

New Perspective on Investment Models

Kees Koedijk and Alfred Slager

Kees Koedijk

is a professor of banking and finance at Utrecht University School of Economics in Utrecht, The Netherlands.

c.g.koedijk@uu.nl

Alfred Slager

is a professor of pension fund management at TIAS School for Business and Society at Tilburg University in Tilburg, The Netherlands.

a.slager@tias.edu

KEY FINDINGS

- Every investor works with an investment model: a unique combination of goals, risk appetite, investment beliefs, and governance of investment implementation.
- Making the underlying assumptions and consequences explicit is key; otherwise, achieving long-term success is a struggle.
- Investment models evolve slowly. The increased focus on long-term, private assets and the incorporation of societal goals are new elements but do not (yet) form an entirely new model. Thus, we have to keep learning from and adapting the existing ones.

ABSTRACT

What is the secret ingredient to securing better long-term investment outcomes? Investors seldom consider institutional investors from an organizational and strategic perspective. Thinking in terms of investment models highlights a severely under-researched area. The authors propose that this different lens is required to make sense of the dynamics in the investment industry and has a lot to offer to boards that are open to this. Five models dominate the investment industry, and the authors identify an emergent one that has its roots in the existing models but takes a strong societal perspective, which they denote the *prudent society* investment model. Thinking in terms of investment models, boards and decision makers will be able, far better than today, to determine why, how, and what is needed for investment success.

TOPICS

[Long-term/retirement investing](#), [pension funds](#), [portfolio theory](#), [financial crises and financial market history](#)*

Putting thought into the design of the investment model pays off. In 2004, pension expert Ambachtsheer analyzed the investment organizations of Harvard Management Company (HMC) and the Ontario Teachers' Pension Plan Board (OTPP), both organizations renowned for their innovative investment policies and strong returns. HMC, which manages Harvard University's endowment, worth almost \$41 billion at the end of 2019, surpassed the university's total return target and its internal benchmark, realizing an annualized rate of return of more than 11% over the previous 20 years. The Canadian pension fund, OTPP, with \$207.4 billion in net assets at the end of 2019, realized an average annual rate of return of 9.5% since 1990, generating almost one-quarter of the fund's growth over its market benchmarks. Ambachtsheer (2004) concluded that the success of these funds can be attributed to a legal foundation that clarifies stakeholders' interests and minimizes the potential

*All articles are now categorized by topics and subtopics. [View at PM-Research.com](#).

for agency conflicts, as well as a governance process that crystallizes the organizations' mission and is based on an understanding of the critical elements needed to achieve it. This gives both funds clear mandates and a well-thought-out governance process, two keys to success. Dalio (2017), founder of global macro investment firm Bridgewater, expands this further, attributing the success of Bridgewater to a well-thought-out and radically executed investment philosophy. All examples have in common a clearly outlined and executed investment model.

INVESTMENT MODEL

An investment model is formed from a unique combination of goals, risk appetite, investment beliefs, and governance of investment implementation. It exists as a blueprint to achieve the pension fund's goals on behalf of its participants; guides the investment decisions and resources of the fund; and, in an ideal situation, directs the board on which strategic tenets they should focus. This implies that every investment organization has an investment model, of which boards are in most cases implicitly and, with a few exceptions, explicitly aware. However, it is safe to argue that many trustees are not aware that they are in charge of an investment model, let alone that there are multiple possible models from which to choose. Rather, trustees often find themselves following an existing model, in which the natural focus is to try to improve the investment choices that have been made, rather than asking questions such as "Could we do this differently and better?" The models in place today have been developed by Canadian pension funds, US endowments, and the Norway Fund, but more models also exist. Focusing on the commonalities, we can group the main approaches in the following fashion: the traditional asset allocation model, the operational benchmark model, the endowment model, the factor allocation model, and the risk parity model (see, e.g., Koedijk, Slager, and Van Dam 2019).

Each model presented in Exhibit 1 is described by a number of elements that a board considers as part of the blueprint. For instance: Is the primary focus on liabilities/risk or on return generation? What is the level of delegation to the investment manager by the board? We will now discuss these models in more detail.

