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A Note on Macaulay's Formula for Duration

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Michael Osborne (https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=303089)

University of Sussex Business School

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Abstract


Macaulay duration approximates the yield elasticity of bond price. Since its introduction in 1938 researchers have sought a more accurate formula. This article demonstrates Macaulay's formula gives accurate results if applied appropriately. A bond with maturity n has n solutions for yield, one orthodox and $(n-1)$ unorthodox. Conventional analysis ignores the distinction, which means a shift in yield shifts all yields at once. In contrast, an other-things-being-equal shift in the orthodox yield, holding the unorthodox yields constant, permits the successful application of Macaulay's formula. This finding questions the conventional focus on the orthodox yield alone.

Keywords: bond, complex number, duration, fixed income, Macaulay

JEL Classification: C60, G10, G11, G12

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