FEATURE ARTICLE

MANAGING SINGAPORE'S FINANCIAL RESERVES FOR THE LONG TERM

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GIC was incorporated in 1981 as a private company wholly owned by the Singapore government to preserve and enhance the international purchasing power of Singapore's financial reserves.

When GIC was founded, Singapore was a young nation. Since its independence in 1965, the Singapore government's pragmatic economic policies and prudent fiscal stance have resulted in a rapid growth of Singapore's reserves through a sustained balance of payment and budget surpluses year after year.

Indeed, by the late 1970s, this pool of reserves had grown to a size above what would be required to meet the obligations of Singapore's currency board or the resources needed by the central bank to manage the floating parity of the Singapore dollar. It was decided that a portion of the reserves would be managed by GIC as long-term investments, separate from the reserves parked within the central bank. GIC was tasked to generate good returns from capital appreciation over the long term by investing in longer-term, higher-yielding assets. This pool of reserves was initially intended as Singapore's "rainy day fund"—a safe- guard against unforeseen shocks that may buffet Singapore's economy. A portion of the returns from the reserves managed by GIC also serves to supplement Singapore's annual budget and can be spent or invested for the benefit of Singaporeans.

GIC'S MANDATE - DEFINING SUCCESS FOR GIC

GIC's client—the Singapore government, represented by the Ministry of Finance—has given GIC a mandate to achieve good long-term returns over global inflation, within specified risk limits.[1] Three aspects of this mandate are important to appreciate:

1. GIC's mandate incorporates a real return target. This ensures that the purchasing power of the reserves does not get eroded by inflation over time.
2. The emphasis on long-term returns aligns GIC's investment horizon with that of the client and allows GIC to keep a focus on long-term returns without having to manage the portfolio in response to short-term market fluctuations. Practically, the performance of GIC is measured on a total portfolio basis, over a 20-year horizon.
3. GIC's portfolio is managed to maximize expected return while minimizing the likelihood of large losses that may lead to permanent impairment. [2] Consistent with this, one of the risk parameters

1 Singapore MOF policy page: http://www.mof.gov.sg/Policies/Our-Nations-Reserves/Section- I-What-comprises-the-reserves-and-who-manages-them; GIC Annual Reports.
2 GIC Annual Report, 2015/2016.

of the portfolio is defined in terms of how the portfolio's value can fall over a period. This risk parameter, along with other risk constraints such as the active risk budget, are designed for consistency with GIC's long-term orientation. Later sections of this article will provide more detail on these risk parameters.

Additionally, GIC's client has specified a Reference Portfolio (RP) for GIC. This RP comprises 65% global equities and 35% global bonds (65:35) and constitutes a generally accepted alternative for GIC that is consistent with the client's risk tolerance. That said, the RP is not a short-term performance or investment benchmark for GIC.

Through a disciplined investment process within a well-structured investment framework coupled with a robust risk management process, both the client and GIC expect the GIC portfolio to deliver on its mandate (points 1, 2, and 3). In doing so, both the client and GIC would expect the GIC portfolio to also outperform the RP over a 20-year time horizon. It is to this investment framework we now turn.

GIC'S INVESTMENT FRAMEWORK

GIC's investment framework has evolved over time as the organization—and Singapore as a whole—have grown and developed. In the early years, GIC's investment stance was conservative, with a focus on building a strong investment organization. The portfolio had more bonds and predominantly invested in publicly traded instruments. As GIC's investment capabilities grew, more markets and financial assets were included in the portfolio. The risk and return profile of the GIC portfolio also shifted to reflect a greater emphasis on long-term, intergenerational returns over shorter-term liquidity needs, as shown in **Exhibit 1**.