MODEL 1: TRADITIONAL ASSET ALLOCATION MODEL

The traditional asset allocation model is rooted in traditional investment textbooks and courses and is as such the natural default for boards and trustees to consider. Pension funds usually aim to generate a specified net return over liabilities at the lowest possible risk. Four ingredients drive investment decision making: matching assets and liabilities, risk management through portfolio diversification, generating investment returns on top of the matching return, and managing costs.

The sequence of actions is usually implemented in a decision-making hierarchy. The board first describes the preferences of its participants and translates their risk aversion into a risk appetite statement; how much risk are they willing to take and under which circumstances? The outcome of this discussion is reflected in the share of matching versus return or bonds versus equities. Next, the translation of risk appetite into quantifiable measures forms the framework for the strategic asset allocation, which is in turn further specified in terms of investment styles and made explicit in a number of mandates that can be handed out to internal or external investment managers. Generally, the board of trustees of a pension fund, endowment, or foundation establishes the strategic asset allocation across major asset classes.

EXHIBIT 1**Stylized Elements of Investment Models**

Model	Liabilities/ Return Focus	Board Delegation	Portfolio Construction	Implementation	Issues for Decision Makers to Resolve in the Investment Model	Examples
1. Traditional Asset Allocation Model	Return or return/liabilities	Depends	Asset–liability management process-driven strategic benchmark is translated to mandates	External/internal, many different mandates	Alpha, cost, and oversight	Smaller and traditional funds
2. Operational Benchmark Model	Return or return/liabilities	Delegation follows benchmarks. Board determines generic benchmark to capture risk appetite.	Generic benchmark is reference for policy benchmark, to reflect value of diversification and (additional) return/risk sources	External/internal. Depends on how the policy benchmark is translated to an operational benchmark, guiding mandates	Managing complexity: creating a consistent framework for three types of benchmarks provides clear delegation but has different evaluation/investing horizons	Norway Fund
3. Endowment Model	Return	Very high	Return objective or simple reference portfolio	External/internal, deep relationships, and long-term relationships	Overconfidence, dominance by one or small group of people	Yale, Harvard, MIT
4. Factor Allocation Model	Risk–return	High	Allocate to factors, not to asset classes	Usually occurs with a high derivative content	Understanding both the conceptual and operational sides of the process	Arbejdsmarkedets Tillaegspension (ATP)
5. Risk Parity Model	Return	Delegation to investment management organization	Risk weightings are spread evenly over scenarios. The asset allocation is the results of that process	Disciplined and scenario based	Leverage needed to allocate risk evenly	Bridgewater, AQR

The choice of strategic asset allocation is paramount here: The underlying assumption is that the choice of policy portfolio (asset allocation and resulting benchmarks) accounts for the bulk of the variability in returns. The policy portfolio is based on the widely used mean–variance optimization approach, which has been refined over time to allow more proprietary views in the process. Portfolio construction is then shaped with straightforward assets and investment strategies and centers on a quasi-static policy portfolio (beta) with modest enhanced return expectations (alpha) within each asset class (see also Anson 2005).

One advantage of this investment model is that it does not require many investment beliefs to start working: The board needs to have a view on diversification, expected returns, the horizon to earn these expected returns, a view on mean reversion, and finally a view on the efficiency of financial markets or more pragmatic active management. This investment model is often implemented via external managers who always promise but do not always deliver outperformance. This can absorb the focus and governance budget of the board but typically does not hamper the results much. Costs can be relatively low given efficient implementation, whereas higher

costs generally signal a governance problem. Overall, this investment model could be qualified as the default to discuss investment models, a solid middle-of-the-road approach that works well for funds with moderately qualified trustees or a small investment management organization or staff.

