# Individual Policy Modifications and Aggregate Payments

# Per-loss and per-payment r.v.s

- We want to take a look at aggregate payments in case the individual policies are modified (in most cases) through a deductible
- We have to assume that the common distribution of the severity r.v.s will **not** be affected by the introduction of that individual policy modification
- Recall that $Y^P = Y^L \mid Y^L > 0$
- Notation: $v = \mathbb{P}[Y^L > 0]$
- Our basic tools when dealing with aggregate payment r.v.s are m.g.f.s and p.g.f.s; so, let us look at the correspondence between $M_{Y^L}$ and $M_{Y^P}$
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$$M_{Y^L}(t) = (1 - v) + vM_{Y^P}(t)$$

# Number of losses and number of payments r.v.s

- It can be shown that

$$P_{N^P}(z) = P_{N^L}(1 - v + vz)$$

# Aggregate losses

- Here we generalize our usual notation by introducing $\{Y_j^L; j = 1, 2, \dots\}$ and $\{Y_j^P; j = 1, 2, \dots\}$
- On the per-loss basis:

$$S = Y_1^L + Y_2^L + \cdots + Y_{N^L}^L$$

- On the per-payment basis:

$$S = Y_1^P + Y_2^P + \cdots + Y_{N^P}^P$$

- This is **one and the same** r.v. written in two different ways.
- If in doubt, look at its m.g.f.