Taylor & Francis
Online

Financial Analysts Journal ›
Volume 41, 1985 - Issue 2

48 Views | 28 CrossRef citations to date | 0 Altmetric

Research Articles

Duration Gap for Financial Institutions

G.O. Bierwag & George G. Kaufman

Pages 68-71 | Published online: 31 Dec 2018

Cite this article https://doi.org/10.2469/faj.v41.n2.68

CFA Institute members: sign in to access the Financial Analysts Journal.

Sample our
Economics, Finance,
Business & Industry Journals
>> Sign in here to start your access
to the latest two volumes for 14 days

Citations Metrics Reprints & Permissions Read this article Share

Click to increase image size

by G. O. Bierwag and George G. Kaufman

Duration Gap for Financial Institutions

THE PROBLEM OF INTEREST RATE risk exposure has become increasingly important for financial institutions, particularly for thrift institutions. This article describes a number of single-factor duration gap equations that may help financial institutions control the value of a desired "target" account.[1]

Interest Rate Risk

Financial institutions assume interest rate risk when the interest sensitivity of their assets differs from that of their liabilities. When the price (income) sensitivity of assets is greater (less) than the price (income) sensitivity of deposits, an unexpected increase in interest rates will reduce the institution's net worth (net income).[2] Conversely, under these conditions, an unexpected decline in interest rates will increase net worth (net income).

The impact of unexpected interest rate changes on a financial institution will depend, not only on the relative interest rate sensitivities of its asset and deposit accounts, but on the account the institution targets as its primary concern. Values of different target accounts are sensitive to changes in the values of different balance sheet accounts.

Theory holds that bankers, or any private firm, should maximize shareholders' wealth—i.e., the market value of net worth or capital. In practice, many bankers prefer to maximize or stabilize annual net income or the income-to-asset ratio, whereas bank regulators may be interested in measuring the impact of interest rate changes on a bank's capital-to-asset ratio. Given different goals, a number of alternative accounts may be targeted for greatest attention; the ultimate selection will depend on the preferences of an institution's senior management. The selection process is not discussed here; suffice it to say that it is nearly impossible to control more than one account simultaneously.

The institution's sensitivity to unexpected interest rate changes may be measured by its maturity gap or duration gap, the gap being the difference between the interest sensitivity measure of one or more asset accounts and that of one or more liability accounts. The duration gap generally provides a more accurate and useful measure of a financial institution's interest sensitivity than the maturity gap.[3]

Calculating Duration Gap

The simple Macaulay measure of duration is:

$$D = \frac{\sum_{n=1}^{m}\left[\frac{nS_n}{(1+i)^n}\right]}{\sum_{n=1}^{m}\left[\frac{S_n}{(1+i)^n}\right]}, \qquad (1)$$

where

S_n = expected cash flow in period n,
m = term to the final expected cash payment, and
i = yield to maturity.

Macaulay's duration measures accurately either a security's average life or its price sensitivity *only* if the yield curve is flat. If the yield curve changes, interest rates change by equal amounts for all maturities, so that the curve remains flat. More complex assumptions about either the current shape of the yield curve or how it may change if interest rates change unexpectedly produce more complex versions of Equation (1). For the sake of expediency, we use only the Macaulay duration and do not consider options, variable rates and risk of default.

Using this measure of duration, we can calculate alternative duration gap measures for four typical target accounts of an institution that has only cash, loans, deposits and net worth on its balance sheet.[4] Table I gives the duration gap measures for capital, capital-to-asset ratio, net income and net-income-to-asset ratio target ac-

1. Footnotes appear at end of article.

G. O. Bierwag is Professor of Finance and Economics at the University of Arizona. George Kaufman is Professor of Finance and Economics at Loyola University of Chicago.

The CFA Institute is collaborating with JSTOR to digitize, preserve, and extend access to *Financial Analysts Journal*
www.jstor.org

Log in via your institution

Access through your institution

Log in to Taylor & Francis Online

Log in

Restore content access

Restore content access for purchases made as guest

Purchase options *

Save for later

PDF download + Online access

- 48 hours access to article PDF & online version
- Article PDF can be downloaded
- Article PDF can be printed

EUR 48.00

Add to cart

Issue Purchase

- 30 days online access to complete issue
- Article PDFs can be downloaded
- Article PDFs can be printed

EUR 136.00

Add to cart

* Local tax will be added as applicable



Related Research

People also read | Recommended articles | Cited by 28

The Impact of Tax Indexing on Housing Demand

Gerald J. Lynch
Financial Analysts Journal
Published online: 31 Dec 2018

Information for

Authors

R&D professionals

Editors

Librarians

Societies

Open access

Overview

Open journals

Open Select

Dove Medical Press

F1000Research

Opportunities

Reprints and e-prints

Advertising solutions

Accelerated publication

Corporate access solutions

Help and information

Help and contact

Newsroom

All journals

Books

Keep up to date

Register to receive personalised research and resources by email

Sign me up

Copyright © 2026 Informa UK Limited Privacy policy

Cookies Terms & conditions Accessibility

Registered in England & Wales No. 01072954
5 Howick Place | London | SW1P 1WG