

Bank of England

Prudential Regulation Authority

Internal model risk output (Life) – Log (for template IM.01)

This template is for the use of life insurer internal model firms only. Firms should complete the template for United Kingdom and other territories and currencies as agreed with their supervisor.

CELL	ITEM	INSTRUCTIONS
	General Comment	This template is for the use of life insurer internal model firms only. Firms should complete the template for United Kingdom and other territories and currencies as agreed with their supervisor.
<u>Z0010</u>	<u>Territory</u>	<u>Territory in which the business is written.</u>
<u>Z0020</u>	<u>Currency</u>	<u>Currency in which the business is written.</u>

Column		
BI1	Firm name	Legal name of the reporting firm
BI2	Identification code	Identification code: - Legal Entity Identifier (LEI). - Interim entity identifier (Pre-LEI). - Identification code used in the United Kingdom (i.e. the Firm Reference Number (FRN)).
BI3	Type of code	Identification of the identification code above - LEI. - Pre-LEI. - Local code.
BI4	Reference date	Date identifying the last day of the reporting period. Date field in format ISO 8601 (yyyy-mm-dd).
BI5	Territory	Territory in which the business is written.
BI6	Currency	Currency in which the business is written.
A C0010	Base	Only applicable to longevity risk – base is the expectation of life with no allowance for improvements in mortality after the valuation date.

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B <u>C0020</u>	Best estimate	Assumption used in the calculation of best estimate liabilities. For Longevity this is the expectation of life including best estimate mortality improvement assumptions.
C-Q <u>C0030</u> , <u>C0040</u> , <u>C0050</u> , <u>C0060</u> , <u>C0070</u> , <u>C0080</u> , <u>C0090</u> , <u>C0100</u> , <u>C0110</u> , <u>C0120</u> , <u>C0130</u> , <u>C0140</u> , <u>C0150</u> , <u>C0160</u> and <u>C0170</u>	Percentile data	<p>Percentile stress tests for 0.1%, 0.5%, 1.0%, 2.5%, 5.0%, 10.0%, 25.0%, 50.0%, 75.0%, 90.0%, 95.0%, 97.5%, 99.0%, 99.5%, and 99.9%.</p> <p>For all risks the stresses should be shown in ascending order. Where the biting stress is a fall in values, the 0.5% value corresponds to 99.5% Value at Risk (VaR).</p> <p>Firms using a stochastic model should show all points in the distribution where readily available.</p> <p>Firms using a correlation matrix should show the stress test for 99.5% VaR, which should be shown as either 0.5% or 99.5% according to whether the biting stress is a decrease or increase.</p>
R <u>C0180</u>	Biting Scenario Stresses	<ul style="list-style-type: none"> - Please provide the risk component information for your combined (biting) scenario that produces the 99.5th highest capital requirement (post any smoothing/averaging where appropriate). - Please enter the information using the definition of the percentile value. For example, for risk free rates, please provide the change in spot yields for each term requested for the yield curve in the scenario which generated your 99.5th capital requirement. - If you use a methodology where you calculate a combined 99.5th percentile capital requirement by combining together a set of univariate stresses using a correlation matrix, please enter your killer scenario information into this column. - If you use a combination of stochastic multivariate approach and correlation matrix approach to calculate your overall 99.5th percentile capital requirement, please provide the risk component information for your combined (biting) scenario that produces the 99.5th highest capital requirement across the stochastic risks.