MODEL 2: OPERATIONAL BENCHMARK MODEL

What if you want to improve diversification further compared to the traditional asset allocation model without losing the reference to broadly accepted standard benchmarks? This model was pioneered by the Norway Fund and applied by many European pension funds. The board sets an overall benchmark to reflect the risk appetite, but further refinements to reflect the breadth of investable assets and the skill of the investment managers are delegated to the investment management organization. To manage this delegation, an operational reference portfolio (ORP) is introduced as an internal benchmark. It is a tailored benchmark with non-market capitalization weights and takes advantage of the characteristics of the fund: a large investor with no fixed liabilities and no immediate liquidity requirements, unconstrained by domestic currency. The Norwegian Fund uses the ORP for three purposes: to diversify more widely than standard benchmarks, take on systematic factor risk exposure, and implement smart rebalancing. The ORP only takes on a limited set of risk factors that have been specified by the Ministry of Finance.

Alternative investments may have become mainstream, but not in the ORP of the Norway Fund. Here, the Government Pension Fund Global keeps 60% of its assets in publicly traded equity, 35% in bonds, and up to 5% in real estate. Hedge funds, private equity, and venture capital have failed to gain a foothold. In other words, it is a clean-cut portfolio that focuses on the main asset allocation choices, with a limited amount of active management.

There is a pragmatic reason for this approach. The Norway Fund is simply too large to invest in alternative types of strategies. It would be too cumbersome and costly to build up a portfolio of illiquid assets that would amount to anything meaningful. Additionally, the fund operates very much under the public eye. The investment policy is therefore articulated and clear, with limited maneuvering scope for grasping new investment opportunities. Although the Norwegian fund has fared quite well with this investment model, its adoption by other investors is not without caveats. Its apparent simplicity could be misinterpreted as an anyone-can-do-it approach, simply by shedding active management and alternative investments. In addition to unnecessarily limiting the investment universe, this also ignores the important role other choices play in this investment model, such as the adherence to investment rules to discipline decision making and combat behavioral biases. The fund is disciplined in its asset allocation and rebalancing.

Another differentiating characteristic is that, although alternative, illiquid investments are almost nonexistent, and the resulting liquid portfolio is very much long-term focused. Which risk premiums can reasonably be earned in liquid markets with a long-term horizon? The Fund takes on smaller stocks and value stocks, which may be trading at lower prices in the short term, but this is setting them up for higher performance in the long term—which research interprets as decades, not a matter of a few years.

MODEL 3: ENDOWMENT MODEL

This investment model was developed by US endowments and foundations; Canadian pension funds adapted key elements (hence the *Canadian model*), and the

model gained further traction in Europe after the deregulation of capital markets in the 1990s, deploying many of these ideas. Investing in long-term, illiquid strategies that earn an illiquidity premium, trying to expand the investment universe as an early adopter, and/or selecting innovative active management styles are the most characteristic adopted strategies. The idea is that the pension fund leverages its horizon and intellectual resources optimally.

The endowment model can be characterized roughly as an investment model in which the natural advantages of a long-term investor are leveraged. This model was popularized in the 1980s by the Yale Endowment through the success and publication of Swensen (2009), with pension funds drawing inspiration from the different approaches that endowments took toward portfolio construction and implementation. Endowment funds operate under fewer regulatory restrictions than pension funds, allowing them to pioneer and adopt new insights in investment management at an earlier stage than pension funds. Endowments have received much attention recently for their superior investment returns compared with other institutional investors; these superior investment returns are difficult for other institutional investors to duplicate. Because the endowment investment model has been copied widely, it pays to briefly review a few reasons for the endowment's superior investment returns.

Similar to the traditional asset allocation model, much of the endowment's performance is achieved through allocation decisions among asset classes that have different risk and return characteristics. Whereas the 1970s and 1980s saw a gradual move away from fixed-income securities and cash and into equities by endowments, the 1990s and 2000s in turn witnessed a shift away from equities and fixed income toward sophisticated, often illiquid alternative assets. Mimicking the asset allocation strategies of the best endowments may not lead to the same stellar results. The alternative investment markets on which successful endowments have relied are particularly sensitive to inflows of capital. A new or niche alternative investment market often has a limited number of opportunities, so additional capital tends to result in the purchase of securities at higher prices and, therefore, ultimately lower returns. This effect is particularly relevant because the strategies of the elite endowments are being scrutinized and imitated as never before.

