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Equity Duration as a Determinant of Differences in Interest Rate Sensitivity between Growth Stocks and Defensive-Sector Stocks

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Abstract

The study examines why growth stocks and defensive-sector stocks respond with different force to the same movement in interest rates. The explanation rests on equity duration, a measure that extends bond duration to equity securities and captures how far into the future a firm's expected cash flows are located. The analysis proceeds from the discounted cash flow model to the Gordon growth representation, in which duration equals the reciprocal of the spread between the required return and the long-run growth rate, and then to the multi-period implied duration used in the accounting and asset-pricing literature. A comparison matrix places information technology and communication services on one side and utilities, consumer staples, and health care on the other, and evaluates eight parameters that lengthen or shorten duration. The results show that the sensitivity gap follows from the timing of cash flows: firms whose value is concentrated in distant periods and in terminal value carry long duration and lose more value per unit increase in the discount rate. The reciprocal form of duration also explains why the exit from near-zero rates in 2022 and 2023 led to a disproportionate repricing of long-duration equities. The practical conclusion is that the interest rate exposure of an equity portfolio should be assessed through the cash flow structure of its holdings, since a historical beta estimated in one rate regime misstates the exposure that appears when the regime changes.

Keywords: *Equity Duration, Implied Duration, Discount Rate Channel, Growth Stocks, Defensive Sectors, Sector Rotation, Monetary Tightening, Discounted Cash Flow Valuation.*

INTRODUCTION

The exit of the United States economy from the zero lower bound during 2022 and 2023 divided the equity market along lines that sector labels describe without explaining them. Indices of information technology and communication services lost far more value than indices of utilities, consumer staples, and health care, and the same divide reappeared with the opposite sign in the phases when rate expectations eased. Practitioners summarize this pattern with two tools: the sector label, which assigns a company to the growth or defensive camp by industry, and the sector's historical beta relative to changes in yields. Both tools record what happened. Neither states why a dollar of expected profit in a software company should be repriced more than a dollar of expected profit in a packaged-food producer when the risk-free rate rises by the same amount.

The discounted cash flow model contains the answer in its own arithmetic. The value of a share equals the sum of expected cash flows, each divided by the discount factor for its date. A change in the discount rate affects each cash flow in proportion to its distance from the present, and the price response of the whole security depends on how the expected cash flows are distributed across time. Fixed-income analysis formalized this dependence long ago under the name of duration, and a line of research extended the concept to equities. Dechow et al. (2021) refine the implied equity duration measure built from financial statement forecasts, Gonçalves (2021b) documents that stocks with cash flows concentrated in the near term earn a premium over long-duration stocks, and Gormsen and Lazarus (2023) show that several major equity factors can be read as bets on near-future cash flows. Golez and Koudijs (2025) add that the duration of the aggregate market has increased over the postwar period as firms retain more earnings and postpone payouts, making prices more sensitive to expected returns and less sensitive to realized growth.

This article continues a line of work on the transmission of Federal Reserve policy to United States equities. The earlier study of the volatility channel (Kobanenko, 2025) used event

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windows around Federal Open Market Committee meetings and GARCH-type models to compare sectors, and it reported that information technology and communication services show a faster and more persistent rise in conditional variance after hawkish signals, while utilities and consumer staples revert to baseline sooner. That study measured the second moment of returns, and the present article turns to the first moment and asks why the same rate shock moves prices in these sectors by different amounts.

The aim of the article is to explain the differences in interest-rate sensitivity between growth stocks and defensive-sector stocks by examining the distribution of their expected cash flows over time and to show that equity duration serves as a common yardstick for this comparison. Three tasks follow from the aim. The first is to formalize the link between cash flow timing and price sensitivity in the Gordon model and in the multi-period discounted cash flow model. The second is to compare growth and defensive sectors on a single set of parameters that determine duration. The third is to derive the consequences for company valuation and for the assessment of portfolio interest rate exposure. No comparison of growth and defensive sectors on a common cash flow duration scale was found in the available literature, and the matrix presented in the third section addresses this gap.

