



2017 / 18

REPORT ON THE
MANAGEMENT OF THE
GOVERNMENT'S PORTFOLIO

Who We Are

GIC's mission is to secure Singapore's financial future. We invest for the long term to preserve and enhance the international purchasing power of the reserves placed under our management. Our work contributes to the well-being of present and future generations of Singaporeans. Long-term orientation and value discipline are at the heart of our investment philosophy. We manage a robust and diversified portfolio to generate steady real returns over a 20-year investment horizon, so as to fulfil our mission. We consider and integrate all opportunities and risks to deliver long-term value through our investment and corporate practices. GIC employs close to 1,500 people across our 10 offices worldwide. We are committed to engaging and growing our people. As an institution and as individuals, we are guided by our common values of Prudence, Respect, Integrity, Merit and Excellence to achieve the results we seek without compromising our reputation.

The year in numbers

3.4%

Annualised rolling
20-year real rate
of return

Close to 1,500

Number of employees

2017/18 Highlights

PERFORMANCE

- GIC achieved a 20-year annualised rate of return of 3.4% above global inflation for the financial year ended 31 March 2018.
- We are prepared for the uncertainty ahead and are committed to delivering steady long-term returns on the reserves placed under our management.

APPOINTMENTS

- We welcome:
 - Mr Koh Boon Hwee, who was appointed to the GIC Board on 14 August 2017.
 - Dr Tony Tan, who was appointed to the GIC Board and as Special Advisor on 1 January 2018.
 - Mr Lawrence Wong, who was appointed to the GIC Investment Strategies Committee on 1 August 2017.
 - Mr Uday Kotak, who was appointed to our International Advisory Board on 1 October 2017.

OUTLOOK

- In view of the high asset valuations, the increased risk of monetary policy tightening across different jurisdictions and the elevated uncertainty, we maintain a cautious investment stance. Nevertheless, we remain ready to take advantage of potential dislocations.

P R I M E

The GIC Primer

Our mission is to preserve and enhance the long-term international purchasing power of the reserves placed under our management. People and talent are central to what we can do. We believe that the results we seek are best achieved through a culture founded on our five PRIME values of Prudence, Respect, Integrity, Merit and Excellence.

PRUDENCE

We exercise prudence and sound judgement and take a considered approach to managing risks as we seek to deliver good investment returns, always conscious of our overriding fiduciary responsibility.

As an institution and as individuals, we conduct ourselves with good sense and circumspection, even as we take the best advantage of our large asset base, global presence, multi-asset approach and long-term orientation.

RESPECT

All of us are united in a common endeavour, regardless of who we are, where we work or what we do. We respect people as individuals, care for their well-being, and welcome diversity in capability and background. We do not tolerate behaviour that works against the interest of our Client or of GIC.

We stress teamwork within and across departments, and with our Client and business partners. We expect everyone to be free, candid and constructive in their comments and suggestions, and always seek to help our colleagues and GIC do better.

INTEGRITY

Everything we do is founded on integrity. We expect the highest standards of honesty from everyone in GIC, both in our work and in our personal lives. This includes abiding by the laws of the countries we invest in, and observing our code of ethics in letter and in spirit.

We must never jeopardise the trust others have in us and in our reputation for professionalism.

MERIT

We recruit and develop our people solely on merit. We draw our talent from around the world and provide challenging and meaningful work. We grant recognition and reward based on performance and conduct consistent with our PRIME values. We develop our people to achieve their potential so that we may also perform to our potential.

We select business partners based on their capability. We believe in long-term relationships built upon high levels of performance and quality of service.

EXCELLENCE

We are relentless in our pursuit of excellence. In all that we do, we strive to be the best that we can be. This demands that we plan and anticipate well, so that we will always be in time for the future, fully able to take up the challenges and opportunities that come, pursuing improvements where they may be found, and economies where these may be gained.

We expect everyone to do their best in every situation. We harness the creativity and imagination of our people and our business partners for superior results.

The GIC Way

The GIC Way is a set of principles that defines the way we think and act. It sharpens our focus on our Client, our commitment to people and our future.

CLIENT FIRST

- When our Client does well, we do well
- Never compromise our PRIME values and reputation; not even for better returns
- Always follow GIC's investment principles:
 - Pursue intrinsic value and maintain price discipline
 - Practise long-term investing
 - Pick our spots: be focused and leverage our strengths
 - Pay attention to risk control
 - Prepare for the future

PEOPLE – THE KEY

- Do what's right, not what's easy
- Help GIC make the best decisions — speak up if you have a different view
- Attract exceptional people and develop them to their full potential
- Embolden innovation and encourage learning
- Reward what matters: contribution; not pedigree, age, gender or nationality
- Excel in what you do; make a difference
- Empower decision-making at every level
- Work seamlessly across boundaries and hierarchy — OneGIC

FUTURE NOW

- Tomorrow is determined today
- Build leadership and resources for the future
- Insist on nimble and responsive structures and processes

6

**OVERVIEW FROM THE
CHIEF EXECUTIVE OFFICER**

9

INVESTMENT REPORT

- 10 Long-Term Investment Performance
- 11 Understanding the Rolling 20-Year Return
- 12 Investment Approach
- 13 The GIC Portfolio
- 14 Intermediate Markers of Investment Performance
- 16 Managing the Volatile Path to Lower Long-Term Expected Returns

17

MANAGING THE PORTFOLIO

- 18 Our Portfolio and How We Manage it
- 19 Building the Portfolio
- 19 Reference Portfolio: Embodying the Client's Risk Limits
- 19 Policy Portfolio: Key Investment Driver
- 20 Active Portfolio: Skill-based Strategies
- 20 GIC Portfolio
- 21 Governance of the Investment Framework
- 22 Investment Process
- 22 Investing Sustainably
- 23 Investment Implementation
- 25 Managing Risks
- 25 Risk Governance
- 26 Three Lines of Defence
- 27 Technology-Driven Internal Audit
- 28 Risk Management Approach

31

**FEATURE ARTICLE:
INVESTING IN
TECHNOLOGY COMPANIES**

- 32 How Did GIC Start Investing in the Technology Space?
- 32 How Does GIC Invest in Technology?
- 33 It Is a Crowded Space. How Does GIC Position Itself?
- 33 With the Wide Range of Technology Investments, How Do You Decide?
- 33 What Key Trends Are You Watching?
- 34 With Technology Reshaping Entire Industries and Categories, How Is GIC Responding?
- 35 What Is a Technology Company?

36

GOVERNANCE

- 37 Source and Purpose of Funds
- 37 The President of Singapore
- 37 The Government
- 37 The Auditor-General of Singapore
- 38 The GIC Board
- 38 Board Committees
- 38 International Advisory Board
- 39 GIC Management
- 40 Governance Structure Overview
- 41 GIC Board, Board Committees and Management Committees
- 42 Organizational Structure
- 43 Profiles
- 48 Executive Management

51

OUR PEOPLE

- 52 One Global Team
- 52 High-Performing and Collaborative Culture
- 52 Recruiting Top Talent
- 53 Developing Our People
- 53 Leadership Changes
- 53 Building Confident Communities
- 54 Our Offices

OVERVIEW FROM THE CHIEF EXECUTIVE OFFICER

REPORT ON THE MANAGEMENT OF THE GOVERNMENT'S PORTFOLIO FOR THE YEAR 2017/18

OVERVIEW



GIC's mission is to preserve and enhance the long-term international purchasing power of the reserves placed under our management. For the year ended 31 March 2018, we achieved a 20-year annualised rate of return of 3.4% above global inflation. In other words, the international purchasing power of the reserves almost doubled during the 20-year period. Our 20-year portfolio volatility remained relatively low at 9.0%, reflecting the benign market environment and a cautious portfolio stance.

As a long-term investor, our main focus is on developments which may shape lasting investment outcomes. These developments include fundamental forces such as economic growth, inflation, asset earnings and capital costs. Importantly, they also include valuation of assets.

Last year saw risk assets generate strong mark-to-market returns, as the global economy experienced broad-based growth with benign inflation. Relatively strong economic recovery in the US, aided by the continued

accommodative monetary policy, was further boosted by expected tax stimulus. Other developed economies as well as developing economies also experienced economic recovery. Along with the fundamental recovery, valuations remained elevated or were stretched further across a broad range of markets.

The strong global growth environment has increased the prospects of a larger withdrawal of the decade-long extraordinary monetary stimulus. Monetary policy tightening poses market and economic risks even in the best of times; and with the limited experience in the unwinding of unconventional policies, even more so. In the last Annual Report we highlighted the unusual divergence between market volatility and uncertainty. Market volatility has since picked up, but uncertainty remains elevated. As a global investor, we are concerned about escalating frictions in international trade and investment arrangements. The tight integration of global supply chains will see tariffs or restrictions having a broader effect across markets than for just the countries directly affected. While the prospect of a near-term compromise remains possible, the deep-seated drivers behind these tensions — the lack of widespread participation in the gains from globalisation and concerns related to national security — mean that these tensions are likely to stay.

In view of the high asset valuations, the increased risk of monetary policy tightening across different jurisdictions and the elevated uncertainty, we maintain a cautious investment stance. Nevertheless, we remain ready to take advantage of potential dislocations. The jump in market volatility experienced in early 2018 offered an indication of potentially bigger market turbulence and opportunities in the future.

Beyond macro-economic and political developments, technology drives lasting investment outcomes. Along with its disruptive effects on global economies, technology reshapes investing too. The feature article in this year's Annual Report — *Investing in Technology Companies* — delves into how we approach new technology investment opportunities and risks, and the benefits it can bring to our own internal processes. Organizationally, in the past year, we strengthened our leadership

bench by adding a Chief Technology Officer to our Group Executive Committee. Ms Wu Choy Peng was appointed to the role to develop our technology vision, strategy and capabilities.

In the last year, we continued to expand and deepen our global network of partnerships. Beyond provision of long-term capital, we have strived to add value through active sharing of our ideas and relationships with our partners. We thank them for another year of fruitful collaborations.

In September last year, the second GIC Insights Forum brought together senior global business leaders to discuss long-term issues pertinent to the international business and investment community. This year, GIC Insights Forum will be held in Beijing, in conjunction with the 20th anniversary of our first office in China. We look forward to a gathering of our esteemed partners and senior policy leaders from around the world. In March this year, we held the inaugural Bridge Forum, organised in collaboration with the Singapore Economic Development Board, as part of the Global Innovation Alliance which was announced in Singapore's Budget 2017. Our partners, including Singapore enterprises, benefitted from the networking and idea sharing at the forum.

We strengthened our sustainability effort in the last year, by further integrating environmental, social and governance considerations into our investment processes, corporate practices and procurement decisions. It is our belief that companies with good sustainability practices are likely to perform well financially in the long term.

In conclusion, we are prepared for the uncertainty ahead and we commit to delivering steady long-term returns on the reserves placed under our management.

A handwritten signature in black ink, appearing to read 'LIM CHOW KIAT'. The signature is stylized and fluid.

LIM CHOW KIAT
Chief Executive Officer

Thank You

It has been our privilege to benefit from the experience and expertise of Mr Deepak Parekh, who stepped down from the GIC International Advisory Board.

Welcome



KOH BOON HWEE

Mr Koh Boon Hwee was appointed to the GIC Board on 14 August 2017.

Mr Koh is the Chairman of Credence Partners and has been a member of the GIC Investment Board since January 2016.



DR TONY TAN KENG YAM

Dr Tony Tan was appointed to the GIC Board and as Special Advisor on 1 January 2018.

Dr Tan was the 7th President of Singapore and Former Deputy Chairman and Executive Director of GIC.



LAWRENCE WONG

Mr Lawrence Wong was appointed to the GIC Investment Strategies Committee on 1 August 2017.

Mr Wong is the Minister for National Development and Second Minister for Finance. He is also Co-Chairman of the Singapore-Tianjin Economic and Trade Council.



UDAY KOTAK

Mr Uday Kotak was appointed to our International Advisory Board on 1 October 2017.

Mr Kotak is the Founder, Executive Vice Chairman and Managing Director of Kotak Mahindra Bank.

INVESTMENT REPORT

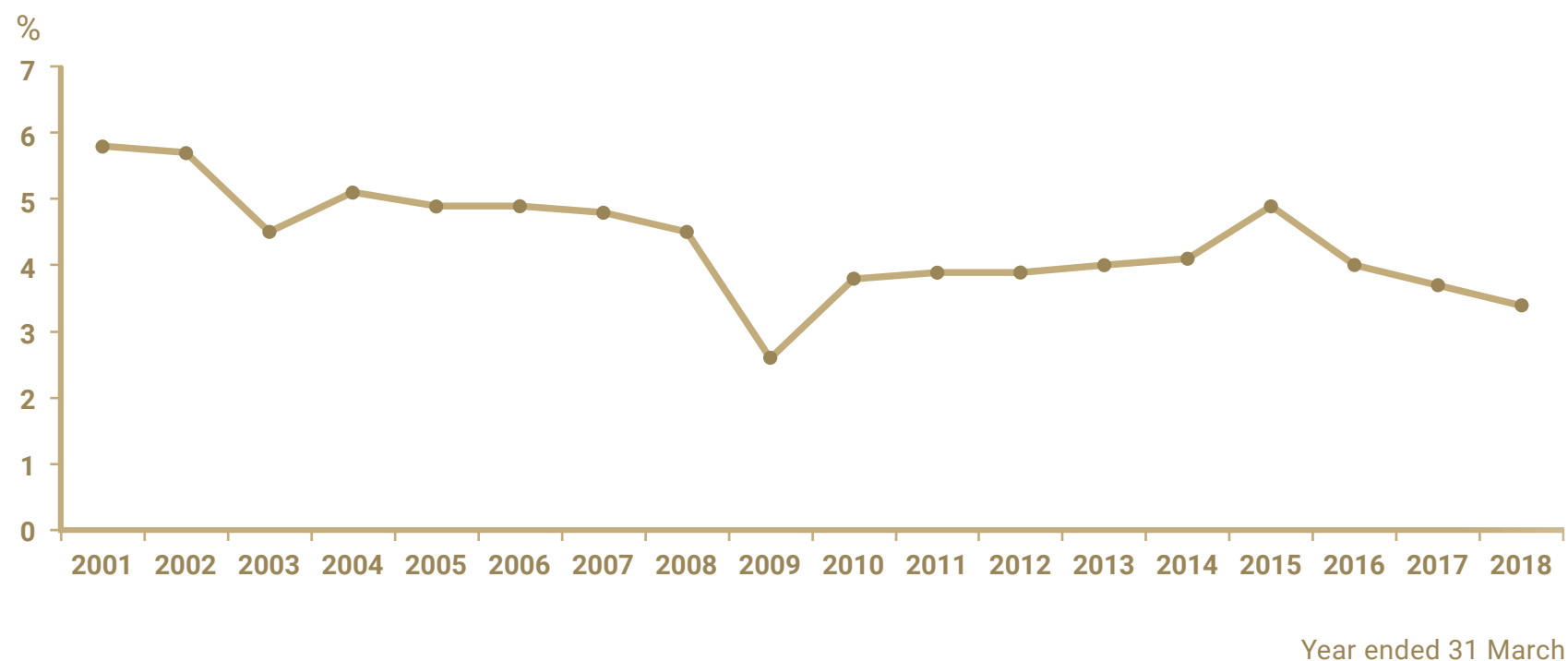
GIC's mandate is to achieve good long-term returns above global inflation, and preserve and enhance the international purchasing power of the reserves placed under its management.

LONG-TERM INVESTMENT PERFORMANCE

GIC’s mandate is to achieve good long-term returns above global inflation. This is represented by the primary metric for evaluating GIC’s investment performance – the rolling 20-year real rate of return. GIC’s goal is to beat global inflation, and preserve and enhance the international purchasing power of the reserves placed under its management.

Over the 20-year period that ended 31 March 2018, the GIC Portfolio generated an annualised real¹ return of 3.4% (see Figure 1). In recent years, GIC’s rolling 20-year return has been fluctuating around 4% but has declined below that level in the last two years. Returns in most recent years have been good. However, the high returns from the beginning of the tech bubble period in the late 1990s have dropped out of the 20-year window, while the post-tech bubble declines have remained in the window (see ‘Understanding the Rolling 20-Year Return’ on the next page). We expect this effect to continue for a few more years, dampening the rolling 20-year return.

Figure 1: Annualised Rolling 20-Year Real Rate of Return of the GIC Portfolio since 2001



¹ An annualised real return is the return adjusted for global inflation. The real return number is independent of the currency used to compute it.

Understanding the Rolling 20-Year Return

GIC reports its performance as an annualised 20-year real return, which is the average time-weighted portfolio return over that period. It is a rolling return, which means that last year’s 20-year return spans the period 1998 to 2017, this year’s 20-year return spans 1999 to 2018, and next year’s return will span 2000 to 2019. For each new year added, the earliest year is dropped out. The change in the rolling 20-year return from year to year is therefore determined by the returns from the earliest year that drops out and what is added for the latest year (see Figure 2).

