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Longevity Insurance

for the Irish ARF and vested-PRSA market

Reserving, pricing and consumer fairness under Solvency II

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Companion workbook: MWP-2026-04_Audit_Workbook_v14.2.0.xlsx
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MWP-2026-04 — Consolidated Erratum

Version 2.2.0 · 29 July 2026 Covers: paper v2.1.0 → v3.1.0 · workbook v13.5.3 → v14.2.0 · Annex B v2.0.0 → v2.1.0 · Annexes A and C v2.0.0 as issued · Annex D v1.0.1 **The paper body and companion workbook already reflect every correction below.** This document is the audit trail from the prior editions to the current ones, not a list of pending fixes. Version 2.1.0 added this preface and Entry 25 following external peer review; version 2.2.0 records the Annex B v2.1.0 reissue.

Continues the running register (Entries 1–11, which stand as historical record) at Entry 12.

Every correction below was verified by full recalculation of the workbook and by independent re-implementation before issue. Across the entire remediation, **exactly two registered figures moved** — the monthly requirement (E12) and the post-reform requirement (E13); all other registered anchors are bit-identical from v13.5.3 through v14.1.0. The corrections originate from an independent computational audit of the workbook, annexes and sources, incorporated at workbook v14; the workbook's Version sheet carries the corresponding release entries.

Part 1 — Workbook corrections (v13.5.3 → v14.0.0)

E12 — Monthly life-expense stress rebuilt (Article 140; see E25). `Projection_M` column X applied the 10% level uplift twice, omitted the (1+inflation) factor carried by the central expense leg, and based the escalation one year late. Rebuilt on the annual-consistent form. Monthly SCR-expense at inception falls €597.50 → €381.70; the monthly day-one requirement (`fig_day1_monthly`) falls **€36,425.77 → €36,317.92**, binding unchanged at year ten; the monthly-less-annual gap moves **−0.96% → −1.26%**. The annual chain — every headline figure of the paper — is unaffected. The corrected figure matches an independently built monthly engine to 1×10^{-10} relative.

E13 — Post-reform requirement re-maximised. The 4.75% cost-of-capital figure had been evaluated at the frozen central binding duration; a smaller risk margin moves the peak. The requirement is now the maximum of the full 56-row post-reform profile: **€32,704.72 → €32,837.52**; the reduction against the current basis **11.1% → 10.7%**; the binding duration **year 8 → year 10**. The frozen-duration evaluation is retained on the sheet as a labelled component (bit-identical to the previous figure) and the block ships with a tie: the same profile at the current rate reproduces the exact requirement to zero.

E14 — The chosen-structure capital cost: one basis, one figure. Prior editions variously quoted €240 and €275 for the capital cost of the recommended commission structure. Both were differences of figures computed on different bases (€240.92 = sampled less exact; €276.14 = sampled less sampled). The like-for-like exact figure is **€253.05** (interpolated: €251.87; the €1.18 difference is second-order). Workbook prose corrected; paper §7.6 and Finding F4 now carry €253.

E15 — Horizon-convention and infeasibility annotations (no computation changed). The stochastic sheet's illustrative $\sqrt{h}$ convention against production's $\sqrt{(4+h)}$ is annotated with its reason — the exposition mirrors Annex A's cohort commencing 2022; production values the cohort commencing 2026 — and the pricing surface's infeasible corner (premium terms under two years, where the commission factor reaches 1 − margin and the identity has no solution) is marked, with the raw corner values retained so Annex B continues to tie cell for cell.

Part 2 — Workbook documentation (v14.1.0, label-only; all 50 anchors bit-identical)

E16 — κ-anchor provenance and sensitivity. The projection's κ(2022) anchor is the **fitted 2022 value** from the Annex A calibration (pandemic-year diagnostic fit; matches the published parameter file to ten decimal places), not the trend construction $\kappa_{2019}+3\mu$ from which the Annex A simulation starts. Sensitivity, now stated on both parameter blocks and in paper §3.2: on the trend anchor the premium is +€5.60 (+0.046%), the exact requirement +€7.90 (+0.021%), and the Article-138 ÷ CBD ratio reads 0.542 rather than 0.545. No verdict changes on either anchor. This entry also resolves the declared reconstruction gap: the 3.6% life-expectancy difference decomposes as ≈0.16 years of start-convention and ≈0.65 years of estimator (Jensen) effect.

E17 — Reader-facing documentation. Column guides beneath the four engine sheets, a Trajectory block map, a README navigation pointer, and Annex D (new): none of these change any figure; they exist so that the file can be audited without private knowledge.

