

Generating Stock-Selection Factors from Valuation Theory: A Structural Framework Based on the Valuation–Return Equilibrium

Abstract

Despite the remarkable success of factor investing, the theoretical origin of stock-selection factors remains insufficiently understood. Most existing factors have been identified through empirical return predictability, leading to the rapid expansion of observable variables commonly referred to as the factor zoo. However, relatively little research has investigated whether stock-selection factors can be derived systematically from economic theory rather than discovered empirically.

This study proposes a valuation-based framework for generating stock-selection factors by establishing a valuation–return equilibrium linking enterprise valuation and market valuation. The equilibrium identifies four structural dimensions—valuation, growth, persistence, and risk—each comprising an enterprise-side component and a market-side component. Together, these dimensions contain eight structural variables that provide a common theoretical foundation through which observable stock-selection variables may be interpreted as empirical measurements of underlying economic mechanisms rather than independent factors.

The framework further provides a structural interpretation of several long-standing observations in the factor-investing literature, including factor overlap, the continuing expansion of the factor zoo, and the potential complementarity of information contained in different factor families. The resulting framework generates a set of theoretical propositions that may be examined in future empirical research.

The principal contribution of this study is not the introduction of another empirical factor model, but the establishment of a valuation-theoretic framework that systematically generates structural stock-selection factors and provides a unified interpretation of observable factor characteristics within modern asset-pricing research.

Keywords: Stock Selection; Factor Investing; Valuation Theory; Valuation–Return Equilibrium; Asset Pricing; Factor Zoo

1. Introduction

The Factor Zoo Problem

Factor investing has become one of the most influential developments in modern asset pricing and quantitative investment management. Since the pioneering studies of Basu (1977), Banz (1981), Fama and French (1992, 1993), and Jegadeesh and Titman (1993), researchers have documented a large number of firm characteristics that appear to predict future stock returns.

Over time, the list of reported factors has expanded substantially. In addition to traditional value, size, and momentum effects, subsequent studies have identified profitability factors, investment factors, quality factors, liquidity factors, volatility factors, betting-against-beta factors, and many other return predictors. Recent surveys suggest that hundreds of factors have been reported in the academic literature.

This rapid proliferation of factors has generated what is commonly referred to as the "factor zoo" problem. Although numerous factors appear statistically significant, their economic interpretation often remains unclear. Many factors are discovered through empirical exploration rather than derived from a common theoretical framework. As a result, the literature contains a large collection of successful predictors but provides limited insight into why these factors exist or how they are related to one another.

Limitations of Existing Factor Research

Despite the success of factor investing, three important limitations remain.

First, most factors have been discovered individually rather than derived theoretically. Researchers typically identify an empirical anomaly and subsequently label it as a factor. Consequently, factor discovery has largely proceeded in a piecemeal manner.

Second, existing studies provide limited theoretical classification of factors. Value, profitability, momentum, investment, quality, and risk factors are usually discussed as separate categories. However, there is no generally accepted theoretical framework explaining how these factors are related or whether they originate from common underlying economic mechanisms.

Third, factor interactions remain insufficiently understood. Modern quantitative investment strategies increasingly rely on combinations of multiple factors rather than individual factors. Empirical evidence suggests that factor effectiveness often depends on the presence of other factors. For example, profitability signals may be more informative among value stocks, while momentum effects may vary across valuation environments. Despite the practical importance of these interactions, their economic foundations remain largely unexplained.

These limitations suggest that factor investing lacks a unified theoretical structure capable of explaining factor existence, factor classification, and factor interactions simultaneously.

From Factor Discovery to Factor Generation

This study argues that many well-known stock-selection factors can be interpreted as manifestations of a common valuation–return equilibrium system.

Building upon the symmetric valuation–return framework developed in previous studies, this paper proposes a factor generation theory linking profitability, valuation, expected returns, persistence, and discount rates within a unified economic structure. Rather than treating factors as independent empirical discoveries, the proposed framework derives factor families from a common set of structural variables.

The central idea is that profitability, valuation, and market returns are jointly connected through a valuation–return equilibrium relationship. When this equilibrium condition is rearranged in different directions, it naturally generates the informational structures underlying value investing, growth investing, profitability investing, momentum investing, and several other well-known factor strategies.

Consequently, factors are not viewed as isolated anomalies. Instead, they emerge as different representations of a common economic system linking firm fundamentals and market expectations.

Four Structural Dimensions

The framework organizes stock-selection information into four structural dimensions: valuation, growth, persistence, and risk. Each dimension contains an enterprise-side component and a market-side component, resulting in eight structural variables. Observable factor characteristics are interpreted as empirical proxies for these underlying structural variables.

Purpose of the Study

The purpose of this study is to develop a unified factor-investing framework based on valuation–return equilibrium.

Specifically, the study seeks to:

1. derive stock-selection factors from a common theoretical framework;
2. establish a unified taxonomy of factor families;
3. explain why factor interactions may arise naturally;
4. provide a theoretical bridge connecting factor investing, valuation theory, and asset-pricing theory.

By shifting attention from factor discovery to factor generation, this study offers a new perspective on the economic foundations of factor investing and provides a more

integrated understanding of how information flows between accounting fundamentals, market expectations, and stock-selection factors.

2. Literature Review

2.1 From Factor Discovery to the Factor Zoo

The modern factor-investing literature originated from efforts to explain the cross-sectional variation of stock returns. Early studies documented systematic return patterns that could not be fully explained by traditional asset-pricing models.

Among the earliest contributions, Basu (1977) reported that stocks with low price-to-earnings ratios earned higher average returns than stocks with high price-to-earnings ratios. Banz (1981) subsequently documented the size effect, showing that small firms tended to outperform large firms. Building on these findings, Fama and French (1992) demonstrated that firm size and book-to-market ratios explain a substantial portion of cross-sectional stock returns, and Fama and French (1993) incorporated these variables into the well-known three-factor model.

Following these pioneering studies, researchers identified an increasingly large number of return predictors. Jegadeesh and Titman (1993) documented the momentum effect, while Novy-Marx (2013) showed that profitability possesses significant predictive power for future returns. Fama and French (2015) further expanded the traditional framework by introducing profitability and investment factors.

Over time, hundreds of factors were proposed in the academic literature. Green, Hand, and Zhang (2017) compiled more than 300 firm characteristics associated with stock returns, illustrating the rapid growth of factor research. The resulting collection of return predictors became widely known as the “factor zoo.”

Although the factor zoo literature has substantially expanded the list of documented return predictors, it has also created a fundamental challenge: the number of factors continues to increase, while our understanding of their underlying economic origins remains limited. The evolution of factor research has largely been driven by empirical discovery rather than theoretical derivation.

2.2 Why Does the Factor Zoo Exist?

The rapid proliferation of factors has generated extensive debate regarding the economic meaning of documented anomalies.

One explanation is provided by traditional risk-based asset-pricing theories. Under this view, factors represent compensation for different forms of systematic risk. The Fama–French models are among the most influential examples of this approach.

A second explanation emphasizes behavioral mechanisms. Momentum effects, investor overreaction, underreaction, and limits to arbitrage suggest that some factors may arise from predictable behavioral biases rather than risk compensation.

A third explanation argues that many reported factors may reflect statistical artifacts. Harvey, Liu, and Zhu (2016) showed that extensive multiple testing can generate a large number of false discoveries. Similarly, McLean and Pontiff (2016) documented that many anomalies weaken after publication, while Hou, Xue, and Zhang (2020) found that numerous reported anomalies become substantially weaker when subjected to replication tests.

A fourth possibility is that many documented factors may be different manifestations of a smaller set of underlying structural variables. Under this view, the large number of reported factors does not necessarily imply the existence of hundreds of independent return-generating mechanisms.

Despite these competing explanations, no existing theory provides a unified framework capable of explaining why such a large number of factors exist simultaneously. Most explanations focus on individual factors rather than the overall structure of the factor zoo.

2.3 Existing Approaches to Factor Classification

As the number of documented factors increased, researchers began to organize factors into broader categories.

The most common approach classifies factors according to investment styles, such as value, momentum, profitability, investment, quality, and low-volatility factors. Other studies distinguish between accounting-based factors and market-based factors. Some researchers further categorize factors according to economic explanations, including risk-based, behavioral, and informational perspectives.

Although these classification systems provide useful descriptions of factor characteristics, they remain largely empirical. Existing taxonomies classify factors according to observed similarities rather than according to a common theoretical structure.

Consequently, current classification systems do not explain whether different factor families originate from common economic variables. Instead, they primarily describe how factors appear rather than why factors exist.