Figure 2: Illustration of a Portfolio’s Rolling 20-Year Return



Investment returns are inherently cyclical and volatile even over 20 years. For example, the 20-year real return for a US 65% equity and 35% bonds portfolio was below 2% in the 1980s, but as high as 10% in 2000. The average 20-year return for a US 65% equity and 35% bonds portfolio was 5.1% over the period from 1900 to 2018.

GIC's long-term performance is largely driven by the dynamics of the global economy and our asset allocation strategy as reflected in the Policy Portfolio. This is complemented by the performance of skill-based strategies.

GIC's long-term performance is largely driven by the dynamics of the global economy and our asset allocation strategy as reflected in the Policy Portfolio. This is complemented by the performance of skill-based strategies undertaken by active strategy investment teams, seeking to add returns above market benchmarks. In aggregate, we strive to achieve the best possible long-term returns for the GIC Portfolio across a variety of economic scenarios, within the risk parameters set by the Client. Our long-term investment approach is elaborated in 'Investment Approach' and in the chapter on 'Managing the Portfolio'.

Investment Approach

GIC's long-term investment approach has a few key features. It allows us to earn risk premia from exposure to systematic risk factors, such as the equity risk premium. It also allows for investment in illiquid asset classes such as private equity and real estate, which offer the prospect of better returns. Exposure to these risk premia enables GIC to harness the power of compounding over time.

In addition, adopting a long-term approach allows GIC to avoid the drawbacks of pro-cyclicality. GIC focuses on long-term fundamentals and value rather than on short-term market price gyrations. This reduces the chances of overpaying at market tops or underinvesting at market bottoms. Long-term investing is not a rigid buy-and-hold approach. GIC's long-term value investing approach distinguishes price from value. If an asset's price persistently exceeds its fundamental value, we would tend to sell, and conversely, even if it sometimes means going against current market sentiment.

THE GIC PORTFOLIO

The GIC Portfolio is a well-diversified portfolio of asset classes. Each asset class carries a different risk and return profile. Growth assets such as equities generate higher returns, but are riskier. Defensive assets such as sovereign bonds offer lower returns, but have lower risk and protect the portfolio in market downturns. As the future is uncertain, the GIC Portfolio is constructed to be resilient across a broad range of plausible market and economic conditions, while generating positive long-term real returns.

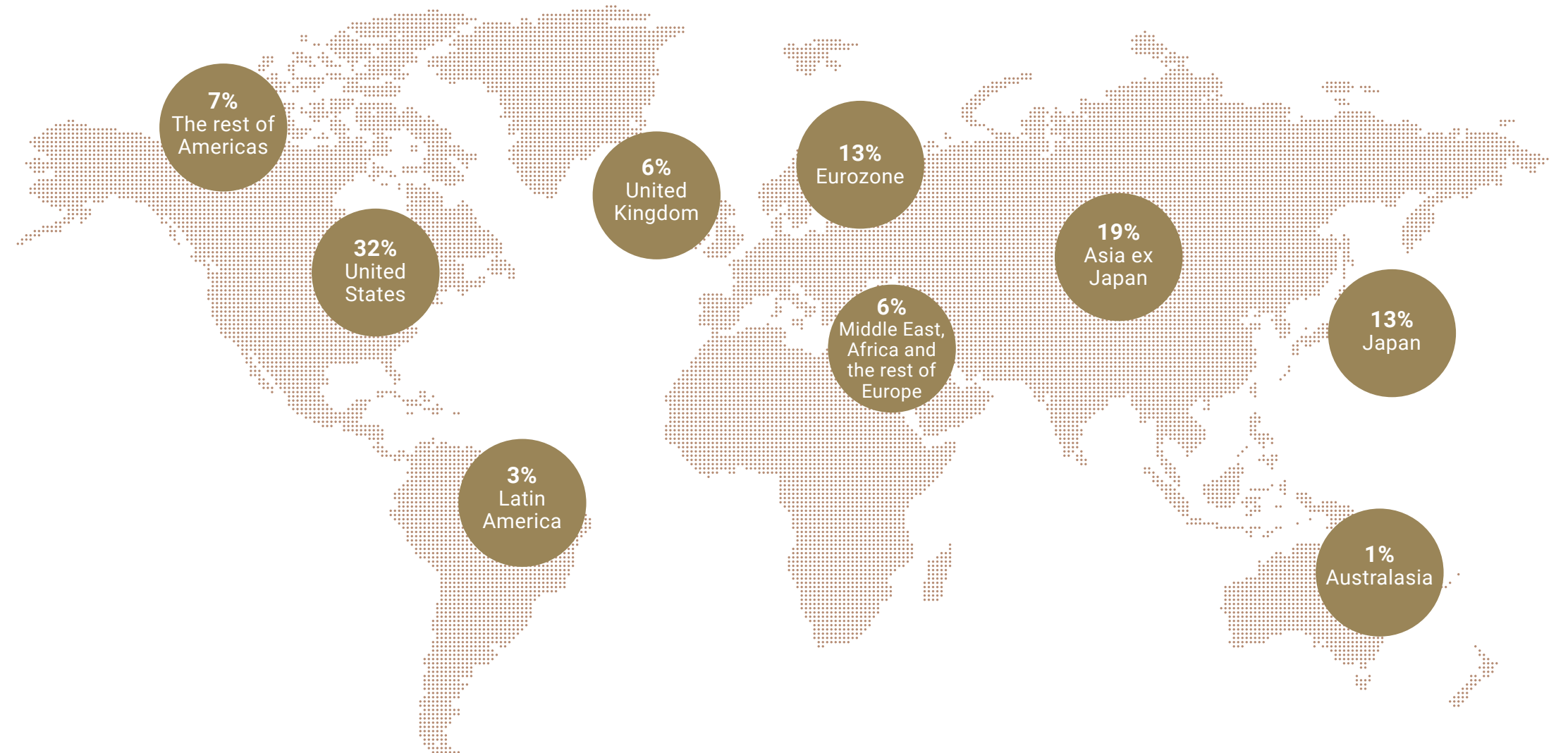
Table 1 and Figure 3 show the asset mix and geographical distribution of the GIC Portfolio as of 31 March 2018.

Table 1: Asset Mix of the GIC Portfolio

Asset Mix	31 March 2018 (%)	31 March 2017 (%)
Developed Market Equities	23	27
Emerging Market Equities	17	17
Nominal Bonds and Cash	37	35
Inflation-linked Bonds	5	5
Real Estate	7	7
Private Equity	11	9
Total	100	100

While asset allocation is our primary focus in portfolio construction, we also monitor our exposures across countries.

Figure 3: Geographical Distribution of the GIC Portfolio



INTERMEDIATE MARKERS OF INVESTMENT PERFORMANCE

While the GIC Portfolio is constructed to deliver good 20-year returns above global inflation, we monitor its ongoing intermediate investment performance. Table 2 shows the **nominal USD returns** over 10 years and 5 years and the corresponding portfolio volatility. We include 20-year nominal numbers for completeness here.²

Table 2: Nominal Annualised Return and Volatility of the GIC Portfolio
(in USD, for periods ending 31 March 2018)

GIC Portfolio		
Time Period	Nominal Return ³	Volatility ⁴
20-Year	5.9%	9.0%
10-Year	4.6%	10.1%
5-Year	6.6%	6.3%

The GIC Portfolio's 20-year real return was 3.4%, or 5.9% per annum in nominal USD terms.

Over the 10-year period ending March 2018, the GIC Portfolio returned 4.6% per annum in USD nominal terms. This period includes the poor market performance due to the Global Financial Crisis and the European Debt Crisis, and the subsequent recovery due to the aggressive monetary policy interventions.

Over the last 5-year period, the GIC Portfolio returned 6.6% per annum in USD nominal terms, benefitting from the run-up in global financial assets. Aggressive non-conventional monetary policies helped to push up market valuations.

² GIC's primary metric is the rolling 20-year real rate of return, which we described earlier in this chapter.

³ The GIC Portfolio's rates of return are computed on a time-weighted basis, net of costs and fees incurred in the management of the portfolio.

⁴ Volatility is computed using the standard deviation of the monthly returns of the GIC Portfolio over the specified time horizon.

We also monitor the performance of a Reference Portfolio which comprises 65% global equities and 35% global bonds.⁵ The Reference Portfolio is not a performance benchmark for the GIC Portfolio but rather, characterises the risk the Client is prepared for GIC to take in generating good long-term investment returns. On occasion, GIC may lower its risk exposure in times of market exuberance. Conversely, GIC may increase its risk exposure when the opportunity arises. This is part of a disciplined, professional approach to long-term value investing.

Table 3 shows the **nominal USD returns** over 20 years, 10 years and 5 years and the corresponding volatility for the Reference Portfolio. The figures do not include adjustments for costs that would be incurred when investing.

Table 3: Nominal Annualised Return and Volatility of the Reference Portfolio (in USD, for periods ending 31 March 2018)

Reference Portfolio		
Time Period	Nominal Return ⁶	Volatility ⁷
20-Year	5.7%	10.8%
10-Year	5.2%	12.0%
5-Year	6.9%	7.5%

Over the three time periods, the GIC Portfolio has lower volatility than the Reference Portfolio due to its diversified asset composition. In addition, increasingly stretched valuations in developed market equities have prompted a reduced allocation to this asset class in recent years. Nevertheless, despite its lower risk exposure than the Reference Portfolio, the GIC Portfolio has performed creditably over a 20-year period.

⁵ The Reference Portfolio was adopted from 1 April 2013, and reflects the risk that the Government is prepared for GIC to take in its long-term investment strategies. It comprises 65% global equities and 35% global bonds. For more details, please refer to the chapter on 'Managing the Portfolio'.

⁶ The Reference Portfolio's rates of return are provided on a gross basis, i.e. without adjustment for costs and fees.

⁷ Volatility is computed using the standard deviation of the monthly returns of the Reference Portfolio over the specified time horizon.

In this challenging investment environment, it is all the more important to maintain strong price discipline. This means not overpaying for assets, and reducing exposure when the risk-reward trade-off is less favourable over the long term.

Managing the Volatile Path to Lower Long-Term Expected Returns

Looking ahead to the next couple of years, the investment environment remains challenging. In this backdrop of high valuations, slow global growth and significant uncertainties, we expect real returns for both the GIC Portfolio and the Reference Portfolio to be lower. The combination of low expected returns and high downside risks explains GIC's continued cautious portfolio stance.

Market valuations remain elevated across a broad spectrum of risk-assets, including US equity markets and high yield credit within public markets. Valuation metrics for US equities, for example, continue to be well above historical averages.

Additionally, the business cycle in advanced economies, especially the US, is mature. Economic activity and corporate earnings may not grow for much longer before the business cycle turns. We expect growth in China to gradually slow due to ongoing efforts to contain leverage, a difficult balancing act between the quality and speed of growth. While global growth may hold up in the near term and will get a boost from the US fiscal stimulus, inflation is expected to pick up in advanced economies and lead to less accommodative monetary policy. This increases the possibility of a global economic downturn over the next couple of years.

A further escalation in trade protectionism and investment restrictions is another risk, with the US threatening to impose

tariffs on key trading partners. Moreover, the uncertainties that we highlighted in previous years – tensions around income inequality, populism, geopolitical conflicts and the potential negative impact of disruptive technologies – still persist. In addition, declining credit quality, hidden liquidity risks, and a proliferation of investment strategies that rely on volatility and rates staying low have contributed to the underlying market vulnerabilities that could amplify any further sell-off.

Long-term returns are likely to be significantly lower than what we experienced since the 1980s given the high valuations today and the expected rise in interest rates from their current very low levels. Moreover, secular economic and earnings growth is expected to be more modest over the next 20 years than it has been since the 1980s due to structural headwinds from demographics, elevated debt, and lower productivity growth.

In this challenging investment environment, it is all the more important to maintain strong price discipline. This means not overpaying for assets, and reducing exposure when the risk-reward trade-off is less favourable over the long term. Our active strategy teams remain focused on utilising our long-term perspective, organizational capabilities and global network to identify attractive idiosyncratic opportunities. We believe this approach puts us in good stead to invest in this new environment.

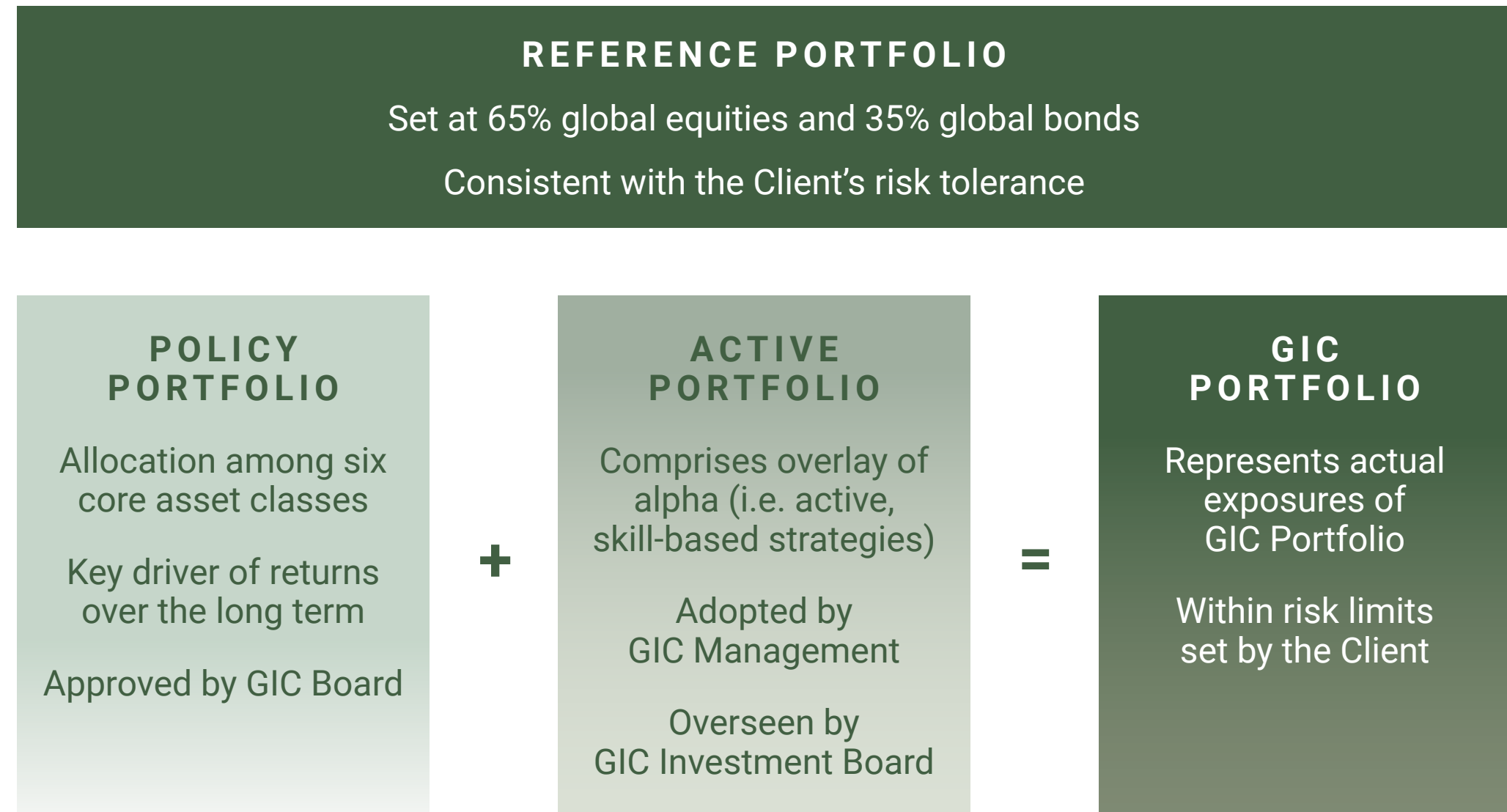
MANAGING THE PORTFOLIO

GIC's investment strategy is to build a portfolio comprising asset classes that generate good long-term real returns, while adhering to our Client's risk tolerance.

Our Portfolio and How We Manage It

Our mission is to preserve and enhance the international purchasing power of Singapore's foreign reserves placed under our management, by delivering good long-term returns above global inflation.

To this end, we established an investment framework that equips GIC for an increasingly challenging and complex investment environment. Adopted in 2013, the framework leverages GIC's strengths, including our ability to invest for the long term, flexible capital and governance structure.



BUILDING THE PORTFOLIO

Our investment framework comprises three building blocks: Reference Portfolio, Policy Portfolio and Active Portfolio.

REFERENCE PORTFOLIO: EMBODYING THE CLIENT'S RISK LIMITS

Our Client, the Singapore Government, owns the funds that GIC manages, and decides on the overall risk tolerance. GIC's role is to generate good long-term returns above global inflation while adhering to our Client's risk tolerance.

