: Monetary|BC/Assets|AS/Property, plant and equipment and financial [other
     than receivables/payables and recoverables]|IO/Investment
15       - mi265 = Metric: Monetary|BC/Assets|AS/Property, plant and equipment|IO/Investment
16       - mi243 = Metric: Monetary|BC/Assets|AS/Financial [other than receivables/payables and
     recoverables]|IO/Participations
17       - mi238 = Metric: Monetary|BC/Assets|AS/Equity instruments|IO/Investments other than
     participations|CT/Corporate other than investment funds
18       - mi213 = Metric: Monetary|BC/Assets|AS/Bonds|IO/Investment
19       - mi228 = Metric: Monetary|BC/Assets|AS/Equity instruments|IO/Investment|CT/Investment funds
20       - mi224 = Metric: Monetary|BC/Assets|AS/Derivatives|IO/Investment|CT/Corporate other than
     investment funds
21       - mi223 = Metric: Monetary|BC/Assets|AS/Deposits|IO/Investment|CT/Corporate other than
     investment funds
22       - mi249 = Metric: Monetary|BC/Assets|AS/Financial other than receivables/payables,
     recoverables, cash, derivatives, deposits, loans, bonds and equity
     instruments|IO/Investment|CT/Corporate other than investment funds
```

- Term ::= {Primary item}[{Dimensional characterisation}]{0-n}

- {Expression} {Condition} {Expression}

- Condition ::= =, >, >=, <, <=, !=, <>

- Operators: +, -, /, *, &&, ||

- Functions: sum, avg, min, max, round, floor, abs, len, exist

- Regular expressions

- Optional inclusion: A = sum({C > 0}? B)
  A must be the sum of all B for which C > 0 (in the same context)

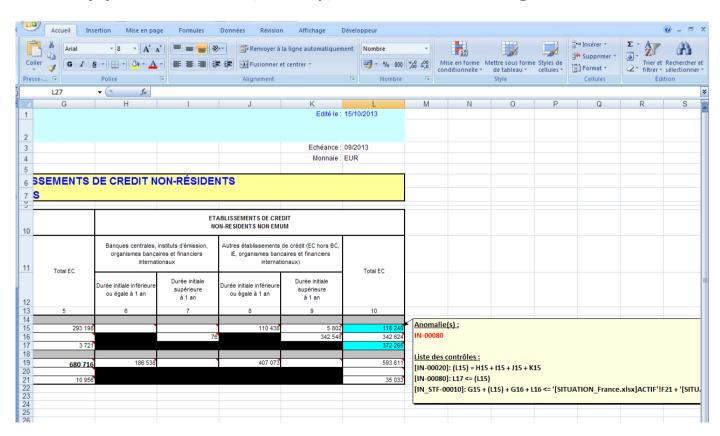- If: A = if((B > 0); C ; D)

- Value in set (for enumerations)

- Multiple primary items
  Assertion = X[Benelux] = X[BE] + X[NL] + X[LU]
  GlobalFilters = [Statutory][!RFF]
  X = (Assets, Liabilities)

- Global filters

- Filing indicators

- Pre-conditions

- Unit filters

- Period filters

- Tolerance margin (default: interval arithmetic)

Taxonomic comments on business checks feed-back

- Regulatory templates are sent back to the filer, as Excel workbooks, completed with filed data
- A comment shows, for each cell, 1) the check(s) associated to this cell and 2) the check(s) not satisfied, if any, with a blue background

Messages / labels for business checks feed-back

TE-00130 (evaluation 1)	satisfied	`<Assertion verifiee="OUI" code="TE-00130" libelle="Autres intérêts sur opérations avec la clientèle, Flux d'intérêt mensuel <= Encours moyen mensuel" type="SCC" donnee="p-ste:AutresInteretsSurOperationsAvecLaClienteleHorsAutresSommesDuesFluxDInteretChargesOuEncoursMoyensPassifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_SocietesNonFinancieres_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`
TE-00130 (evaluation 2)	satisfied	`<Assertion verifiee="OUI" code="TE-00130" libelle="Autres intérêts sur opérations avec la clientèle, Flux d'intérêt mensuel <= Encours moyen mensuel" type="SCC" donnee="p-ste:AutresInteretsSurOperationsAvecLaClienteleHorsAutresSommesDuesFluxDInteretChargesOuEncoursMoyensPassifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_NonResidentsEmum_SocietesNonFinancieres_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`
TE-00130 (evaluation 3)	satisfied	`<Assertion verifiee="OUI" code="TE-00130" libelle="Autres intérêts sur opérations avec la clientèle, Flux d'intérêt mensuel <= Encours moyen mensuel" type="SCC" donnee="p-ste:AutresInteretsSurOperationsAvecLaClienteleHorsAutresSommesDuesFluxDInteretChargesOuEncoursMoyensPassifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_Particuliers_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`
TE-00130 (evaluation 4)	satisfied	`<Assertion verifiee="OUI" code="TE-00130" libelle="Autres intérêts sur opérations avec la clientèle, Flux d'intérêt mensuel <= Encours moyen mensuel" type="SCC" donnee="p-ste:AutresInteretsSurOperationsAvecLaClienteleHorsAutresSommesDuesFluxDInteretChargesOuEncoursMoyensPassifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_NonResidentsEmum_Particuliers_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`
TE-00130 (evaluation 5)	satisfied	`<Assertion verifiee="OUI" code="TE-00130" libelle="Autres intérêts sur opérations avec la clientèle, Flux d'intérêt mensuel <= Encours moyen mensuel" type="SCC" donnee="p-ste:AutresInteretsSurOperationsAvecLaClienteleHorsAutresSommesDuesFluxDInteretChargesOuEncoursMoyensPassifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_EntrepreneursIndividuels_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`
TE-00130 (evaluation 6)	satisfied	`<Assertion verifiee="OUI" code="TE-00130" libelle="Autres intérêts sur opérations avec la clientèle, Flux d'intérêt mensuel <= Encours moyen mensuel" type="SCC" donnee="p-ste:AutresInteretsSurOperationsAvecLaClienteleHorsAutresSommesDuesFluxDInteretChargesOuEncoursMoyensPassifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_NonResidentsEmum_EntrepreneursIndividuels_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`