MATERIALS AND METHODS

The analytical framework rests on three representations of one idea. The first is the definition of duration as the price elasticity with respect to the discount rate, taken with a negative sign so that a positive number denotes a loss of value when the rate rises. For a bond, this quantity equals the present-value-weighted average time to each payment, and the same weighting applies to the residual claim of a shareholder. The second representation is the Gordon growth model, in which the price equals the next-period dividend, D_1, divided by the spread between the required return, r, and the constant growth rate, g, so that

$$P=D_1/(r-g)$$

Differentiating this expression with respect to r and dividing by price gives a duration equal to 1/(r-g). The formula carries two implications for the comparison that follows. Duration increases with the expected growth rate because a higher g pushes a larger share of value into distant periods, and duration grows without bound as the required return approaches the growth rate, making the relation between duration and the level of rates convex. The third representation is the implied equity duration of Dechow et al. (2021), which forecasts cash flows over a finite horizon from financial statement data, treats the remaining value as a terminal claim, and computes the weighted-average time of the entire stream.

The literature corpus was assembled around three questions: how duration is measured for equities, how the term structure of equity discount rates evolves over time, and through which channels changes in policy rates affect equity prices. On the first question, Gonçalves (2021b) supplies the cross-sectional evidence on the short duration premium, Gonçalves (2021a) provides an intertemporal model in which long-duration claims carry reinvestment risk, and Gormsen and Lazarus (2023) use single-stock dividend futures to show that the expected alpha on individual cash flows falls with maturity within a firm. On the second question, Gormsen (2021) documents a countercyclical slope in the equity term structure, Bansal et al. (2021) estimate a regime-switching model for the same object, and Golez and Koudijs (2025) trace the rise in aggregate equity duration since 1945. On the third question, Gürkaynak et al. (2022) isolate a cash flow effect of policy announcements, Bauer et al. (2023) document a risk-taking channel, and Nagel and Xu (2024) measure the share of the market reaction to FOMC surprises that runs through the default-free yield curve. Maloney and Moskowitz (2021) serve as the main counterweight to a duration-based reading, and the prior study of the volatility channel (Kobanenko, 2025) provides the sector-level facts on second moments that the present article complements.

The comparison matrix was built in three steps. First, the parameters that enter the duration formulas were listed: the expected growth rate, the payout ratio, the share of terminal value in total value, and the reinvestment rate. Second, four parameters that affect rate sensitivity through channels adjacent to duration were added so that the matrix would not attribute to cash flow timing an effect that belongs elsewhere: the stability of cash flows, the cyclical elasticity of demand, the pass-through of inflation into nominal cash flows, and financial leverage. Third, each parameter was assessed for the growth group, which comprises information technology and communication services, and for three defensive sectors, utilities, consumer staples, and health care, on a three-level scale of high, moderate, and low. The assessment is qualitative and draws on the sector characteristics discussed in the sources above. The article contains no independent estimates of duration or of return sensitivity, and every empirical statement about sectors refers to published results.

RESULTS

From the Timing of Cash Flows to Duration

Two firms with the same total of undiscounted expected cash flows can carry durations that differ by a multiple. Figure 1 presents two stylized profiles that illustrate the point. In the growth profile the expected cash flows start small and rise from period to period, and the terminal value, which stands for all cash flows beyond the explicit forecast horizon, dominates the total. In the defensive profile the cash flows are of similar size in every period and the terminal value adds a moderate amount. The profiles are illustrative constructions without calibration to any company or index.