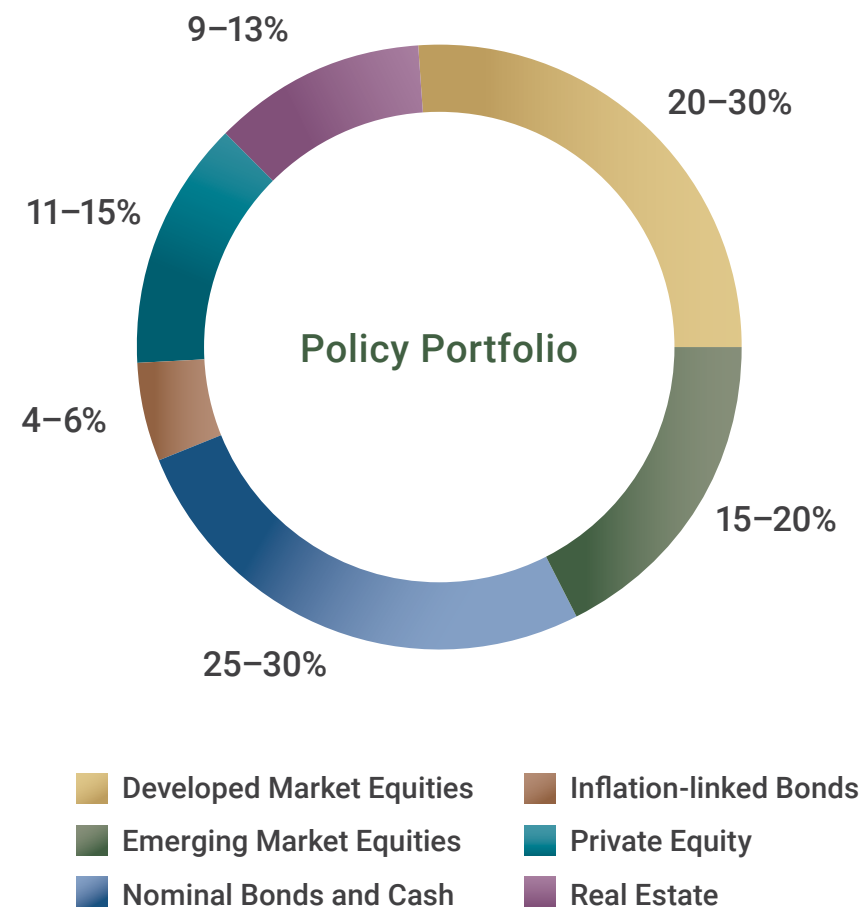
The Reference Portfolio characterises the risk the Client is prepared for GIC to take in its long-term investment strategies. It comprises 65% global equities and 35% global bonds. It is not a short-term performance benchmark for GIC.

GIC's investment strategy is not to track the Reference Portfolio, but to build a portfolio comprising asset classes that can generate good long-term returns above global inflation, while adhering to our Client's risk tolerance as embodied by the Reference Portfolio. This approach results in deviations between the GIC Portfolio and the Reference Portfolio and can result in significant differences in performance from time to time.

POLICY PORTFOLIO: KEY INVESTMENT DRIVER

The Policy Portfolio represents GIC's asset allocation strategy over the long term. It accounts for the bulk of the risk and return potential of the GIC Portfolio. The Policy Portfolio seeks to balance the way different asset classes respond to varied possible economic environments.

The Policy Portfolio comprises six asset classes: Developed Market Equities, Emerging Market Equities, Nominal Bonds and Cash, Inflation-linked Bonds, Private Equity and Real Estate.



Through the diversity of asset classes, the Policy Portfolio is expected to outperform the Reference Portfolio over a 20-year period. However, in the short term, there can be underperformance vis-à-vis the Reference Portfolio.

The Policy Portfolio has a long-term investment horizon and is not intended to be adjusted frequently or in response to market cycles. GIC's approach to rebalancing our portfolio ensures we keep to the allocated ranges of asset classes in the Policy Portfolio. Rebalancing involves systematically buying assets that have decreased in price and selling assets that have increased in price, to keep the asset composition in our portfolio steady over time. When an asset class such as equities does particularly well, the rebalancing rule compels investors to sell. Conversely, when equities do very poorly, such as after the bursting of an economic bubble, rebalancing calls for acquiring assets that have decreased in price. Nevertheless, GIC can and does occasionally adjust its asset allocation over the medium term when there are fundamental changes in the global investment environment, such as structural shifts in the risk and return profile of a particular asset class or geographical region.

The GIC Portfolio is constructed to be resilient across a broad range of possible market and economic conditions, while generating good returns above global inflation in the long term.

ACTIVE PORTFOLIO: SKILL-BASED STRATEGIES

The Active Portfolio comprises a group of investment strategies in which managers add value to the Policy Portfolio, while broadly maintaining the same level of systematic risk.

Alpha is the additional return achieved by active strategies as compared to the Policy Portfolio, while beta comprises market returns. At GIC, active, skill-based ‘alpha’ strategies are separated from beta activities to better manage our return and risk drivers. Our alpha activities aim to earn returns from GIC’s competitive advantages. Our beta activities seek to achieve a diversified mix of asset classes through careful portfolio construction which considers the response of various asset classes to different possible economic environments.

Each active strategy must generate a return above its cost of capital and is funded through the sale of an asset class or combination of asset classes in the Policy Portfolio with a similar systematic risk exposure. For example, active strategies designed to outperform public equities are funded from public equity holdings in the Policy Portfolio. This way, passive investments in the Policy Portfolio are replaced by an active strategy with the potential for greater returns without additional systematic risk to the portfolio.

The GIC Board sets an overall risk budget which GIC Management can use for its active strategies. These strategies are stress-tested to understand and quantify their performance under various extreme but plausible market conditions, including macroeconomic and geopolitical events. The active risk budget establishes the total level of risk for the Active Portfolio. GIC Management employs risk budgeting to allocate risk to different strategies.

GIC PORTFOLIO

Through the Policy Portfolio and Active Portfolio, the GIC Portfolio is diversified across asset classes, with each carrying a different risk and return profile. Growth assets such as equities generate higher returns, but are riskier. Defensive assets such as sovereign bonds offer lower returns, but embody lower risk and protect the portfolio in market downturns.

The GIC Portfolio is constructed to be resilient across a broad range of possible market and economic conditions, while generating good returns above global inflation in the long term.

For more information on the GIC Portfolio, please refer to the chapter ‘Investment Report’.

GOVERNANCE OF THE INVESTMENT FRAMEWORK

The investment framework encapsulates the various long-term risk and return drivers for GIC. It also reflects the responsibilities of the GIC Board and Management. The Reference Portfolio embodies the Client’s risk appetite, while the GIC Board approves the Policy Portfolio which is designed to deliver good, long-term returns. GIC Management is empowered to add value within the risk limits stipulated by the GIC Board through the Active Portfolio which comprises active, skill-based strategies.

The Investment Board (IB) provides an independent layer of oversight on GIC’s active investment management and process. IB members come from the private sector and may not necessarily be GIC Board Directors. Together, they offer extensive experiences in various types of investments across geographies. The IB ensures that GIC invests in a sound and disciplined manner. Additionally, the IB ensures that GIC takes into account potential reputational risks arising from investment activities.

In its totality, our investment framework leverages GIC’s strengths. These include our long-term investment horizon; capabilities in both public and private markets and the possibility to synergise these for cross-asset investment opportunities; presence in all major financial cities; and a governance structure that clearly lays out the responsibilities of the GIC Board and Management.

The following table summarises the responsibilities within GIC under the investment framework.

	Responsibility
GIC Board	<ul style="list-style-type: none"> • Approves the Policy Portfolio and active risk budget
Investment Strategies Committee	<ul style="list-style-type: none"> • Reviews GIC Management’s recommendations on the Policy Portfolio and active risk budget
Investment Board	<ul style="list-style-type: none"> • Oversees GIC Management’s active strategies and large investments • Ensures GIC does not take on undue reputational risk in pursuit of returns
GIC Management	<ul style="list-style-type: none"> • Recommends the Policy Portfolio and constructs the Active Portfolio • Adds value through the Active Portfolio within the risk tolerance in GIC’s mandate set by the Client
Investment Teams	<ul style="list-style-type: none"> • Implement the Policy Portfolio and conduct active strategies

INVESTMENT PROCESS

As a disciplined long-term value investor, we take a systematic, patient and diversified approach in seeking investment opportunities, where there is a clear difference between the current price and intrinsic value of an asset.

GIC's investment approach is underpinned by our discipline to distinguish price from value. An asset's price is driven largely by market sentiments, while its value is its fundamental worth. Anchored by this perspective, we seek to appraise value appropriately and adhere to price discipline, even when it sometimes means going against prevailing market sentiments.

To determine where true fundamental value lies, we identify and assess drivers of long-term value as a core part of our investment process. This approach comprises top-down and bottom-up analyses for all investments. In the top-down analysis, we review a country's macroeconomics, politics, currency and corporate governance culture, as well as sector fundamentals such as industry structure, drivers and trends. This top-down approach is similar for asset classes in public and private markets.

Our bottom-up analysis is more varied and depends on the assets we invest in. For example, in public equities, we focus on the stock's fundamentals, such as the company's business model and its competitive strengths, balance sheet, profitability and management. In real estate, our teams conduct bottom-up analysis based on property-specific factors such as location, building quality, tenant mix, lease expiry profiles and income stream outlook. Our value investing mindset is the common underlying principle.

To deliver good long-term returns, we consider all opportunities and risks that could drive investment value in the long run. These considerations, which include track record, ability and integrity of management teams and business practices, are integral to our investment process. We expect our investee companies to comply with applicable laws and regulations and apply appropriate corporate governance and stakeholder engagement practices.

We also actively advocate long-term thinking in the wider community, as exemplified by our participation in initiatives such as Focusing Capital on the Long Term (FCLTGlobal) and the International Forum of Sovereign Wealth Funds.

Investing Sustainably

It is our belief that companies with good sustainability practices are likely to perform well financially in the long term. Our approach integrates sustainability considerations into our investment and corporate processes.

Taking a long-term perspective

GIC is most concerned about preserving and enhancing the long-term value of our total portfolio. Corporate practices in the areas of environment, social and governance (ESG) have significant impact on value, and are therefore important considerations in our investment decision process.

Establishing a robust sustainability process

We incorporate the quantitative impact of sustainability factors into our valuation process and conduct additional due diligence on companies more exposed to sustainability issues.

Responsible stewardship

We are guided by sound stewardship principles to promote sound corporate governance and sustainable business practices. We engage with portfolio companies on sustainability and exercise our voting rights in a responsible manner. Our voting choices are informed by a set of global principles and policies, while being sensitive to local differences. Our votes reflect our long-term view and sustainability beliefs.

INVESTMENT IMPLEMENTATION

At GIC, our investment teams work to find attractive bottom-up investment opportunities.

Our core investment groups are Public Equities, Fixed Income, Private Equity, Infrastructure and Real Estate. In addition, our Integrated Strategies Group evaluates and invests in cross-asset investment opportunities.

We are open to investing in all countries outside of Singapore, but do not invest in countries that are subject to United Nations Security Council sanctions. We monitor our investee companies and exercise ownership rights, with the intent to preserve and enhance long-term investment value and protect the financial interests of our Client.

Investment Groups in Public and Private Markets

GIC invests in both public and private markets. In public markets, we invest in public equities in both developed and emerging markets, absolute return strategies (hedge funds), fixed income and cash. We manage a diversified portfolio to produce good risk-adjusted performance. In private markets, we invest in opportunities that have the potential to generate high long-term real returns and the ability to diversify the portfolio. Real estate assets, in particular, also serve as a hedge against inflation.

Public Equities Group

Our equity investing effort is carried out by a team of in-house research analysts and portfolio managers, organised along product groups specialising in total return, relative return and quantitative strategies. The team conducts in-depth due diligence and research to identify businesses with the potential to generate good long-term returns.

Fixed Income Group

The Fixed Income business in GIC is broadly organised along three areas: global macro, global credit/spread sector and cross-asset systematic/quantitative investing. We invest across the entire fixed income spectrum which includes government bonds, emerging market bonds, corporate bonds and loans, convertible bonds, hybrid securities, securitized products, structured credit and global currencies. Our multi-asset macro and systematic strategies also invest in asset classes such as equities and commodities.

Private Equity Group

GIC's private equity universe includes buyouts, minority growth, pre-IPO investing, venture capital and special situations such as mezzanine debt, distressed debt and secondary fund investments. We invest in companies directly and through funds. The direct investment programme is focused on taking minority equity positions and providing mezzanine financing in buyouts. Our funds strategy aims to identify, and invest with, leading private equity and venture capital funds globally, and grow with them in the long run. We have built up a network of over 100 active fund managers. The investment teams add value to the boards and management of the investee companies by providing advice and access to a global network of business links.

Infrastructure Group

GIC's Infrastructure Group engages a multi-strategy approach to investing. The main strategy is to make direct private equity investments in operating infrastructure assets with a high degree of cash flow visibility and which provide a hedge against inflation. These include mature, low- to moderate-risk assets in developed markets, complemented by investments with higher growth potential in emerging markets. The group also invests in infrastructure funds, non-investment grade infrastructure debt and structured investments in listed infrastructure companies.

Real Estate Group

GIC was an early entrant among institutional investors in real estate. Our investments in the space now include traditional private real estate (brick-and-mortar assets), public equities, real estate investment trusts and real estate-related debt instruments. Our real estate assets span multiple property sectors, including office, retail, residential, industrial and hospitality.

Through active asset management, GIC can further generate income and enhance the market value of its assets through tenant management, market positioning, leasing and capital improvements.

Integrated Strategies Group

The Integrated Strategies Group (ISG) focuses on cross-asset and less-conventional investment opportunities across products and geographies. ISG collaborates with the other groups to jointly invest in large investment opportunities. It develops thematic investment strategies and expands our network of relationships beyond traditional domains.

Portfolio Execution Group

The Portfolio Execution Group is responsible for implementing liquid market decisions, and is made up of two arms – the Global Trading Unit (GTU) and the Treasury and Portfolio Management Group (TPMG). GTU executes investment decisions across all public market asset classes and provides market intelligence. GTU is organised into four teams – Equities, Fixed Income and Currencies, Liquid Strategies and Execution Research – and operates around the clock across three centres – Singapore, London and New York. TPMG is responsible for total portfolio rebalancing, liquidity management, strategy funding, as well as equity beta replication and financing. Our portfolio managers seek efficiency while minimising transaction costs.

External Fund Managers

GIC employs external fund managers to access investment capabilities and opportunities. External managers enable GIC to gain exposure across public and private markets. In particular, they offer us specialised and local expertise in various geographies. They also provide us with valuable investment insights.

Investment Services

GIC has a dedicated investment services team that supports public and private market investment activities. This includes support for deal closing, investment and data operations, investment reporting, management reporting, portfolio accounting, valuation and financing.

MANAGING RISKS

Investing involves prudent risk-taking. Identifying and managing risk is therefore a core responsibility of all GIC staff. Each employee has individual accountability and clearly defined responsibilities within a well-defined risk management framework. This ensures risks taken are in line with the risk tolerance set by the Client.

Risk Management Objectives

GIC's risk management objectives are to ensure that:

- I. The investment strategies pursued are consistent with the risk tolerance set by our Client.
- II. Policies, guidelines and control processes are in place to reduce the likelihood of significant losses.
- III. Any reputational impact due to our actions is carefully managed.
- IV. The risks associated with each investment are well-understood and we are adequately compensated for taking those risks.

RISK GOVERNANCE

The GIC Board provides ultimate risk oversight. It is responsible for determining GIC's risk appetite in conjunction with investment objectives. The GIC Board is supported by the Board Risk Committee, which advises the Board on risk matters. The Board Risk Committee sets the overall direction of risk management policies and practices in GIC. In addition, it reviews significant risk issues arising from GIC's operations and investments.

