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About the authors

Chris Goolgasian helps develop and manage a variety of defined contribution, tactical, absolute return, and alternative risk premia strategies for the firm's clients. He is co-portfolio manager of Wellington's target-date portfolios.

Nick Petrucelli co-manages the firm's target-date portfolios with Chris. In addition, Nick contributes to the research and portfolio management of the firm's real asset strategies, including inflation-hedging and real-total-return solutions.

Grace Le supports several Wellington strategies, including our target-date series, and meets with clients, prospects, and consultants to communicate investment philosophy, strategy, positioning, and performance.

Tomorrow's target-date portfolios: Ideas for better retirement outcomes

KEY POINTS

- To combat the three main risks to retirement security — longevity, draw-down, and inflation — we believe target-date portfolios should aim to protect against downside risk, particularly near retirement; be truly diversified; and be actively managed.
- In our view, seeking to protect against drawdowns means not only lowering equity exposure along the glidepath, but also adjusting the mix within each asset class and reducing exposure to uncompensated risks such as currency.
- Diversification should exist along several dimensions: by asset class, geography, economic environment, and investment style.
- Given expectations of low future market returns, we believe that actively managing both security selection and asset allocation is essential to addressing participants' retirement needs.

TARGET-DATE PORTFOLIOS HAVE RESHAPED THE DEFINED CONTRIBUTION (DC) LANDSCAPE OVER THE PAST DECADE.

While not a panacea, they have allowed participants to make a single investment decision and potentially end up with a better-diversified, generally more age-appropriate asset allocation. In our view, however, there is still room for meaningful improvement.

Participants in defined contribution plans face three key risks: *longevity* — the risk of outliving one's savings; *drawdown* — the risk of an ill-timed decline in retirement savings that severely impairs retirement spending; and *inflation* — the risk of erosion in the purchasing power of savings.

We follow a set of core tenets that in our view maximize the probability of successful retirement outcomes by addressing these risks.

- **Downside risk management** should be emphasized near retirement, when losses are most impactful and behavioral risk is highest. This helps mitigate drawdown risk, which in turn reduces longevity risk.

- **Diversification** should be broad across geographies, economic environments, and investment styles. This helps hedge inflation risk and guard against significant volatility and drawdowns.
- **Active management** in both security selection and asset allocation should be viewed as essential for addressing the key retirement risks and maximizing long-term expected returns. This is particularly true in an era of lengthening lifespans and expected lower market returns.

This paper outlines how we incorporate these core beliefs into our target-date portfolios.

Downside risk management

In our target-date portfolios, we aim to provide the appropriate risk and return profiles for the age-based time horizons of participants. Exposure to return-seeking assets is higher for younger participants, while downside mitigation is a focus for those closer to retirement age. These tilts are implemented not only by reducing equity exposure in favor of bonds along the glidepath, but also by adjusting risk exposures within each asset class.

Thus, in the early stage of the glidepath, riskier assets such as equities make up the vast majority of holdings. Within equities, there is greater exposure to unconstrained strategies and global small-cap equities, which tend to have higher expected risk but also greater expected returns — essential to combating longevity risk. However, as the participant ages, longevity risk diminishes and our strategies reduce equity exposure, while also dialing down risk within equities. By age 65, the portfolios hold no allocations to small-cap and unconstrained equities, and half of equity exposure is in lower-volatility and downside-mitigation-oriented strategies. Also, the duration of fixed income assets decreases as the participant enters retirement due to the shorter duration of her/his liabilities.

We believe it is essential to focus on downside mitigation as the participant approaches retirement, for two reasons. First, a drawdown near retirement can be crippling to retirement readiness. **FIGURE 1** shows the relative impact of a hypothetical 25% drawdown occurring at different points in a participant's adult lifespan. Each bar compares the difference in final portfolio value between two hypothetical scenarios: a constant 5% geometric return earned each year throughout the period, and a 25% drawdown occurring at the specified age but with higher returns in all other years so as to achieve the same cumulative overall return.

So two participants could earn the same average annual returns over a given period, yet have very different outcomes depending on the timing of a significant drawdown — illustrating “sequencing” risk.



In our target-date portfolios, we aim to provide the appropriate risk and return profiles for the age-based time horizons of participants.