Part 3 — Paper corrections (v2.1.0 → v3.0.0; the edition is a full rewrite, and the following are the substantive corrections within it)

E18 — §7.6 commission table rebuilt on a disclosed basis. Candidate-structure requirements are computed exactly at the two endpoints (current design; recommended structure) and interpolated between, accurate to ±€0.49 — now stated in the table note. Corrected requirement column: €36,812 / €36,908 / €36,971 / €37,032 / €37,247 (capital costs +€33 / +€129 / +€191 / +€252 / +€468). The recommended structure's exact recomputation is €253.05 and moves the binding date to year nine.

E19 — Margin lever corrected. At a 2% provider margin the requirement is **€38,992 on the held-duration basis (€38,999 exactly re-maximised)** — €15.13 of additional capital per €1 of margin surrendered; at a zero margin own funds are zero at inception and the capital-to-margin ratio is undefined. Prior text understated the lever and did not label the basis.

E20 — Reinsurance section completed. The swap-cost sensitivity now reads **€59,179.23 / €66,122.18 / €73,065.13** at 8% / 10% / 12% of ceded reserves, and the parameters previously implicit are stated: swap cost 10% of ceded reserves at the centre, counterparty-default charge 4% of ceded reserves, ceded reserve at vesting €169,782.91, uncedable deferral floor €27,456.08.

E21 — Binding-duration characterisation corrected. "The binding duration is consistently about half the deferral" is withdrawn. The ratio of binding year to deferral runs **0.29 to 0.85 across the panel, rising with deferral length** — which is the argument for annual resolution, stated correctly in paper §6.6.4 and superseding the sentence in Annex B §B.6 as issued.

E22 — Annex B reliability statement corrected. The prior edition's caution that Annex B might not be relied upon is withdrawn: Annex B v2.0.0 is generated from the workbook and was verified to tie **cell for cell across all 1,326 numeric table entries**.

E23 — Reproducibility claims made precise. The reconstruction statement formerly given as "to within 0.004" is now named and quantified: the measure is the **ratio of the Article-138 shift to the 99.5% shift**; the deterministic rebuild reproduces it to **0.0042 at age 65** (within 0.005), the divergence growing to **0.1056 at age 85** as the extrapolated region dominates — an estimator effect, not a discrepancy. The single-cell proving block's agreement with the annual engine is stated exactly: **€5.28, 0.014%**, a documented fixed-expense scaling residual. (Annex A's own "within 0.004" should be read as 0.0042.)

E24 — Basis statements added or unified. The mass-lapse sub-stress is non-zero at inception (€1,565.31) and gated to the deferral; the Article 140 expense-stress parameters are stated (see E25) (+10% level with +1 point of expense inflation, jointly, on the identical basis in both engines following E12); the decomposition's in-force gross-up (÷0.826) is disclosed; the two monthly premium figures are distinguished (€1,003.26 fully monthly; €1,026.34 annual ÷ 12); income is quoted at the vesting date throughout, with the 1.3459 conversion stated and the six worked examples restated as surface cells in that single convention; the improvement projection is described as **CMI_2022-style** (a rebuild from a published CBD calibration), not CMI_2022; and the companion artefact is cited uniformly as **workbook v14.1.0 — 45 sheets, 76,434 formulas, 50 registered figures** (prior documents cited v10.0.0, v11.1.0 and v12.1.0 in different places).

E25 — Legal citations corrected (arising from peer review). The life-expense sub-module is **Article 140** of Delegated Regulation 2015/35 — Article 141 is revision risk — and the risk margin rests on **Article 77(5) of the Directive with Articles 37–39 of the Delegated Regulation** (the "Article 77b" previously cited is the matching adjustment). Verified against the EIOPA Single Rulebook consolidated text. Corrected throughout paper v3.1.0, the workbook's face labels (v14.2.0) and Annex D v1.0.1; Annexes A–C as issued carry the older citations and are superseded on this point. The stress parameters and every computation are unchanged: the workbook always implemented the Article 140 stress; only the citation moves.

Part 4 — Annex reissue and standing items

Annex B is reissued at v2.1.0, correcting at source the three items previously standing in it: the §B.6 binding-duration sentence (per E21 — the ratio runs 0.29 to 0.85, rising with deferral), the corner note (the cells exceeding €10,000 per month are 74/76 and 75/77; the 75/76 cell is infeasible), and the display of the two infeasible corner cells, now marked by a note above Table B.1 with the raw values retained so the tables continue to tie cell for cell. Its companion citation is updated per E24. Annexes A and C stand at v2.0.0: their version citations are superseded per E24, their legal citations per E25, and Annex A's "within 0.004" reads 0.0042 per E23.

Prepared from the workbook's Version-sheet release records and the independent audit's verification logs. Every figure above was confirmed by recalculation of the issued files.

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