Row	Base, best estimate and selected percentiles of stress tests for this risk
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Row	Base, best estimate and selected percentiles of stress tests for this risk
1 (C1 – P1) <u>R0010</u>	Well diversified equity portfolio total annual return.
2 <u>R0020</u>	Change in equity volatility 1 year ATM put option At the money (rows 2, 3 and 6 <u>R0020, R0030 and R0060</u>) is defined as: Strike = $1 * \text{Spot} * \exp[(r(t) - q)t]$ for a t-year option where r(t) is continuously compounded t-year interest rate and q is continuously compounded dividend (q>0 for a price index such as FTSE, q=0 for a total return index). (ie a forward strike of 1).
3 <u>R0030</u>	Change in equity volatility 10 year ATM put option.
4 <u>R0040</u>	Property commercial portfolio total annual return.
5 <u>R0050</u>	Property residential portfolio total annual return.
6 <u>R0060</u>	Change in property volatility 10 year ATM option.
7 <u>R0070</u>	Change in risk free zero coupon bond spot yield Term 2. The change in risk free zero coupon bond yields is the change in risk free <u>the</u> annualised continuously compounded rate from best estimate of the risk free spot yield for a zero coupon bond of term T years as specified, e.g. best estimate <u>swap-based</u> risk free rate = 4.00%, 90th percentile risk free rate = 5.00%, change from best estimate = +1.00%.
8 <u>R0080</u>	Change in risk free zero coupon bond spot yield Term 5.
9 <u>R0090</u>	Change in risk free zero coupon bond spot yield Term 10.
10 <u>R0100</u>	Change in risk free zero coupon bond spot yield Term 15.
11 <u>R0110</u>	Change in risk free zero coupon bond spot yield Term 25.
<u>R0115</u>	<u>Change in risk free zero coupon bond spot yield Term 40.</u>
12 <u>R0120</u>	Change in risk free rate component of IAS19 discount rate.
13 <u>R0130</u>	Change in implied interest rate volatility on 5 X 15 ATM swaption. <u>This is a swaption with an expiry of 5 years based on a swap with a maturity of 15 years.</u>
14 <u>R0140</u>	Change in <u>market</u> implied inflation spot yield <u>rate</u> Term 2. The change from in <u>market</u> implied inflation spot yields <u>rate</u> is the change in

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Row	Base, best estimate and selected percentiles of stress tests for this risk
	<p>best estimate of the implied inflation spot yield for a zero coupon bond of term T years as specified,</p> <p>e.g. best estimate <u>risk-free implied inflation</u> rate = 2.00%, 90th percentile <u>risk-free implied inflation</u> rate = 3.00%, change from best estimate = +1.00%.</p>
45 <u>R0150</u>	Change in <u>market</u> implied inflation spot yield <u>rate</u> Term 5.
46 <u>R0160</u>	Change in <u>market</u> implied inflation spot yield <u>rate</u> Term 10.
47 <u>R0170</u>	Change in <u>market</u> implied inflation spot yield <u>rate</u> Term 15.
48 <u>R0180</u>	Change in <u>market</u> implied inflation spot yield <u>rate</u> Term 25.
49 <u>R0190</u>	<p>Change in AAA rated ZCB spot yield spread (over RF) Term 2.</p> <p>The change in spot yield spreads is the change from best estimate of the spread (expressed as an annualised rate) for an [AAA etc]-rated zero coupon bond of term T years as specified,</p> <p>e.g. best estimate spread = 3.00%, 90th percentile spread = 5.00%, change from best estimate = +2.00%.</p> <p>The values in rows 19 to 38 should take into account the combined impact of spread widening, migrations and default. Where necessary they should include an adjustment so as to be post-diversification with the risk drivers represented by the other rows. In other words, at any given percentile, applying the stresses in rows 19 to 38 simultaneously to the firm's own portfolio of assets in the specified currency should give the same impact as if the asset-side credit risk losses had been calculated using the firm's internal model (allowing for diversification between the risk factors).</p>
49 <u>R0191</u>	<p>Change in AAA rated ZCB spot yield spread (over RF) Term 2 - <u>financials</u>.</p> <p>The change in spot yield spreads is the change from best estimate of the spread (expressed as an annualised rate) for an [AAA etc]-rated zero coupon bond of term T years and sector [<u>financials / non-financials</u>] as specified,</p> <p>e.g. best estimate spread = 3.00%, 90th percentile spread = 5.00%, change from best estimate = +2.00%.</p> <p>The values in rows 49 to 38 <u>R0191 to R0387</u> listed below should take into account the combined impact of spread widening, migrations and default. Where necessary they should include an adjustment so as to be post-diversification with the risk drivers represented by the other rows <u>of the same sector [financials or non-financials, as applicable]</u>. In other words, at any given percentile, applying the stresses in rows 49 to 38 <u>R0191 to R0387</u> simultaneously to the firm's own portfolio of assets in the specified currency should give the same impact as if the asset-side credit risk losses had been calculated using the firm's internal model (allowing for diversification between the risk factors, but with no diversification between the financials and non-</p>