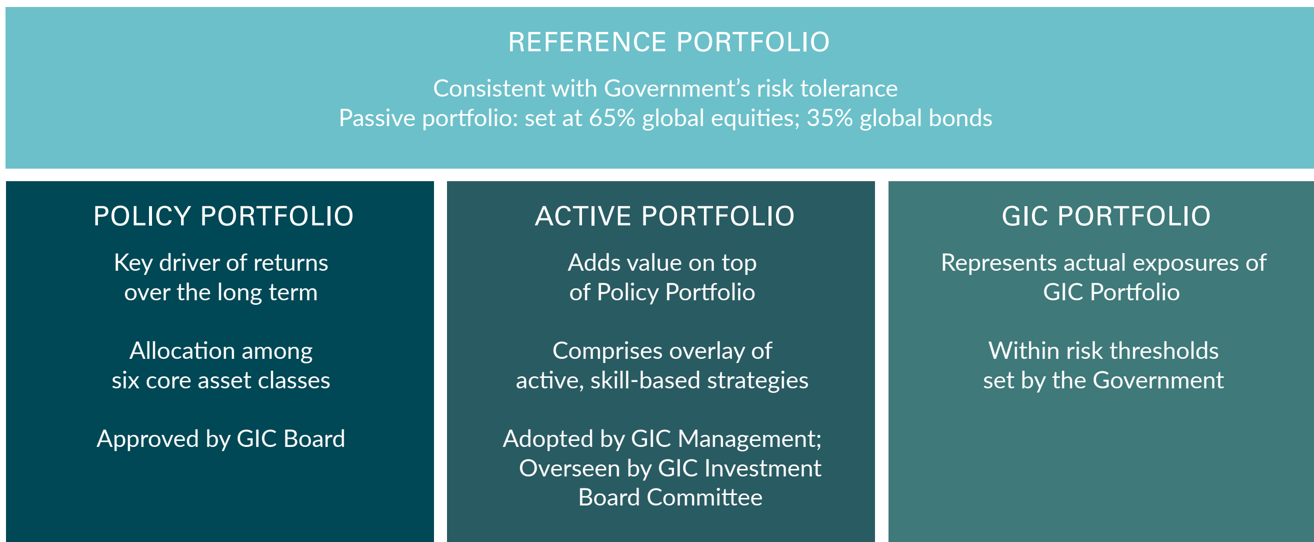
In 2012, GIC embarked on a comprehensive review of its investment framework, in response to the growing complexity of managing a multi-asset, multi-strategy portfolio in an increasingly challenging investment environment. This "new investment framework" is designed to achieve clarity on

1. the different drivers of return to the GIC Portfolio;
2. the horizon over which they pay off; and
3. how to achieve strong governance around investment decisions and attribution of returns.

EXHIBIT 1: MAJOR CHANGES TO GIC'S INVESTMENT FRAMEWORK

The architecture of the GIC portfolio (represented in **Exhibit 2**) neatly encapsulates these three aforementioned design considerations. Within this construct, the GIC Portfolio can be conceptually divided into two components.

EXHIBIT 2: GIC'S INVESTMENT FRAMEWORK



A. ***The Policy Portfolio (PP).*** The Policy Portfolio is constructed to harvest systematic risk premia from core asset classes over the long term. For GIC, six core asset classes have been identified: developed market equities, emerging market equities, nominal bonds and cash, inflation-linked bonds, private equity, and real estate. Diversification across these asset classes serves to improve the risk–return profile of the PP as a whole.

Because the PP is structured to capture time-varying, long-term risk premia arising from structural changes in the global environment, the PP is not intended to be adjusted frequently in response to market cycles. Nevertheless, the PP is reviewed regularly to determine whether any changes to the mix are needed.

Concurrently, a disciplined rebalancing regime serves to keep this asset mix steady over time and is expected to contribute to good performance in the long run.

From the governance perspective, the PP's mix is recommended by GIC's management and approved by GIC's Board. The performance of the PP is evaluated over a 20-year time frame.

B. ***The Active Portfolio (AP).*** While the Policy Portfolio, on its own, serves to reap systematic long-term risk premia, GIC recognizes the need to add value on top of the PP, to increase the likelihood of achieving GIC's overall mandate. This is especially pertinent given more muted prospects for asset returns over the next 10–20 years, as compared with returns from the 1980s to the 2000s. Indeed, GIC expects the prospective real return from both the PP and RP to be lower due to unprecedented low interest rates, modest growth prospects globally, and high asset valuations. The contribution of the AP to GIC's total return is thus expected to grow in importance.

In essence, the AP is made up of GIC's entire suite of active strategies, each targeting its own separate stream of excess return over their own specific performance benchmarks. One key difference between the AP and PP is the time horizon for each portfolio. While the PP reaps long-term risk premia (over 20 years or more), the AP is made up of active strategies that generate value add over 5–7 years from excess return streams that have very low correlation with PP asset class returns.