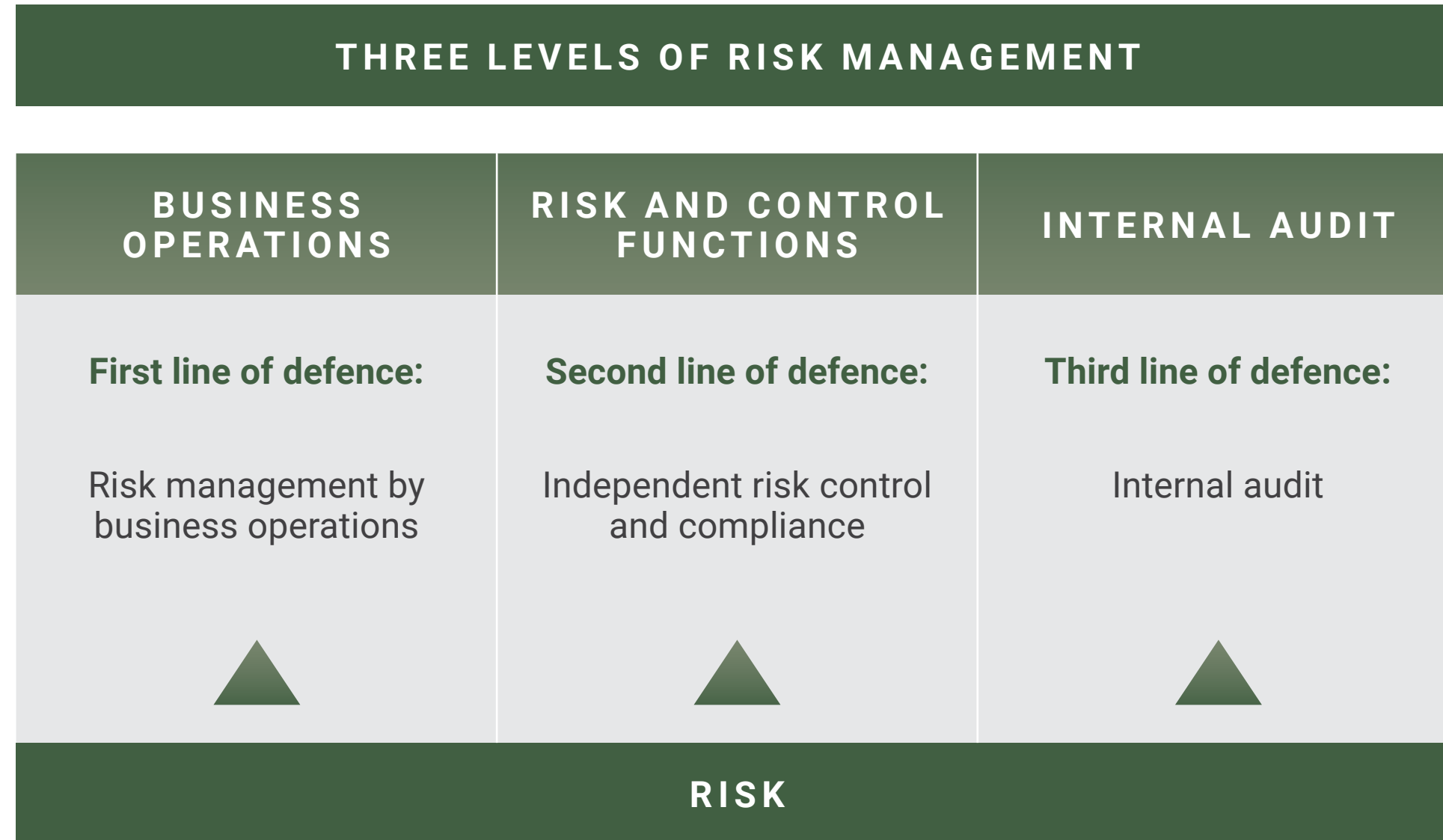
The Group Executive Committee is the highest management body in GIC. It deliberates on investment and risk issues before they are submitted to relevant board committees. It is also the forum that assesses and makes determinations on fiduciary risk and reputational risk issues.

The Chief Risk Officer (CRO) is a member of the Group Executive Committee and reports to the Chief Executive Officer (CEO) and Chairman of the Board Risk Committee. The CRO is accountable to the Board of Directors, primarily through the Board Risk Committee, on all risk-related matters.

The CRO chairs the Group Risk Committee that is vested with responsibility to oversee implementation of risk policies, review significant risk issues from investments and operations, as well as to ensure the resolution of these issues.

Three Lines of Defence

GIC's risk management model operates along 'three lines of defence' which ensure that there is clarity and transparency in risk ownership and accountability.



The First Line: Operating Units

People are the cornerstone of any risk management system. All GIC staff are expected to act with integrity and exercise sound judgement; they need to understand, evaluate and carefully manage the risks that they take.

All operating units own, and are primarily accountable for, the risks inherent in their activities. They are responsible for ensuring that an appropriate risk-and-control environment and robust processes are in place as part of their day-to-day operations. Our risk assessments are forward-looking and form an important element of our long-term approach. We consider a broad spectrum of risks with potential long-term impact, including sustainability risks and risks from activities managed by appointed agents.

The Second Line: Independent Risk Functions

Risk management and control functions independent of the risk-taking business units are the second line of defence. They provide appropriate day-to-day risk oversight and control. These functions include the risk management function, legal and compliance function, and finance function. While they each have their defined set of responsibilities, they also work collectively to provide the requisite ‘checks and balances’ to the risk-taking activities of GIC’s investment groups.

The risk management function is responsible for the independent assessment, measurement, monitoring and reporting of GIC’s investment, counterparty credit and operational risk profile.

The legal and compliance function is responsible for the independent assessment, handling, monitoring, reporting and escalation of significant legal, regulatory and compliance matters to the Group and Board Risk Committees. It also manages litigation, regulatory inquiries and our regulatory relationships.

The finance function is responsible for establishing and executing internal controls over the GIC group’s accounting and financial procedures. It also monitors and mitigates tax risks in our operations and investments.

The Third Line: Internal Audit

Our Internal Audit Department (IAD) forms the third line of defence. It provides an independent assessment and assurance on the adequacy and effectiveness of our internal risk management controls. It reports functionally to the Chairperson of the Audit Committee, and administratively to the CEO.

Technology-Driven Internal Audit

GIC has incorporated advancements in data science to sharpen investment decisions, identify new business opportunities and drive operational improvements. GIC’s IAD has similarly leveraged data science to achieve greater risk coverage, stronger assurance and deeper business insight.

IAD’s data science capabilities include machine learning for anomaly detection and risk identification, the use of Natural Language Processing to analyse unstructured data, and proficiency in ‘Big Data’ platforms for efficient analysis of vast datasets. These capabilities have allowed IAD to progress towards a systematic, continuous audit approach with multi-dimensional analysis of complete data sets. This data-driven approach is embedded within the audit process, including business risk assessment, audit execution and ongoing business monitoring. Overall, these capabilities have raised audit results and reduced control risk across GIC.

IAD will continue to incorporate advanced data science capabilities into its toolkit. This will enable it to tackle emerging risks and continue to provide independent assurance on the adequacy of internal controls within GIC.

RISK MANAGEMENT APPROACH

Our approach to risk management is multi-pronged:

- I. Managing portfolio investment risk to ensure that risk taken is consistent with our mandate and commensurate with expected returns;
- II. Managing legal, regulatory and compliance risks to safeguard the reputation and interests of GIC and our Client, and to comply with applicable laws and regulations;
- III. Managing tax risk to ensure compliance with the tax laws of applicable jurisdictions;
- IV. Managing operational risk through an effective system of internal controls and processes to support GIC operations;
- V. Managing cyber security and IT risk;
- VI. Managing counterparty credit risk to minimise the impact to GIC if any counterparties were to default;
- VII. Managing reputational risk; and
- VIII. Managing people risk.

The multi-pronged approach to risk management, complemented by the three lines of defence, ensures that risks within the portfolio are looked at in a comprehensive manner. While risks remain, they are well identified and managed within established risk tolerance.

Managing Portfolio Investment Risk

The Policy Portfolio is constructed with our Client's long-term real return objective and risk tolerance in mind. Deviation of asset allocation exposure from policy benchmarks is constrained by a set of operating bands around the Policy Portfolio's target weights. In addition, the GIC Board sets an active risk budget to limit the risk arising from the deviation of the Active Portfolio from the Policy Portfolio.

GIC manages investment risk with these principles in mind:

- i. Risks taken are in line with the mandate given by the Client and Board, and within defined bounds authorised by the Client, Board and Management;
- ii. Risks borne by GIC are well-understood to enable GIC to stay the course of being a long-term investor; the Client, Board and Management are sufficiently informed about key risk attributes and potential downside risks for the portfolio and for each strategy, including mitigating actions to manage the risks of large drawdowns, as well as permanent impairment; and
- iii. Risks assumed are commensurate with expected returns and efficiently allocated to optimise the risk-reward ratio of the portfolio.

Policies, guidelines and processes are established to ensure consistency and clarity across the firm, while reducing the likelihood of significant unexpected losses to the assets under management. The policies and guidelines translate our investment mandate and risk management principles into standards that guide our day-to-day activities. For example, the group-wide investment authorisation framework sets out the approving authorities for investments based on size. Another example is the cost-of-capital framework which determines an appropriate performance hurdle for each active strategy that includes the cost of funding these strategies and a premium for additional risk undertaken.

We identify, measure, report and monitor all the risks that are assumed. GIC employs a suite of measures including volatility, risk concentrations, sensitivities to risk factors, liquidity profile and expected shortfall to identify and analyse the risks in the portfolio from a top-down and bottom-up perspective. Each measure is designed to highlight a specific aspect of the portfolio that could lead to an undesirable outcome. These statistical measures are supplemented by a set of stress tests and scenario analyses. Reverse stress tests further help to identify otherwise undetected risks that could lead to large or sustained drawdowns.

The risk management function sets and monitors performance and risk review thresholds independently to highlight potential changes in risk-taking behaviour and inconsistencies with the stated risk and return assumptions.

Managing Legal, Regulatory and Compliance Risks

Legal and regulatory risks relate to uncertainties in the interpretation and application of laws and regulations, the enforcement of rights or the management of potential litigation, breaches in contracts, laws or regulations.

Compliance risk refers to the risk of legal or regulatory sanctions, financial loss or reputational damage arising from non-compliance with applicable laws and regulations.

GIC's compliance programme comprises robust policies, procedures, effective controls, monitoring and surveillance. The implementation of a rigorous compliance programme is underpinned by a strong culture of ethics and compliance. All staff are required to observe the policies and procedures set out in GIC's Compliance Manual (incorporating the Code of Ethics), comply with all applicable laws and regulations, uphold exemplary conduct and act with integrity at all times. Regular and targeted training is conducted and an annual compliance quiz is administered, to reinforce awareness and understanding and strengthen GIC's compliance culture. The compliance programme also requires that all staff adhere to their confidentiality obligations and responsibilities.

The investment and operations teams collaborate with the legal and compliance function to manage legal, regulatory and compliance risks arising from the group's investment activities. The legal and compliance function monitors compliance with laws and regulations, including laws on securities trading and investment, competition law requirements, financial crimes compliance, and licensing and regulatory approvals. Emerging legal and regulatory issues and proposed regulatory changes are also closely monitored.

Additionally, the in-house legal team works with external lawyers to address legal risks.

Managing Tax Risk

GIC's Tax Risk Management Framework underscores our commitment to be compliant with tax laws, rules, regulations and obligations set by the respective governments of the jurisdictions in which we invest and operate. We ensure that tax-related decisions are handled with professional skill, care and diligence, with relevant documentation that evidences the facts, considerations and decisions taken. We seek written advice, opinion or confirmation, where appropriate, to substantiate our tax positions. Our tax positions and obligations are clearly represented in line with applicable tax laws and regulations. We also engage with tax authorities in an open, constructive and professional manner.

Managing Operational Risk

All investment and operations staff are required to identify, evaluate, manage and report risks in their own areas of responsibility, and to comply with established risk policies, guidelines, limits and procedures.

New investment products or strategies are subject to a risk identification and assessment process conducted by a cross-functional group. This ensures that risks associated with the new product or activity are identified and analysed prior to investment or engagement. We must be satisfied that the required people and infrastructure, including systems, procedures and controls, are in place to manage these risks before the investment is permitted.

We assess the control environment to ensure that any control weakness is promptly identified and addressed. Infrastructure plays a critical role to enable effective investment and risk management. Policies and procedures are established to safeguard the physical security and integrity of GIC's technology and data assets.

Our business continuity plan is tested and reviewed regularly to ensure that our procedures and infrastructure can support operations in the event of a business disruption. This enhances corporate resilience and safeguards the group's operations.

Throughout the year, internal and external auditors scrutinise all operations and business processes. Any deficiencies identified must be addressed within set time frames and reported to senior management.

Managing Cyber Security and IT Risk

As GIC adopts advanced information technologies, we recognise the importance of having strong cyber security defences and robust internal controls for our operating environment. A dedicated team of cyber security and IT risk management professionals maintains our cyber defence capabilities, as well as oversees technology operations and usage of IT across the organization. With the evolution of our business and the IT landscape, we continue to invest in people, processes and tools to protect GIC's IT assets and business data.

Managing Counterparty Credit Risk

GIC adopts a strong control orientation in managing counterparty credit risk, trading only with financially sound and reputable counterparties. A stringent selection and approval process is in place to appoint counterparties. We review the counterparties and monitor our counterparty exposure against set limits. Counterparty profiles are regularly reported to senior management. Other measures to mitigate credit risk include using netting agreements and programmes requiring counterparties to pledge collateral.

Managing Reputational Risk

Managing reputational risk is part of GIC's overall risk management framework. Our governance and investment processes ensure that we exercise caution and do not take on undue reputational risk in our pursuit of returns.

Managing People Risk

We require our staff to observe the applicable laws and regulations, GIC's internal policies and procedures, to conduct ourselves in an exemplary manner at all times and uphold GIC's fiduciary duty to our Client.

Consistent with our long-term orientation, GIC's remuneration policies and practices support and reinforce a prudent risk-taking culture, as well as recognise and reward our people on the basis of long-term results. We are committed to developing our employees to their full potential for the long term through many learning programmes. We continue to develop a strong leadership bench for GIC, allowing us to build new investment capabilities and extend our investment and operating platforms.

People are at the heart of our business. Our PRIME values are the compass in the management of our people, processes and portfolio. Assessment of these values is included in our staff appraisals.

FEATURE ARTICLE: *INVESTING IN TECHNOLOGY COMPANIES*

Technology companies have always had a place in GIC's portfolio. In recent years, as technology has disrupted traditional industries and spawned new businesses, our investing and organizational efforts in this area have also expanded. In this feature article, we answer questions on how we approach and invest in technology.

GIC looks to being a lifetime partner to our investee companies. Our long-term orientation and flexibility in deploying capital across the private, semi-private and public spaces enable us to grow together with them.

HOW DID GIC START INVESTING IN THE TECHNOLOGY SPACE?

GIC has been in this space since our founding. We started by investing in technology companies listed on the major stock markets. When we opened our San Francisco office in 1986, we expanded into venture capital funds. Hence, we went into private venture capital earlier than most other institutional investors. This has given GIC time to build up strong partnerships with leading technology investment managers that have long track records.

HOW DOES GIC INVEST IN TECHNOLOGY?

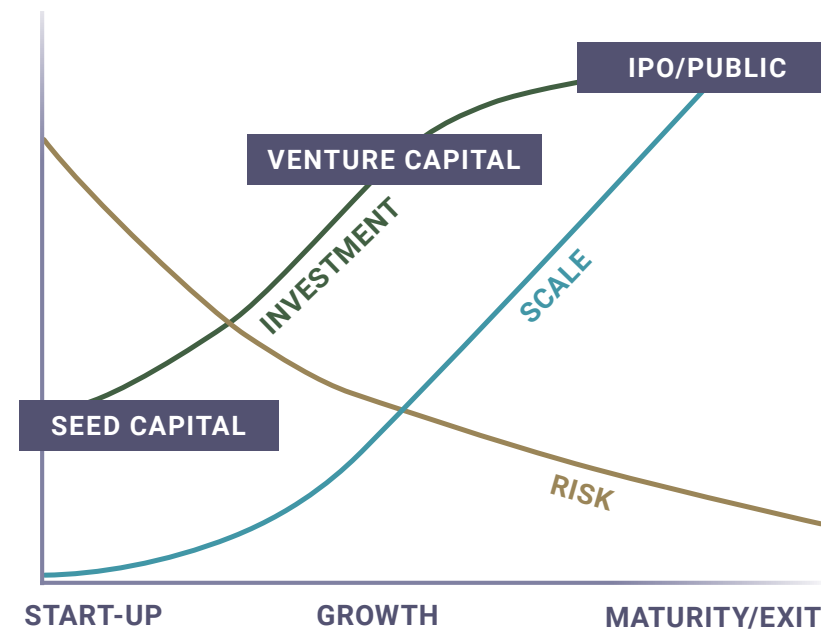
GIC's investments in technology cover all stages of the financing life-cycle of a company: seed (start-up), venture capital (growth), IPO/public equity (maturity and exit), as illustrated in Figure 1.

GIC invests directly and through external fund managers in start-ups, growth companies, pre- and post-listed companies. We also provide seed capital via venture capital funds.

We are organised to cover both strategic positioning and ground level investing. Our Technology Business Group comprises specialists from different asset classes and regions. It monitors and assesses industry trends, and recommends GIC's overall technology portfolio size and composition, as well as partnership strategy. Early stage investments are mostly handled by our Technology Investment Group through venture capital funds, co-investments and direct investments. We also have sector specialists for public and private market investments.

GIC has a broad investment mandate with flexibility in terms of the development stage, capital structure, investment size, sub-sector, geography and duration. We typically stay invested for the long term, including post-IPO for newer companies. This connects GIC to the whole life-cycle of the company, during which founders can tap GIC for capital at different stages of growth.

Figure 1: Financing Life-Cycle of a Company



IT IS A CROWDED SPACE. HOW DOES GIC POSITION ITSELF?

Even with the secular trend of technological disruption, we believe there are cycles. So it is most important to stay disciplined through time. Generally, valuations of technology companies have gone up substantially. It pays to be cautious and selective.