The absence of a theoretically grounded taxonomy remains one of the most important limitations of the factor-investing literature. Existing classification systems are primarily descriptive. They group factors according to observed characteristics or investment styles. In contrast, the present study seeks to classify factors according to their positions within the valuation–return equilibrium system.

2.4 Factor Interactions and Multi-Factor Investing

The development of quantitative investing has shifted attention from individual factors toward combinations of factors.

Numerous empirical studies show that multi-factor portfolios often outperform single-factor strategies. Value and profitability factors frequently reinforce one another, while momentum effects often vary across valuation environments. Similarly, quality and low-volatility factors are commonly combined with traditional value factors in practical portfolio construction.

These findings suggest that factors interact rather than operate independently.

However, existing studies typically examine factor interactions from a statistical perspective. Factors are combined because doing so improves portfolio performance, not because their economic relationships are well understood.

As a result, the economic foundations of factor interactions remain unclear. Existing research generally explains whether factor interactions exist but provides limited insight into why they exist. Existing studies document factor interactions empirically, but they rarely provide a theoretical explanation for why such interactions should arise.

2.5 Valuation–Return Equilibrium Framework

A separate stream of research has focused on the fundamental relationship among valuation, profitability, growth, and expected stock returns.

Early studies emphasized that equity valuation cannot be fully understood through either value characteristics or growth characteristics alone. Yeh and Hsu (2011) proposed the Growth Value Two-Factor Model, which integrates growth and value information within a unified valuation framework and demonstrates that both dimensions jointly determine firm value.

Subsequent studies further developed this perspective. Yeh and Lien (2017) introduced a Growth–Value Hybrid Valuation Model based on mean reversion, showing that profitability persistence plays a central role in linking current fundamentals to future valuation outcomes. Building upon this idea, Kong, Lin, Yeh, and Chang (2019) developed an errors-in-variables approach to estimate growth–value valuation relationships more accurately and reduce measurement biases commonly encountered in empirical valuation models.

More recent studies expanded the framework in several directions. Yeh (2024) compared residual-income valuation models and growth–value valuation models and demonstrated that many seemingly different valuation approaches share common structural foundations. Yeh (2025) further derived a closed-form equity valuation formula based on a differential-equation formulation, providing an alternative

analytical representation of equity valuation dynamics. Yeh and Chi (2025) further developed a stock valuation model based on the mean reversion of return on equity, highlighting the importance of profitability persistence in determining long-run firm value. Yeh and Liu (2023) explored the growth–value framework through data visualization techniques and investigated the dynamic interaction between growth and value characteristics within equity valuation systems.

Collectively, these studies suggest that valuation, profitability, growth, persistence, and expected returns are not independent variables. Instead, they are linked through a common equilibrium structure that governs the relationship between accounting fundamentals and market prices.

Building upon this literature, the valuation–return equilibrium framework establishes a symmetric relationship between valuation and returns. Unlike traditional valuation models that focus primarily on explaining stock prices, or traditional asset-pricing models that focus primarily on explaining expected returns, the valuation–return framework integrates both perspectives within a unified equilibrium system.

A key implication of this framework is that valuation and returns contain reciprocal information. Valuation ratios and profitability measures may be used to infer future stock returns, while market valuation and return dynamics may be used to infer future profitability. This symmetry generates two complementary informational routes linking firm fundamentals and market expectations.

Unlike traditional factor-investing research, which begins with empirical anomalies and subsequently searches for explanatory factors, the valuation–return equilibrium framework begins with a structural economic relationship. This characteristic makes it possible to derive factor families from a common theoretical foundation rather than discover them individually.

Consequently, the framework provides a natural starting point for the development of a factor generation theory capable of explaining factor origins, factor classification, and factor interactions within a unified economic structure.

2.6 Research Gap

Despite the substantial progress achieved by the factor-investing literature, three important questions remain unresolved.

First, why do stock-selection factors exist?

Second, why do factors interact with one another?

Third, why has the literature produced such a large number of factors?

Existing studies have documented factors, classified factors, and evaluated factor performance. However, they have not established a unified theory explaining factor origins, factor classification, and factor interactions simultaneously.

To address these limitations, this study proposes a factor generation theory based on the valuation–return equilibrium framework. Rather than treating factors as isolated empirical discoveries, the proposed framework derives factor families from a common set of structural variables linking profitability, valuation, persistence, risk, and market expectations.

By shifting attention from factor discovery to factor generation, the study seeks to provide a unified explanation for factor existence, factor classification, and factor interactions, thereby offering a more integrated perspective on the economic foundations of factor investing.

More fundamentally, existing studies have not established a theory capable of linking factor generation, factor classification, and factor interactions within a single framework.

3. The Symmetric Valuation–Return Framework

3.1 Intrinsic Value Valuation Model (IVVM)

The theoretical framework developed in this section builds upon a series of growth–value valuation models proposed in previous studies (Kong et al., 2019; Yeh, 2024; Yeh & Lien, 2017). These studies demonstrate that valuation, profitability, and expected returns can be linked through a common equilibrium relationship. The present paper extends this literature by deriving two symmetric informational routes that connect valuation, profitability, and return dynamics.

The Intrinsic Value Valuation Model (IVVM) evaluates the fair value of equity from the enterprise side. The model assumes that the value of a firm depends on:

- current book value,
- current profitability,
- required return,
- and the persistence of profitability.

Let:

B_0 = current book value per share

ROE_0 = current return on equity

r = required return rate

m = persistence coefficient of ROE

The intrinsic fair price is defined as:

$$P_I = B_0 \left(\frac{1 + ROE_0}{1 + r} \right)^m \quad (1)$$

This equation implies that firm value depends on current book value adjusted by the discounted persistence of profitability.

The coefficient m plays a critical role in the model. If profitability is highly persistent, current ROE exerts a stronger influence on intrinsic value. Conversely, if profitability rapidly mean-reverts, current ROE becomes less important for long-run valuation. Thus, the IVVM captures the enterprise-side mechanism through which profitability affects firm value.

3.2 Extrinsic Value Valuation Model (EVVM)

The second component of the framework evaluates equity from the market side. Whereas the IVVM focuses on enterprise fundamentals, the Extrinsic Value Valuation Model (EVVM) focuses on expected stock return dynamics and market pricing behavior. Let:

P_0 = current market price

R = expected stock return

n = return persistence coefficient

The market-side fair value is defined as:

$$P_E = P_0 \left(\frac{1 + R}{1 + r} \right)^n \quad (2)$$

This equation implies that market valuation depends on expected return persistence. If return persistence is strong, market expectations exert a larger effect on fair price. If returns rapidly mean-revert, the impact of current return expectations becomes weaker. The EVVM therefore represents the market-side pricing mechanism.

3.3 Valuation–Return Equilibrium

The preceding sections introduced two alternative perspectives of equity valuation. The Intrinsic Value Valuation Model (IVVM) evaluates a firm from the perspective of its future profitability and accounting fundamentals, whereas the Extrinsic Value Valuation Model (EVVM) evaluates the same firm from the perspective of expected investment returns and market expectations.

Because both models describe the value of the same stock, equilibrium requires that intrinsic value and extrinsic value converge:

$$P_I = P_E \quad (3)$$

Substituting the IVVM and EVVM into the equilibrium condition yields:

$$B_0 \left(\frac{1 + ROE_0}{1 + r} \right)^m = P_0 \left(\frac{1 + R}{1 + r} \right)^n \quad (4)$$

Equation (4) should be interpreted as a model-imposed valuation-consistency condition obtained by equating the IVVM and EVVM, rather than as a separately estimated causal relationship. Here, R denotes the expected stock return implied by the equilibrium, whereas r denotes the required return used as the common discount rate.

This equation represents the central equilibrium relationship of the present study and forms the foundation of the symmetric valuation–return framework. Unlike conventional valuation models, which typically explain either stock prices or expected returns, the equilibrium equation simultaneously links:

- current valuation,
- current profitability,
- expected future return,
- profitability persistence,
- and return persistence.

Consequently, valuation is not merely an outcome variable. Instead, valuation serves as the bridge connecting firm fundamentals and market expectations. A particularly important feature of the equilibrium equation is its symmetry. The equation can be interpreted from two different directions.

The first approach treats profitability and valuation as the primary information variables and solves for the future expected return. Under this interpretation, investors begin with accounting fundamentals and valuation ratios and attempt to estimate future stock performance. This perspective naturally corresponds to the traditional philosophy of value investing.

