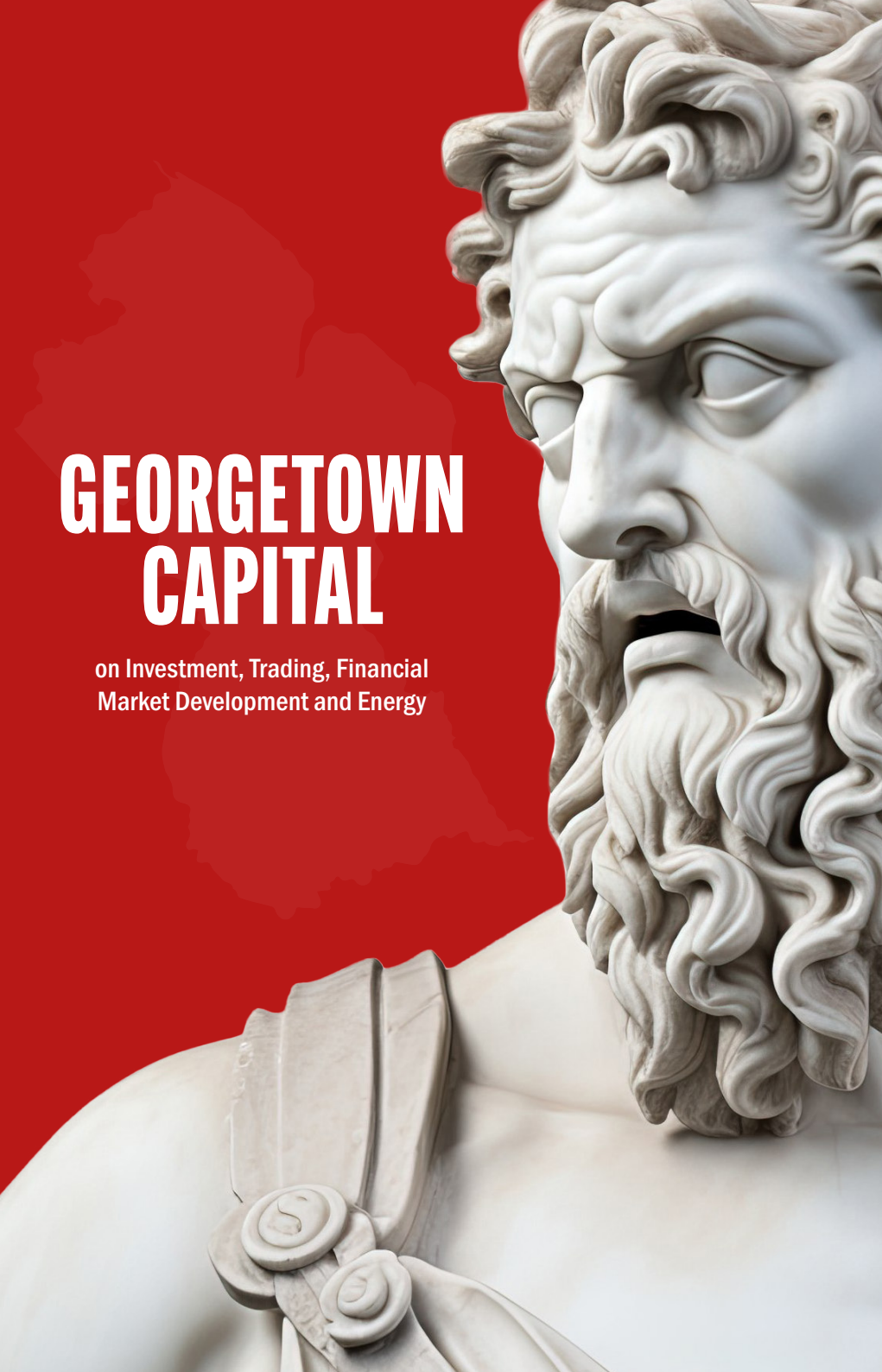
GEORGETOWN CAPITAL

on Investment, Trading, Financial Market Development and Energy



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2020 to 2021 Market Chronicles