FIGURE 1
Drawdowns near retirement are often the most damaging
 Hypothetical impact of a 25% drawdown, by age of participant at time of drawdown (US\$)

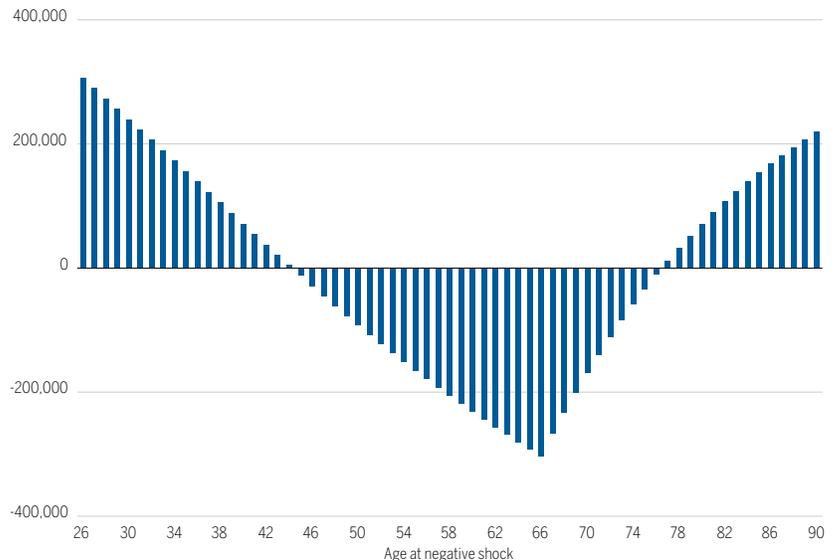


FIGURE 2
Low-volatility stocks have historically generated the highest absolute and risk-adjusted returns

Volatility quintile	Volatility (%)	Return (%)	Return/risk
Lowest	10.44	11.34	1.09
Low	13.07	11.10	0.85
Medium	15.31	9.12	0.60
High	17.72	8.82	0.50
Highest	26.00	6.31	0.24

Based on MSCI World Index constituents for the period December 1990 through December 2017; average total returns to equally weighted quintile portfolios sorted by trailing three-month total volatility. The use of alternative time periods could yield different results. | Sources: MSCI, Wellington Management | For illustrative purposes only and not indicative of any actual portfolio. **PAST RESULTS ARE NOT NECESSARILY INDICATIVE OF FUTURE RESULTS AND AN INVESTMENT CAN LOSE VALUE.**

¹A simple example of a normal distribution: If a coin is flipped many times, the probability of getting a given number of heads in a series of flips will approach a normal curve.

This analysis is a simplified hypothetical example that assumes starting salary of \$30,000 growing at 3% annually; savings rate of 8% of salary with 0.20% annual increase to maximum savings rate of 12% until retirement at age 65; annual replacement rate of 40% of the final working year’s salary during the postretirement period to age 95. If alternative assumptions were used, results would differ. Each bar compares the hypothetical difference in final portfolio value between two scenarios: a constant 5% geometric return earned each year throughout the period based on the assumptions noted, and a 25% drawdown occurring at the specified age but with higher returns in all other years so as to achieve the same cumulative overall return. **PAST AND HYPOTHETICAL RESULTS ARE NOT NECESSARILY INDICATIVE OF FUTURE RESULTS.**

Secondly, while modeling optimizations, which are often based on statistically “normal”¹ distributions of outcomes, may suggest taking significant risk at later ages, market returns do not have normal distributions. Thus, drawdowns can be more severe than what such models suggest. Also, these models often assume that participants stay fully invested throughout their working lives. Yet many participants sell riskier assets like equities after even a modest market downturn. For older participants approaching retirement, such selling can lock in losses.

That is why we think the glidepath should shift equity exposure to lower-volatility and downside-mitigation-oriented strategies at this stage. Low-volatility equities offer a more defensive allocation while retaining the potential to realize equity-like returns over the long term. As **FIGURE 2** shows, historically (and counterintuitively) the least-volatile stocks have provided the highest absolute and risk-adjusted returns.

We use drawdown-mitigation strategies with a history of lower down-market capture to potentially limit drawdowns, help participants preserve gains near retirement, and lessen the tendency to sell at market lows.