Alternatively, the equilibrium equation can be interpreted in the opposite direction. Rather than solving for expected returns, investors may begin with market valuation and stock-price dynamics and infer future profitability. Under this interpretation, valuation and market performance become forward-looking signals regarding future business fundamentals. This perspective corresponds more closely to growth investing.

Therefore, the same equilibrium relationship can generate two inverse structural equations: $ROE, B/P \Rightarrow R$, and $P/B, R \Rightarrow ROE$. The first equation represents the value-investing route, while the second represents the growth-investing route. Importantly, neither equation is imposed independently. Both arise from the same valuation–return equilibrium condition and therefore represent two complementary views of the same economic system.

This observation constitutes the central theoretical insight of the present study. Traditional finance generally treats value investing and growth investing as competing approaches. In contrast, the symmetric valuation–return framework suggests that they

are inverse representations of a common equilibrium relationship linking fundamentals and market expectations. The following two sections derive these two structural equations formally and examine their economic implications.

3.4 The Value Equation

The ERRM naturally generates the structure underlying traditional value investing. A value investor begins from firm fundamentals and asks: Given current profitability and valuation, what future return should this stock generate?

Starting from

$$B_0 \left(\frac{1 + ROE_0}{1 + r} \right)^m = P_0 \left(\frac{1 + R}{1 + r} \right)^n \quad (5)$$

Dividing both sides by P_0

$$\frac{B_0}{P_0} \left(\frac{1 + ROE_0}{1 + r} \right)^m = \left(\frac{1 + R}{1 + r} \right)^n \quad (6)$$

Taking the $1/n$ power

$$\frac{1 + R}{1 + r} = \left[\frac{B_0}{P_0} \left(\frac{1 + ROE_0}{1 + r} \right)^m \right]^{1/n} \quad (7)$$

Therefore

$$1 + R = (1 + r) \left[\frac{B_0}{P_0} \left(\frac{1 + ROE_0}{1 + r} \right)^m \right]^{1/n} \quad (8)$$

Finally

$$R = (1 + r) \left[\frac{B_0}{P_0} \left(\frac{1 + ROE_0}{1 + r} \right)^m \right]^{1/n} - 1 \quad (9)$$

This equation is referred to as the Expected Return Rate Model (ERRM). The equation implies that expected return depends jointly on:

- valuation,
- profitability,
- profitability persistence,
- return persistence,
- and required return.

More compactly:

$$R = f(B/P, ROE, m, n, r) \quad (10)$$

This equation forms the theoretical basis for value investing. This corresponds to the informational direction:

$$\mathbf{ROE \rightarrow R}$$

Using the ERRM, we observe that expected return increases when:

$$\mathbf{B/P \uparrow}$$

or equivalently:

$$\mathbf{P/B \downarrow}$$

Expected return also increases when:

$$\mathbf{ROE \uparrow}$$

provided that profitability persistence remains sufficiently strong.

This immediately generates the classical value-investing structure:

$$\mathbf{Low\ P/B + High\ ROE \Rightarrow High\ Expected\ Return}$$

This result is important because it demonstrates that value investing is not simply a preference for cheap stocks. Instead, superior future return emerges from the interaction between undervaluation and profitability.

A low-valuation firm with poor profitability may remain a value trap, whereas a highly profitable firm with extremely high valuation may already fully reflect future growth. Thus, the value equation suggests that the strongest value stocks are firms that simultaneously exhibit:

- undervaluation,
- profitability,
- and profitability persistence.

This corresponds to the structural relation:

$$\mathbf{ROE, B/P \Rightarrow R}$$

which forms the first half of the symmetric framework.

3.5 The Growth Equation

The same equilibrium condition can be solved in the opposite direction.

Starting from:

$$B_0 \left(\frac{1 + ROE_0}{1 + r} \right)^m = P_0 \left(\frac{1 + R}{1 + r} \right)^n \quad (11)$$

To solve ROE, divide both sides by B_0

$$\left(\frac{1 + ROE}{1 + r}\right)^m = \frac{P}{B} \left(\frac{1 + R}{1 + r}\right)^n \quad (12)$$

Taking the 1/m power

$$\frac{1 + ROE}{1 + r} = \left[\frac{P}{B} \left(\frac{1 + R}{1 + r}\right)^n \right]^{1/m} \quad (13)$$

Therefore

$$1 + ROE = (1 + r) \left[\frac{P}{B} \left(\frac{1 + R}{1 + r}\right)^n \right]^{1/m} \quad (14)$$

Finally,

$$ROE = (1 + r) \left[\frac{P}{B} \left(\frac{1 + R}{1 + r}\right)^n \right]^{\frac{1}{m}} - 1 \quad (15)$$

This equation is the central theoretical contribution of the present paper.

It implies:

$$ROE = f(P/B, R, n, m, r) \quad (16)$$

Unlike the value equation, the growth equation begins from the market side.

A growth investor observes:

- high valuation,
- strong market return,
- strong momentum,
- and high investor expectations,

and interprets these signals as evidence of future profitability growth.

Thus, high valuation is not necessarily interpreted as overpricing. Instead:

High P/B

may imply that the market anticipates:

High Future ROE

Similarly, strong return momentum may contain forward-looking information regarding future profitability. This corresponds to the reverse informational direction:

R→ROE

The growth equation therefore generates the structure:

$$\text{High P/B} + \text{High Return or Momentum} \Rightarrow \text{High Future ROE}$$

This forms the second half of the symmetric framework. The overall structure of the proposed factor generation framework is illustrated in Figure 1.

METHODOLOGY: FROM VALUATION THEORY TO STRUCTURAL STOCK-SELECTION FACTOR FAMILIES

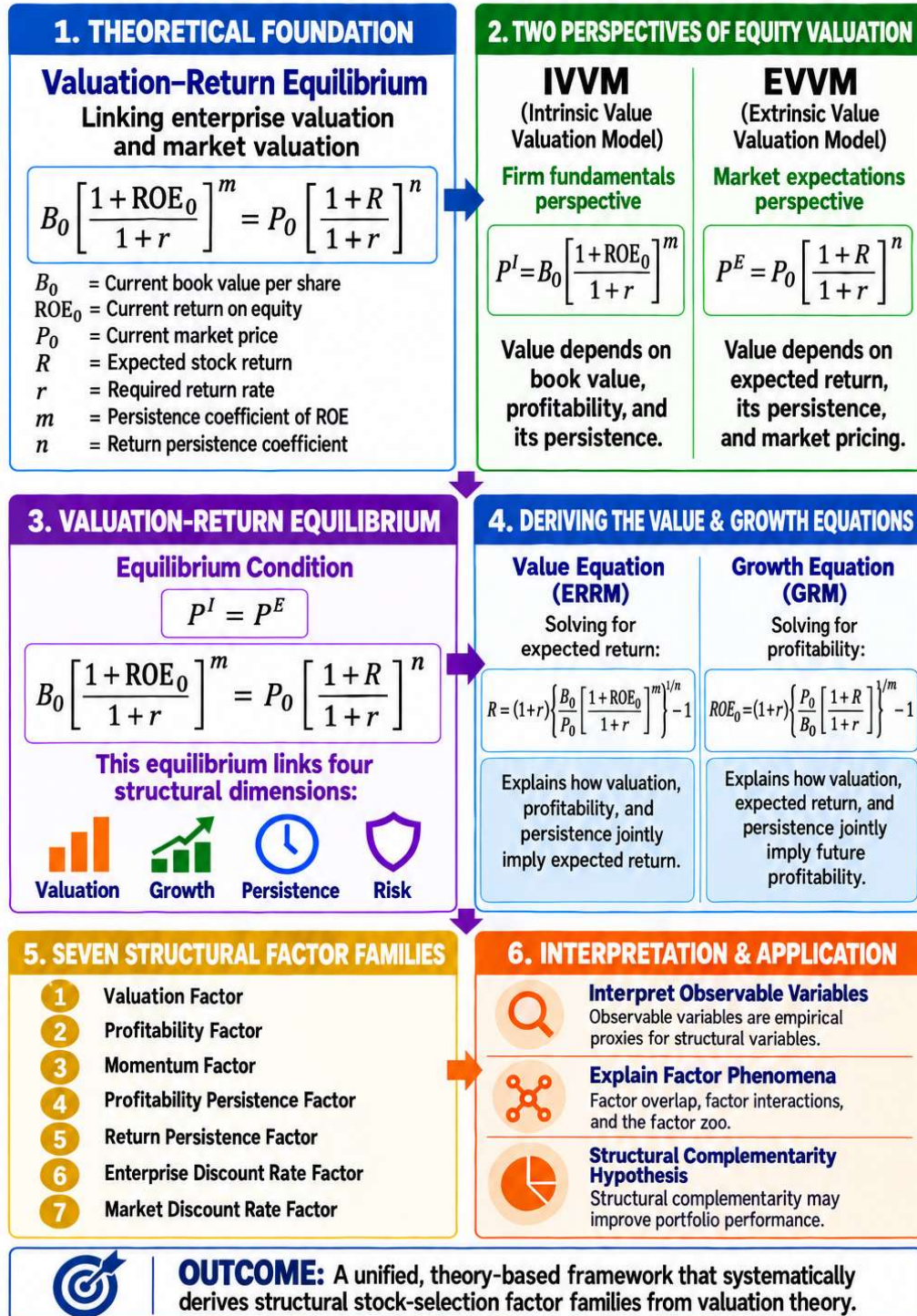


Figure 1. Research Framework for Generating Structural Stock-Selection Factors from Valuation Theory