As a whole, the AP is designed to add value above the PP. This is achieved through GIC's "cost of capital" (CoC) system—an integral part of our overall investment framework. The GIC Investment Board is tasked with the oversight of the AP. More details on the CoC system, as well as the principles underlying the construction of the AP and selection of active strategies, are outlined in greater detail later in this chapter.

C. ***The GIC Portfolio.*** The GIC Portfolio represents the actual investment holdings of GIC at any point in time. The return of the GIC Portfolio is the sum of the PP return and the total value added generated by the AP above the PP. It is this total portfolio return, over a 20-year horizon, that GIC is held accountable to. GIC's focus on long-term total portfolio return is worth emphasizing—

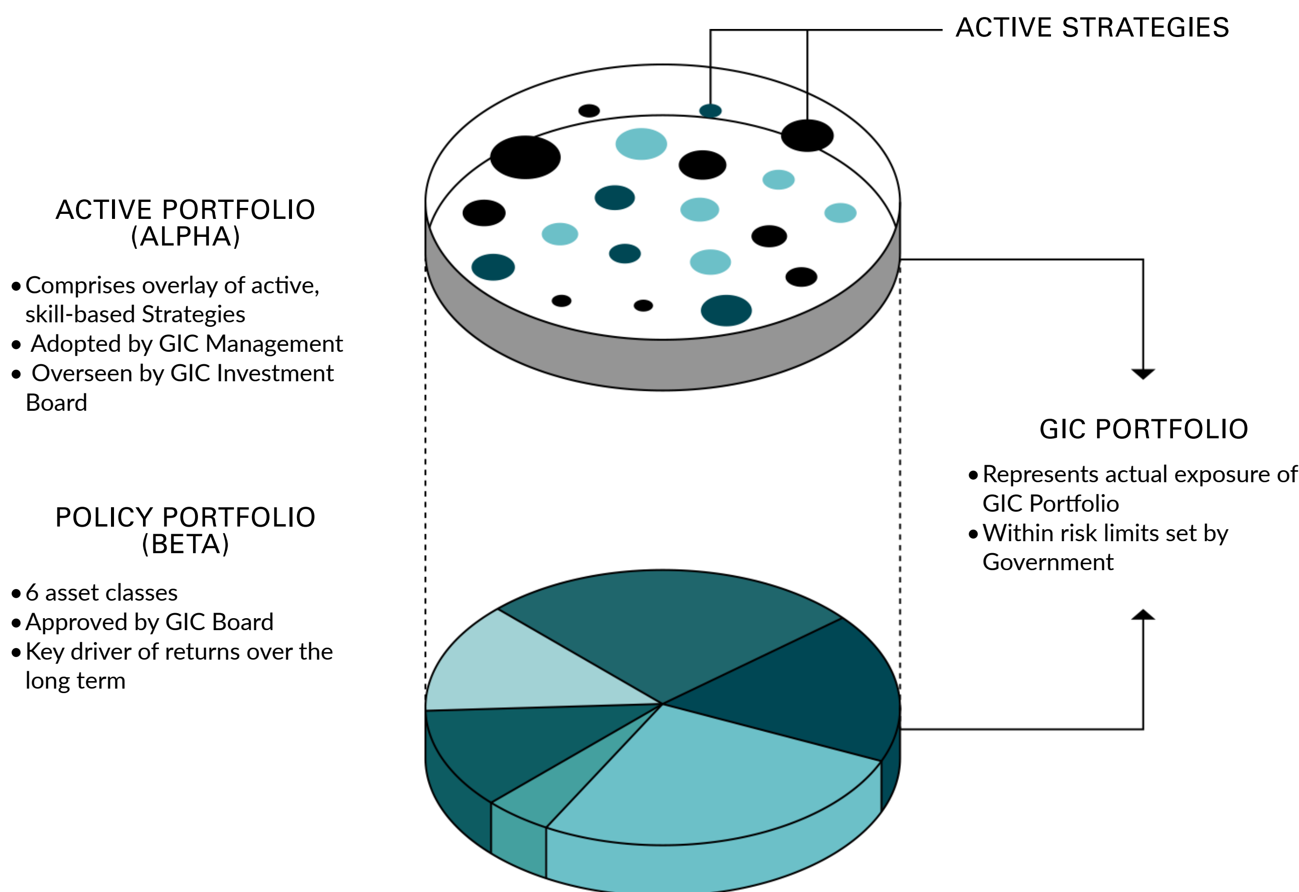
while GIC makes individual investments on the basis of a favorable risk–reward profile after taking into account available information, we acknowledge that all investments carry risks. There will inevitably be some investments that do not turn out as well as we had hoped, and we recognize that losses on certain investments will happen. GIC takes every decline in the value of individual investments very seriously and aims to learn from every such occurrence. However, we believe that maintaining our long- term orientation, taking calculated risks, and running a diversified portfolio with a disciplined rebalancing process give us the best chance of achieving good long-term real returns for the portfolio as a whole.