Furthermore, the superior endowment performance may be due not solely to asset class allocation, but also to the selection of assets within each class. The skills and experience of investment managers appear to play a substantial role in the success of endowment investments, with the staff able to identify and source strategies and asset classes at an early stage. The staff of successful academic endowments have considerable experience and have often worked together for many years. Finally, the staff of successful university and college endowments have an academic orientation, which leads to a process of periodic self-evaluation.

A third offered explanation for the superior endowment performance is investment governance. Top-performing endowments have active investment committees, generally drawn from the ranks of alumni. These bodies see their role not as micro-managing the decisions of the investment staff but, rather, as setting broad policy and serving as an informed sounding board. The contrast with public pension funds is particularly stark here.

Riding on the success of the Yale Endowment and Harvard Management Company, many boards have been advised by consultants to adopt elements of the endowment model and make major commitments to alternative investments in hedge funds of various types, private equity, real estate, venture capital, and so on. Canadian pension funds helped pave the way: They adapted in the 1990s the endowment model, building an investment organization in which the board delegated to a large degree to the investment staff, which was placed at arm's length. The asset allocation focused on illiquid assets and the costs and agency issues controlled by bringing the management

of these assets in-house. Although the long-term record achieved at leading endowments and several Canadian pension funds remains compelling, pension boards have at best struggled to emulate this success and in some cases have even lagged behind compared to traditional bond/equity asset allocation benchmarks. This raises a painstaking, soul-searching question for many boards: Do we understand, and do we have what it takes to implement this model successfully?

MODEL 4: FACTOR ALLOCATION MODEL

If diversification in essence should center around spreading risk, rather than spreading assets, then portfolio construction and the resulting portfolio weights probably diverge markedly from the traditional asset allocation model. This novel view in portfolio construction was pioneered by the Washington State Investment Board and Danish Arbejdsmarkedets Tillaegspension (ATP) and adopted in watered-down forms by many other funds worldwide.

Traditionally, portfolio diversification was an intuitive, sensible choice for an investor to make, and researchers have steadily added important theoretical ideas, including mean–variance optimization, the capital asset pricing model, and asset pricing theory, which have shaped our understanding of the meaning of diversification. Investment portfolios today may look quite different from portfolios of a decade ago, but they still share diversification as a central tenet (see Fabozzi, Focardi, and Jonas 2014). The factor allocation model takes a different approach to diversification; it is far more important to diversify over a number of risk factors that the assets may have in common than to diversify over assets.

After the 2001–2002 financial meltdown, there was an accelerated shift in asset allocation toward alternative asset classes such as private equity, hedge funds, and commodities. These new allocations, however, provided only part of the expected diversification. Alternative asset classes have turned out to be more correlated with traditional equities and bonds than previously thought. The success of many new alternative strategies was boosted by the same factors: low interest rates and robust economic growth. Some alternative investments share more factors; private equity gives investors exposure to the same kind of risk as publicly traded equity, albeit with added leverage. When prospects deteriorated, investors with liquidity constraints were forced to sell those alternative asset classes simultaneously.

Armed with this sobering experience, institutions began to reconsider what purpose diversification serves within the investment process and what the most important factors are during volatile periods. The novel proposition is that investors could redesign the investment process by directly allocating to factor premiums within the strategic asset allocation as a way forward. A traditional portfolio would first be diversified across asset classes, followed by allocation (e.g., to regions and sectors), and then to (external) fund managers. A factor-based portfolio is diversified across premiums, such as low-volatility, small-cap, value, and momentum premiums. Investment management practice has developed methods of incorporating one or more of these premiums, either by developing investment strategies solely to capture one of the premiums or by embedding them as tilts in the overall strategic asset allocation. The Norway Fund views this as “harvesting risk premia from multiple sources [which] can be seen as broadly consistent with risk parity investing, which should result in more effective diversification and avoid a heavy reliance on the equity premium.”

The research on factors in the recent decade could leave the impression that factor-based investment models are widely applied. This is not the case, however. In daily practice, investors apply a factor-based approach within one or more asset categories, mostly equities. When applied to portfolio construction, the exposure to

factors is typically grouped in new asset categories, such as inflation-sensitive assets or growth-oriented assets. A rigorous, consistent, integral factor-based implementation has yet to emerge.