Symmetric Valuation–Return Framework: Unifying Value and Growth Investing

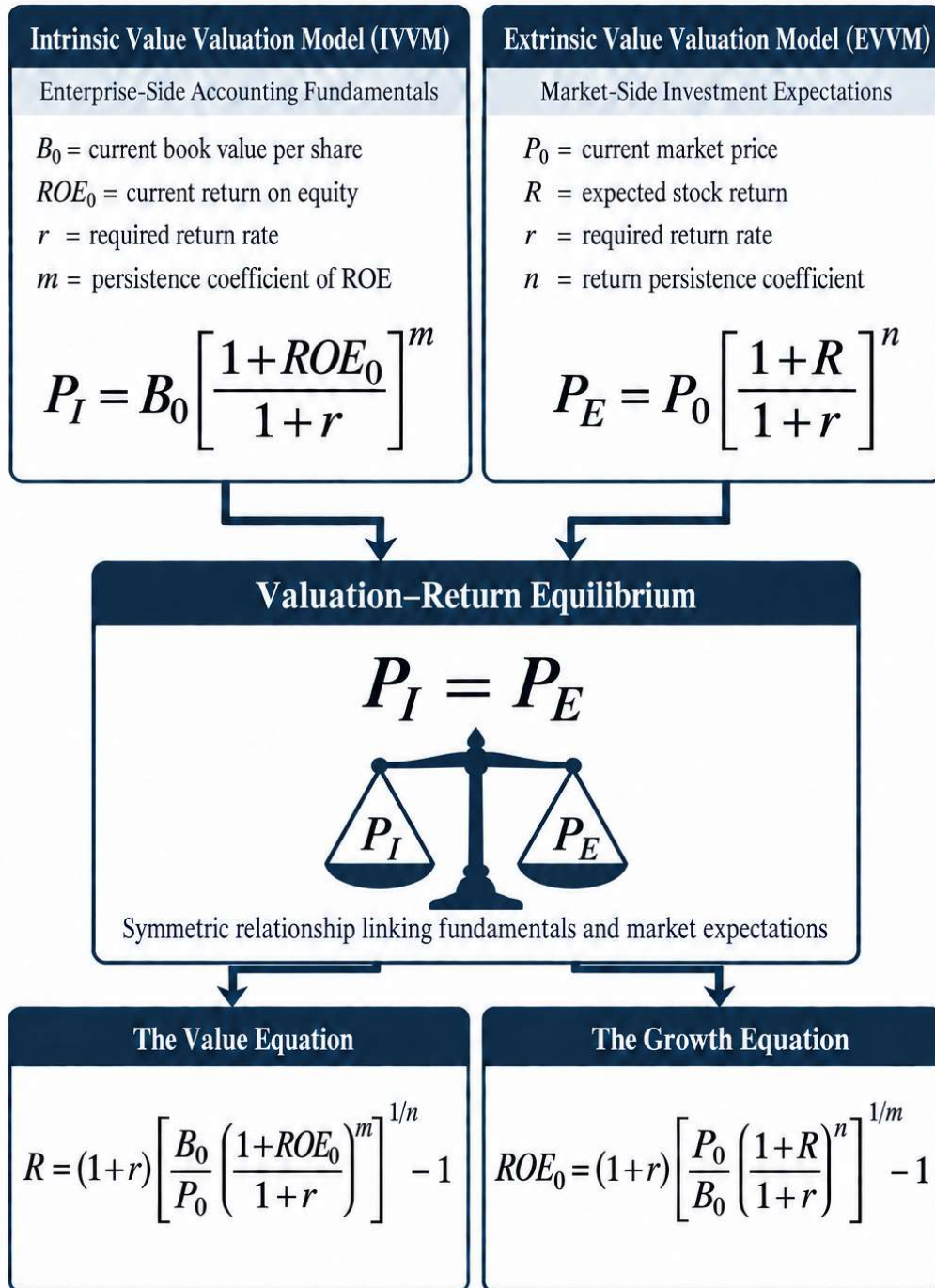


Figure 2. Symmetry Between Value and Growth

3.6 Symmetry Between Value and Growth

The key insight of this paper is that value investing and growth investing are generated from two inverse equations derived from the same equilibrium condition.

The value equation estimates future return from profitability and valuation:

$$\text{ROE, B/P} \Rightarrow \text{R}$$

The growth equation estimates future profitability from return dynamics and valuation:

$$\text{R, P/B} \Rightarrow \text{ROE}$$

Thus:

Value Investing: $\text{ROE} \rightarrow \text{R}$

Growth Investing: $\text{R} \rightarrow \text{ROE}$

The two approaches are therefore not fundamentally contradictory.

Rather, they represent two different informational directions embedded within the same valuation-return equilibrium system. The mapping of the structural dimensions to the eight structural variables is summarized in Figure 2.

4. Factor Generation Theory

4.1 Structural Logic of the Valuation–Return Equilibrium System

The valuation–return equilibrium framework developed in the previous section implies that stock-selection factors should not be viewed as independent empirical anomalies. Instead, they can be interpreted as structural variables generated by the interaction between two complementary perspectives: the enterprise-shareholder perspective and the stock-market-investor perspective.

The enterprise-shareholder perspective emphasizes long-term corporate value creation. From this perspective, the relevant object is the shareholder's ownership claim on the firm. The fundamental value of this claim is represented by book value, and its growth is represented by return on equity.

The stock-market-investor perspective emphasizes market valuation and investment return. From this perspective, the relevant object is the market price of the stock. The market value of this claim is represented by stock price, and its growth is represented by stock return.

These two perspectives are not contradictory. Rather, they represent two sides of the same valuation–return equilibrium system. The shareholder side focuses on corporate fundamentals and long-term value creation, whereas the investor side focuses on market prices and return dynamics. In equilibrium, the two sides must be linked.

This study therefore proposes that the factor generation system consists of four structural dimensions, each with an enterprise-side variable and a market-side variable:

$$D_V = (B, P)$$

$$D_G = (ROE, R)$$

$$D_P = (m_1, m_2)$$

$$D_R = (r_1, r_2)$$

where (B) denotes book value, (P) denotes stock price, (ROE) denotes return on equity, (R) denotes stock return, (m_1) denotes profitability persistence, (m_2) denotes return persistence, (r_1) denotes the fundamental discount rate associated with corporate profitability, and (r_2) denotes the market discount rate associated with stock-return risk.

For consistency with the notation used in Section 3, m_1 and m_2 correspond to m and n , respectively. The distinction between r_1 and r_2 represents a conceptual decomposition of the common required return r into enterprise-side and market-side risk perspectives, rather than two separately estimated discount rates in the baseline equations.

This structure generates eight structural variables organized into four dimensions. When expressed as factor families, B and P jointly define the valuation factor family, whereas ROE, R, m_1 , m_2 , r_1 , and r_2 define six additional factor families, yielding seven structural factor families. Thus, the four dimensions, eight structural variables, and seven factor families represent different levels of classification rather than competing taxonomies.

4.2 The Valuation Dimension: Book Value and Market Price

The first structural dimension is valuation.

Book Value

From the enterprise-shareholder perspective, the relevant valuation variable is book value: B. Book value represents the accounting value of shareholders' equity. It measures the capital base owned by shareholders and provides the fundamental anchor for intrinsic valuation.

Market Price

From the stock-market-investor perspective, the corresponding valuation variable is market price: P. Market price represents the value assigned to the same ownership claim by investors in the stock market. Unlike book value, market price changes continuously and reflects investors' expectations, sentiment, information processing, liquidity conditions, and risk preferences.