As previously mentioned, the RP also forms part of the investment framework, notwithstanding that it does not form part of the GIC Portfolio per se. The RP serves as a passive portfolio that is consistent with the client's risk tolerance. The RP, by construction, will be more volatile than the GIC Portfolio, which is more diversified.

The overall architecture of the GIC Portfolio (illustrated in **Exhibit 3**) clearly sets out, at a broad level, the different return streams that GIC aims to harvest and allows for a clear delineation of responsibility across various parts of GIC around the associated investment decisions. Importantly, the separation between passive returns (beta) and active, skill-based value added (alpha) enables a greater level of under- standing and management of the return and risk of the GIC Portfolio as a whole.

The discussion that follows will provide more detail on the principles underlying the construction of the PP and AP and illustrate why these are important in the context of the overall GIC Portfolio.

EXHIBIT 3: THE ARCHITECTURE OF THE GIC PORTFOLIO



THE POLICY PORTFOLIO

To recap, the aim of the Policy Portfolio is to harvest long-term systematic risk premia via exposure to core asset classes. In terms of time horizon, the PP is aligned with the client's overall goal of achieving good real returns over 20 years, subject to risk constraints. The PP represents the bulk of the GIC portfolio's overall risk. As such, any changes to asset class weights in the PP are approved by the Board, upon recommendation by GIC management.

The following principles govern the construction of the PP. This methodology allows the asset classes in the PP to be put together in a mix that aims to maximize the chance of delivering good real returns over the long term.

1. ***Robustness.*** The future is inherently uncertain, and both GIC's management and Board recognize the need to have a degree of humility when it comes to predicting the behavior of the markets and the macroeconomic environment. As such, the PP is designed to meet the client's mandate across a range of plausible market scenarios. For a particular outcome, the PP may not be the portfolio that gives the highest return. However, given a set of plausible market outcomes, the PP is designed to achieve reasonably good real returns regardless of which specific outcome eventually transpires. While we acknowledge that it would not be practical to take into account every single possible scenario, we believe that this consideration of robustness relative to an appropriate set of plausible scenarios is a prudent approach in a world where the future is uncertain. In addition, GIC employs stress tests based on a variety of extreme scenarios to determine the impact of tail events on the portfolio. The results of these analyses form a valuable input into the portfolio construction process.

2. ***Diversified.*** GIC's PP is constructed to achieve a good degree of diversification, to benefit from the distinct characteristics of each asset class in the policy mix. For instance, the GIC portfolio aims to generate good long-term returns via exposure to growth assets such as public and private equity, but it also offers protection from downside risk via exposure to defensive assets, such as high-quality nominal bonds.

   By definition, a diversified portfolio such as the PP will underperform more-concentrated portfolios in certain scenarios. The last five-year period is a case in point—because of the strong bull run in developed market equities over this period, particularly in the United States, the PP underperformed portfolios with a larger allocation to developed market equities (such as the RP, for instance). However, this same PP is expected to outperform in a bear market. Over the long term, a well-diversified portfolio provides the best mix of safety and growth and offers the best chance of contributing to the fulfillment of GIC's mandate.