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Row	Base, best estimate and selected percentiles of stress tests for this risk
	<u>financials risk drivers</u>). Firms that do not have a financials / non-financials sector split of their calibration should enter the same calibration details for the rows labelled 'financials' as they do for the rows labelled 'non-financials'.
<u>R0192</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 2 – non-financials.</u>
20 <u>R0200</u>	Change in AAA rated ZCB spot yield spread (over RF) Term 5.
<u>R0201</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 5 - financials.</u>
<u>R0202</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 5 – non-financials.</u>
21 <u>R0210</u>	Change in AAA rated ZCB spot yield spread (over RF) Term 10.
<u>R0211</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 10 - financials.</u>
<u>R0212</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 10 – non-financials.</u>
22 <u>R0220</u>	Change in AAA rated ZCB spot yield spread (over RF) Term 15.
<u>R0221</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 15 - financials.</u>
<u>R0222</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 15 – non-financials.</u>
<u>R0226</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 25 – financials.</u>
<u>R0227</u>	<u>Change in AAA rated ZCB spot yield spread (over RF) Term 25 – non-financials.</u>
23 <u>R0230</u>	Change in AA rated ZCB spot yield spread (over RF) Term 2.
<u>R0231</u>	<u>Change in AA rated ZCB spot yield spread (over RF) Term 2 - financials.</u>
<u>R0232</u>	<u>Change in AA rated ZCB spot yield spread (over RF) Term 2 – non-financials.</u>
24 <u>R0240</u>	Change in AA rated ZCB spot yield spread (over RF) Term 5.
<u>R0241</u>	<u>Change in AA rated ZCB spot yield spread (over RF) Term 5 - financials.</u>
<u>R0242</u>	<u>Change in AA rated ZCB spot yield spread (over RF) Term 5 – non-financials.</u>

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Row	Base, best estimate and selected percentiles of stress tests for this risk
25 <u>R0250</u>	Change in AA rated ZCB spot yield spread (over RF) Term 10.
<u>R0251</u>	Change in AA rated ZCB spot yield spread (over RF) Term 10 - <u>financials</u> .
<u>R0252</u>	<u>Change in AA rated ZCB spot yield spread (over RF) Term 10 – non-financials.</u>
26 <u>R0260</u>	Change in AA rated ZCB spot yield spread (over RF) Term 15.
<u>R0261</u>	Change in AA rated ZCB spot yield spread (over RF) Term 15 - <u>financials</u> .
<u>R0262</u>	<u>Change in AA rated ZCB spot yield spread (over RF) Term 15 – non-financials.</u>
<u>R0266</u>	<u>Change in AA rated ZCB spot yield spread (over RF) Term 25 – financials.</u>
<u>R0267</u>	<u>Change in AA rated ZCB spot yield spread (over RF) Term 25 – non-financials.</u>
27 <u>R0270</u>	Change in A rated ZCB spot yield spread (over RF) Term 2.
<u>R0271</u>	Change in A rated ZCB spot yield spread (over RF) Term 2 - <u>financials</u> .
<u>R0272</u>	<u>Change in A rated ZCB spot yield spread (over RF) Term 2 – non-financials.</u>
28 <u>R0280</u>	Change in A rated ZCB spot yield spread (over RF) Term 5.
<u>R0281</u>	Change in A rated ZCB spot yield spread (over RF) Term 5 - <u>financials</u> .
<u>R0282</u>	<u>Change in A rated ZCB spot yield spread (over RF) Term 5 – non-financials.</u>
29 <u>R0290</u>	Change in A rated ZCB spot yield spread (over RF) Term 10.
<u>R0291</u>	Change in A rated ZCB spot yield spread (over RF) Term 10 - <u>financials</u> .
<u>R0292</u>	<u>Change in A rated ZCB spot yield spread (over RF) Term 10 – non-financials.</u>
30 <u>R0300</u>	Change in A rated ZCB spot yield spread (over RF) Term 15.
<u>R0301</u>	Change in A rated ZCB spot yield spread (over RF) Term 15 - <u>financials</u> .
<u>R0302</u>	<u>Change in A rated ZCB spot yield spread (over RF) Term 15 – non-financials.</u>
<u>R0306</u>	<u>Change in A rated ZCB spot yield spread (over RF) Term 25 – financials.</u>
<u>R0307</u>	<u>Change in A rated ZCB spot yield spread (over RF) Term 25 – non-financials.</u>
31 <u>R0310</u>	Change in BBB rated ZCB spot yield spread (over RF) Term 2.