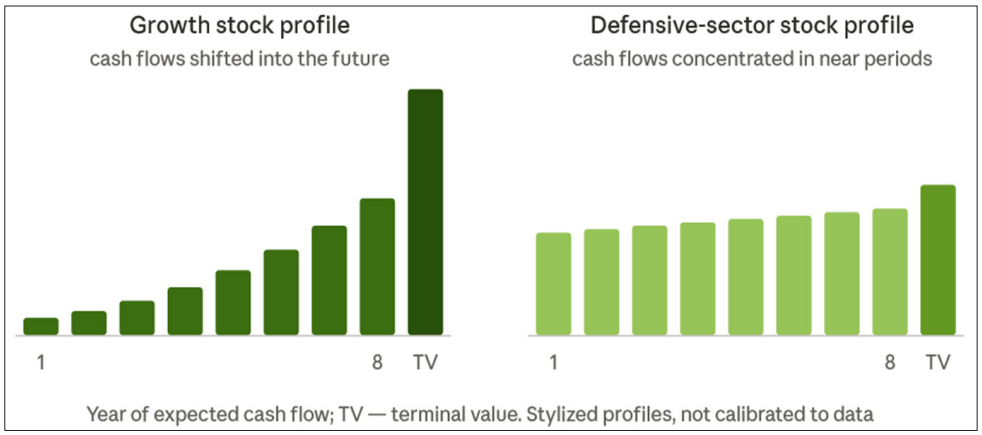

Fig. 1. Stylized cash flow profiles of a growth stock and a defensive-sector stock

The weighting behind duration explains why the growth profile responds more to the discount rate. When r rises by a given amount, the present value of a cash flow due in one year falls by about that amount in percentage terms, whereas the present value of a cash flow due in ten years falls by about ten times as much. The growth profile places most of its weight on distant dates and on the terminal value, so its weighted average time is long and its price falls by a larger percentage. The defensive profile places its weight on near dates, so its weighted average time is short and the same rate change removes a smaller fraction of value. In the language of the Gordon model, the growth firm has a high g and a narrow spread r − g, and the defensive firm has a low g and a wide spread.

The result concerns one channel among several through which a policy rate reaches an equity price, and the channels need to be separated before sector differences are attributed to duration. The discount rate channel operates through the risk-free component of the required return and depends on the timing of cash flows as described above. The cash flow channel operates through the effect of rates on expected cash flows: Gürkaynak et al. (2022) show that stock price reactions to policy announcements depend on the type and maturity of the debt a firm has issued, because floating-rate and short-maturity debt transmit a rate increase into interest expense. The risk premium channel operates through the compensation investors demand for holding equities, and Bauer et al. (2023) find that surprise tightening lowers an index of risk appetite in a persistent way. The volatility channel studied in earlier work (Kobanenko, 2025) falls within this third group, since a rise in conditional variance is one form that risk repricing takes.

The relative weight of these channels matters for the argument. If most of the market reaction to a policy surprise were driven by the risk premium, sector differences would have little to do with cash flow timing. Nagel and Xu (2024) use dividend futures to compute the counterfactual index change implied by the shift in the default-free yield curve alone, and they find that this counterfactual accounts for most of the observed reaction to FOMC announcements. The discount rate channel carries the bulk of the level effect, and within that channel, the timing of cash flows determines which sectors lose more.

Comparison of Sectors on the Parameters of Duration

Table 1 presents the comparison matrix. Each row is a parameter that enters the duration formulas or a parameter that affects rate sensitivity through an adjacent channel. The second column states the direction in which the parameter moves duration or marks the parameter as an adjacent channel, and the remaining columns give the qualitative assessment for the growth group and for the three defensive sectors.

Table 1. Comparison of growth and defensive sectors by parameters determining equity duration

Parameter	Effect on duration	Growth stocks	Utilities	Consumer staples	Health care
Expected growth rate g	Higher g lengthens	High	Low	Low	Moderate
Payout ratio	Higher payout shortens	Low	High	High	Moderate
Share of terminal value	Higher share lengthens	High	Low	Low	Moderate
Reinvestment rate	Higher rate lengthens	High	Moderate	Low	Moderate
Cash flow stability	Higher stability shortens	Low	High	High	Moderate
Cyclical demand elasticity	Lower elasticity shortens	High	Low	Low	Low
Inflation pass-through	Higher pass-through shortens	Moderate	Moderate	High	Moderate
Financial leverage	Adjacent channel	Low	High	Moderate	Low
Expected relative duration	Row summary	Long	Short*	Short	Short to medium

* Short cash flow duration combined with a second source of rate sensitivity through leverage.