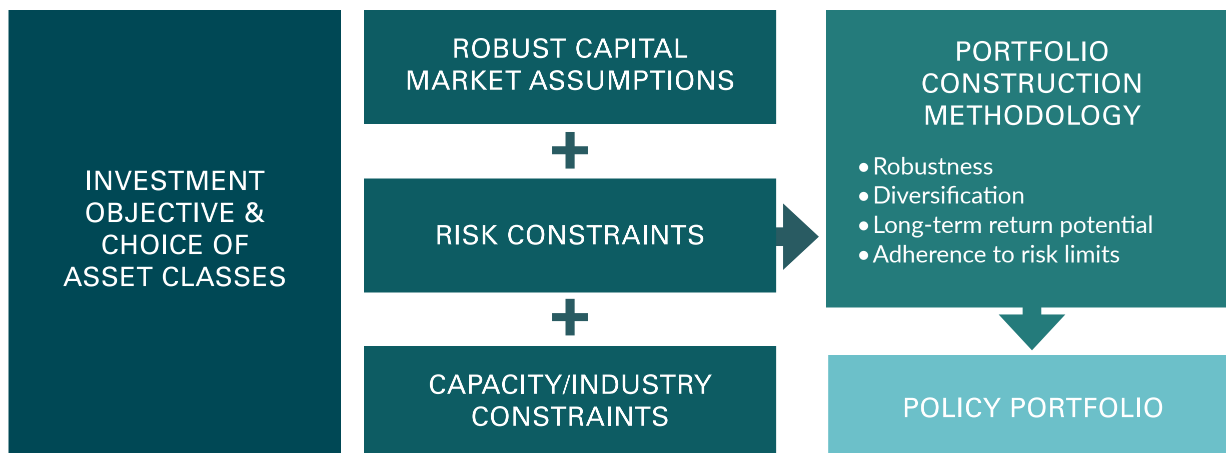
3. ***Good long-term return potential.*** The PP must be constructed such that, on a forward-looking basis, the portfolio has good long-term return potential. In practice, this requires the PP's asset classes to be chosen carefully—only those asset classes that are able to offer good long term returns (even if they are time varying over shorter horizons) should be included in the PP. The only exceptions to this principle are defensive asset classes, which are included to bolster the robustness of the PP as a whole as well as to ensure the PP's risk characteristics are within pre-specified limits.

   These long-term risk premia that the PP aims to capture generally stem from investor risk aversion and a desire for liquidity, sup- ported by corporate or government revenues. Long-term returns are also affected by secular forces, starting valuations, trends in investor behavior, changes to market structures, and a tendency for asset values to revert to some "equilibrium" level. In GIC's regular review of the PP mix, these factors are carefully analyzed to determine how the prospective long-term returns from each asset class are affected and the attendant impact on the optimal PP mix. GIC's management is also constantly scanning the investment environment to determine if any other asset classes should be included in the PP. For example, high-yield credit had been considered as a potential asset class in the PP, but after a thorough analysis, GIC concluded that high-yield credit did not sufficiently meet the criteria for inclusion in the PP.

4. ***Adherence to risk limits.*** The risk constraints imposed on the GIC portfolio affect the construction of the PP. This is because the PP is the main contributor of risk to the GIC portfolio. By including some exposure to defensive assets, such as nominal bonds and inflation-linked bonds, the overall risk of the PP can be reduced.

The process of selecting asset class weights in the PP invariably involves a combination of quantitative analysis and qualitative professional judgment. The eventual PP mix that is adopted depends heavily on ex ante return and risk projections for each asset class, which are modeled based on a forward-looking assessment with some guidance from his- tory. Using a suite of forward-looking scenarios, candidate portfolios are constructed and tested against the criteria outlined above. The final PP is selected based on a balance of risk factors, robustness and acceptable return, subject to the market capacity of each asset class. **Exhibit 4** provides a conceptual illustration of the PP construction process.

EXHIBIT 4: THE PP CONSTRUCTION PROCESS - A CONCEPTUAL ILLUSTRATION



THE ACTIVE PORTFOLIO

As outlined earlier, the Active Portfolio serves to add additional return above that of the PP. The construction of the AP is governed by a risk budget set by the Board, which determines the maximum extent to which the AP can deviate from the PP. In addition, the GIC Investment Board oversees the AP as a whole.