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Row	Base, best estimate and selected percentiles of stress tests for this risk
<u>R0311</u>	Change in BBB rated ZCB spot yield spread (over RF) Term 2 - <u>financials</u> .
<u>R0312</u>	<u>Change in BBB rated ZCB spot yield spread (over RF) Term 2 – non-financials.</u>
32 <u>R0320</u>	Change in BBB rated ZCB spot yield spread (over RF) Term 5.
<u>R0321</u>	Change in BBB rated ZCB spot yield spread (over RF) Term 5 - <u>financials</u> .
<u>R0322</u>	<u>Change in BBB rated ZCB spot yield spread (over RF) Term 5 – non-financials.</u>
33 <u>R0330</u>	Change in BBB rated ZCB spot yield spread (over RF) Term 10.
<u>R0331</u>	Change in BBB rated ZCB spot yield spread (over RF) Term 10 - <u>financials</u> .
<u>R0332</u>	<u>Change in BBB rated ZCB spot yield spread (over RF) Term 10 – non-financials.</u>
34 <u>R0340</u>	Change in BBB rated ZCB spot yield spread (over RF) Term 15.
<u>R0341</u>	Change in BBB rated ZCB spot yield spread (over RF) Term 15 - <u>financials</u> .
<u>R0342</u>	<u>Change in BBB rated ZCB spot yield spread (over RF) Term 15 – non-financials.</u>
<u>R0346</u>	<u>Change in BBB rated ZCB spot yield spread (over RF) Term 25 – financials.</u>
<u>R0347</u>	<u>Change in BBB rated ZCB spot yield spread (over RF) Term 25 – non-financials.</u>
35 <u>R0350</u>	Change in B rated ZCB spot yield spread (over RF) Term 2.
<u>R0351</u>	Change in B rated ZCB spot yield spread (over RF) Term 2 - <u>financials</u> .
<u>R0352</u>	<u>Change in B rated ZCB spot yield spread (over RF) Term 2 – non-financials.</u>
36 <u>R0360</u>	Change in B rated ZCB spot yield spread (over RF) Term 5.
<u>R0361</u>	Change in B rated ZCB spot yield spread (over RF) Term 5 - <u>financials</u> .
<u>R0362</u>	<u>Change in B rated ZCB spot yield spread (over RF) Term 5 – non-financials.</u>
37 <u>R0370</u>	Change in B rated ZCB spot yield spread (over RF) Term 10.
<u>R0371</u>	Change in B rated ZCB spot yield spread (over RF) Term 10 - <u>financials</u> .