GIC looks to being a lifetime partner to our investee companies. Our long-term orientation and flexibility in deploying capital across the private, semi-private and public spaces enable us to grow together with them. We also seek multiple touch points with these companies. For example, with one technology company we invested in its private equity, subsequently invested in its technology venture investment arm, and also participated as a sponsor in its incubator programme.

Besides investee companies, we work collaboratively with our external fund managers. Beyond generating investment returns on our capital, our external fund managers help us to stay abreast of market developments, give us co-investing opportunities and add to the network that our investee companies can tap on.

Our global set-up helps us to spot leads and lags across regions. Having a local presence in innovation hubs such as Silicon Valley and Beijing enables us to capture interesting opportunities. This is in turn backed by our global presence through eight other offices and experience in multiple asset classes. We leverage our global networks to share useful connections and insights with our investee companies. For example, our recent GIC Insights Forum and the Bridge Forum generated new business ideas and our partners struck new relationships at the events.

WITH THE WIDE RANGE OF TECHNOLOGY INVESTMENTS, HOW DO YOU DECIDE?

GIC has no fixed allocation to any specific geographies and sub-sectors. We study industry trends to help filter areas for deeper research and potential opportunities, not to allocate capital.

We invest through a bottom-up stock selection process, using the same long-term, fundamentals-based approach as the other asset classes. For early-stage companies, due diligence on the calibre and integrity of the entrepreneur is indispensable. So is a clear understanding of the business model. One way we do this is by spending time with the production engineers. After seeing what problems they can or cannot solve in one domain, we can gauge the success of other domains. Another way is by getting first-hand experience as a customer, which provides us with a direct assessment of products or services.

However, investments carry risks, especially investments in young companies. In technology investments, we manage the risks by diversifying across sectors and life-cycle stages, having a robust investment process, adhering to strict pricing discipline, understanding the risk-reward calculus and sizing the investment.

WHAT KEY TRENDS ARE YOU WATCHING?

First, as technology is reshaping entire industries, we need to look beyond traditional investment categories. Incumbents are constantly challenged by disruptors from outside the traditional verticals. For instance, an e-commerce company can now offer wealth management and enterprise infrastructure services, while the sharing economy is changing the competition landscape for hotels, transportation and luxury retail.

Second, disruption is not a zero-sum game. By targeting inefficiencies and creating scalable platforms, disruptors are enabling better consumer choices and experiences, compelling incumbents to do the same, and creating new industries. Start-ups also provide innovation capacity that large companies need. Companies are setting up corporate venture funds and incubators, so as to discover, work with and invest in promising start-ups. By providing start-ups with better resources, networks and business platforms, they also improve the chances of their success. We see this in the pharmaceutical industry, where large companies are licensing drugs developed by smaller start-ups.

Third, technology has enabled business ‘ecosystems’ to form a powerful strategy in this highly competitive environment. Large technology companies have created rich digital platforms where different component businesses reinforce each other. Customers are ‘locked in’ via multiple channels such as e-commerce, search, social media and entertainment. In addition, data-rich platforms provide hyper-customised experiences, allowing the companies to cross-sell effectively, take more wallet share and build customer loyalty. For investors, an expanded customer base often creates a network effect, providing an ‘investor surplus’ as additional profits are generated without additional capital from investors.

Fourth, emerging markets, notably China and India, are seeing their own wave of innovation, and in some cases a faster adoption curve than in developed markets. Leapfrogging is happening due to their greater openness to experiment, less mature industries, fewer legacy arrangements, underserved customer base, and strong talent pool. This is a very important trend to participate in.

WITH TECHNOLOGY RESHAPING ENTIRE INDUSTRIES AND CATEGORIES, HOW IS GIC RESPONDING?

Our ‘ODE to technology framework’ describes our holistic approach to responding to the repercussions of disruptive technology. O-D-E stands for Offence, Defence and Enterprise Excellence. It covers both our investing and organizational responses to this important force of change and uncertainty.

Offence:

This is about how we gain from technological disruption by investing in the winners of this shift. While this naturally puts the spotlight on new companies, the large incumbents, with their vast resources, are not to be overlooked. Nevertheless, new technology will mean the rise of many promising entrants. New business models are being rolled out regularly, requiring us to be open to changing assumptions about industry classification, the pace of change, brand value, consumer loyalty, product bundling, industry structure, regulatory regime and the like.

Defence:

This is how we protect our existing investments as they face disruption. Given our diversified portfolio that holds many established companies, this defensive stance is as important as offence, if not more so. In fact, a huge benefit from our investing in technology is a better appreciation of the threats and opportunities faced by companies in our portfolio. In some cases, we have worked with existing investees to adjust to the new reality. This helps us to protect our portfolio value.

Enterprise Excellence:

The investment business is not immune from this trend, with the same offence and defence forces evident in our business. New technology, especially in data analytics and machine learning, is increasingly being applied in investment management. Investment approaches are also becoming increasingly technology intensive. GIC needs to change. We have invested significantly in such capabilities, adjusted our investment processes, and we will need to do more. Importantly, we recognise the need for structure and culture change, including the use of agile methods in our work processes, greater experimentation and embedding technology specialists in our investment teams.

Facing the highly uncertain and rapid nature of technological disruption, GIC, like all businesses, is on an uncharted path, and will surely learn many lessons along the way. We believe our approach to finding good companies, good technologies and good business models, and applying these to our investment and organizational strategies, will give us a competitive edge, and leave us well-placed to invest in this challenging environment.

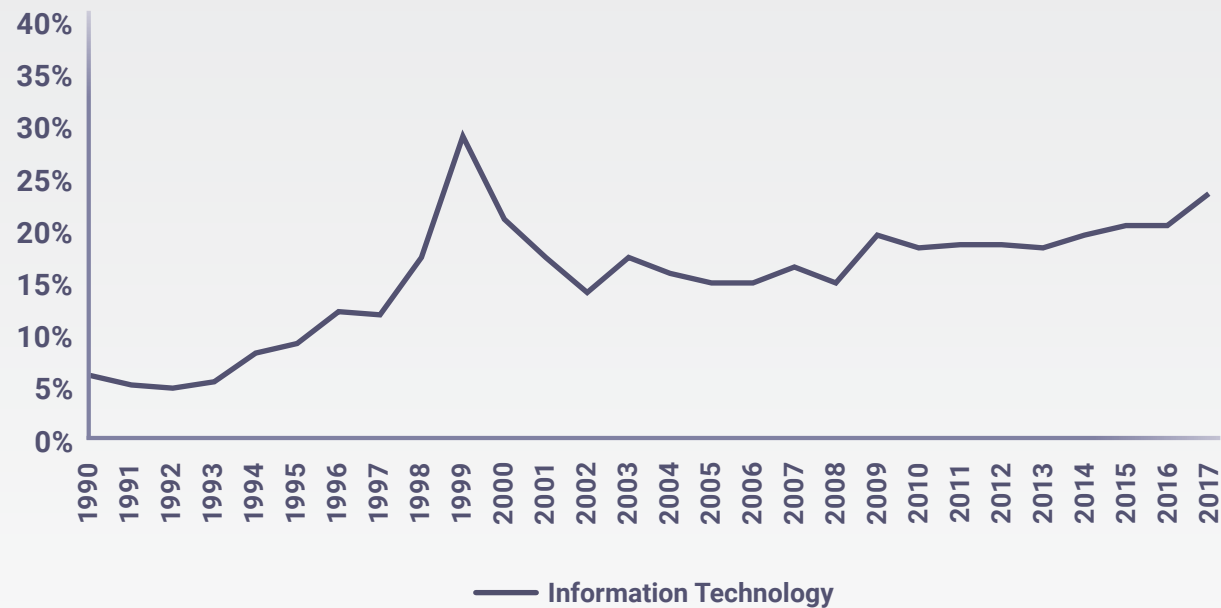
What Is a Technology Company?

By a technology company, we mean a company in the ‘information technology’ (IT) sector. It used to be that IT was typically viewed as comprising software and services, technology hardware and equipment, and semiconductor and semiconductor equipment. However, with technology permeating and drastically changing all kinds of businesses, it is increasingly difficult to delineate a pure technology company. In this article, we use ‘technology’ to refer more loosely to companies which sell mostly information technology products and services or are intensive users of technology in

their business models. Examples of the former are mobile phone producers and cyber security service companies, and for the latter, e-commerce companies and social media companies.

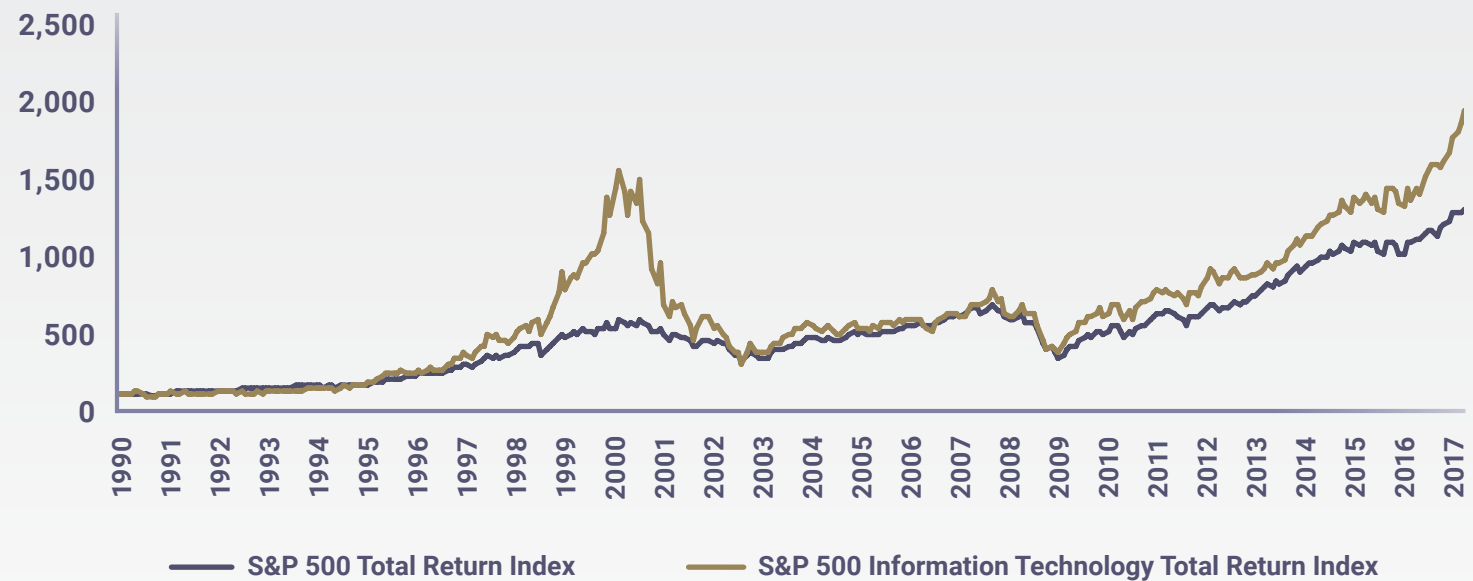
Technology has been an important sector for investors over the last 30 years. The two charts below show respectively the share of IT in the S&P 500 Index (a widely-followed composition of representative US stocks) and its return performance since 1990.

Figure 2: Share of Information Technology Sector in S&P 500 (By Market Capitalisation)



Source: Bloomberg

Figure 3: Performance of Information Technology Sector (Total Return Index)



Source: Bloomberg

GOVERNANCE

The Government, represented by the Ministry of Finance (MOF), sets the investment objective, risk parameters and investment horizon for the portfolio. It also ensures a competent board of directors is in place.

The GIC Board is responsible for the Policy Portfolio which determines GIC's long-term asset allocation and is accountable to the Government for the overall performance of the portfolio.

The GIC Management is responsible for formulating and executing investment strategies and for individual investments. The Management also reports to the Government on the risk and performance of the portfolio.

GIC was incorporated in 1981 under the Singapore Companies Act and is wholly owned by the Government of Singapore. It was set up with the sole purpose of managing Singapore's foreign reserves and currently invests well over US\$100 billion globally in a wide range of asset classes and instruments. As a rule, GIC invests outside Singapore.

SOURCE AND PURPOSE OF FUNDS

GIC is a fund manager for the Government, and does not own the assets that it manages. The sources of the Government's assets managed by GIC, as stated by the MOF, include proceeds from the issuance of Singapore Government Securities (SGS) and Special Singapore Government Securities (SSGS), Government budget surpluses and proceeds from the Government's land sales.

The Government does not specify to GIC the proportion of assets from each source. The Government mandates GIC to manage all assets in a single pool, on an unencumbered basis and without regard to their source, with the aim of achieving good long-term real returns. (An explanation of the Government's framework for managing its assets and liabilities is available on the MOF's website.)

Each year, part of the GIC Portfolio returns is tapped by the Government for its annual Budget and spent on key public services that improve the lives of Singaporeans. Under the Constitution, the Government is allowed to spend up to 50% of the long-term expected real return on the net assets managed by GIC and those owned by the Monetary Authority of Singapore and Temasek Holdings¹ in its annual budget. The Government's reserves therefore provide a stream of returns that benefit present and future generations of Singaporeans.

THE PRESIDENT OF SINGAPORE

Since 1991, the Constitution of Singapore has provided for the President of Singapore to be elected directly by Singaporeans every six years. The President is independent of the Government and must not be a member of a political party.

The Constitution gives the President discretionary powers to protect the reserves not accumulated by a government during its current term of office. The system aims to prevent the Government of the day from drawing on past reserves or spending reserves not accumulated during its current term in office.

As a Fifth Schedule company, GIC is directly accountable in a number of key areas to the Singapore President, who is empowered to access any information needed to safeguard the country's reserves. No one may be appointed to or removed from the GIC Board without the President's concurrence. This additional layer of control ensures that the company appoints only people of integrity who are competent and can be trusted to safeguard these assets.

THE GOVERNMENT

The Government mandates GIC to manage Singapore's foreign reserves with the aim of achieving good long-term real returns. The mandate sets out the terms of appointment, investment objectives, investment horizon, risk parameters and investment guidelines for managing the reserves. In particular, the expectation on the amount of risk GIC can bear is characterised by the Reference Portfolio.

The Government, represented by the MOF, holds the GIC Board accountable for the overall portfolio performance. It does not direct or influence GIC's decisions on individual investments.

GIC provides monthly and quarterly reports to the Government through the Accountant-General of Singapore. These reports list the financial transactions, holdings and bank account balances. They also provide detailed performance and risk analytics, as well as the distribution of the portfolio by asset class, country and currency.

Once a year, the GIC Management formally meets the Minister for Finance and his officials to report on the risk and performance of the portfolio in the preceding financial year.

THE AUDITOR-GENERAL OF SINGAPORE

The Auditor-General, who is appointed by the President of Singapore, submits an annual report to the President and Parliament on his audit of the Government and other bodies managing public funds. This audit includes the Government's portfolio managed by GIC and the main companies in the GIC Group - GIC Asset Management, GIC Real Estate and GIC Special Investments. These companies are also audited by GIC's internal audit.

Other companies in the Group and the investment holding companies are audited by public accounting firms.

¹ Temasek Holdings was included in the NIRC framework with effect from FY16/17.

THE GIC BOARD

The GIC Board is responsible for the GIC's Policy Portfolio which determines the long-term asset allocation strategy and for the overall performance of the portfolio. GIC's asset allocation operates within the risk constraints determined by the Government in its mandate to GIC and represented by the Reference Portfolio.

The Board is supported by five board committees.

BOARD COMMITTEES

Investment Strategies Committee

The Investment Strategies Committee reviews and evaluates management recommendations on asset allocation before they are submitted to the GIC Board for decision. The GIC Management reports to this committee on the performance of the portfolio. The committee recommends the key drivers for GIC's return and risk outcomes, and does not decide on specific deals.

Investment Board

The Investment Board provides oversight of GIC's investment processes and its implementation, with particular attention to large individual investments. It is not involved in the asset allocation decisions, which are the responsibility of the GIC Board. It also ensures GIC does not take on undue reputational risk in pursuit of good returns.

Risk Committee

The Risk Committee advises the GIC Board on risk matters and broadly supervises the effectiveness of risk management policies and practices. It reviews GIC's risk profile and significant risk issues arising from operations and investments.

Audit Committee

The Audit Committee reviews and assesses the adequacy and effectiveness of internal controls. These include financial, operational and compliance, as well as risk management policies and procedures. It also supervises and evaluates the effectiveness of the internal audit function. The committee reviews the integrity of the financial reporting process and other related disclosures for GIC companies, significant ethics violations, the impact of changes in the regulatory and legal environment, and issues of fraud and financial loss.

Human Resource and Organization Committee

The Human Resource and Organization Committee oversees organizational matters in GIC, including compensation policies, talent development, succession planning, and organizational development.

INTERNATIONAL ADVISORY BOARD

The International Advisory Board provides the GIC Board, board committees and GIC Management global and regional perspectives on geopolitical, economic and market developments. It provides advice and perspectives on a range of investment-related matters; in particular, global investment trends, emerging asset classes and new growth opportunities.