MODEL 5: RISK PARITY MODEL

More than any other investment model, this model can be described as a factor allocation investment model that embraces uncertainty and scenario thinking. Investors cannot be certain about capital market expectations; hence, the assets are spread equally over different scenario outcomes, based on their contribution to the total portfolio risk.

The solution to a disproportionate risk allocation to stocks is to reduce the weight of stocks according to risk parity and increase the weight of bonds so that equities and bonds have a similar volatility impact on the portfolio. However, the overall volatility of the portfolio will drop. If the investor is comfortable with the initial volatility of the 60/40 portfolio, proponents of risk parity suggest that leverage should be used to achieve the required risk level. Overall, average returns would have increased with decreased risk. The risk-parity-based portfolio construction process is agnostic in the sense that it balances the portfolio so that each asset class contributes the same potential for losses, so-called *risk parity*.

The assumption of risk parity is that an investor will always be rewarded over the long term for taking risks rather than holding cash. Pension funds can develop risk parity, or an all-weather portfolio, in a two-step process. First, the risk budget is allocated into four compartments (low or high economic growth and low or high inflation). Second, within each risk budget compartment, asset classes are suballocated (also on an even basis), based on exposure to the growth–inflation dimension. Here, the purer the asset class or strategy, preferably based on one factor premium, the more effective this approach is.

This is an appealing concept for pension funds and their trustees but might be difficult to implement (Inker 2010). An objection is that volatility and risk are not the same things. For example, leverage allows investors to boost returns, but it also introduces path dependency. Although an unleveraged investor can wait for a process to converge to certain valuations, a leveraged investor may not have this luxury. Leveraged investors cannot expect to maintain the same amount of leverage during periods of high volatility but, rather, are forced to reduce leverage and sell securities—at the risk of forgoing positive future returns as a result of overreaction and mean-reversion after periods of financial distress.

Another issue relates to the selection of factors. Although risk parity may suggest a valuation-neutral approach, in reality it is not neutral, and investors might end up leveraging risks without associated positive returns. For example, the term-structure premium is a factor behind fixed income. A risk parity approach would significantly increase exposure to this factor, but does this make sense in today's monetary environment? Looking at a risk distribution pie chart does not give the investor information as to whether the portfolio is optimally diversified. For example, although country risk might be dealt with in the risk distribution, it still matters which country's default risk is included. In other words, for pension funds considering looking into the risk parity approach, one consideration could be that risk parity improves the investor's insight into the portfolio's risks and sensitivity to scenarios. On the other hand, in-depth insight into the portfolio is still needed, alongside knowledge of the intended or unintended interaction between leverage and risk appetite.

REFLECTION ON INVESTMENT MODELS

Through the lens of investment models, we find that boards are helped when they better understand why they succeed or fail in achieving their investment objectives and what is needed to successfully pursue their mission.

Reflection 1: Avoid adopting an investment model without thinking through the consequences. The CalPERS case study is a widely publicized failure during the 2008–2009 crisis (Ang and Abrams 2012). In essence, the board assumed that it pursued an endowment model, but it did not understand or subscribe to the elements that make this model successful over time: a more or less constant risk appetite, commitment to illiquid assets, and commitment to rebalancing during the most difficult periods. Board members failed to understand what sort of organization they were leading and the type of investment model to which they basically subscribed. Simply adopting investment models is one of the worst possible choices. We observe that, since then, boards have worked on grasping the essentials of the investment models.

Reflection 2: Develop and adopt your investment model for the right reasons. Today, funds have adopted one of these models, with varying intensity of adoption. If we take a closer look, we find that many boards over time have combined elements of different investment models. Many pension funds started out with the standard asset allocation model in the 1990s, moved toward the endowment model in the 2000s, and have added factor allocation choices since 2020. This shows the adaptive nature of financial markets and boards.