The first four rows concern the timing of cash flows in the strict sense. Growth firms have a high expected growth rate, retain most of their earnings, reinvest at a high rate, and hold a large share of their value in the terminal claim, so each of these factors lengthens their duration. Utilities and consumer staples show the opposite pattern: their growth expectations are low, their payout ratios are high, and their terminal values, while present, account for a smaller share of total value because near-term dividends carry more weight. Health care occupies an intermediate position because the sector combines pharmaceutical firms with mature product portfolios and high payouts with biotechnology firms whose value rests on products that do not yet generate revenue. Gormsen and Lazarus (2023) link these characteristics to duration by showing that the value, profitability, investment, and payout factors select firms that earn most of their cash flows in the near future, and Golez and Koudijs (2025) observe the same relation at the aggregate level.

The fifth, sixth, and seventh rows concern the reliability of the cash flows and their behavior under inflation. Stable and predictable cash flows shorten effective duration in a second sense: the forecast error around near-term payments is small, so the present value of the stream concentrates on the forecasts where the forecasts are firm. Demand for electricity, groceries, and prescription drugs varies little with the business cycle, a property that earned these sectors the defensive label. Inflation pass-through matters because a rise in nominal rates driven by inflation affects both the discount rate and a firm's nominal cash flows. A firm that can raise prices in step with inflation sees its nominal cash flows rise with the nominal rate, and the two effects offset each other in part. Consumer staples have a long record of price adjustment, utilities pass costs through with a regulatory lag, and growth firms vary in this respect from case to case.

The eighth row is separated from the rest because leverage affects rate sensitivity via the cash flow channel described by Gürkaynak et al. (2022), via interest expense and refinancing costs, while leaving the timing of operating cash flows unchanged. Utilities have the highest sector leverage, creating a second source of rate sensitivity on top of their short cash flow duration. Market participants describe utility stocks as bond proxies for this reason, though the mechanism runs through the cost of debt and the regulated return on equity, which rate setters adjust with a delay. The final row of the table summarizes the eight assessments. The growth group emerges with long duration, consumer staples with short duration, health care with short to medium duration, and utilities with short cash flow duration, qualified by the leverage effect. The matrix thus reproduces the ranking of rate sensitivity observed in the market while grounding it in parameters that can be read from financial statements before any price data are examined.

The Exit from Near-Zero Rates and the Relative Repricing of Sectors

The Gordon formula makes duration a convex function of the required return, and this convexity explains why the shift out of the low-rate regime affected sectors to such different degrees. Figure 2 plots duration as $1/(r - g)$ against the required return for two growth rates, 6 percent for the growth profile and 2 percent for the defensive profile, over the range from 7 to 12 percent. The values are computed from the formula and contain no empirical data.

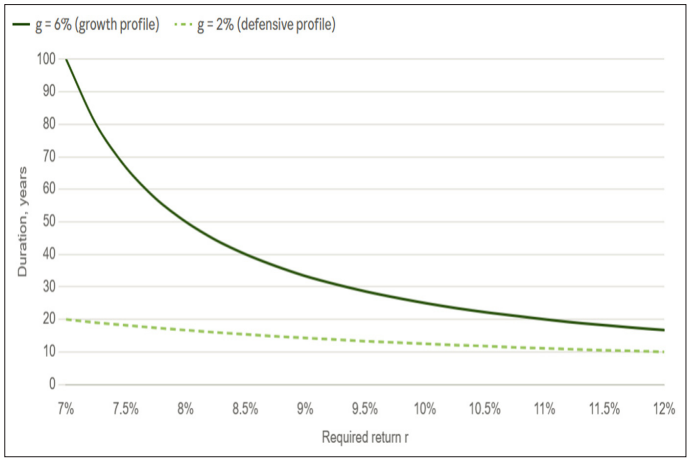

Fig. 2. Equity duration in the Gordon growth model as a function of required return for two growth rates