Preface

Georgetown Capital, formerly Bunhill Row Reader, was launched in June 2020. The founder, Mr. Alex Armogan, previously designed and developed the University of Guyana's Energy Think Tank and served as the Founding Director of the University's Institute for Energy Diplomacy. The experience generated from academia informed the vision of Georgetown Capital. Mr. Armogan recalls that he was exposed to Bloomberg and Eikon during his time at Cass Business School, University of London. A desire was born to launch a service that could grow and evolve into a similar offering as the Caribbean region advances. This book contains a collection of market articles released by Georgetown Capital over 2020 and 2021.

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SOVEREIGN WEALTH FUNDS

The Externally Focused and Passive Investment Approach of Guyana's Sovereign Wealth Fund

Alex Armogan

Sovereign Wealth Funds (SWF) are state-owned investment vehicles that primarily seek to grow the Assets Under Management (AUM) via international and domestic investments. International capital market investments attract the bulk of SWF allocations and represent an avenue for economic diversification. In 2016, Saudi Arabia announced its post-oil strategy, Vision 2030. The strategy is premised on the creation of the world's largest SWF. To date, Saudi Arabia has repositioned its Public Investment Fund to global investments and injected the SWF with additional capital from the late-2019 fractional public listing of Saudi Aramco.

SWFs that are categorized as Development Funds invest directly in the domestic economy, such as Abu Dhabi's Mubadala Investment Company. There is a debate on the direct funding of infrastructure and other critical domestic investment needs versus a withdrawal rule linked to the national budgeting process. Experts highlight the corruption risk of direct SWF domestic investments.

Guyana's SWF, the Natural Resource Fund (NRF), does not directly invest in the local economy and focuses on external financial market investments. The Natural Resource Fund Act 2019 sets out a passive investment approach, and similar to Norway's Government Pension Fund Global (GPFG), it does not delve into the realm of active fund management. Section 35 of the NRF 2019 Act explicitly provides for a passive approach and details the relevant indices the fund's investments should track. Section 33 references investments for long-term savings. The allowable tracking errors between the returns on the NRF's eligible investments and their respective benchmarks is determined by the NRF's Investment Committee as an element of their advice on the Investment Mandate (IM) to the Minister of Finance (MoF).

Guyana's NRF and Norway's GPFG both serve a stabilization and intergenerational wealth function. The merger of the stabilization and intergenerational wealth objectives into a single fund translates to lower allocations in riskier assets than a pure intergenerational wealth SWF.

Funds with a stabilization objective place emphasis on liquidity for adequate withdrawals. Kazakhstan's SWF has a novel approach to fusing two objectives into a single fund and carries distinct portfolios to match each objective.

The NRF Act 2019 defines eligible investments, in Section 31, across asset classes, limits investments by establishing floors and ceilings, and prevents investments in riskier assets when the fund is below a set threshold. The eligibility of bank deposits and treasury bills are linked to an appropriate credit rating by Fitch, Moody's and Standard and Poor's. Barclays' indices are relied upon for sovereign and corporate bonds, while the MSCI World Index qualifies equities. Derivatives are eligible for the purpose of hedging exposure. Gold is the only eligible commodity investment. Section 32 limits allocations to only very safe investments, defined as eligible bank deposits and treasury bills, when the NRF's balance is less than US$500 million. The removal of the limit depends on the fund surpassing the US$500 million mark and the balance equating to more than three times the approved withdrawal for the next ensuing fiscal year. While riskier investments can be made beyond the aforementioned, per the ceilings and floors in Schedule 2 of the Act, a cushion of very safe investments must be maintained; the value of the very safe investments will be the larger of either US$500 million or three times the approved withdrawal amount for the next ensuing fiscal year.