The relationship between (B) and (P) generates traditional valuation factors. For example, B/P represents the book-to-price ratio, while P/B represents the price-to-book ratio. These ratios are not primitive structural variables. Rather, they are relational variables connecting the enterprise side and the market side. A high B/P ratio indicates that the market price is low relative to book value and is therefore associated with value investing. A high P/B ratio indicates that the market price is high relative to book value and may reflect strong market expectations regarding future profitability.

Thus, valuation factors originate from the relationship between book value and market price: (B, P). This interpretation differs from traditional factor models, which often treat book-to-market as an isolated return predictor. In the present framework, valuation ratios are equilibrium variables that measure the relative position of enterprise value and market value.

4.3 The Growth Dimension: ROE and Stock Return

The second structural dimension is growth.

Growth of Book Value: return on equity

From the enterprise-shareholder perspective, the growth of shareholder value is represented by return on equity: ROE. ROE measures the rate at which the firm generates earnings relative to shareholders' equity. It therefore captures the growth rate of book value from the perspective of shareholders.

Growth of Market Price: rate of return

From the stock-market-investor perspective, the corresponding growth variable is stock return: R. Stock return measures the rate at which the market price of the stock changes over time. It therefore captures the growth rate of market value from the perspective of investors.

The pair (ROE, R) is central to the valuation–return equilibrium system. The shareholder side asks whether the firm can generate sustainable profitability. The investor side asks whether the stock can generate investment returns.

The value equation uses current profitability and valuation to explain future stock returns:

$$R_{t+1} = F\left(\frac{B_t}{P_t}, ROE_t, m_1, m_2, r_1, r_2\right) + \varepsilon_{t+1} \quad (17)$$

The growth equation uses market valuation and stock returns to infer future profitability:

$$ROE_{t+1} = G\left(\frac{P_t}{B_t}, R_t, m_1, m_2, r_1, r_2\right) + \eta_{t+1} \quad (18)$$

These two equations show that (ROE) and (R) are not unrelated variables. Instead, they form a symmetric pair. ROE represents the growth of enterprise value, while stock return represents the growth of market value.

This interpretation also clarifies the economic meaning of profitability and momentum-related factors. Profitability factors arise from the enterprise-side growth variable (ROE), whereas return-based factors arise from the market-side growth variable (R). The two are linked through valuation equilibrium rather than being independent factor categories.

4.4 The Persistence Dimension: Profitability Persistence and Return Persistence

The third structural dimension is persistence. While valuation describes the level of value and growth describes the rate of value creation, persistence describes the extent to which growth can be maintained through time.

Profitability Persistence

From the enterprise-shareholder perspective, persistence is represented by the persistence of profitability, denoted by m_1 . Profitability persistence measures the degree to which current profitability continues into future periods. A firm with a high value of m_1 is characterized by stable earnings, durable competitive advantages, strong market positions, or long-term growth opportunities. Conversely, a firm with a low value of m_1 exhibits greater earnings volatility and weaker long-term profitability sustainability.

Empirical accounting and finance research repeatedly document that profitability tends to display persistence but not permanent divergence. Accordingly, the framework assumes that the discounted growth rate of shareholders' equity gradually converges toward its long-run equilibrium level:

$$\frac{1 + ROE_{t+1}}{1 + r} = \left(\frac{1 + ROE_t}{1 + r} \right)^{1/b} \quad (19)$$

The parameter b denotes the mean reversion speed of profitability. A larger value of b ($b > 1$) implies quicker adjustment of profitability, and smaller persistence of profitability. Theoretically, profitability persistence

$$m_1 = \frac{1}{b - 1} \quad (20)$$

Return Persistence

From the stock-market-investor perspective, persistence is represented by the persistence of stock returns, denoted by m_2 . Return persistence measures the degree to which recent stock-price movements continue into future periods. A stock with a high

value of m_2 is characterized by strong trend-following behavior, sustained investor optimism or pessimism, and persistent price momentum. Conversely, a stock with a low value of m_2 exhibits weaker trend continuation and faster dissipation of return persistence.

Empirical finance research has documented that stock returns often display short- to intermediate-term momentum, although this persistence is not permanent and eventually weakens as prices adjust toward intrinsic value. Accordingly, the framework assumes that the expected return gradually converges toward its long-run equilibrium level:

$$\frac{1 + R_{t+1}}{1 + r} = \left(\frac{1 + R_t}{1 + r} \right)^{1/a} \quad (21)$$

The parameter a denotes the mean reversion speed of return. A larger value of a ($a > 1$) implies quicker adjustment of return, and smaller persistence of return. Theoretically, return persistence

$$m_2 = \frac{1}{a - 1} \quad (22)$$

The two persistence variables describe different aspects of economic reality. The first reflects the persistence of corporate performance, whereas the second reflects the persistence of market behavior. Nevertheless, both capture the same fundamental concept: the degree to which current growth carries forward into the future. Consequently, profitability persistence and return persistence form a natural pair within the valuation–return equilibrium system: (m_1 , m_2).

The enterprise side asks whether profitability can persist. The market side asks whether stock returns can persist. This interpretation provides a theoretical explanation for a wide range of persistence-related factors documented in the literature. Variables such as firm size, market share, revenue growth, investment intensity, and competitive advantage may influence profitability persistence. Similarly, momentum measures, turnover ratios, investor attention, and trading activity may influence return persistence.

Importantly, these observable variables should not be viewed as persistence factors themselves. Rather, they are potential determinants or proxies of the underlying persistence parameters m_1 and m_2 . This distinction is crucial because it suggests that many apparently different factors may ultimately reflect variations in a smaller number of structural persistence variables.

Furthermore, persistence need not be identical across firms, industries, or markets. Different industries exhibit different competitive structures, growth opportunities, and barriers to entry. As a result, profitability persistence may vary systematically across

sectors. Similarly, return persistence may differ across markets due to differences in investor composition, liquidity, and market efficiency.

Therefore, persistence factors may possess a hierarchical structure consisting of market-level, industry-level, and firm-level components. This perspective provides a possible explanation for why persistence-related factors often display substantial heterogeneity across empirical studies.

4.5 The Risk Dimension: Fundamental Discount Rate and Market Discount Rate

The fourth structural dimension is risk. While valuation determines the level of value, growth determines the rate of value creation, and persistence determines the sustainability of growth, risk determines how future growth is discounted into present value.

Enterprise Discount Rate

From the enterprise-shareholder perspective, risk is represented by the fundamental discount rate: r_1 . The fundamental discount rate reflects the uncertainty associated with future profitability and future book-value growth. A firm operating in a highly uncertain environment should be assigned a higher discount rate than a firm with stable and predictable profitability.

Consequently, the enterprise-side discount rate is related to the volatility of future profitability, earnings uncertainty, business risk, and long-term growth uncertainty. Within the valuation–return equilibrium framework, r_1 influences the present value of future shareholder wealth and therefore affects intrinsic valuation.

Market Discount Rate

From the stock-market-investor perspective, risk is represented by the market discount rate: r_2 . The market discount rate reflects the return required by investors to hold risky assets. Unlike r_1 , which focuses on corporate fundamentals, r_2 focuses on market risk and investor compensation.

Traditional asset-pricing theories, particularly the Capital Asset Pricing Model (CAPM), interpret required returns as compensation for systematic risk. Under this framework, higher-risk assets should be associated with higher expected returns. Accordingly, r_2 is related to variables such as market beta, return volatility, downside risk, liquidity risk, and other measures of investment uncertainty.

The two discount rates therefore represent different dimensions of risk: (r_1 , r_2). The enterprise side evaluates the uncertainty of future profitability, whereas the market side evaluates the uncertainty of future investment returns.

Although the two discount rates are conceptually distinct, they are linked through valuation equilibrium. In the long run, firms generating higher profitability tend to attract higher market valuations, while investors require compensation for bearing the associated risks. Consequently, the enterprise-side and market-side discount rates should not be viewed as independent variables. Rather, they represent different manifestations of risk within the same economic system.

An important implication of this framework is that many traditional risk factors may be interpreted as observable proxies for the underlying discount-rate variables (r_1) and (r_2). For example, variables such as earnings volatility, cash-flow volatility, leverage, and business uncertainty may serve as proxies for (r_1). Similarly, beta, return volatility, downside risk, liquidity risk, and other market-based measures may serve as proxies for (r_2).

This interpretation provides a unified explanation for the large number of risk-related factors documented in the literature. Rather than representing independent sources of return predictability, many risk factors may simply reflect different measurements of a smaller number of underlying discount-rate variables.

Furthermore, similar to persistence factors, discount-rate factors may exhibit hierarchical structures. Different industries, firms, and markets may possess different levels of fundamental risk and market risk. Consequently, both (r_1) and (r_2) may vary across markets, industries, and firms.