At a required return of 7 percent, the growth profile has a duration of 100 years, and the defensive profile a duration of 20 years, a ratio of five. At 12 percent, the durations are about 17 and 10 years, a ratio below two. Two observations follow. First, the growth profile loses duration fast as the required return rises, so its price sensitivity is highest when rates are lowest and declines as tightening proceeds. Second, the gap between the profiles is widest at low rates. A regime of near-zero policy rates therefore compresses the spread $r - g$ for growth firms to a minimum and places their valuations at the steepest part of the curve, where a small rise in r removes a large fraction of value. The same rise in r, applied to a defensive firm sitting on the flat part of the curve, removes a much smaller fraction. The relative repricing of growth and defensive sectors during 2022 and 2023 is the market counterpart of this movement along the two curves.

Published evidence on the equity term structure supports this reading and adds the business-cycle dimension. Gormsen (2021) finds that the term structure of one-period expected returns on dividend claims slopes downward on average and that its slope is countercyclical, so that distant cash flows are discounted at a higher premium in bad times. Bansal et al. (2021) estimate that the term structure of expected dividend strip returns slopes downward in recessions and upward in expansions, and they argue that the short samples used in earlier studies overweight recessions. Both results imply that the required return on long-duration claims moves more when the macroeconomic state changes, amplifying

the duration effect during a tightening coinciding with fears of recession. Gonçalves (2021a) supplies the mechanism: a long-term investor who dislikes declines in expected returns demands compensation for holding claims whose value depends on reinvestment at uncertain future rates, and long-duration equities are such claims.

Golez and Koudijs (2025) provide the longest historical perspective. Using data from 1871 to 2022, they show that the payout ratio has fallen, the duration of the aggregate market has risen, and expected returns have come to dominate price variation. The large weight of information technology and communication services in the main indices at the start of the tightening cycle meant that the aggregate market itself carried long duration, so the sector divide analyzed here appeared within a market whose average sensitivity to rates was already elevated by historical standards.

DISCUSSION

The central contrast of the article is between duration and historical beta as measures of rate sensitivity. Beta with respect to yield changes is estimated from a sample of past returns, and its value depends on the rates that prevailed in that sample. Figure 2 shows why this dependence is a problem. A beta estimated in a low-rate regime, where growth profiles sit on the steep part of the duration curve, will be high for growth sectors, but an analyst who uses it to forecast the next tightening will misjudge the exposure once rates have moved, because the duration of the same firms has fallen along the curve. A beta estimated in a high-rate regime, in turn, understates the exposure that appears if rates return to low levels. Duration computed from the cash flow structure avoids this circularity because it uses the current required return and growth expectations, and states what the sensitivity is now.

The second point of the discussion connects the present results to the volatility channel examined in the earlier study (Kobanenko, 2025). That study found that information technology and communication services exhibit higher ARCH coefficients and a positive asymmetry parameter in EGARCH specifications, indicating a faster and stronger rise in conditional variance after hawkish signals, whereas utilities and consumer staples show lower persistence and a quicker return to baseline. Duration offers a reason for the pattern in the second moment as well as in the first. A long-duration claim has a price that depends on a narrow spread between two uncertain quantities, the required return and the long-run growth rate, and any news that moves either quantity produces a large percentage change in price. The variance of returns for such a claim is high for the same reason its level sensitivity is high.

The third point concerns the distinction between nominal and real rates. Duration is defined against the discount rate that applies to cash flows in the same units, so for nominal cash flows, the relevant rate is nominal, and for real cash flows, it is real. When nominal rates rise because expected inflation has risen, firms whose cash flows adjust with inflation see the numerator and denominator of the valuation move together, and their price sensitivity to the nominal rate is lower than their nominal duration would suggest. When rates rise because the real component has risen, no such offset exists, and duration operates in full. The tightening in 2022 and 2023 combined both components, and the seventh row of Table 1 shows that consumer staples have the strongest inflation pass-through among the sectors compared. Part of the resilience of that sector during the episode may reflect this property in addition to its short duration.