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Row	Base, best estimate and selected percentiles of stress tests for this risk
<u>R0372</u>	<u>Change in B rated ZCB spot yield spread (over RF) Term 10 – non-financials.</u>
38 <u>R0380</u>	Change in B rated ZCB spot yield spread (over RF) Term 15.
<u>R0381</u>	Change in B rated ZCB spot yield spread (over RF) Term 15 - <u>financials.</u>
<u>R0382</u>	<u>Change in B rated ZCB spot yield spread (over RF) Term 15 – non-financials.</u>
<u>R0386</u>	<u>Change in B rated ZCB spot yield spread (over RF) Term 25 - financials.</u>
<u>R0387</u>	<u>Change in B rated ZCB spot yield spread (over RF) Term 25 – non-financials.</u>
39 <u>R0390</u>	Change in credit spread component of IAS19 discount rate.
40 <u>R0400</u>	<p>Change in spread of swaps over gilts spot yield Term 2</p> <p>The change in spread of swaps over gilts is the change from best estimate of the spread for between swaps and gilts for term T years.</p> <p>Where the swap rate is higher/lower than the gilt rate, the difference should be set as positive/negative.</p> <p>This should be the difference between the two zero coupon yield curves implied by swap rates and gilt prices (as opposed to difference between swap rates and redemption yields for coupon bearing gilts),</p> <p>eg best estimate spread = 1.00%, 90th percentile spread = 1.40%, change from best estimate = +0.40%.</p>
41 <u>R0410</u>	Change in spread of swaps over gilts spot yield Term 5.
42 <u>R0420</u>	Change in spread of swaps over gilts spot yield Term 10.
43 <u>R0430</u>	Change in spread of swaps over gilts spot yield Term 15.
44 <u>R0440</u>	Change in spread of swaps over gilts spot yield Term 25.
45 <u>R0450</u>	<p>Change in exchange rate, EUR to <u>per</u> GBP.</p> <p>The relative change from best estimate of the exchange rate between two currencies,</p> <p>eg best estimate exchange rate = €1.14 <u>per</u> £1, 90th percentile risk free rate = €1.54 <u>per</u> £1, change from best estimate = +35%.</p>
46 <u>R0460</u>	Change in exchange rate, USD to <u>per</u> GBP.
47 <u>R0470</u>	Expectation of life at male age 50 (overall).

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Row	Base, best estimate and selected percentiles of stress tests for this risk
48 <u>R0480</u>	Expectation of life at male age 65 (overall).
49 <u>R0490</u>	Expectation of life at male age 80 (overall).
50 <u>R0500</u>	Expectation of life at female age 50 (overall).
51 <u>R0510</u>	Expectation of life at female age 65 (overall).
52 <u>R0520</u>	Expectation of life at female age 80 (overall).
53 <u>R0530</u>	Expectation of life at male age 50 (under mis-estimation risk).
54 <u>R0540</u>	Expectation of life at male age 65 (under mis-estimation risk).
55 <u>R0550</u>	Expectation of life at male age 80 (under mis-estimation risk).
56 <u>R0560</u>	Expectation of life at female age 50 (under mis-estimation risk).
57 <u>R0570</u>	Expectation of life at female age 65 (under mis-estimation risk).
58 <u>R0580</u>	Expectation of life at female age 80 (under mis-estimation risk).
59 <u>R0590</u>	Expectation of life at male age 50 (under trend risk).
60 <u>R0600</u>	Expectation of life at male age 65 (under trend risk).
61 <u>R0610</u>	Expectation of life at male age 80 (under trend risk).
62 <u>R0620</u>	Expectation of life at female age 50 (under trend risk).
63 <u>R0630</u>	Expectation of life at female age 65 (under trend risk).
64 <u>R0640</u>	Expectation of life at female age 80 (under trend risk).
65 <u>R0650</u>	Mortality catastrophe for age 25 (Overall). Firms should fill in the overall catastrophe section regardless of whether they model epidemics and other catastrophes separately. <u>Rates should be expressed as an amount per mille.</u>
66 <u>R0660</u>	Mortality catastrophe for age 40 (Overall).
67 <u>R0670</u>	Mortality catastrophe for age 55 (Overall).
68 <u>R0680</u>	Mortality catastrophe for age 75 (Overall).