In an effort to further mitigate downside risk, we hedge about 50% of the foreign-currency exposure in our core global equity approach; this level of hedging has historically helped lower the volatility of such strategies.²

Lastly, we use an alternative portfolio that is designed to directly manage drawdown risk by targeting a specific volatility level (which implies selling equities as volatility is spiking); this strategy is also designed to systematically reduce risk as drawdowns occur. Although it would not be positioned to capture rebounds occurring immediately after market downturns, this strategy could potentially experience less volatility over time and outperform in major bear markets.

Diversification

Our target-date portfolios incorporate three dimensions of diversification in addition to asset class — by geography, macroeconomic environment, and investment style — with the aim of investing in higher-returning assets without increasing portfolio volatility. This multidimensional structure has the potential to provide more stable returns during drawdowns and across market environments.

To achieve diversification across geographies, approximately 50% of our target-date portfolios' equity exposure is typically outside the US — a higher level than in many US target-date funds. **FIGURE 3** highlights how powerful this diversification benefit has been historically, using market indexes.

For the nearly seven-decade period shown in **FIGURE 3**, on average the US was the best-performing region and the one with the least risk (volatility) among the three regions displayed. However, the Global index in the fourth column, whose regional allocations are typical of those in our core global equity allocation, delivered similar returns over the same period with 1.5% less risk, thus achieving higher risk-adjusted returns than the US-only index.

FIGURE 3
Performance of regional and global equity market indexes, 1950 – 2017

	US	Developed markets ex US	Emerging markets	Global	Hypothetical cap-weighted global blend
Return (%)	11.4	10.6	10.9	11.3	11.0
Risk (volatility)	14.3	14.9	18.8	12.8	15.0

US equities represented by the S&P 500 Index, developed markets ex US by the MSCI EAFE Index, emerging markets by the MSCI Emerging Market Index, global equities by the MSCI World Index. Global capitalization-weighted blend is a hypothetical blend with a targeted static weighting of 50% US, 40% developed markets ex US, and 10% emerging markets over the period, implemented through monthly rebalancing. These weightings are based on estimates of long-term relative market-capitalization weightings, and this blend does not reflect the diversification benefit of a global versus US-only equity portfolio. Results are for illustrative purposes, reflect a blend of indexes only, and are not representative of any actual portfolio. Performance is developed with the benefit of hindsight (i.e., actual knowledge of market conditions) and thus has many inherent limitations. **PAST RESULTS ARE NOT NECESSARILY INDICATIVE OF FUTURE RESULTS AND AN INVESTMENT CAN LOSE VALUE.** | Sources: Global Financial Data (1950 – 1987), MSCI (1988 – 2017).

²**PAST RESULTS ARE NOT NECESSARILY INDICATIVE OF FUTURE RESULTS.** For more on this topic, see our paper "[Currency hedging considerations for US target-date strategies](https://www.wellington.com/en/insights/currency-hedging-considerations-us-target-date-strategies)", <https://www.wellington.com/en/insights/currency-hedging-considerations-us-target-date-strategies>

How is this possible? In the rightmost column of FIGURE 3, combining each region's final results in a hypothetical static global blend results in less return and more risk than the US-only index — as one would expect, given the outperformance of the US versus the other regions over this period. However, this doesn't take into account the power of diversification. Spreading risks across regions, as in the Global column, appears to have lowered risk while raising returns by 0.3% versus the hypothetical capitalization-weighted global blend due to higher compounding of returns.

Diversification across economic environments starts with an asset allocation philosophy we call “Think Function, Not Form.” Investors may think their portfolio is diversified because it holds multiple asset classes. But we believe it's more important to consider the drivers of return and when certain allocations should perform relatively well — in other words, their “function” rather than simply their “form” (asset class).

For example, while large-cap growth, mid-cap value, and high-yield bonds are all different asset classes by name, historically they have all performed poorly in a recession — the very situation when diversification is most needed. Instead, holding an asset that has historically done relatively well when growth falls, such as US Treasuries, may provide the diversification that is actually needed.

Since World War II, the US economy has been in growth periods about half the time, weak growth/deflation periods about one-sixth, and inflationary periods one-third³ — frequently enough, we think, to make inflation a risk worth hedging against.