The 2020 pandemic episode shows the other side of the same mechanism. Dechow et al. (2021) find that during the first quarter of 2020, stock returns rose with implied duration, so that low-duration firms suffered the largest losses because the shutdown removed near-term cash flows while leaving distant cash flows intact. The 2020 shock hit the short end of the cash flow stream; the 2022 shock hit the long end through the discount rate; and together, the two episodes confirm that duration sorts firms by the location of their value in time.

The fourth point gives the counterargument its due. Maloney and Moskowitz (2021) test whether interest rates, changes in short and long rates, and the slope of the yield curve explain value factor returns, using several factor constructions and data from the United States, the United Kingdom, Germany, and Japan. They find modest links that change sign or lose significance across specifications, and they conclude that factor timing on interest rate signals should be expected to fail. Their object is the return of a long-short value factor over time, which depends on changes in the duration gap between value and growth portfolios and on changes in expected growth that accompany rate changes. The present argument concerns the cross-sectional sensitivity of price levels to a given change in the required return, holding growth expectations fixed. The two questions overlap without coinciding, and a weak time-series result leaves a strong cross-sectional mechanism intact. Their study also predates the 2022 episode, the first large move out of near-zero rates since implied equity duration entered the literature.

Two implications for practice follow. For company valuation, the share of terminal value in a discounted cash flow model is itself a duration statistic, and a sensitivity table over the discount rate should be read as a statement about duration. A growth valuation in which the terminal value dominates total value is a long-duration claim whose fair value swings by large percentages for small changes in the required return. For portfolio management, the interest rate exposure of an equity portfolio can be approximated by the value-weighted average of the durations of its holdings, as with a bond portfolio, and this figure can be compared across sectors and over time without reference to a beta estimated under a past regime.

The analysis relies on published estimates and on a qualitative matrix, contains no independent measurement of

sector durations, and is confined to the United States market. The health care assessment averages across pharmaceutical and biotechnology firms with varying durations, and the leverage row for utilities mixes regulated and unregulated business models. Two extensions follow from these limits: an estimate of implied equity duration by sector over the 2020 to 2024 window, and a test of whether portfolios sorted on duration explain sector returns for that period better than portfolios sorted on yield beta.

CONCLUSION

Growth stocks and defensive-sector stocks respond to the same change in interest rates with different magnitudes because the distributions of their expected cash flows over time differ. Equity duration, defined as the present-value-weighted average time to cash flows, measures this distribution and converts the sector label into a quantity that can be compared across firms and industries. The Gordon model defines duration as the reciprocal of the spread between the required return and the growth rate, which makes long-duration claims most sensitive to rates when rates are lowest and helps explain why the exit from near-zero rates repriced growth sectors far more than defensive ones.

The comparison matrix shows that every cash flow timing parameter points in the same direction for the two groups. Growth firms combine high expected growth, low payouts, high reinvestment, and a dominant terminal value, and each of these lengthens duration. Utilities, consumer staples, and health care combine lower growth expectations, higher payouts, stable demand, and a stronger weight of near-term cash flows than the growth group, thereby shortening duration. Leverage adds a second source of rate sensitivity for utilities, running through interest expense and leaving the timing of operating cash flows unchanged, while inflation pass-through gives consumer staples a partial offset that further shortens their effective nominal duration.

The evidence on the term structure of equity discount rates reinforces the mechanism. Distant cash flows are discounted at a rate that moves more with the state of the economy, so a tightening that coincides with recession fears widens the gap between long- and short-duration claims beyond what the arithmetic of a single rate change implies. The volatility results of the earlier study fit the same picture: a claim whose value rests on a narrow spread between two uncertain quantities shows high return variance for the same reason it shows high sensitivity.

The interest rate sensitivity of an equity portfolio is a property of the cash flow structure of its holdings, and equity duration reads that structure from financial statements and growth expectations before prices move.

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