GIC MANAGEMENT

GIC Management formulates and executes investment strategies. Once the long-term asset allocation strategy (as set out in the Policy Portfolio) is decided by the GIC Board, the management seeks to add value through an overlay of active, skill-based strategies (i.e. the Active Portfolio). The management structure is relatively flat and comprises four committees with clear reporting lines and accountability.

Group Executive Committee

The Group Executive Committee is the highest management body in GIC, bringing together the Group's functional and investment heads. It deliberates on management proposals on organizational, investment and risk issues before these are submitted to the relevant board committees and the GIC Board. The committee reviews and approves major business, governance and policy issues which apply to the entire group, and oversees organizational management initiatives, business planning and personnel matters (including succession planning, talent development, compensation and performance management).

Investment Management Committee

The Investment Management Committee assists the Group Executive Committee in the implementation of investment policies and active strategies. It regularly reviews matters related to portfolio management, including rebalancing, portfolio liquidity, capital budget usage, active strategy implementation, risk methodologies, scenarios, and stress loss. The committee monitors the performance and risk of the portfolio, including active strategies, on a monthly basis.

Direct Investment Steering Committee

The Direct Investment Steering Committee oversees the strategic plan, as well as the progress and pace of direct investments across GIC. It also reviews relationships with investee companies to help identify and develop deal opportunities. The committee does not approve investments.

Group Risk Committee

The Group Risk Committee provides oversight for the risk management policies and practices for the GIC Group. The committee also acts as a forum for the Chief Risk Officer to solicit views on the strategic risk management issues that would enable him to carry out his duties.

GOVERNANCE STRUCTURE OVERVIEW

The following chart summarises the accountability of the GIC Board, International Advisory Board and board committees.

Terms of Reference	
GIC Board	Responsible for the GIC's Policy Portfolio which determines its long-term asset allocation strategy and for the overall performance of the GIC Portfolio. Does not approve individual investments which are the responsibilities of GIC Management.
International Advisory Board	Provides views on market developments generally and, in particular, the medium- to long-term outlook for investment opportunities around the world.
Board Committees	Investment Strategies Committee Assists the GIC Board in evaluating GIC Management's recommendations on asset allocation, and in its oversight of overall portfolio performance. Recommends the key drivers for GIC's return and risk outcomes. Does not approve individual investments.
	Investment Board Assists the GIC Board in its oversight of GIC's investment process, with particular attention to large individual investments.
	Risk Committee Oversees the effectiveness of risk management policies and practices in the GIC Group.
	Audit Committee Looks into the effectiveness of the internal control systems for safeguarding company assets and Client's investment portfolios. Reviews integrity of the financial reporting process, significant ethics violations, compliance with regulatory and legal requirements, and issues of fraud and financial losses.
	Human Resource and Organization Committee Oversees organizational matters in GIC, including compensation policies, talent development, succession planning, and organizational development.
GIC Management	Formulates and executes investment strategies. Constructs the Active Portfolio, with an overlay of active, skill-based strategies.

GIC BOARD, BOARD COMMITTEES AND MANAGEMENT COMMITTEES

Board of Directors	Board Committees		International Advisory Board	Group Committees			
Board of Directors	Investment Strategies Committee	Risk Committee	International Advisory Board	Group Executive Committee	Investment Management Committee	Direct Investment Steering Committee	Group Risk Committee
Chairman <u>Lee Hsien Loong</u>	Chairman <u>Tharman Shanmugaratnam</u>	Chairman <u>Lim Hng Kiang</u>	Chairman <u>Teo Chee Hean</u>	Chairman <u>Lim Chow Kiat</u> <i>Chief Executive Officer</i>	Chairman <u>Dr Jeffrey Jaensubhakij</u> <i>Group Chief Investment Officer</i>	Chairman <u>Lim Chow Kiat</u> <i>Chief Executive Officer</i>	Chairman <u>Dr Chia Tai Tee</u> <i>Chief Risk Officer</i>
Directors <u>Lim Hng Kiang</u> <u>Tharman Shanmugaratnam</u> <u>Teo Chee Hean</u> <u>Heng Swee Keat</u> <u>Ang Kong Hua</u> <u>Peter Seah Lim Huat</u> <u>Chew Choon Seng</u> <u>Hsieh Fu Hua</u> <u>Loh Boon Chye</u> <u>Gautam Banerjee</u> <u>Suppiah Dhanabalan</u> <u>Koh Boon Hwee</u> <small>(appointed 14 August 2017)</small> <u>Dr Tony Tan Keng Yam</u> <small>(appointed 1 January 2018)</small> <u>Lim Chow Kiat</u> <u>Dr Jeffrey Jaensubhakij</u>	Deputy Chairman <u>Peter Seah Lim Huat</u> Members <u>Lim Hng Kiang</u> <u>Ang Kong Hua</u> <u>Heng Swee Keat</u> <u>S Iswaran</u> <u>Lawrence Wong</u> <small>(appointed 1 August 2017)</small> Advisors <u>Dr Martin L Leibowitz</u> <u>G Leonard Baker Jr</u> <u>Knut Kjær</u> <u>David Denison</u> <u>Mark Kritzman</u> <u>Dr Mohamed El-Erian</u>	Members <u>Loh Boon Chye</u> <u>Lam Kun Kin</u> Advisors <u>Dr Martin L Leibowitz</u> <u>Mark Kritzman</u> Audit Committee Chairman <u>Chew Choon Seng</u> Members <u>Loh Boon Chye</u> <u>Gautam Banerjee</u> Human Resource and Organization Committee Chairman <u>Peter Seah Lim Huat</u> Members <u>Chew Choon Seng</u> <u>Hsieh Fu Hua</u> <u>Gautam Banerjee</u>	Members <u>G Leonard Baker Jr</u> <u>Léon Bressler</u> <u>Knut Kjær</u> <u>David Denison</u> <u>Mark Kritzman</u> <u>Dr Mohamed El-Erian</u> <u>Uday Kotak</u> <small>(appointed 1 October 2017)</small>	Members <u>Dr Jeffrey Jaensubhakij</u> <i>Group Chief Investment Officer</i> <u>Lim Kee Chong</u> <i>Deputy Group Chief Investment Officer, President (Americas) and Director, Integrated Strategies</i> <u>Tay Lim Hock</u> <i>Deputy Group Chief Investment Officer and President (Europe)</i> <u>Goh Kok Huat</u> <i>Chief Operating Officer</i> <u>Dr Chia Tai Tee</u> <i>Chief Risk Officer</i> <u>Dr Leslie Teo</u> <i>Chief Economist and Director, Economics & Investment Strategy</i> <u>Deanna Ong</u> <i>Chief People Officer</i> <u>Wu Choy Peng</u> <i>Chief Technology Officer</i> Advisor <u>Lim Siong Guan</u>	Members <u>Dr Chia Tai Tee</u> <i>Chief Risk Officer</i> <u>Dr Leslie Teo</u> <i>Chief Economist and Director, Economics & Investment Strategy</i> <u>Bryan Yeo</u> <i>Chief Investment Officer, Public Equities</i> <u>Liew Tzu Mi</u> <i>Chief Investment Officer, Fixed Income</i> <u>Ang Eng Seng</u> <i>Chief Investment Officer, Infrastructure</i> <u>Choo Yong Cheen</u> <i>Chief Investment Officer, Private Equity</i> <u>Lee Kok Sun</u> <i>Chief Investment Officer, Real Estate</i> <u>Betty Tay</u> <i>Director, External Managers</i> <u>Arjun Khullar</u> <i>Head, Integrated Strategies</i>	Members <u>Dr Jeffrey Jaensubhakij</u> <i>Group Chief Investment Officer</i> <u>Lim Kee Chong</u> <i>Deputy Group Chief Investment Officer, President (Americas) and Director, Integrated Strategies</i> <u>Tay Lim Hock</u> <i>Deputy Group Chief Investment Officer and President (Europe)</i> <u>Bryan Yeo</u> <i>Chief Investment Officer, Public Equities</i> <u>Choo Yong Cheen</u> <i>Chief Investment Officer, Private Equity</i> <u>Lee Kok Sun</u> <i>Chief Investment Officer, Real Estate</i> <u>Ang Eng Seng</u> <i>Chief Investment Officer, Infrastructure</i>	Members <u>Dominic Lim</u> <i>Director, Risk & Performance Management</i> <u>Dr Leslie Teo</u> <i>Chief Economist and Director, Economics & Investment Strategy</i> <u>Charles Lim</u> <i>General Counsel</i> <u>Chan Hoe Yin</u> <i>Director, Investment Services (Private Markets and Finance)</i> <u>Leong Wing Kwan</u> <i>Director, Investment Services (Public Markets)</i> <u>Joyce Tan</u> <i>Director, Business Solutions & Technology</i> <u>Loh Wai Keong</u> <i>Director, Enterprise Strategy</i> <u>John Tang</u> <i>Global Head, Global Investments, Strategy & Risk, Private Equity</i> <u>Ravi Balasubramanian</u> <i>Head, Asia Equities Research, Public Equities</i> <u>Jin Yuen Yee</u> <i>Head, Macro Research & Strategy, Fixed Income</i> <u>Ang Choon Beng</u> <i>Senior Vice President, Real Estate</i>
	Investment Board Chairman <u>Ang Kong Hua</u> Members <u>G Leonard Baker Jr</u> <u>Léon Bressler</u> <u>David Denison</u> <u>Hsieh Fu Hua</u> <u>Koh Boon Hwee</u>						

ORGANIZATIONAL STRUCTURE

Board of Directors				International Advisory Board	
Board Committees					
Investment Strategies Committee		Audit Committee			
Investment Board		Human Resource & Organization Committee			
Risk Committee					
Group Executive Committee					
LIM CHOW KIAT Chief Executive Officer		DR JEFFREY JAENSUBHAKIJ Group Chief Investment Officer		LIM KEE CHONG Deputy Group Chief Investment Officer	
DR CHIA TAI TEE Chief Risk Officer		DR LESLIE TEO Chief Economist		TAY LIM HOCK Deputy Group Chief Investment Officer	
		WU CHOY PENG Chief Technology Officer		DEANNA ONG Chief People Officer	
				GOH KOK HUAT Chief Operating Officer	
				LIM SIONG GUAN Advisor	
Corporate Headquarters			Investment Groups		
JOYCE TAN Business Solutions & Technology		LOH WAI KEONG Enterprise Strategy		Public Equities	
WONG AI CHIAT Corporate Administration & Infrastructure		PETER GOH Human Resource & Organization		BRYAN YEO Chief Investment Officer	
JENNIFER LEWIS Corporate Affairs & Communications		VINCENT CHEANG Internal Audit		Private Equity	
DR LESLIE TEO Economics & Investment Strategy		CHAN HOE YIN Investment Services (Private Markets and Finance)		CHOO YONG CHEEN Chief Investment Officer	
				Real Estate	
				LEE KOK SUN Chief Investment Officer	
				External Managers	
				BETTY TAY Director	
				Fixed Income	
				LIEW TZU MI Chief Investment Officer	
				Infrastructure	
				ANG ENG SENG Chief Investment Officer	
				Integrated Strategies Group	
				LIM KEE CHONG Director	
				Portfolio Execution Group	
				SAM KIM Director	
Overseas Offices					
LIM KEE CHONG President (Americas)		KISHORE GOTETY Mumbai Office		LEE KOK SUN Seoul Office	
TAY LIM HOCK President (Europe)		KEVIN LOOI San Francisco Office		SUN JIANJUN Shanghai Office	
SHARON SUN Beijing Office		WOLFGANG SCHWERDTLE São Paulo Office		KEN CHAN Tokyo Office	

GOVERNANCE

PROFILES



LEE HSIEN LOONG

Prime Minister

Lee Hsien Loong has been Prime Minister of Singapore since 2004. He was previously Deputy Prime Minister and has also held ministerial appointments in Trade and Industry, Defence and Finance. Mr Lee chaired the Monetary Authority of Singapore from 1998 to 2004, where he shifted MAS towards a lighter supervisory touch. As Prime Minister, he launched SkillsFuture to support Singaporeans in embracing lifelong learning and skills, and the Smart Nation initiative to use technology to create a future of better living, more opportunities and stronger communities. Before entering politics, Mr Lee was a Brigadier-General in the Singapore Armed Forces.

Mr Lee has a BA (First Class Honours) in Mathematics and a Diploma in Computer Science from Cambridge University, as well as a Masters in Public Administration from Harvard University.



LIM HNG KIANG

Special Advisor to
Ministry of Trade & Industry

Lim Hng Kiang, the Special Advisor to the Ministry of Trade and Industry, chairs the GIC Risk Committee and sits on the Investment Strategies Committee. He is also Deputy Chairman of the Monetary Authority of Singapore. Mr Lim was Minister for Trade and Industry from 2004 until 2015, when the Ministry was carved into two portfolios. He was then appointed Minister for Trade and Industry (Trade) until he stepped down in May 2018. In his current appointment, Mr Lim provides advice on the Ministry's economic strategies to grow Singapore's capabilities and international economic space. He has held Cabinet posts in National Development, Health, Foreign Affairs, Finance and the Prime Minister's Office. Before entering politics in 1991, he was Deputy Secretary in the Ministry of National Development.

Mr Lim graduated from Cambridge University with First Class Honours (Distinction) in Engineering. He later earned a Masters in Public Administration from Harvard University.



THARMAN SHANMUGARATNAM

Deputy Prime Minister &
Coordinating Minister for Economic
and Social Policies

Tharman Shanmugaratnam is Singapore's Deputy Prime Minister and Coordinating Minister for Economic and Social Policies. He chairs the GIC Investment Strategies Committee, and is also Chairman of the Monetary Authority of Singapore. Tharman also chairs the Group of Thirty, an independent global council of economic and financial policy leaders, and the G20 Eminent Persons Group on Global Financial Governance. He led the International Monetary and Financial Committee (IMFC), the key policy forum of the IMF, from 2011-2014, and was its first Asian chair. He served as Minister for Finance for eight years, and as Minister for Education for five years.

Tharman studied Economics at the LSE and Cambridge University. He also holds a Masters in Public Administration from Harvard University where he was named a Lucius N Littauer Fellow.



TEO CHEE HEAN

Deputy Prime Minister &
Coordinating Minister for National Security

Teo Chee Hean has been Deputy Prime Minister of Singapore since 2009. He chairs the GIC International Advisory Board. He is currently Coordinating Minister for National Security, and also oversees the Prime Minister's Office Strategy Group, including the National Population and Talent Division and the National Climate Change Secretariat. Mr Teo has held Cabinet positions in Home Affairs, Defence, Education, Finance, Environment, and Communications. Prior to entering politics in 1992, he was the Chief of Navy holding the rank of Rear Admiral.

Mr Teo graduated with a BSc (First Class Honours) in Electrical Engineering and Management Science from the University of Manchester. He holds an MSc (Distinction) in Computing Science from Imperial College and a Masters in Public Administration from Harvard University, where he was named a Littauer Fellow.



HENG SWEE KEAT

Minister for Finance

Heng Swee Keat is the Minister for Finance, and is a member of the GIC Investment Strategies Committee. He chairs the tripartite Future Economy Council which oversees the implementation of national strategies in areas such as skills and capabilities development, innovation and productivity, and industry transformation. He is also the Chairman of the National Research Foundation. From 2011 to 2015, Mr Heng served as Minister for Education. Before entering politics in 2011, he was Managing Director of the Monetary Authority of Singapore. He also served as Permanent Secretary of the Ministry of Trade and Industry, as well as CEO of the Trade Development Board. Between 1997 and 2000, he was Principal Private Secretary to then-Senior Minister Lee Kuan Yew.

Mr Heng has an MA in Economics from Cambridge University, and also holds a Masters in Public Administration from the Kennedy School of Government, Harvard University.

GOVERNANCE

PROFILES



ANG KONG HUA

Chairman
Sembcorp Industries Ltd

Ang Kong Hua is the Chairman of Sembcorp Industries. He chairs the GIC Investment Board and sits on the Investment Strategies Committee. He has helmed several of Singapore's biggest companies, bringing years of experience spanning the manufacturing, services and financial sectors. Mr Ang started his career at the Economic Development Board. He then joined DBS Bank at its inception in 1968 and pioneered its investment banking division. From 1974, he was CEO of NSL (formerly NatSteel) until he retired in 2003, and stayed as its Executive Director until 2010. He was previously Chairman of Global Logistic Properties, Singapore Telecommunications and Singapore Post, Vice-Chairman of Neptune Orient Lines, and a Director of DBS Bank, CIMC Raffles Offshore (Singapore) and k1 Ventures.

Mr Ang holds a BSc (Honours) in Economics from the University of Hull.