FIGURE 4 puts the impact of inflation on retirement financial security in context. As you can see, someone retiring in 1966, just before inflation took off for the next 16 years, would have faced a dramatically worse financial situation than someone retiring in 1929, just before the Great Depression. What explains the dramatic difference in results despite equities performing significantly better in the 1970s than the 1930s?

The hypothetical 1966 retiree would have had about 70% of the value of his or her savings wiped away over the course of 16 years by inflation alone and, as a result, would have been more likely to run out of money early. For the hypothetical 1929 retiree, each dollar saved would have become 30% more valuable by 1932 because of deflation. While the stock-market crash starting that year would have hurt the investment portfolio, the remaining savings would have had more purchasing power.



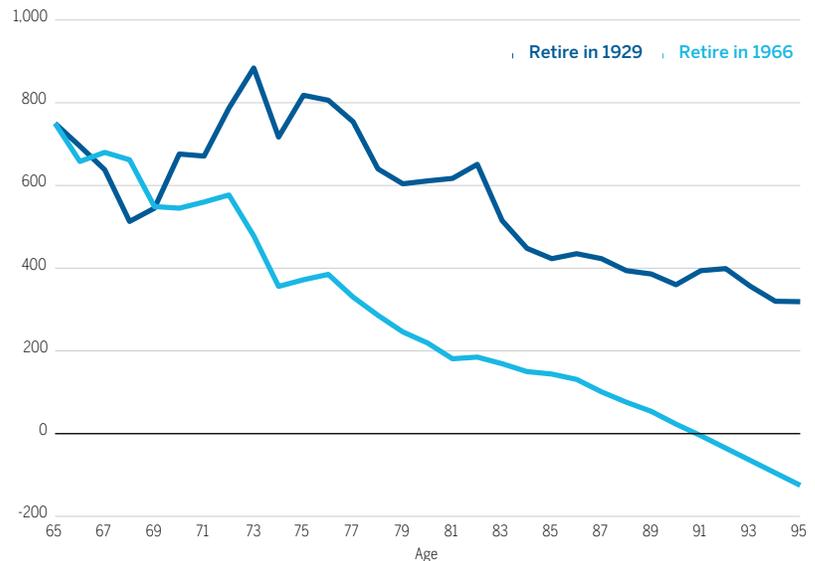
Someone retiring in 1966, just before inflation took off... would have faced a dramatically worse financial situation than someone retiring in 1929, just before the Great Depression.

³Economic environments are defined by year-over-year changes in GDP growth and inflation. Growth: rising GDP growth, falling inflation. Weak growth: falling GDP growth, rising inflation. Inflation: rising GDP growth, rising inflation. Stagflation: falling GDP growth, rising inflation.

FIGURE 4

Inflation can damage a retiree's spending ability

Hypothetical asset balance for a defined contribution participant, US\$ thousands



This analysis is a simplified hypothetical example that assumes US\$750,000 beginning asset balance with US\$30,000 annual withdrawals, and an average glidepath using real returns after inflation which begins retirement at 50% equities/50% bonds and glides to 30% equities/70% bonds at age 80, remaining there through age 95. Equities: S&P 500 Index; Bonds: Bloomberg Barclays US Aggregate Bond Index 1976 – 1996, Bloomberg Barclays US Government/Corporate Bond Index 1973 – 1975, Citigroup High Grade Corporate Bond Index 1969 – 1972, S&P High Grade Corporate Bond Index 1929 – 1968. If alternative assumptions were used, results would differ. | This is for illustrative purposes and reflects index blends only. This does not reflect the results any actual retiree achieved and is not representative of any actual portfolio. Performance is developed with the benefit of hindsight (i.e., actual knowledge of market conditions) and thus has many inherent limitations. | **PAST RESULTS ARE NOT NECESSARILY INDICATIVE OF FUTURE RESULTS AND AN INVESTMENT CAN LOSE VALUE.** | Sources: S&P, Barclays, Citigroup, US Bureau of Labor, Wellington Management

While in the midst of a long period of disinflation, it is tempting to delay allocating to real assets until inflation is a clear risk. But predicting inflation — before markets bid up the price of inflation-sensitive assets — is difficult. That is why our target-date portfolios include structural allocations to US Treasury Inflation-Protected Securities (TIPS) within fixed income; commodities, historically the asset class most highly correlated to inflation; and inflation-sensitive equities, such as natural-resource companies. In addition, we employ an alternative strategy that aims to provide consistent real return regardless of market environment or direction and to further diversify the overall portfolio.