This perspective suggests that risk factors should be viewed not as fixed quantities but as structural parameters whose values depend on economic environments, competitive conditions, and investor behavior.

5. Observable Factors as Proxies for Structural Variables

5.1 From Structural Variables to Observable Factors

The factor generation theory developed in the previous section proposes that the valuation–return equilibrium system consists of eight structural variables: (B , ROE , m_1 , r_1) and (P , R , m_2 , r_2). These variables represent the fundamental building blocks of the equilibrium system.

However, most empirical asset-pricing studies do not directly measure these structural variables. Instead, they employ observable characteristics that serve as proxies for the underlying economic dimensions.

Consequently, many documented stock-selection factors should be interpreted as observable manifestations of a smaller set of structural variables rather than as

independent sources of return predictability. This perspective provides the foundation for a unified interpretation of the factor zoo.

Most structural variables in the valuation–return equilibrium system are directly observable or can be reasonably approximated from accounting and market data. Book value, market price, profitability, and stock returns can be measured directly. Discount-rate variables may be approximated using long-run required returns or risk-related measures. In contrast, profitability persistence and return persistence are generally latent variables that must be inferred indirectly. Consequently, observable stock-selection factors often serve as proxies for these underlying persistence dimensions.

5.2 Observable Proxies for the Valuation Dimension

The valuation dimension consists of (B, P) and describes the relationship between enterprise value and market value. The most widely used valuation proxies include: B/P, P/B, E/P, CF/P, and dividend yield.

Although these measures appear different, they all attempt to capture the relationship between accounting value and market value. For example, the book-to-price ratio compares shareholders' equity with market valuation, while the earnings-to-price ratio compares current earnings with market valuation.

Therefore, these variables should be viewed as alternative measurements of the same structural valuation dimension.

5.3 Observable Proxies for the Growth Dimension

The growth dimension consists of (ROE, R) and reflects value creation from both the shareholder and investor perspectives. On the enterprise side, common growth proxies include: ROE, ROA, gross profitability, operating profitability, and earnings growth. These variables measure different aspects of corporate performance and value creation.

On the market side, growth is represented by stock returns and return-related measures, including: R, past returns, relative strength, and momentum measures. Although profitability and momentum are often treated as separate factor categories, the valuation–return equilibrium framework suggests that they represent different manifestations of the same growth dimension.

5.4 Observable Proxies for the Persistence Dimension

The persistence dimension consists of (m_1 , m_2) and captures the sustainability of growth through time. Unlike valuation and growth variables, persistence variables are generally not directly observable. Instead, they are inferred through various firm characteristics.

Potential proxies for profitability persistence include: firm size, market share, revenue growth stability, investment intensity, research and development expenditures, competitive advantage indicators. These variables influence the degree to which current profitability can be sustained in future periods.

Similarly, potential proxies for return persistence include: momentum measures, turnover ratios, investor attention indicators, trading activity measures, ownership concentration. These variables influence the degree to which return trends continue over time.

An important implication of the factor generation theory is that many apparently unrelated factors may actually reflect different determinants of the same persistence variables.

5.5 Observable Proxies for the Risk Dimension

The risk dimension consists of (r_1, r_2) and captures uncertainty on both the enterprise side and the market side.

Enterprise-side risk proxies include: earnings volatility, cash-flow volatility, leverage, operating leverage, business uncertainty. These variables influence the uncertainty of future profitability and therefore affect the fundamental discount rate.

Market-side risk proxies include: beta, return volatility, downside risk, liquidity risk, idiosyncratic volatility. These variables influence the required return demanded by investors and therefore affect the market discount rate.

Within the proposed framework, these variables are not risk factors themselves. Rather, they serve as observable measurements of the underlying discount-rate variables.

5.6 A Unified Interpretation of the Factor Zoo

The factor-zoo literature documents hundreds of return predictors. Traditional interpretations often view these predictors as distinct factors. The factor generation theory offers a different perspective.

Many documented factors may not represent independent sources of return predictability. Instead, they may serve as alternative proxies for a relatively small number of structural variables embedded within the valuation–return equilibrium system.

Under this interpretation, the large number of reported factors does not necessarily imply the existence of hundreds of independent economic mechanisms. Instead, factor proliferation may arise because researchers employ different observable variables to measure similar underlying structural dimensions. Consequently, the factor zoo may be viewed as a collection of observable proxies rather than a collection of fundamentally distinct factors.

This interpretation provides a theoretical explanation for both the proliferation of factors and the widespread success of multi-factor investing.

The large number of documented factors does not necessarily imply the existence of an equally large number of independent economic mechanisms. Instead, many factors may represent alternative measurements of the same structural variable. Consequently, the factor zoo may be substantially compressed into a smaller set of structural dimensions.

5.7 Multiple Proxies and Factor Overlap

One important implication of the factor generation theory is that a single observable factor may simultaneously reflect multiple structural dimensions. Traditional factor classifications implicitly assume that each factor belongs to a unique category. However, many empirical variables contain information regarding more than one structural variable.

For example, ROE contains information about profitability growth. At the same time, firms with persistently high ROE often possess stronger profitability persistence. Consequently, ROE may reflect both the growth dimension and the persistence dimension.

Similarly, P/B contains information about valuation. However, growth firms frequently trade at high valuation multiples because investors expect superior future profitability. Therefore, market valuation ratios may contain information regarding both valuation and growth.

The same logic applies to firm size, investment intensity, leverage, volatility, and many other documented factors. As a result, observable factors should not always be assigned to a single category. Instead, many factors may represent combinations of multiple structural dimensions. This perspective provides a natural explanation for why factor classifications frequently overlap and why the boundaries between factor families are often unclear. The definitions and economic interpretations of the variables used in the valuation framework are summarized in Table 1.

Table 1. Structural Variables and Representative Observable Factors

Dimension	Perspective	Structural Variable	Representative Observable Factors
Valuation	Enterprise	B	P/B, P/E, P/CF
	Market	P	
Growth	Enterprise	ROE	ROE, ROA, ROIC
	Market	R	Quarterly Return, Annual Return
Risk	Enterprise	r_1	Earnings Volatility, Cash-Flow Volatility, Leverage, Beta of ROE, Volatility of ROE
	Market	r_2	Market Beta, Return Volatility, Downside Risk, Liquidity Risk
Persistence	Enterprise	m_1	ROE Persistence, Earnings Stability, Sales Growth Stability
	Market	m_2	Momentum, Relative Strength, Turnover, Investor Attention, Market Value

5.8 Implications for Future Factor Research

The factor generation theory has important implications for future asset-pricing research. Traditionally, researchers have focused on discovering new factors capable of predicting future returns. Under the proposed framework, however, the primary objective shifts from factor discovery to structural interpretation.

Rather than asking whether a new factor predicts returns, researchers should ask which structural variable the factor measures. This shift in perspective may substantially reduce the apparent complexity of the factor zoo.

If numerous observable factors are measuring similar structural variables, then the true number of underlying economic mechanisms may be much smaller than the number of reported factors. Consequently, future research should focus not only on identifying new factors but also on understanding the structural variables that generate those factors.

The proposed framework suggests that progress in factor investing may depend less on discovering additional factors and more on improving the measurement of the underlying structural dimensions.

6. Discussion

6.1 From Factor Discovery to Factor Generation

The development of factor investing has traditionally followed an empirical discovery paradigm. Researchers begin by proposing an observable firm characteristic, evaluate its ability to predict future stock returns, and subsequently investigate its possible economic interpretation. This research strategy has produced a large and continuously expanding collection of stock-selection variables, commonly referred to as the factor zoo. Although many of these variables exhibit statistically significant predictive ability, the process by which they are identified is largely empirical, and the structural relationships among them remain only partially understood.

The valuation–return equilibrium developed in this study suggests a fundamentally different perspective. Instead of beginning with observable variables and asking whether they predict future returns, the proposed framework begins with economic theory. By linking enterprise valuation and market valuation through a common equilibrium, the framework derives structural stock-selection factors analytically before considering their observable empirical measurements. Observable variables therefore become measurements of underlying economic mechanisms rather than the starting point of factor discovery.

This distinction represents a conceptual shift from **factor discovery** to **factor generation**. Under the traditional approach, each newly identified variable is often regarded as a potential new factor. In contrast, the proposed framework argues that observable variables should first be interpreted according to the structural information they measure. Multiple variables may therefore represent different empirical proxies for the same structural factor, while a single observable variable may simultaneously reflect more than one structural factor. Consequently, the discovery of additional observable variables does not necessarily imply the existence of additional independent economic mechanisms.