Table: Ceilings and Floors per Eligible Investments (outside of very safe investments)

	Floor	Ceiling
T. Bills and Deposits	0%	45%
Bonds -Sovereign Bonds - Corporate Bonds	 30% 0%	 60% 20%
Equities	0%.	40%
Others -Derivatives -Commodities	 0% 0%	 10% 10%

Guyana's central bank, Bank of Guyana (BoG), is the operational manager of the NRF and executes the Investment Mandate delivered by the MoF. Section 14 guides the Investment Committee on what must be considered when crafting the mandate. Amongst the considerations, the Act references the principle of financial diversification, market conditions and timing, the risk tolerance of Guyana and the long-term goal, on average, of at least 3% real total return per annum. The IM will contain directions on liquidity, management of financial risks, ethical investments, composition of the fund by eligible asset class, relevant indices, and acceptable tracking errors, among others.

Passive versus Active Fund Management

Important to the distinction between passive and active fund management is the concept of market return, loosely defined as the return from a portfolio containing all assets available to investors in an economy. Active fund management aims to beat the market return, often represented by a section of market assets embodied in an Index, via value or growth strategies. Passive fund management does not try to out-wit the market return and aims to match its performance. A passive fund, aiming to replicate the performance of an Index, has a beta close to 1. Beta is a sensitivity measure linked to the return on the market portfolio.

Per the Capital Asset Pricing Model (CAPM), a portfolio with a beta of 1 has successfully diversified away the firm-specific risk factors of its holdings and is only exposed to economy-wide risk factors known as systematic risks. A portfolio with a beta higher than 1 has more volatility than the market, while a beta lower than one indicates less volatility. The expected return on a well-diversified portfolio, per CAPM, is the risk-free rate, proxied by the return on short-term government bonds, added to the result of beta times the expected risk premium. The risk premium, return from being exposed to additional risk, is the gap between the market return and the risk-free return. However, CAPM has its shortcomings, such as smart betas, and there is evidence that investment managers can add or subtract value to a portfolio.

Extra returns from a positive Alpha, return above being exposed to the market, is the lure of active fund management. Skill is not the only determinant of active fund management since the role of luck cannot be

dismissed in success or failure. Active fund management generates higher costs due largely to higher buy and sell costs as compared to the longer holding periods of passive funds. Active fund managers who outperform the market beyond a short- to medium-term time horizon are the exception rather than the norm. Passive fund management represents a safe approach to the achievement of Guyana's SWF objectives.

The Sovereign Wealth Fund Withdrawal Mechanism

Alex Armogan

The numerical withdrawal rule of Guyana's Sovereign Wealth Fund (SWF) has been questioned on complexity, stringency, and excessive discretion. The attention garnered by the mechanism is not unusual since it controls the flow of funds to the national budgeting process. Globally, there has been an amplification of focus on SWF withdrawal mechanisms as governments tackle the COVID-19 pandemic and the deteriorating macroeconomic environment. Countries such as Norway, Bahrain and Kuwait have made headlines for the increased intensity of drawdowns to help their domestic economies.

Norway's model was closely examined in the design of Guyana's SWF per the 2018 Green Paper. Norway's deposit and withdrawal rules are not mandatory like Guyana's deposit of petroleum revenues and maximum withdrawal amount in a fiscal year, the Economically and Fiscally Sustainable Amount (EFSA). Norway's rules are supported by the consensus of their Ministry of Finance and Parliament. The withdrawal rule mirrors the expected sustainable long-term real return of the Fund. For several years, a 4% return was deemed reasonable and formed the guideline for government spending. In 2017 Norway revised the expected real return to 3% and in May 2020, news emerged of the country's intention to ramp up withdrawal beyond its 3% guideline to meet budgetary needs. Pressure has been placed on oil-exporting countries to consider large drawdowns from Intergenerational Wealth Funds, such as Bahrain's US$450 million withdrawal to support the state's budget, while Kuwait's budgetary needs may require a similar out of the box drawdown.