TE-00130 (evaluation 7)	satisfied	`<Assertion verifiee="OUI" code="TE-00130" libelle="Autres intérêts sur opérations avec la clientèle, Flux d'intérêt mensuel <= Encours moyen mensuel" type="SCC" donnee="p-ste:AutresInteretsSurOperationsAvecLaClienteleHorsAutresSommesDuesFluxDInteretChargesOuEncoursMoyensPassifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_InstitutionsSansButLucratifAuServiceDesMenages_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`
TE-00130 (evaluation 8)	satisfied	`<Assertion verifiee="OUI" code="TE-00130" libelle="Autres intérêts sur opérations avec la clientèle, Flux d'intérêt mensuel <= Encours moyen mensuel" type="SCC" donnee="p-ste:AutresInteretsSurOperationsAvecLaClienteleHorsAutresSommesDuesFluxDInteretChargesOuEncoursMoyensPassifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_NonResidentsEmum_InstitutionsSansButLucratifAuServiceDesMenages_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`
TE-00140 (evaluation 1)	notSatisfied	`<Assertion verifiee="NON" code="TE-00140" libelle="Total des concours sains, Flux d'intérêt mensuel <= Encours moyen mensuel, par PFIT" type="SCC" donnee="p-ste:TotalDesConcoursSainsFluxDInteretProduitsOuEncoursMoyensActifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_SocietesNonFinancieres_FluxDInteretMensuel" valeurGauche="200000" valeurDroite="0" difference="200000" margeDeTolerance="3000" />`
TE-00140 (evaluation 2)	notSatisfied	`<Assertion verifiee="NON" code="TE-00140" libelle="Total des concours sains, Flux d'intérêt mensuel <= Encours moyen mensuel, par PFIT" type="SCC" donnee="p-ste:TotalDesConcoursSainsFluxDInteretProduitsOuEncoursMoyensActifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_SocietesNonFinancieres_FluxDInteretMensuel" valeurGauche="200000" valeurDroite="0" difference="200000" margeDeTolerance="3000" />`
TE-00140 (evaluation 3)	notSatisfied	`<Assertion verifiee="NON" code="TE-00140" libelle="Total des concours sains, Flux d'intérêt mensuel <= Encours moyen mensuel, par PFIT" type="SCC" donnee="p-ste:TotalDesConcoursSainsFluxDInteretProduitsOuEncoursMoyensActifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_SocietesNonFinancieres_DureeInitialeInferieureOuEgaleA1An_FluxDInteretMensuel" valeurGauche="130000" valeurDroite="0" difference="130000" margeDeTolerance="3000" />`
TE-00140 (evaluation 4)	notSatisfied	`<Assertion verifiee="NON" code="TE-00140" libelle="Total des concours sains, Flux d'intérêt mensuel <= Encours moyen mensuel, par PFIT" type="SCC" donnee="p-ste:TotalDesConcoursSainsFluxDInteretProduitsOuEncoursMoyensActifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_SocietesNonFinancieres_DureeInitialeSuperieureA1AnEtInferieureOuEgaleA5Ans_FluxDInteretMensuel" valeurGauche="50000" valeurDroite="0" difference="50000" margeDeTolerance="3000" />`
TE-00140 (evaluation 5)	notSatisfied	`<Assertion verifiee="NON" code="TE-00140" libelle="Total des concours sains, Flux d'intérêt mensuel <= Encours moyen mensuel, par PFIT" type="SCC" donnee="p-ste:TotalDesConcoursSainsFluxDInteretProduitsOuEncoursMoyensActifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_SocietesNonFinancieres_DureeInitialeSuperieureA5Ans_FluxDInteretMensuel" valeurGauche="20000" valeurDroite="0" difference="20000" margeDeTolerance="3000" />`
TE-00140 (evaluation 6)	satisfied	`<Assertion verifiee="OUI" code="TE-00140" libelle="Total des concours sains, Flux d'intérêt mensuel <= Encours moyen mensuel, par PFIT" type="SCC" donnee="p-ste:TotalDesConcoursSainsFluxDInteretProduitsOuEncoursMoyensActifElementsDeCalculDesTauxApparents" contexte="I_2009_France_Euros_Residents_Particuliers_FluxDInteretMensuel" valeurGauche="0" valeurDroite="0" difference="0" margeDeTolerance="3000" />`

- Code of the assertion

- Label of the assertion

- Satisfied: Yes / No

- Expression of the assertion

- Dimensional context of the evaluation

- Value of the left term

- Value of the right term

- Difference

- Tolerance margin

- Business checks must have codes, to communicate

- Business checks must have labels, to express what is checked

- Data-centric and form-centric are dual ways to define business checks

- Data-centric should be mandatory, form-centric is a way to present but is linked to a particular layout (typically regulatory templates)

- Presention of feed-back is also very important and should be harmonized

- *BCDL is a way to express business checks in a simple and flexible way*

Thank you.

Questions ?

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