In GIC's investment framework, each active strategy replaces part of the passive exposure in the PP with a skill-based, value-adding investment opportunity. An easy way to understand this is to think of part of the PP being sold and the cash raised is then passed on to an active strategy to fund its investment activities. This active strategy is then expected to generate a return that is higher than its "cost of capital"—that is, what GIC would have otherwise received from the passive investments that were sold to fund the strategy plus other premia for additional risk taken.

Put another way, the CoC approach to funding active strategies aims to separate the systematic risks in each strategy (represented by the CoC, i.e., returns of the passive assets that are "sold" to fund the strategy plus premia for additional risks taken) from the returns attributable to the skill of the strategy team (represented by the value added above the CoC). This "risk-matching" approach helps to ensure that the active strategies will not have a significant impact on the risk characteristics of the portfolio as a whole.

In this construct, the following design principles govern the construction of the AP and selection and sizing of the constituent active strategies.

1. ***Ability to add value to the GIC Portfolio.*** An active strategy is deemed to be ex ante accretive to GIC if its return is expected to cover:
   - the return of the passive assets used to fund the strategy;
   - all business operating costs and fees; and
   - hedging costs, if any.

   In addition, the expected positive risk-adjusted added value of a strategy must compare favorably with other strategies in order to justify an allocation within the AP.

2. ***Scalability of each strategy.*** Strategies within the AP need to be reasonably scalable before being given an allocation in the AP, even if they have superior value-adding potential on a percentage

basis. This is true for the following reasons:
• The total size of the GIC Portfolio is large—well over US$100 billion. A strategy needs to be able to scale to a certain size before it can make an appreciable impact on the GIC Portfolio's total return.
• If a strategy's maximum size is too small, it will be difficult to justify the investment in human resources and infrastructure required to run the strategy.

3. ***Diversification and risk characteristics.*** As a result of the CoC system of funding active strategies, the AP as a whole should be, in essence, a collection of uncorrelated streams of alpha return. The AP thus should not only be diversified but also have a low correlation with the PP.

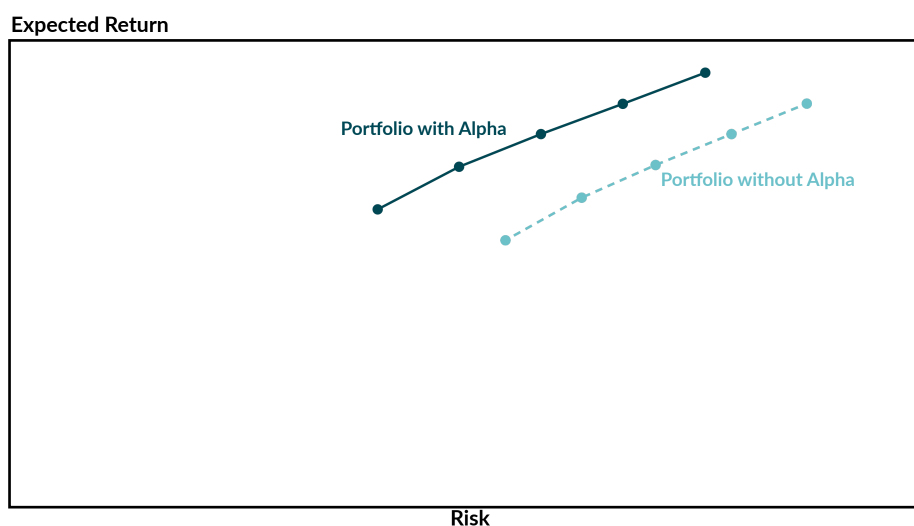
Continuous robust evaluation of the active strategies (and the AP as a whole) is vital in ensuring that the AP achieves its outperformance objective while keeping within the prescribed risk limits. This is especially so given that the evaluation timeframe of active strategies is shorter than that for the PP, ranging from five to seven years on aver- age, depending on the nature of each strategy.

Both the strategy teams and GIC management need to be vigilant to changes in market structure, macroeconomic trends, and investor behavior that could render the investment thesis of a strategy invalid. In such instances, there are established processes to downsize or close down such strategies and redeploy the capital to other strategies with stronger value-adding potential. A monitoring process is also in place to alert the strategy teams and management to fundamental changes to the risk characteristics of a strategy so that appropriate changes can be made to how the strategy's risks are being monitored and managed.