Withdrawals from SWFs in a depressed asset price environment can result in realized losses. Unrealized losses refer to the drop in the value of investment positions on paper; if an equity position is liquated at a lower value due to the down market, a realized loss occurs. Portfolios are constructed based on the objective/s of the SWFs. As a rule of thumb, over 50% of SWF allocations remain in cash, fixed income and public equity investments. Market downturns also present the opportunity to invest in equities and bonds, among others, at depressed prices. The current environment has not produced the low price-to-earnings ratios

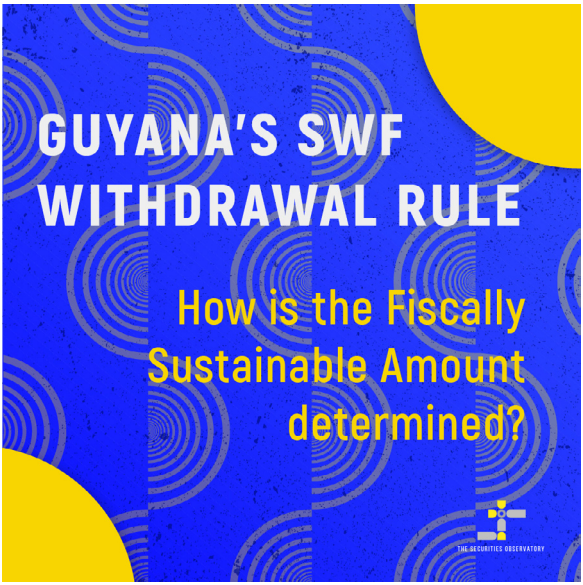
of prior downturns, yet several SWFs are exploiting perceived opportunities. An example of selective risk-taking by SWFs in turbulent market conditions are the SWF investments made during the Global Financial Crises of 2007/2008. Singapore and Kuwait SWFs on aggregate made billions from investments in depressed US financial assets, but some positions soured; the Abu Dhabi Investment Authority sued Citigroup over its $7.5 billion investment.

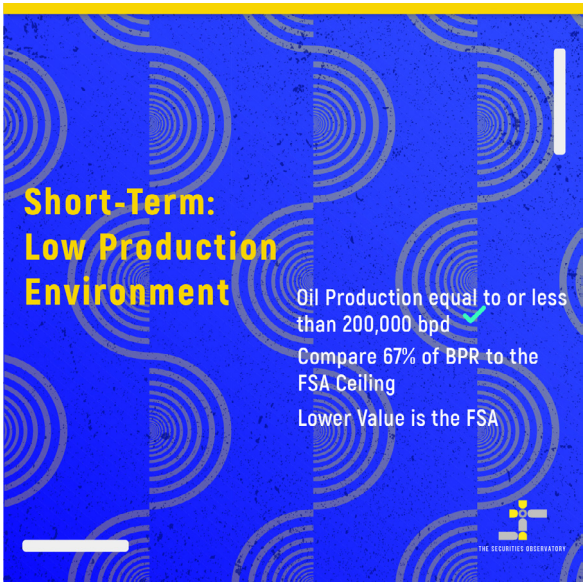
Guyana's EFSA, the withdrawal limit in a fiscal year, is the lower value of two critical calculations—the Economically Sustainable Amount (ESA) and the Fiscally Sustainable Amount (FSA). The Macroeconomic Committee (MC), created by the NRF Act, is required to determine the ESA based on a model that accounts for the impact/likely impact of past and future withdrawals from the fund on Guyana's economic competitiveness. The Act contains a non-exhaustive list of variables that should be included in the analysis, such as inflation, real exchange rate, composition of public spending (current v. capital), public debt and balance of payments. The Minister of Finance is ultimately responsible for the adopted ESA and can differ from the recommendation of the Macroeconomic Committee; the Minister's discretion is said to be mitigated by reporting requirements.