However, the discussion of the invest models also pointed to the fact that, although some models attract a lot of attention, they are at the core non-implementable. Thus, boards have no other option than to adapt the model to their tastes. The Norway model propagates a form of transparency and passive investing but only because it has size constraints in an unexpected way: It is simply too large to buy anything else. Risk parity is theoretically sound but requires a form of implementation that makes funds stand out from the crowd for prolonged periods. Finally, the endowment model rests on a unique combination of sourcing net asset strategies and active selection that is difficult to emulate.

Reflection 3: A concern remains that the investment choices of the investment models have been adapted, but adaptation of the required governance is unresolved. We observe that many boards still face the same challenge as CalPERS in 2008: Are we aware of the main choices that make this investment model a long-term success for our participants, and do we implement it consequently? This creates a strategic agenda for any pension board that takes its mission seriously. If we look at our current investment model, what is our mission, what does our investment process look like, and what are the implicit and explicit assumptions behind these choices? From an investment perspective, what are the consequences of these assumptions? Are we facilitating this as a board or hindering it?

Reflection 4: New investment models emerge from existing ones. If we plot the development of models over time, we find that the different models are driven by different motives. The endowment model and factor allocation model apply new technological advances, are proactive, and leverage the unique characteristics of long-term investors. Overall, a view of financial markets is upheld in which the basic tenets continue to work: diversification, mean reversion, alpha. Risk parity, on the other hand, changes a central tenet: the fundamental uncertainty of risk in financial markets as a basis for portfolio construction. In contrast, innovations in the Norway model are externally driven: Societal views that are externally developed are over time embedded within and shape the investment model.

What will shape the development of investment models in the coming period? Our discussions with boards seem to paint the following emergent picture. The trend toward more private assets might be sustained. The endowment model pioneered the added value of illiquid, long-term assets in portfolios. Governments worldwide will, to heed the challenges of climate change, post-COVID transition, or other challenges, help create investment solutions and new markets, in which institutional investors play a pivotal role. For publicly listed securities, boards might reassess the move toward passive investing and experiment with how to become more involved shareholders as part of their fiduciary duties and sustainability choices. More-concentrated equity portfolios with a long holding period and active role seem to be a commonality here, in which insights on factor-based investing are used to tweak the exposure to different sustainability factors. Intertwined with this, a growing group of institutional investors are committing themselves, by adopting guidelines like the OECD or UN Guiding Principles, to assess the impact that their investment choices have on stakeholders, whether employees, families, or others, with the ultimate goal of internalizing this impact to integrate it within decision making.

This suggests a new investment model on the rise, which we call *prudent society*. The investment model looks through financial assets and focuses on companies, consumers, and society. In practice, this translates to long-term investing, concentrated portfolios, and new forms of illiquid investments, especially risk premiums from incomplete markets—as well as accountability based on impact, not just risk–return.

REFERENCES

Ambachtsheer, K. 2004. “Should (Could) You Manage Your Fund Like Harvard or Ontario Teachers?” The Ambachtsheer Letter.

Ang, A., and J. Abrams. 2012. “California Dreamin’: The Mess at CalPERS.” Columbia Business School.

Anson, M. 2005. “Institutional Portfolio Management.” *The Journal of Portfolio Management* 31 (4): 33–43.

Dalio, R. *Principles: Life and Work*. New York: Simon & Schuster, 2017.

Fabozzi, F. J., S. M. Focardi, and C. Jonas. 2014. “Investment Management: A Science to Teach or an Art to Learn?” CFA Institute Research Foundation.

Inker, B. 2010. “The Hidden Risks of Risk Parity Portfolios.” White paper, GMO.

Koedijk, C. G., A. Slager, and J. Van Dam. *Achieving Investment Excellence. A Practical Guide for Trustees of Pension Funds, Endowments and Foundations*. Hoboken, NJ: John Wiley & Sons, 2019.

Swensen, D. F. *Pioneering Portfolio Management: An Unconventional Approach to Institutional Investment, Fully Revised and Updated*. New York: Simon and Schuster, 2009.

To order reprints of this article, please contact David Rowe at d.rowe@pageantmedia.com or 646-891-2157.