A third dimension of diversification — across investment styles — arises from active management of our underlying strategies. Wellington's structure as a community of collaborative but independent boutiques allows us to access several independent alpha streams in our target-date portfolios; average alpha correlations among the underlying strategies is almost nil.⁴ Additionally, core global equity approaches are diversified across style factors, including strategies focused on value, growth, and quality. These factors are combined in a dynamic mix that aims to avoid concentrated structural factor exposures and uncompensated tracking risk versus the market, as well as ill-timed policy shifts of underperforming managers.

⁴The average alpha correlation among underlying strategies within the Wellington target-date series over the trailing five years ended 31 December 2017 was 0.04.

The portfolios are also diversified by investment approach, from purely quantitative, to bottom-up security selection driven, to more thematic, recognizing that different approaches will be in favor at different times.

In our view, this multidimensional approach to diversification helps combat longevity risk by allowing greater exposure to higher-growth, higher-potential-return securities due to the anticipated volatility reduction at the portfolio level. We think this approach can also mitigate drawdown risk by removing unnecessary concentration risks, and hedge inflation risk through allocations to inflation-sensitive assets.

Active management

We view active management as essential to meeting participants' retirement needs, for several reasons.

We believe returns from stock and bond markets will likely be weak going forward, based on today's high market valuations. Fees for active management have dropped industry wide, lowering the hurdle for achieving net-of-fee alpha. Alpha tends to be more risk-efficient than beta to achieve a higher return objective. (In other words, earning 1% more return from alpha adds less risk than earning 1% more by increasing the equity exposure and decreasing the fixed income exposure.) An increasingly short-term mind-set among market participants creates more potential opportunities for long-term investors. And some market segments, such as small-cap equities, have significant inefficiencies that can be exploited to potentially generate alpha.

Furthermore, the market indexes typically used as portfolio benchmarks are generally misaligned with investors' goals. For example, global fixed income indexes have weightings that are concentrated in the most indebted issuers or distorted by massive central bank purchases. To combat this, our global bond approach allocates sovereign exposures based on valuations and fundamentals, not benchmark weights.

Lastly, Wellington has a proven track record of generating positive alpha across the investment platform, with 77% of equity and 95% of fixed income approaches above benchmark over a recent 10-year period.⁵

FIGURE 5 suggests how difficult it would be to boost investment performance through market returns alone. Assuming a hypothetical 60/40 equity/bond portfolio and average historical real returns of equity and bond markets dating back nearly 100 years, the equity/bond mix would need to shift to 80/20 in order to achieve the same improved outcome at age 65 as through 0.75% of net-of-fee alpha. The market returns would come with 2.7% more risk, while the alpha would come with only 0.5% more risk.



We view active management as essential to meeting participants' retirement needs, for several reasons.

⁵Gross composite returns for the trailing 10 years as of 31 December 2017. The 78 equity composites and 38 fixed income composites were selected based on objective, non-performance-based criteria. Criteria include all composite strategies with at least 10 years of trailing performance history, which we believe best represents Wellington Management's equity and fixed income portfolio management teams. If alternative time periods were used, results may differ. **PAST RESULTS ARE NOT NECESSARILY INDICATIVE OF FUTURE RESULTS.**

FIGURE 5

Alpha may be more risk-efficient than market beta in seeking return objectives

Based on historical average returns and volatility, 1925 – 2017

	60% equity/ 40% bond passive index blend	Hypothetical portfolio: 60/ 40 equity/ bond passive + 0.75% alpha	80% equity/ 20% bond passive index blend
Real return (annual average, %)	4.60	5.35	5.30
Volatility	9.41	9.88	12.14
Return/risk (volatility)	0.49	0.54	0.44

Equities proxied by the S&P 500 Index, bonds by the Bloomberg Barclays US Aggregate Bond Index. Key assumptions: Zero correlation between active risk and beta; 0.1 correlation between bonds and equities; active risk earns 0.75% annual return net-of-fees with 3.0% risk (volatility), based on 6.0% real return with 15% risk for equities, 2.5% real return with 5.0% risk for bonds. These returns and risk assumptions are in line with historical averages over the period 1925 – 2017. The use of alternative assumptions would yield different results. This table is for illustrative purposes and not indicative of our forward-looking expectations for asset classes. Hypothetical and past results are not necessarily indicative of future results and an investment can lose value.