In other instances, although the investment thesis and market opportunity for a particular strategy may remain promising, GIC may not have the required expertise in-house to harvest these alpha streams. In such scenarios, a choice can be made to use external managers to access the returns in the strategy. As a general principle, the choice between internal and external managers for any given strategy is made objectively based on the "best sourcing" principle net of costs and fees.

The principles that guide the construction and constant reevaluation of the AP ensure that the AP continues to play a key role in contributing to the total return of the GIC Portfolio without adding to the risk of the GIC Portfolio in a significant way. **Exhibit 5** provides a stylized illustration of the benefits the AP can bring to the total portfolio. The addition of alpha that is uncorrelated with the PP gives the total port- folio superior risk–return characteristics. The alpha–beta separation afforded by this investment framework also allows a more accurate attribution of return across various strategy teams in GIC, as well as a more granular understanding of the various sources of return across the portfolio.

EXHIBIT 5: THE BENEFITS OF ADDING ALPHA



Note: The dots on each efficient frontier represent different allocations of both public and private market risk assets. The corresponding dots on the frontier for the "Portfolio with Alpha" result from the addition of an AP with zero correlation with the PP. Each AP is assumed to represent 70% of the size of the total portfolio. In all cases, addition of the AP shifts the efficient frontier upwards and to the left, representing better expected returns for a given level of risk.

GIC'S STRENGTHS

Although a strong and robust investment framework is critical to GIC's ability to meet our client's objective of achieving good long- term real returns, GIC recognizes that a framework is useful only if it is complemented by good processes, policies, and people. The following investment beliefs and aspects of GIC's organizational culture serve to complement GIC's investment framework and allow GIC to access investment opportunities not commonly accessible to other investors.

1. ***Long-term investment perspective.*** Being able to invest with a long- term horizon is a key advantage GIC possesses. The long-term and diversified nature of the GIC portfolio, coupled with sound governance and risk management processes, allow GIC to ride through both short-term market volatility as well as more severe market crises. Our investment framework and processes also allow GIC to take advantage of opportunities that may arise from market downturns, through taking a contrarian stance in the face of short- term sentiment to reap long-term risk premia. The fact that GIC represents a large pool of stable, patient capital has also made us an attractive investor of choice.

2. ***Clear governance structure.*** The clear governance structure afforded by GIC's investment framework provides clear lines of account- ability throughout the organization. Clarity of roles allows every professional in GIC to focus on building deep expertise, with the assurance that good performance will be accurately attributed and rewarded.

3. ***Robust risk management framework and a risk-conscious culture.*** GIC's risk management framework lays out appropriate account- ability and responsibility parameters for risk taking at all levels of the organization, from the Board down to individual members of investment teams. A dedicated risk and performance management department conducts regular monitoring of performance and risk to ensure adherence to defined risk thresholds, as well as highlighting portfolio behaviors that are inconsistent with stated risk and return assumptions. Processes are likewise in place to monitor and mitigate legal, regulatory compliance, infrastructure, operational, and people risk. GIC aims to continually reinforce a risk-conscious culture at all levels of the organization, as we believe that such a mindset forms the bedrock of an effective risk management frame- work that will effectively contribute to good portfolio outcomes.

4. ***Culture of collaboration.*** As a multi-asset investor, GIC has an expertise in investing across a wide range of asset classes. Crucially, GIC has developed a culture of collaboration where there are processes for teams from different asset classes to pool resources and invest synergistically, for instance, across the capital structure in the same company in both the public and private market spaces. This ability to invest in a cross-asset manner has allowed GIC's active strategies to identify and participate in investment opportunities that would otherwise not be accessible.

5. ***Global presence - skilled and experienced talent pool.*** GIC is a global investment organization with 10 offices located worldwide, staffed by skilled and experienced investment and business professionals. This combination of a global presence and deep expertise allows GIC to be close to key financial markets worldwide, with "boots on the ground" to identify investment opportunities and build relationships with key stakeholders across the world.

CONCLUSION

Investing is inherently a risky business. In addition, we believe that the world will increasingly be characterized by volatility and uncertainty. Against this backdrop, investing in a diversified manner over the long-term within a robust risk management framework and clear governance structure remains the most prudent approach for a large, global, long term investor like GIC.