Aside from guarding against the Dutch Disease, the need to fiscally smooth and the quest of intergenerational wealth while utilizing petroleum wealth to finance national development priorities are ingrained in the determination of the Fiscally Sustainable Amount. The Minister of Finance is responsible for the FSA based on the explicit numerical rule contained in the NRF 2019 Act.

The concepts of "Benchmark Petroleum Revenues" (BPR) and "Fiscally Sustainable Amount Ceiling" are relevant to the FSA determination. The BPR is a conservative estimate of petroleum revenues for a fiscal year. It uses a seven-year average of the most relevant price benchmark, Dated Brent, and a production estimate to determine the expected revenues. The seven-year price average consists of the preceding three fiscal years, the current fiscal year and the succeeding three fiscal years. The average requires forecasting, with reference to EIA's International Energy Outlook. The FSA Ceiling is the larger value of either 25% of a five-year average of non-petroleum revenues or 3% of the projected balance of the NRF for the fiscal year.

In the long term, the FSA value will be equal to 3% of the NRF. The reasoning behind the long-term Fiscally Sustainable Amount is the expected 3% long-term real rate of return on the Fund's investments. The FSA value in the short and medium term is the lower value when comparing a percentage of Benchmark Petroleum Revenues, linked to the level of oil production, and the FSA Ceiling. See the following graphical depiction for details:




Short-Term:
Low Production
Environment
Oil Production equal to or less than 200,000 bpd
Compare 67% of BPR to the FSA Ceiling
Lower Value is the FSA
THE SECURITIES OBSERVATORY


Short to Medium Term:
Moderate Production
Environment
Oil Production between 200,000 and 400,000 bpd
Compare 50% of BPR to the FSA Ceiling
Lower Value is the FSA
THE SECURITIES OBSERVATORY


Medium-Term:
High Production Environment
Oil Production equal to or greater than 400,000 bpd
Compare 33% of BPR to the FSA Ceiling
Lower Value is the FSA
THE SECURITIES OBSERVATORY


Long-term
The fiscal year when the calculated BPR is less than 3% of the balance of the NRF
The FSA is equal to 3% of the NRF
THE SECURITIES OBSERVATORY

If Guyana undergoes a re-examination of the Natural Resource Fund, the new government must take note of the unfolding lessons of 2020. The optimal withdrawal rule for Guyana speaks to the need for the SWF to allow sufficient support to the domestic economy in dire situations, an aspect of the stabilization objective, while sustaining the long-term quest for intergenerational wealth. The adequacy of Guyana's withdrawal rule is largely dependent on the Fiscally Sustainable Amount due to its binding nature. If the FSA, as elaborated in the First Schedule of the NRF Act 2019, does not strike an appropriate balance and caters to sufficient withdrawals in budget crunch years such as 2020, it must be improved. Discretion over the amount saved and withdrawn is an easy target for criticism, but rigidity can be a potential shackle to addressing domestic needs.

Should Guyana Establish More Than One SWF?

Alex Armogan

Sovereign Wealth Funds (SWF) popularly serve objectives of macroeconomic stabilization and the creation of intergenerational wealth via long-term investment of savings. It can serve domestic development purposes, but experts have advised against an SWF investing directly in domestic assets. Guyana's Natural Resource Fund (NRF) aims to simultaneously tackle the need for economic stabilization, intergenerational wealth, and the current generation spending of petroleum revenues on national development priorities via the budgeting process. Section 3 (2) of the NRF Act, which sets out the objectives of the fund, explicitly provides that natural resource revenues should not lead to a loss of economic competitiveness and indicates Guyana's emphasis on avoiding the Dutch Disease.