So in this example, reaching the improved age-65 outcome through market returns alone required taking on *five times* the incremental risk needed to achieve it through reasonably successful active management. These findings will be roughly consistent as long as the return differential between stocks and bonds is near its 3.5% historical norm.

While achieving the 0.75% return from alpha is certainly not a foregone conclusion, neither is the return from increasing the allocation to equities. In fact, equities may be likely to return less than their historical average 6.0% annual real return over the next several years, given today's elevated levels of corporate profitability and high price-to-earnings multiples. Below-average returns from equity markets would create an even more challenging environment for savers relying solely on market returns to meet their investment goals.⁶

We think active management of target-date portfolios should apply not only to security selection, but also asset allocation. In our portfolios, we do not tactically shift allocations based on macro or short-term views, but believe strongly that the appropriate asset allocation evolves over time as market conditions evolve. (For example, holding significant duration in bond portfolios was much more appealing in the early 1980s, when 10-year Treasuries were yielding more than 10%, than in 2016, when yields dipped below 2%.)

Our disciplined, value-driven process leverages long-term fundamental insights from our in-house analysts in estimating the long-term return potential of each asset class. As our return expectations evolve, we may strategically deviate from the glidepath, adjusting the portfolios' exposures to asset classes, regions, sectors, and factors.

In conclusion

A target-date portfolio should address the key risks to participants' long-term financial success: longevity, drawdown, and inflation. In our opinion, to do so effectively the portfolio should tackle all three risks in multiple, diverse ways, emphasizing downside mitigation and diversification while integrating active management throughout as an essential tool. ■

⁶"Accepting market returns: Risky business for defined contribution plans?," February 2017, <https://www.wellington.com/en/insights/accepting-market-returns-risky-business-for-defined-contribution-plans/>

TARGET-DATE PORTFOLIOS

Principal investment risks

Equity market risks – Equity markets are subject to many factors, including economic conditions, government regulations, market sentiment, local and international political events, and environmental and technological issues.

Fixed income securities market risk – Fixed income securities markets are subject to many factors, including economic conditions, government regulations, market sentiment, and local and international political events. In addition, the market value of fixed income securities will fluctuate in response to changes in interest rates, currency values, and the creditworthiness of the issuer.

Foreign markets risk (includes emerging markets) – Investments in foreign markets may present risks not typically associated with domestic markets. These risks may include changes in currency exchange rates; less-liquid markets and less available information; less government supervision of exchanges, brokers, and issuers; increased social, economic, and political uncertainty; and greater price volatility. These risks may be greater in emerging markets, which may also entail different risks from developed markets.

Interest-rate risk – Generally, the value of fixed income securities will change inversely with changes in interest rates. The risk that changes in interest rates will adversely affect investments will be greater for longer-term fixed income securities than for shorter-term fixed income securities.

Manager risk – Investment performance depends on the portfolio management team and the team's investment strategies. If the investment strategies do not perform as expected, if opportunities to implement those strategies do not arise, or if the team does not implement its investment strategies successfully, an investment portfolio may underperform or suffer significant losses.

Risks of derivative instruments – Derivatives can be volatile and involve various degrees of risk. The value of derivative instruments may be affected by changes in overall market movements, the business or financial condition of specific companies, index volatility, changes in interest rates, or factors affecting a particular industry or region. Other relevant risks include the possible default of the counterparty to the transaction and the potential liquidity risk with respect to particular derivative instruments. Moreover, because many derivative instruments provide significantly more market exposure than the money paid or deposited when the transaction is entered into, a relatively small adverse market movement can not only result in the loss of the entire investment, but may also expose a portfolio to the possibility of a loss exceeding the original amount invested.

Risks of investments in other pools – Investors in a fund that has invested in another fund will be subject to the same risks, in direct proportion to the amount of assets the first fund has invested in the second, as direct investors in that second fund.

Smaller-capitalization stock risk – The share prices of small- and mid-cap companies may exhibit greater volatility than the share prices of larger capitalization companies. In addition, shares of small- and mid-cap companies are often less liquid than larger capitalization companies.



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