PETER SEAH LIM HUAT

Chairman
DBS Group Holdings Ltd

Peter Seah Lim Huat is the Chairman of DBS Group Holdings. He chairs GIC's Human Resource and Organization Committee, and is Deputy Chairman of the Investment Strategies Committee. He heads the boards of Singapore Airlines, Singapore Health Services, LaSalle College of the Arts, and chairs the National Wages Council. He was a banker for 33 years before retiring as Vice-Chairman and CEO of the former Overseas Union Bank in 2001. He was also President and CEO of the Singapore Technologies Group. Mr Seah also serves on the boards of Fullerton Financial Holdings and STT Communications.

Mr Seah graduated from the University of Singapore with a degree in Business Administration.



CHEW CHOON SENG

Former Chairman
Singapore Exchange Ltd

Chew Choon Seng chairs the GIC Audit Committee and is a member of the Human Resource and Organization Committee. He was the CEO of Singapore Airlines from 2003 till his retirement in 2010, and a Governor of the International Air Transport Association from 2003 to 2010 and its Chairman in 2006 to 2007. He was a board director of the Singapore Exchange from 2004 and its Chairman from 2011 to 2016, and Chairman of the Singapore Tourism Board from 2011 to 2016. In 2017, he was appointed Chairman of the Council assigned to review Singapore's Code of Corporate Governance.

Mr Chew graduated with a Bachelor of Mechanical Engineering (First Class Honours) from the University of Singapore. He also has an MSc in Operations Research and Management Studies from the Imperial College of Science and Technology, University of London.



HSIEH FU HUA

Co-Founder and Advisor
Prime Partners Group

Hsieh Fu Hua is the Co-Founder and Advisor to PrimePartners Group. He is a member of the GIC Investment Board and the Human Resource and Organization Committee. He also serves on the boards of several non-profit organizations. He is President of National Council of Social Service, Chairman of National Gallery Singapore, and Stewardship Asia Centre. He chairs the Board of Trustees of National University of Singapore, and has recently been appointed Chairman-designate to National University Health System. Mr Hsieh started his career in merchant banking and capital markets in 1974 when he joined Morgan Grenfell Asia Holdings upon graduation, eventually rising to head the organization. Subsequently he served as Group Managing Director of BNP Prime Peregrine Group Hong Kong, CEO of Singapore Exchange and President of Temasek Holdings. He also served as Chairman of UOB Group.

Mr Hsieh holds a Bachelor of Business Administration (Honours) from the University of Singapore.



LOH BOON CHYE

Chief Executive Officer
Singapore Exchange Ltd

Loh Boon Chye is the CEO of Singapore Exchange. He sits on the GIC Risk and Audit Committees. He has close to 30 years of experience in the financial industry and has played a key role in the development of Southeast Asia's capital markets. Prior to SGX, he was Deputy President for Asia Pacific, Head of Asia Pacific Global Markets, and Country Executive for Singapore and Southeast Asia at Bank of America Merrill Lynch. He spent 17 years in Deutsche Bank where his last role was the Head of Corporate and Investment Banking for Asia Pacific. He started his career with the Monetary Authority of Singapore and Morgan Guaranty Trust Co. of New York.

Mr Loh holds a Bachelor of Engineering degree from the National University of Singapore.

GOVERNANCE

PROFILES



GAUTAM BANERJEE

Senior Managing Director and Chairman
Blackstone Singapore

Gautam Banerjee is a Senior Managing Director and Chairman of Blackstone Singapore. He sits on the GIC Audit as well as the Human Resource and Organization Committees. Before joining Blackstone, Mr Banerjee spent over 30 years with PricewaterhouseCoopers, serving as Executive Chairman of PwC Singapore for nine years until he retired in 2012. He serves on the boards of Singapore Airlines, Singapore Telecommunications Ltd, Piramal Enterprises, and The Indian Hotels Company Limited, and is also the Vice-Chairman of the Singapore Business Federation.

Mr Banerjee has a BSc (Honours) in Accounting and Financial Analysis from the University of Warwick. He is a Fellow of the Institute of Chartered Accountants in England and Wales, the Institute of Singapore Chartered Accountants and the Singapore Institute of Directors.



S DHANABALAN

Member
Council of Presidential Advisers

S Dhanabalan is a member of the Council of Presidential Advisers and a permanent member of the Presidential Council for Minority Rights. He chairs the Board of Trustees of Temasek Trust and Mandai Park Holdings. He was Chairman of Temasek Holdings, Singapore Airlines and DBS Group Holdings, and sat on the board of GIC from 1981 to 2005. Mr Dhanabalan joined the Civil Service in 1960, before moving to the newly-formed Economic Development Board in 1961. As the need for industrial capital grew, he was part of a small group that established the Development Bank of Singapore, where he served from 1968 to 1978. After entering politics in 1976, Mr Dhanabalan served as Minister for Foreign Affairs, National Development, Trade and Industry, Culture and Community Development.

Mr Dhanabalan holds a degree in Economics from the University of Malaya in Singapore.



KOH BOON HWEE

Chairman
Credence Partners Pte Ltd

Koh Boon Hwee is the Chairman of Credence Partners Pte Ltd. He sits on the GIC Investment Board. He is also the Chairman of Sunningdale Tech, Yeo Hiap Seng, Far East Orchard, Rippledot Capital Advisers, the Securities Industry Council, Agilent Technologies and AAC Technologies. He started his career in 1977 at Hewlett-Packard and rose to become its Managing Director in Singapore from 1985 to 1990. From 1991 to 2000, he was Executive Chairman of the Wuthelam Group. Mr Koh was also the Chairman of Singapore Telecom, Singapore Airlines and DBS Bank at various times.

Mr Koh received his Bachelor's Degree (First Class Honours) in Mechanical Engineering from the Imperial College of Science and Technology, University of London, and his MBA (Distinction) from Harvard Business School. He also received an honorary doctorate from Imperial College London.



DR TONY TAN KENG YAM

Special Advisor
GIC

Dr Tony Tan Keng Yam has served as the Minister for Finance, Trade and Industry, Education and Deputy Prime Minister and Co-ordinating Minister for Security and Defence. He was the Chairman and CEO of OCBC Bank from 1992 to 1995. In September 2005, after leaving the Cabinet, Dr Tan was appointed Deputy Chairman and Executive Director of GIC, Chairman of the National Research Foundation and Chairman of SPH. In July 2011, Dr Tan contested in the Presidential Election and was sworn in as the seventh President of the Republic of Singapore on 1 September 2011 for a 6-year term. In September 2017, he was appointed the Honorary Patron and Distinguished Senior Fellow of Singapore Management University.

Dr Tan graduated from the University of Singapore with a First Class Honours Degree in Physics in 1962. He has a Master of Science degree from MIT and a PhD in Applied Mathematics from the University of Adelaide.



S ISWARAN

Minister for Communications & Information
and Minister-in-charge of Trade Relations

S Iswaran is the Minister for Communications and Information and Minister-in-charge of Trade Relations in the Ministry of Trade and Industry. He sits on the GIC Investment Strategies Committee, and oversees the Agency for Science, Technology and Research, Energy Market Authority, International Enterprise Singapore, Singapore Tourism Board, Sentosa Development Corporation and SPRING Singapore. Since joining the Civil Service in 1987, Mr Iswaran has served in the Ministries of Home Affairs and Education. He was Director for Special Projects in the National Trades Union Congress and CEO of the Singapore Indian Development Association. He was also Director for Strategic Development at Singapore Technologies and Managing Director of Temasek Holdings. Mr Iswaran was Minister for Trade and Industry (Industry) from 2015 until April 2018.

Mr Iswaran graduated from the University of Adelaide with First Class Honours in Economics. He holds a Master of Public Administration from Harvard University.

GOVERNANCE
PROFILES



LAM KUN KIN

Senior Executive Vice President,
Head of Global Treasury & Investment
Banking, OCBC Bank

Lam Kun Kin is Senior Executive Vice President and Head of Global Treasury & Investment Banking at OCBC Bank. He is a member of the GIC Risk Committee. At OCBC, he has global responsibility for the financial market businesses and asset liability management, and also oversees the Global Investment Banking division. Prior to joining OCBC, Mr Lam held senior management positions at GIC, Citibank Singapore and Temasek Holdings. In September 2014, he was appointed by the MAS as Co-Chairman of the Singapore Foreign Exchange Market Committee. Currently, he serves on the boards of Bank of Singapore, OCBC Securities, AVIC Trust, REACH Community Service Society and the Great Eastern Group's Asset & Liability Committee and Investment Committee.

Mr Lam holds a B.Acc (Honours) from the National University of Singapore. He is a Chartered Financial Analyst, Fellow Chartered Accountant of Singapore, and Institute of Banking and Finance (IBF) Distinguished Fellow.



LAWRENCE WONG

Minister for National Development and
Second Minister for Finance

Lawrence Wong is the Minister for National Development and Second Minister for Finance. He is a member of the GIC Investment Strategies Committee and the Co-Chairman of the Singapore-Tianjin Economic and Trade Council. Mr Wong began his career as a civil servant, and his portfolio included the Director of Healthcare Finance at the Ministry of Health, the Chief Executive of the Energy Market Authority and the Principal Private Secretary to Prime Minister Lee Hsien Loong. He was elected a Member of Parliament in May 2011 and subsequently held positions in the Ministry of Defence, the Ministry of Education, the Ministry of Communications and Information, and the Ministry of Culture, Community and Youth.

Mr Wong obtained his Bachelor's and Master's degrees in Economics from the University of Wisconsin-Madison and the University of Michigan-Ann Arbor respectively. He also holds a Master's degree in Public Administration from the Harvard Kennedy School.



DR MARTIN LEIBOWITZ

Managing Director
Morgan Stanley

Dr Martin L. Leibowitz is a Managing Director of Morgan Stanley, and Vice Chairman of its Research Department. He advises GIC's Investment Strategies and Risk Committees. Prior to joining Morgan Stanley, Dr Leibowitz was the Vice-Chairman and Chief Investment Officer of TIAA-CREF, responsible for the management of more than US\$300 billion in equity, fixed income and real estate assets. He was also Director of Global Research at Salomon Brothers, and has received wide recognition for his writings on various financial topics and investment analysis. He now serves on the investment advisory committees of The Rockefeller Foundation, The Carnegie Foundation, the IMF Pension Fund, the American Academy of Arts and Sciences, and The Institute for Advanced Study.

Dr Leibowitz holds both an AB and MS degree from the University of Chicago and a PhD in Mathematics from the Courant Institute of New York University.



LEONARD BAKER

Partner
Sutter Hill Ventures

Leonard Baker is a Partner in Sutter Hill Ventures. He advises GIC's Investment Strategies Committee and sits on the Investment Board. He was a trustee of Yale University, where he chaired the Finance Committee and served on the Yale Investment Committee from 1990 to 2015, and also a member of the Advisory Council of the Stanford Graduate School of Business. Mr Baker is a board member of Stanford Management Company, advises the David and Lucile Packard Foundation Investment Committee, and is a board member of the US Environmental Defense Fund. He is also a member of the Board of Trustees of Berklee College of Music in Boston. In 2005, he was conferred the Public Service Star Award in Singapore for his contributions in the areas of education and investment management.

Mr Baker holds a BA in Mathematics from Yale and an MBA from Stanford.



LÉON BRESSLER

Managing Partner
Aermont Capital

Léon Bressler is the Managing Partner of Aermont Capital LLP, formerly Perella Weinberg Real Estate UK LLP, since its inception in 2007. He is a member of the GIC Investment Board. Prior to joining Perella Weinberg Partners, Mr Bressler was the Chairman and CEO of Unibail (now Unibail-Rodamco). Under his leadership, Unibail grew to become Europe's largest real estate investment trust. Mr Bressler began his career with Chase Manhattan Bank in Paris, before joining the Midland Bank Group where he became the Chairman of the Executive Board of Midland Bank SA. He has also held positions as CEO of the Lanvin Group and Managing Partner of Worms & Cie.

Mr Bressler is a graduate of the Institut d'Etudes Politiques de Paris and has a degree in Law.

GOVERNANCE

PROFILES



KNUT KJÆR

Chairman and Partner
FSN Capital

Knut Kjær is Chairman and Partner of FSN Capital, as well as Executive Chairman of Sector Asset Management. He is an advisor to the GIC Investment Strategies Committee. Mr Kjær was the Founding CEO of the Norwegian Sovereign Wealth Fund, Norges Bank Investment Management (NBIM), in 1998. When he left in 2008, he had built an asset management team that grew NBIM's reserves from US\$25 billion to US\$400 billion. He was President of RiskMetrics Group in New York from 2009-2010. He is currently a member of the MAS Investment and Risk Advisory Panel, APG Asset Management Supervisory Board, and also sits on the International Advisory Council of the China Investment Corporation.

Mr Kjær holds a Masters in Economics and a degree in Political Science from the University of Oslo.



DAVID DENISON

Former President and CEO
Canada Pension Plan Investment Board

David Denison is a corporate director with extensive experience in the financial services industry. He advises the GIC Investment Strategies Committee and sits on the Investment Board. He served as President and CEO of the Canada Pension Plan Investment Board from 2005 to 2012. Prior to that, he was President of Fidelity Investments Canada Limited. Mr Denison currently serves as Chairman of Hydro One Limited, and is a director of Royal Bank of Canada and BCE Inc. He also sits on the International Advisory Council of the China Investment Corporation and is Co-Chair of the University of Toronto Foundation Investment Committee. He was named an Officer of the Order of Canada in 2014.

Mr Denison earned Bachelor of Arts and Education degrees from the University of Toronto and is a Fellow of the Institute of Chartered Accountants of Ontario.



MARK KRITZMAN

Founding Partner and CEO
Windham Capital Management

Mark Kritzman is a Founding Partner and Chief Executive Officer of Windham Capital Management and Chairman of Windham's Investment Committee. He advises GIC's Investment Strategies and Risk Committees. He was a Founding Director of the International Securities Exchange and has served on several boards, including the Institute for Quantitative Research in Finance, The Investment Fund for Foundations, and State Street Associates. He is also on several editorial boards, and is the author of seven books including *Puzzles of Finance* and *The Portable Financial Analyst*. Mr Kritzman has won multiple awards including the Graham and Dodd Scroll, the Bernstein-Fabozzi/Jacobs-Levy Award, the Roger F. Murray Q-Group Prize, and the Peter L. Bernstein Award.

Mr Kritzman has a BSc degree in Economics from St. John's University, an MBA (Distinction) from New York University, and a CFA designation. In 2004, he was elected a Batten Fellow at the Darden Graduate School of Business Administration, University of Virginia.



DR MOHAMED EL-ERIAN

Chief Economic Advisor
Allianz

Dr Mohamed El-Erian is Chief Economic Advisor at Allianz, the parent of PIMCO where he served as CEO and co-CIO (2007-14), and former chair of President Obama's Global Development Council. He is an advisor to the GIC Investment Strategies Committee. He was President and CEO of Harvard Management Company, Managing Director at Salomon Smith Barney/Citigroup, and Deputy Director at the International Monetary Fund in Washington, DC. Dr El-Erian writes regularly, and is a *Financial Times* Contributing Editor and *Bloomberg View* columnist. He has two *New York Times* best sellers – the 2008 “When Markets Collide” and the 2016 “The Only Game in Town”.

Dr El-Erian holds a Bachelor of Economics from Cambridge University, as well as a Masters and PhD in Economics from Oxford University. He is an Honorary Fellow of Queens' College, Cambridge University.



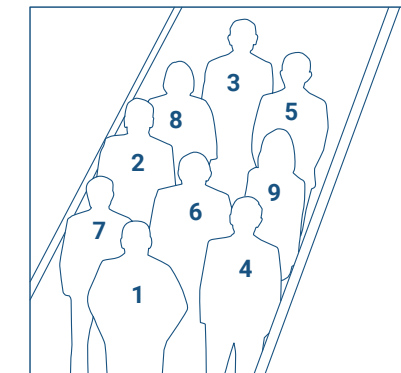
UDAY KOTAK

Executive Vice Chairman and
Managing Director, Kotak Mahindra Bank

Uday Kotak, Founder, Executive Vice Chairman and Managing Director of Kotak Mahindra Bank, has led the group in a broad range of financial services for over 32 years. The Group's vision for equitable prosperity extends beyond financial services. The Kotak Education Foundation works with some of India's most economically underprivileged communities, attempting to alleviate poverty through education and livelihood programmes. Mr Kotak is a member of the International Advisory Panel of Monetary Authority of Singapore, and has served as Chairman of the Corporate Governance Committee constituted by SEBI. He has been awarded the 'Ernst & Young World Entrepreneur of the Year Award' in 2014 and 'Economic Times Business Leader of the Year Award' in 2015.

Mr Kotak holds a Bachelor's degree in Commerce, and a MMS degree from Jamnalal Bajaj Institute of Management Studies, Mumbai.