The proposed perspective also changes the objective of future factor research. Rather than continuously expanding the list of observable predictors, future studies may focus on identifying the underlying structural factors from which observable variables originate. Improvements in accounting measurements, market indicators, machine-learning techniques, or portfolio construction methods should therefore be viewed primarily as improvements in the empirical measurement of structural information rather than as evidence for an ever-growing number of independent factors.

More broadly, the proposed framework illustrates how valuation theory can serve as a foundation for systematic factor generation. The valuation–return equilibrium specifies the economic information required to connect enterprise fundamentals with market prices, and the resulting structural factors emerge naturally from this equilibrium rather than from statistical screening. This theoretical perspective complements, rather than replaces, existing empirical factor research by providing a

common structural framework within which previously documented observable variables can be interpreted and organized.

The transition from factor discovery to factor generation therefore represents more than a change in methodology. It reflects a shift in the underlying philosophy of factor research—from searching for statistically significant variables toward understanding the economic structure that gives rise to those variables. Within this perspective, the principal objective of future research is not simply to discover more factors, but to deepen our understanding of the structural mechanisms through which valuation information is transformed into observable stock-selection characteristics.

6.2 Structural Interpretation of Observable Stock-Selection Variables

One of the most important implications of the proposed framework is that observable stock-selection variables should be distinguished from structural stock-selection factors. Existing empirical studies generally treat accounting ratios, market indicators, or other firm characteristics as factors because they exhibit return predictability. However, within the valuation–return equilibrium developed in this study, these variables are more appropriately interpreted as observable measurements of underlying structural information.

This distinction helps explain why many documented factors exhibit substantial empirical overlap. Variables such as book-to-price ratios, earnings yields, cash-flow yields, and dividend yields are frequently reported as separate factors in the empirical literature. From a structural perspective, however, these variables primarily measure different aspects of the same valuation factor. Similarly, profitability measures including return on equity, return on assets, gross profitability, and operating profitability can be interpreted as alternative measurements of the profitability factor rather than independent economic mechanisms.

The same interpretation extends to market-based variables. Momentum, price trends, and other return-based indicators are not necessarily distinct sources of return predictability. Instead, they represent alternative observable measurements of market information and return persistence generated by the valuation–return equilibrium. Consequently, differences among observable variables often reflect differences in measurement methods rather than differences in underlying economic structure.

An important consequence of this perspective is that the number of observable variables is not expected to equal the number of structural factors. A single structural factor may be represented by numerous observable measurements, while one observable variable may simultaneously contain information associated with multiple

structural factors. Observable variables therefore should not be interpreted independently without considering the structural information embedded within them.

This structural interpretation also provides a natural explanation for the continuing expansion of empirical factor research. As accounting information, financial databases, statistical methodologies, and machine-learning techniques continue to evolve, researchers are able to construct increasingly diverse observable variables. Such developments enrich the measurement of structural information but do not necessarily imply that financial markets contain an ever-growing number of independent pricing mechanisms.

The proposed framework therefore suggests that future research should distinguish clearly between **structural factors**, which represent fundamental economic mechanisms derived from valuation theory, and **observable stock-selection variables**, which provide empirical measurements of those mechanisms. Establishing this distinction offers a unified perspective for interpreting existing empirical findings while providing a common theoretical language for future factor research.

6.3 Implications for Future Factor Research

The proposed framework has several implications for the future development of factor research. Most existing studies seek to improve investment performance by identifying additional observable variables that exhibit incremental return predictability. This empirical strategy has contributed substantially to the rapid expansion of the factor literature. However, from the perspective of the valuation–return equilibrium, future progress may depend less on discovering additional observable variables than on improving our understanding of the structural information that those variables represent.

Within the proposed framework, the primary objective of future research is to identify the structural factors underlying observable stock-selection variables. Observable variables should therefore be evaluated not only according to their predictive performance but also according to the structural information they contain. Variables exhibiting similar predictive ability may measure different structural factors, while variables constructed from different accounting or market information may ultimately represent alternative measurements of the same structural factor.

This perspective also suggests that future factor development should emphasize improvements in measurement rather than continual expansion of factor lists. Advances in accounting quality, financial reporting, market microdata, and machine-learning techniques are likely to generate increasingly accurate measurements of structural information. Such developments may substantially improve portfolio performance without requiring the introduction of additional structural factors.

Another important implication concerns factor interactions. Traditional empirical studies often interpret interactions among observable variables as statistical phenomena.

In contrast, the valuation–return equilibrium suggests that these interactions may arise because observable variables jointly measure multiple structural factors. Understanding the structural origin of factor interactions may therefore become an important direction for future theoretical and empirical research.

The proposed framework also provides a basis for systematic factor classification. Instead of organizing factors according to data sources or empirical performance, future studies may classify observable variables according to the structural factors they primarily measure. Such a classification system would facilitate comparisons across studies, improve the interpretation of newly proposed variables, and provide a common theoretical language for factor research.

More broadly, the transition from factor discovery to factor generation suggests a gradual convergence between valuation theory and empirical factor investing. Rather than treating theoretical models and empirical predictors as separate research traditions, future studies may integrate both perspectives within a unified structural framework in which economic theory guides factor generation and empirical analysis evaluates alternative measurements of structural information.

6.4 Structural Foundations of Multi-Factor Investing

The widespread adoption of multi-factor investing has demonstrated that portfolios constructed from multiple stock-selection variables frequently outperform strategies based on a single factor. Existing studies generally attribute this improvement to diversification, reduced estimation error, or the complementary predictive power of different observable variables. While these explanations are empirically useful, they do not fully explain why combining factors should systematically improve investment performance.

The valuation–return equilibrium suggests a structural complementarity hypothesis for multi-factor investing. Within the proposed framework, observable stock-selection variables measure different components of the information required to establish the equilibrium between enterprise valuation and market valuation. Under this hypothesis, combining variables associated with different structural factors may allow investors to integrate complementary economic information rather than merely combining multiple statistical predictors.

This distinction also provides a possible hypothesis for why multi-factor strategies may perform differently. Combining several observable variables that primarily measure the same structural factor may provide only limited additional information because these variables largely reflect the same underlying economic mechanism. In contrast, combining variables associated with different structural factors increases the diversity of structural information incorporated into the investment decision. The structural complementarity hypothesis therefore predicts that portfolio performance

may depend not only on the number of observable variables employed but also on the complementarity among those variables.

The proposed framework further suggests that factor interactions should not always be interpreted as purely statistical phenomena. Since many observable variables simultaneously contain information related to more than one structural factor, interactions among variables may arise naturally from overlapping structural information. Understanding these interactions therefore requires identifying the structural origin of each observable variable rather than considering only its empirical return predictability.

From this perspective, future multi-factor portfolio construction may benefit from shifting its emphasis from variable selection to structural information allocation. Instead of maximizing the number of observable predictors, investors may seek to combine variables representing complementary structural factors while avoiding redundant measurements of the same underlying economic mechanism. Such an approach provides a theoretical basis for designing more parsimonious and economically interpretable multi-factor investment strategies.

6.5 Hierarchical Structure of Persistence and Risk

An additional implication of the framework concerns the hierarchical nature of persistence and risk.

The persistence parameters m_1 and m_2 need not be constant across firms, industries, or markets. Profitability persistence is likely to depend on competitive structure, barriers to entry, technological change, and industry characteristics. Similarly, return persistence may vary according to market liquidity, investor composition, and trading behavior. Consequently, persistence may possess a hierarchical structure consisting of market-level, industry-level, and firm-level components.

The same logic applies to discount-rate variables r_1 and r_2 . Different firms and industries face different levels of business risk, while different markets exhibit different risk premia and investor preferences.

Future research may therefore investigate persistence and risk not as fixed parameters but as hierarchical variables influenced by broader economic environments.

6.6 Relationship with Existing Asset-Pricing Models

The proposed framework complements rather than replaces existing asset-pricing models.

- The Capital Asset Pricing Model emphasizes systematic risk.
- The Fama–French models emphasize value, size, profitability, and investment effects.
- Momentum models emphasize expectation dynamics.

The factor generation theory does not reject these approaches. Instead, it provides a common framework capable of organizing them into a unified structure. Consequently, the proposed framework may be viewed as a higher-level conceptual model linking various strands of the asset-pricing literature.

6.7 Limitations and Future Research

Although the proposed valuation–return equilibrium provides a unified theoretical framework for generating structural stock-selection factors, several limitations should be acknowledged.