The deposit, withdrawal, and investment provisions of the single fund are designed to ensure the achievement of the multiple objectives. Some countries have established separate funds to achieve specific objectives, such as Chile's Pension Reserve Fund, which assists the financing of pension and social welfare spending, and the Economic and Social Stabilization Fund, which is a macroeconomic stabilization and countercyclical tool. Similarly, there is the Ghana Stabilization Fund and the Ghana Heritage Fund with provisions to merge the two funds into a single fund, Ghana Petroleum Wealth Fund.

The establishment of separate funds for macroeconomic stabilization and the creation of intergenerational wealth is said to improve investment focus and risk/return optimization. Stabilization SWFs are composed of safer and more liquid assets than Intergenerational Wealth SWFs due to the needed flexibility of withdrawals to stabilize the domestic economy. Intergenerational Wealth SWFs require a higher rate of return and invest in riskier and less liquid assets than Stabilization SWFs through a more diversified and optimized portfolio. Withdrawals from funds intending to create wealth for future generations are more restrictive than withdrawals from Stabilization SWFs.

The Green Paper on the establishment of the NRF highlights the single-fund models of Norway, Botswana and Timor-Leste that are

successfully achieving both stabilization and saving objectives in contrast with the poor track record of Nigeria's multiple funds aimed at stabilization, intergenerational wealth and domestic spending on infrastructure. If Guyana follows a multiple fund model for its expected revision of the Natural Resource Fund, the management and oversight functions would increase in complexity with allocations between separate funds, and the varying deposit, withdrawal and investment provisions per fund. The cost implication of having multiple SWFs is a further key area of consideration.

SWF Special Focus: Chile

Alex Armogan

Chile is often considered a leading example in natural resource management. The country has a deep history of trials and errors since its independence in 1810. It has navigated a dependence on nitrates pre-1930 and the current reliance on copper. The praise of Chile's symphony in blending monetary and fiscal policies to produce macroeconomic stability and growth is centred around its post-1990s performance. The country has been one of the fastest-growing economies in Latin America and the Caribbean (LAC).

The country attempted to blunt the impact of commodity price volatility by pursuing import-substitution industrialization over the 1940s to 1970s. Chile underwent a socialist experiment under the 1970 to 1973 Allende administration before the military seized power in 1973. The economic calibration entailed limited international trade and private capital flows, government-dominated production and various protectionist measures. The 1970 administration led the control over productive activities and nationalized Chile's banking system. Government expenditure was aggressively scaled up as populist policies were pursued. In 1971, the money supply expanded by 66% (real value) and the public sector deficit as a percentage of GDP swelled from 2.7% in 1970 to 24.7% in 1973 (Caputo and Saravia 2019). Inflation made an interstellar leap from 28.2% in 1971 to 608.7% in 1973. Post-1973, restrictive monetary and fiscal policies were implemented to address the years of excess. The combination of the restrictive policies, the collapse in copper price and rising oil price led to the 1975 recession.

Chile's economic growth story has been facilitated in part by a structural budget balance rule in combination with two Sovereign Wealth Funds that allow for fiscal smoothing, stabilization, and saving. Chile has progressively addressed its issue of unsustainably increasing government spending in good times and accumulating large public deficits.

Chile's Copper Revenue Compensation Fund, the precursor to the Economic and Social Stabilization Fund, was established in 1987 against the backdrop of pro-market policies, the 1970s stabilization efforts, and the early 1980s economic contractions. The designers of the fund envisaged

its use as a tool to ensure sustainable government spending and debt by balancing spending across copper market cycles and accumulating savings when the price exceeded its long-term average. The CRC Fund operated until 2006 and was complemented by the 2001 structural budget balance rule.

The structural balance rule uses long-term values to frame fiscal policy and facilitates fiscal discipline by expanding government focus to long-term GDP growth and copper revenues. Independent expert committees are responsible for forecasting and determining the copper price, output and other parameters. The estimates generated by the committees are communicated to the Ministry of Finance. The Natural Resource Governance Institute (2013) notes that "empirical evidence shows that when the forecast of sensitive variables in the budget process is left to the government, predictions tend to be overly optimistic; for that reason, copper price projection and the long-term GDP trend were delegated to independent committees."