EXECUTIVE MANAGEMENT



- 1 **LIM CHOW KIAT**
Chief Executive Officer
- 2 **DR JEFFREY JAENSUBHAKIJ**
Group Chief Investment Officer
- 3 **LIM KEE CHONG**
Deputy Group Chief Investment Officer
- 4 **TAY LIM HOCK**
Deputy Group Chief Investment Officer
- 5 **GOH KOK HUAT**
Chief Operating Officer
- 6 **DR CHIA TAI TEE**
Chief Risk Officer
- 7 **DR LESLIE TEO**
Chief Economist
- 8 **WU CHOY PENG**
Chief Technology Officer
- 9 **DEANNA ONG**
Chief People Officer

EXECUTIVE MANAGEMENT

**LIM CHOW KIAT**

Chief Executive Officer

Lim Chow Kiat was appointed Chief Executive Officer on 1 January 2017. He was previously Group Chief Investment Officer of GIC and Deputy Group President. He joined GIC as a portfolio manager upon graduation in 1993 and subsequently rose to head the Fixed Income, Currency and Commodities Department. He was President, Europe in 2009, overseeing investments and relationships in Europe, Africa and the Middle East before his appointment as President of GIC Asset Management in 2011. Mr Lim is the Chairman of Wealth Management Institute and serves on the boards of Nanyang Technological University, National Research Foundation, Enterprise Singapore and FCLT Global. He is also a member of Agence France Trésor's Strategic Committee and International Advisory Council of Mizuho Financial Group.

Mr Lim holds a First Class Honours degree in Accountancy from Nanyang Technological University, Singapore.

**DR JEFFREY JAENSUBHAKIJ**

Group Chief Investment Officer

Dr Jeffrey Jaensubhakij was appointed as Group Chief Investment Officer on 1 January 2017. He joined GIC in 1998 as a Senior Economist covering the US economy. He has held asset allocation portfolio responsibilities as Co-Head of Asset Allocation Strategy in the Economics and Strategy Department, and from 2003 to 2011 was Head of Total Return Equities and the US Equities teams based in GIC's New York Office. In 2011, he was appointed President, Europe, responsible for coordinating GIC's investment activities in Europe across public and private asset classes. He was appointed President, Public Markets and Director of Public Equities in 2013, and Deputy Group Chief Investment Officer in 2016.

Dr Jaensubhakij holds a BA in Economics from Cambridge University, as well as a Masters and a PhD in Economics from Stanford University.

**LIM KEE CHONG**

Deputy Group Chief Investment Officer

Lim Kee Chong has been GIC's Deputy Group Chief Investment Officer and Director of Integrated Strategies Group since April 2013, and is currently based in GIC's New York Office. He is concurrently President (Americas). He joined GIC in 1987, and built his career in the Equities Department. He was appointed Head of global equities in July 2010. In his tenure at GIC, he has managed portfolios running the gamut of developed market equities, as well as global sector and global equities portfolios. As Director of Integrated Strategies, he heads a unit that looks at opportunities in both public and private companies.

Mr Lim graduated with an Economics degree from the University of Tokyo, where he studied under a government scholarship.

**TAY LIM HOCK**

Deputy Group Chief Investment Officer

Tay Lim Hock joined GIC's Asian Private Equity (PE) team in 1995. He was posted to London (2000) as Head PE Europe and to San Francisco (2003) as Head PE US. He became Global Head of the Funds and Co-Investment Group in 2008, Deputy President of PE & Infrastructure in 2010, and President in 2011. In January 2017, Mr Tay returned to London as President (Europe), and as Deputy Group Chief Investment Officer. Prior to GIC, he worked as an Aeronautical Engineer with the Republic of Singapore Air Force.

Mr Tay graduated from I'Ecole Nationale de l'Aviation Civile (ENAC) in Toulouse, France, with a Masters in Aeronautical Engineering in 1987, and completed the Stanford Executive Program in 2004.

**GOH KOK HUAT**

Chief Operating Officer

Goh Kok Huat has been GIC's Chief Operating Officer since April 2014. He was appointed as Advisor of GIC Real Estate on 1 January 2017, after stepping down from President, GIC Real Estate, a role he took on in July 2011. He joined GIC Real Estate in 2009 as Managing Director, Asia - Investment Management. Mr Goh joined GIC from Tishman Speyer in New York, where he headed the firm's emerging markets portfolio management, before being appointed Managing Director of equity capital markets. Prior to that, he was with the Ascendas Group, where he held various senior appointments including COO of the Group, CEO of Ascendas-MGM, CEO of Singapore Operations, CEO of India Operations and CEO of Bangalore IT Park. He spent 10 years in the military upon graduation.

Mr Goh has a BA in Economics from Cambridge University.

EXECUTIVE MANAGEMENT

**DR CHIA TAI TEE**

Chief Risk Officer

Dr Chia Tai Tee is Chief Risk Officer at GIC. Before his appointment in July 2011, he served as Deputy Chief Risk Officer and Director of Risk and Performance Management Department. He has held various positions in economics and strategy, foreign exchange, and quantitative investments. Dr Chia sits on the EDHEC-Risk Institute International Advisory Board, chairs the People's Association Investment Advisory Committee, is a member of the Tote Board Investment Committee, Singapore Institute of Technology endowment fund Investment Committee as well as the Ministry of Home Affairs Pension Plan Board of Trustees, and its Risk and Audit Committee. Prior to joining GIC in 1994, he was a lecturer at the National University of Singapore.

Dr Chia graduated with a degree in Economics from the University of Adelaide and holds a PhD from Australian National University.

**DR LESLIE TEO**

Chief Economist

Dr Leslie Teo is GIC's Chief Economist and Director of Economics & Investment Strategy. He joined GIC from the International Monetary Fund, where he was Deputy Division Chief and Assistant to the Director of the Asian Department. Dr Teo started his career as an economist at the IMF in 1996, and has also served at the Monetary Authority of Singapore. He joined GIC as a senior investment manager in the Economics & Strategy Department in 2008. He headed GIC's Asian/Emerging Market Research and Strategy team before being appointed Deputy Director of the Economics & Investment Strategy Department.

Dr Teo has a BA in Economics from the University of Chicago, an MA in Economics, and a PhD in Economics and Finance from the University of Rochester.

**WU CHOY PENG**

Chief Technology Officer

Ms Wu Choy Peng was appointed GIC's Chief Technology Officer on 14 August 2017 to provide integrated oversight for technology and data analytics. Before joining GIC, she was Group Chief Information Officer of Singapore Telecommunications Limited (Singtel). From 2006 to 2012, she was Group Chief Information Officer of Neptune Orient Lines Group. Prior to that, she held various senior appointments including the Singapore Government's Chief Information Officer, Deputy Chief Executive (Industry) of the Infocomm Development Authority (IDA) and Chief Information Officer of the Ministry of Education (MOE). She spent 10 years at the National Computer Board (NCB) upon graduation. Ms Wu is on the board and executive committee of the National University Health System (NUHS), and chairs its Board IT Committee.

Ms Wu holds a Bachelor of Science (Hons) degree in Computer/Communication Science/Mathematics and a Master of Science in Computer Science/Engineering, both from the University of Michigan, Ann Arbor.

**DEANNA ONG**

Chief People Officer

Deanna Ong was appointed Chief People Officer in April 2017 to oversee human capital strategy, talent management, leadership and organization development in GIC. She has been responsible for Human Resource & Organization and Corporate Governance since 2012. Ms Ong was Director, Finance from 2009 to 2014, during which she headed the Finance Group responsible for financial management across GIC's portfolio, covering financing arrangements for assets, tax planning, investment holding structures, accounting and management of group revenue and expenditure. Prior to joining GIC in 1994, she was a tax accountant with Arthur Andersen. Ms Ong is currently a board member of the International Forum of Sovereign Wealth Funds.

Ms Ong holds a Bachelor of Accountancy from the Nanyang Technological University of Singapore, and has completed the Stanford Executive Program.

**LIM SIONG GUAN**

Advisor

Lim Siong Guan is a Professor in the Lee Kuan Yew School of Public Policy and Advisor to the Group Executive Committee of GIC. He was the Group President of GIC from 2007 to 2016, and a former Head of the Civil Service, Chairman of the Economic Development Board, and Permanent Secretary variously in the Ministries of Defence, Education, Finance, and the Prime Minister's Office. He founded a charity, Honour (Singapore), to promote a culture of honour and honouring for the well-being of the nation, and co-authored two books with Joanne H. Lim, 'The Leader, The Teacher & You' and 'Winning with Honour'.

Mr Lim had First Class Honours in Mechanical Engineering from the University of Adelaide, and has a Postgraduate Diploma in Business Administration from the National University of Singapore.

OUR PEOPLE

GIC is a global long-term investment organization. We are headquartered in Singapore with offices in 10 cities. Our team is made up of close to 1,500 people with a wide range of backgrounds, spanning more than 40 nationalities.

OUR PEOPLE

ONE GLOBAL TEAM

Our team operates out of offices in Singapore, Beijing, London, Mumbai, New York, São Paulo, San Francisco, Seoul, Shanghai and Tokyo.

Regardless of role, function or location, we are one GIC team, united in the common pursuit of investing well for Singapore.

HIGH-PERFORMING AND COLLABORATIVE CULTURE

Talent is critical to GIC's success. We seek to attract and develop the best talent, with the right values, to contribute to a high-performing and collaborative organization.

Our PRIME values and the GIC Way lie at the heart of our work. They serve as our compass as we navigate an increasingly complex global investment environment.

RECRUITING TOP TALENT

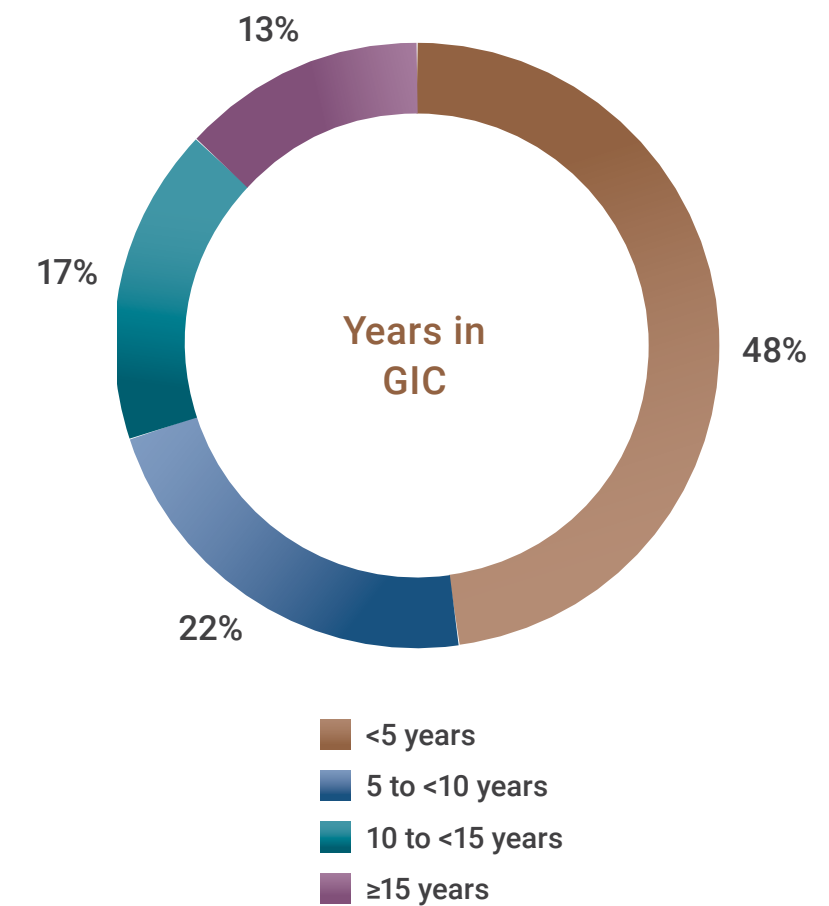
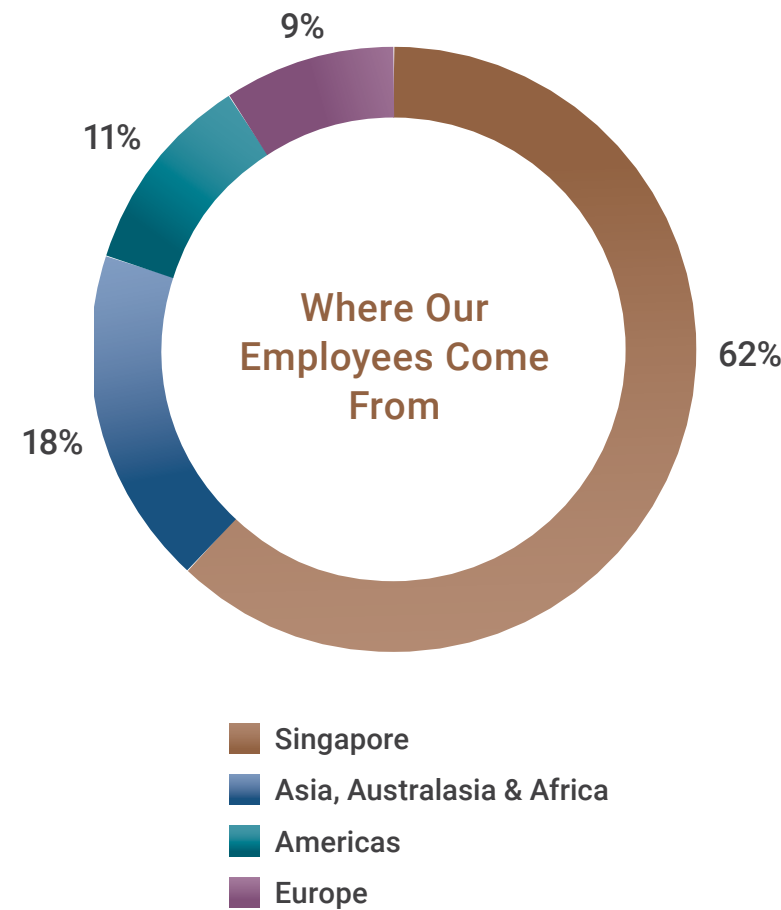
Beyond integrity and motivation, we look for qualities such as capacity, first-principle thinking, intellectual curiosity and resilience.

We recruit mid-career professionals who are experts in their respective fields. We expect them to add immediately to our existing investing and business capabilities, as well as be coaches and mentors to their juniors.

Our GIC Professionals Programme (GPP) recruits new graduates annually and gives them a firm foundation

through training, apprenticeship and rotations. In this programme, they gain business exposure under the guidance of experienced professionals. GPP graduates are deployed to business areas suited to their aspirations, skills and interests, as they start their career in GIC.

Our GIC Internship Programme accepts promising undergraduates, who by working with us, gain practical insights into the fund management industry and a chance to pursue a career with GIC. Our interns tap the knowledge of seasoned professionals in the course of their work.



DEVELOPING OUR PEOPLE

In developing our people, we emphasise a growth mindset and a long-term approach to equip them for the future.

As a global fund manager invested across diverse asset types, we leverage our geographical and sectoral network to create development opportunities for our people. These include postings to our global offices, rotations to different business groups, and attachments with external fund managers. Our leaders and supervisors play an active role in people development through learning communities, dialogues, and mentorship programmes.

The GIC School, our dedicated Learning & Development academy, complements our on-the-job training. It runs foundation programmes to ensure our people are prepared for the expectations, responsibilities and challenges at each level of appointment. The School also offers multi-disciplinary elective courses that equip staff to renew and reinvent themselves to be future-ready. Our GIC Digital Curriculum, for example, is a collection of modules and dialogues, focused on enhancing the digital proficiency of our people. Our People Managers' Programme is conducted for all managers globally to ensure a high level of team effectiveness in organizational management.

LEADERSHIP CHANGES

On 1 June 2018, Mr Boon Chin Hau, Mr Derek Tien, Mr Guan Ong, Mr Jeffrey Tan, Mr Kishore Gotety, Mr William Ng, Ms Elaine Chan and Ms Wong Ai Chiat were appointed Managing Directors.

Ms Wu Choy Peng and Mr Sam Kim joined GIC as Managing Directors on 14 August 2017 and 4 June 2018 respectively.

Managing Director Mr Choy Siew Kai retired from GIC on 1 July 2018. We are grateful for his dedicated years of service and contributions to GIC.

BUILDING CONFIDENT COMMUNITIES

Our community programmes seek to build more confident and inclusive communities.

GIC Sparks & Smiles (Sparks) is a leadership programme that empowers committed Singaporean students from low-income households to make a difference in the lives of others. Our Sparks' recipients receive a grant to support their studies, are trained by experienced social service professionals, engage with GIC Management, and commit to serving the community. Since its launch in 2015, more than 300 students have participated in the programme. They have collectively contributed more than 7,500 hours to mentoring disadvantaged youth, tutoring children and volunteering at job fairs, amongst other activities. These efforts have created a positive impact in the community while also enabling our recipients to grow in confidence and leadership. In this way, the value of Sparks is multiplied.

We also partner The Purple Symphony, Singapore's largest inclusive orchestra, for a training award that supports disadvantaged individuals and persons with special needs to access music lessons and performing opportunities. By learning and performing, our awardees develop their talents and gain confidence over the long term. GIC's support, through the award as well as employee volunteering efforts, has also helped the orchestra to pursue more performances at the national level.

OUR OFFICES





www.gic.com.sg