First, the present study focuses on the theoretical development of the structural framework and does not provide a comprehensive empirical validation of its implications. Future research may examine the predictive performance of the proposed structural components, the empirical relationships between structural variables and observable factor proxies, and the applicability of the framework across different markets and investment horizons.

Second, the present framework is developed from the perspective of firm-level valuation. Consequently, the proposed structural factors primarily explain stock-selection characteristics associated with corporate fundamentals and market expectations. Broader sources of return variation arising from macroeconomic conditions, monetary policy, market microstructure, investor sentiment, or option pricing are beyond the scope of the current framework. Extending the valuation–return equilibrium to incorporate these additional economic dimensions represents an important direction for future theoretical research.

Third, observable stock-selection variables frequently contain information associated with multiple structural factors. Although the proposed framework provides a conceptual basis for interpreting these relationships, identifying the relative contribution of each structural factor remains an important empirical challenge. Future studies may employ statistical learning, latent-variable models, or structural estimation techniques to quantify the structural composition of observable variables.

Finally, the proposed framework establishes a theoretical foundation for factor generation rather than a complete theory of asset pricing. The objective of this study is to explain how valuation-related information gives rise to structural stock-selection factors. Future research may further investigate how this framework can be integrated with broader asset-pricing theories, portfolio optimization models, and investment decision systems.

Despite these limitations, the valuation–return equilibrium provides a new perspective on stock-selection research by demonstrating that structural factors may be derived systematically from valuation theory rather than discovered solely through empirical exploration. It is hoped that the proposed framework will stimulate further

theoretical and empirical research toward a more unified understanding of factor investing.

6.8 Positioning the Factor Generation Theory

The factor generation theory differs from conventional asset-pricing frameworks in both its starting point and its primary objective. Traditional models generally begin with observed return patterns and seek to identify factors that explain the cross-sectional variation in expected returns. The present framework instead begins with valuation theory and asks how stock-selection factors are generated from the equilibrium linking enterprise fundamentals and market valuation.

This distinction places the proposed framework at a different analytical level. Models such as the Capital Asset Pricing Model, the Fama–French models, the Carhart four-factor model (Carhart, 1997), and the q-factor model (Hou, Xue, and Zhang, 2015) focus primarily on the pricing or explanatory roles of specified factors. By contrast, the factor generation theory focuses on the structural origins of factor information. It does not seek to replace existing asset-pricing models or claim superior return-explanatory power. Rather, it provides a higher-level framework for interpreting why valuation, profitability, momentum, persistence, and risk-related variables arise and how they are connected.

From this perspective, established factor models may be viewed as empirical implementations of selected components of the valuation–return equilibrium. Value factors reflect valuation information, profitability factors reflect enterprise growth information, momentum reflects market-return information, and investment-related variables may contain information associated with persistence or discount rates. The proposed framework therefore provides a common structural language through which different factor models can be compared without treating them as mutually exclusive theories.

The distinction between empirical factors and structural factors is central to this positioning. Existing models generally operate with observable factor portfolios or firm characteristics. The present framework introduces an underlying structural layer that links those observable measures to valuation theory. Its contribution therefore lies not in adding another factor model to the existing literature, but in explaining how multiple factor families may arise from a common valuation–return equilibrium.

Accordingly, the factor generation theory should be interpreted as complementary to, rather than competitive with, conventional asset-pricing models. Its role is to organize and explain the structural relationships among established factors, while empirical models continue to evaluate their pricing performance and investment usefulness. The relationship between the proposed structural taxonomy and existing factor models is summarized in Table 2.

Table 2. Comparison of Major Asset-Pricing Frameworks

Framework	Factors Included in the Model	Number of Factors
CAPM	Market Risk	1
Fama–French 3-Factor	Market, Size, Value	3
Carhart 4-Factor	Market, Size, Value, Momentum	4
Fama–French 5-Factor	Market, Size, Value, Profitability, Investment	5
q-Factor Model	Market, Size, Investment, Profitability	4
Factor Zoo Literature	Value, Momentum, Investment, Profitability, Size, Risk, Liquidity, Issuance, Distress, Quality, etc.	Hundreds
Factor Generation Theory	(Valuation, Growth, Risk, Persistence) × (Enterprise, Market)	$4 \times 2 = 8$

7. Conclusion

Summary

The rapid expansion of factor investing has generated a large number of observable stock-selection variables, yet the structural origin of these variables has remained largely unexplained. Rather than identifying additional return predictors empirically, this study develops a valuation-based framework that systematically derives structural stock-selection factors from the valuation–return equilibrium linking enterprise valuation and market valuation. The resulting framework provides a theoretical foundation for understanding how valuation information is transformed into observable stock-selection characteristics.

Main Contributions

The present study makes three principal contributions to the factor-investing literature.

First, it shifts the perspective of factor research from empirical factor discovery toward theoretical factor generation by deriving structural stock-selection factors directly from valuation theory.

Second, it distinguishes structural factors from observable stock-selection variables, thereby providing a unified structural interpretation of the factor zoo and explaining why different observable variables may measure the same underlying economic mechanism.

Third, the proposed framework establishes an integrated theoretical foundation linking valuation theory, factor investing, and empirical asset-pricing research, demonstrating that value investing and growth investing are complementary manifestations of a common valuation–return equilibrium rather than competing investment philosophies.

Future Research

The proposed framework also opens several directions for future research. Empirical studies may examine the structural composition of observable stock-selection variables, evaluate alternative measurements of structural factors, and investigate the interaction among complementary structural information. Extensions of the valuation–return equilibrium may further incorporate macroeconomic variables, market-wide information, and additional dimensions of firm valuation. Such developments would contribute to a more comprehensive theory of factor generation while providing new insights into portfolio construction and asset pricing.

Final Remarks

Traditional factor research has achieved remarkable success in documenting variables that predict future stock returns. The next stage of factor research, however, may depend less on discovering additional observable variables than on understanding the structural economic mechanisms from which those variables originate. By demonstrating that stock-selection factors can be systematically generated from valuation theory through the valuation–return equilibrium, the present study provides a new theoretical perspective for interpreting existing factor evidence and guiding future factor research. It is hoped that this framework will contribute to a more unified understanding of valuation theory, factor investing, and modern asset-pricing research.

References

- Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9(1), 3–18.
- Basu, S. (1977). Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *The Journal of Finance*, 32(3), 663–682.
- Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of Finance*, 52(1), 57–82.
- Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, 47(2), 427–465.
- Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3–56.

- Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *Journal of Financial Economics*, 116(1), 1–22.
- Green, J., Hand, J. R. M., & Zhang, X. F. (2017). The characteristics that provide independent information about average U.S. monthly stock returns. *Review of Financial Studies*, 30(12), 4389–4436.
- Harvey, C. R., Liu, Y., & Zhu, H. (2016). ...and the cross-section of expected returns. *Review of Financial Studies*, 29(1), 5–68.
- Hou, K., Xue, C., & Zhang, L. (2015). Digesting anomalies: An investment approach. *Review of Financial Studies*, 28(3), 650–705.
- Hou, K., Xue, C., & Zhang, L. (2020). Replicating anomalies. *Review of Financial Studies*, 33(5), 2019–2133.
- Jegadeesh, N., & Titman, S. (1993). Returns to buying winners and selling losers: Implications for stock market efficiency. *The Journal of Finance*, 48(1), 65–91.
- Kong, D., Lin, C. P., Yeh, I. C., & Chang, W. (2019). Building growth and value hybrid valuation model with errors-in-variables regression. *Applied Economics Letters*, 26(5), 370–386.
- McLean, R. D., & Pontiff, J. (2016). Does academic research destroy stock return predictability? *The Journal of Finance*, 71(1), 5–32.
- Novy-Marx, R. (2013). The other side of value: The gross profitability premium. *Journal of Financial Economics*, 108(1), 1–28.
- Yeh, I. C. (2024). Comparisons of residual income model and growth value model. *Applied Economics*, 56(11), 1327–1345.
- Yeh, I. C. (2025). A closed-form formula for equity valuation model based on differential equation. *OPSEARCH*, 62(2), 1039–1060.
- Yeh, I. C., & Chi, W. S. (2025). Stock valuation model based on mean reversion of return on equity. *OPSEARCH*, 1 – 37.
- Yeh, I. C., & Hsu, T. K. (2011). Growth value two-factor model. *Journal of Asset Management*, 11, 435–451.
- Yeh, I. C., & Lien, C. H. (2017). Growth and value hybrid valuation model based on mean reversion. *Applied Economics*, 49(50), 5092–5116.
- Yeh, I. C., & Liu, Y. C. (2023). Exploring the growth value equity valuation model with data visualization. *Financial Innovation*, 9(1), 2.