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Row	Base, best estimate and selected percentiles of stress tests for this risk
69 <u>R0690</u>	Mortality catastrophe for age 25 (flu/similar epidemic). Firms should only complete the epidemic section if they model epidemics separately. <u>Rates should be expressed as an amount per mille.</u>
70 <u>R0700</u>	Mortality catastrophe for age 40 (flu/similar epidemic).
71 <u>R0710</u>	Mortality catastrophe for age 55 (flu/similar epidemic).
72 <u>R0720</u>	Mortality catastrophe for age 75 (flu/similar epidemic).
73 <u>R0730</u>	Mortality catastrophe for age 25 (Other). Firms should only complete the other catastrophe section if they model epidemics and other catastrophes separately.
74 <u>R0740</u>	Mortality catastrophe for age 40 (Other).
75 <u>R0750</u>	Mortality catastrophe for age 55 (Other).
76 <u>R0760</u>	Mortality catastrophe for age 75 (Other).
77 <u>R0770</u>	Change in mortality rate at male age 25.
78 <u>R0780</u>	Change in mortality rate at male age 40.
79 <u>R0790</u>	Change in mortality rate at male age 55.
80 <u>R0800</u>	Change in mortality rate at female age 25.
81 <u>R0810</u>	Change in mortality rate at female age 40.
82 <u>R0820</u>	Change in mortality rate at female age 55.
83 <u>R0830</u>	Change in inception rate at male age 25.
84 <u>R0840</u>	Change in inception rate at male age 40.
85 <u>R0850</u>	Change in inception rate at male age 55.
86 <u>R0860</u>	Change in inception rate at female age 25.
87 <u>R0870</u>	Change in inception rate at female age 40.
88 <u>R0880</u>	Change in inception rate at female age 55.
89 <u>R0890</u>	Change in recovery rate at male age 25 (claiming for 12 months).

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Row	Base, best estimate and selected percentiles of stress tests for this risk
90 <u>R0900</u>	Change in recovery rate at male age 40 (claiming for 12 months).
91 <u>R0910</u>	Change in recovery rate at male age 55 (claiming for 12 months).
92 <u>R0920</u>	Change in recovery rate at female age 25 (claiming for 12 months).
93 <u>R0930</u>	Change in recovery rate at female age 40 (claiming for 12 months).
94 <u>R0940</u>	Change in recovery rate at female age 55 (claiming for 12 months).
95 <u>R0950</u>	Change in lapse rates for with-profits endowment.
96 <u>R0960</u>	Change in lapse rates for unit-linked endowment.
97 <u>R0970</u>	Change in lapse rates for protection products.
98 <u>R0980</u>	Change in lapse rates for unit-linked investment bonds.
99 <u>R0990</u>	Change in lapse rates for unit-linked individual pensions.
<u>R0991</u>	<u>Change in lapse rates for with-profits individual pensions.</u>
<u>R0992</u>	<u>Change in lapse rates for income drawdown.</u>
400 <u>R1000</u>	Change in lapse rates for unit-linked group pensions.
401 <u>R1010</u>	Mass lapse rate for with-profits endowment. For all mass lapse stresses the amount shown is the percentage of business loss above best estimate.
402 <u>R1020</u>	Mass lapse rate for unit-linked endowment.
403 <u>R1030</u>	Mass lapse rate for protection products. <u>For all mass lapse stresses the amount shown is the percentage of business loss above best estimate.</u>
404 <u>R1040</u>	Mass lapse rate for unit-linked investment bonds.
405 <u>R1050</u>	Mass lapse rate for unit-linked individual pensions.
<u>R1051</u>	<u>Mass lapse rate for with-profits individual pensions.</u>
<u>R1052</u>	<u>Mass lapse rate for income drawdown.</u>
406 <u>R1060</u>	Mass lapse rate for unit-linked group pensions.
407 <u>R1070</u>	Change in guaranteed annuity rate take-up (absolute amount, e.g. +5% for 80%-75%).

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Row	Base, best estimate and selected percentiles of stress tests for this risk
408 <u>R1080</u>	Change in proportion married.
409 <u>R1090</u>	Change in base acquisition expense assumption.
440 <u>R1100</u>	Change in base investment expense assumption.
444 <u>R1110</u>	Change in base servicing expense assumption.
442 <u>R1120</u>	Change in expense inflation (absolute amount, eg +1.0% for 2.5%-1.5%).

Draft for consultation