Chile implemented a Fiscal Responsibility Law in 2006 that authorized the establishment of the Economic and Social Stabilization Fund (ESSF), replacing the CRC Fund, and the Pension Reserve Fund (PRF). The ESSF was born in 2007 as a stabilization and countercyclical tool. The PRF assists the financing of pension and social welfare spending. The deposit and withdrawal rules of the two SWFs are subject to the overarching structural balance rule. If the rule is set to target a 1% deficit (e.g., 2014), withdrawals will be required, while a 1% surplus target (e.g., the mid-2000s) indicates a period of deposits to the funds. The PRF's deposit rule sets a 0.2% of the previous year's GDP floor and provides a 0.5% of the previous year's GDP ceiling if the effective surplus is greater (NRGI and CCSI 2013). After the PRF's first bite, the remaining fiscal surplus less priority deductions, such as debt repayments, is channelled to the ESSF. Withdrawals from the ESSF flow through two channels; the stabilization fund can make payments to the Pension Reserve Fund and fill the fiscal deficit gap and reduce public debt.

The high praise over Chile's macroeconomic framework has come under question in recent years. Large-scale protests, propelled by income inequality, have poured onto the streets of Santiago, the capital and name bearer of SWF best practices. The COVID-19 pandemic has further

fuelled the social unrest which has spread to the outskirts of the country over food shortages. Chile joins a long list of locations impacted in 2019 and 2020 by uprisings. According to the World Bank, Chile has succeeded in real wage increases and reductions in poverty. However, income inequality remains a pressing issue. The Gini coefficient was circa 0.44 in 2017, representing one of the highest rates for income inequality in the region, while over 2006 to 2017, the country reduced those earning less than US$5.5 US (2011 value) per day from 19.6% to 3.7% (World Bank 2020).

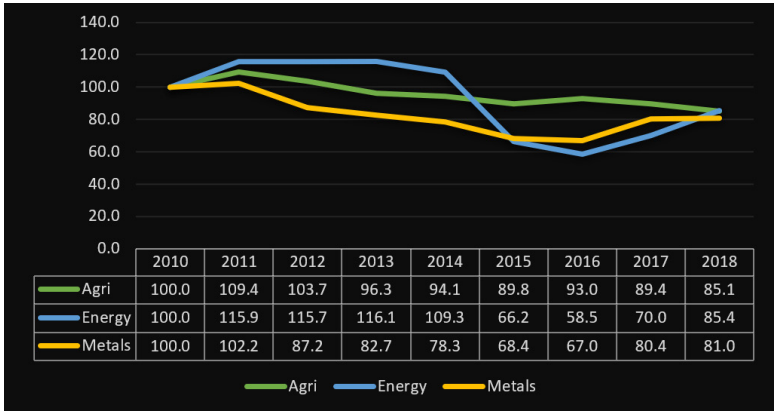
The government has sought to remedy the situation by commencing efforts toward a new social contract in the form of constitutional reform and via ramping up government spending on healthcare and pensions, among other areas. The SWFs, containing over US$10 billion, is being tapped along with government borrowing. The deficit target will be updated to ensure sufficient yet sustainable withdrawals. The funds are an ample cushion in the face of the required increase in government spending and level of public debt. The accumulated savings will contribute to the required domestic needs in an increasingly difficult global environment.

The Copper Market and Chile

The story of man's use of copper is tightly knitted with the journey of civilization. Copper proved an early source for coins and ornaments and importantly facilitated the Bronze Age. The two most common types of copper found are porphyry deposits, two-thirds of the world's copper, and strata-bound deposits (Doebrich 2009). The primary production of copper is rooted in ores and can be refined from copper concentrates or via solvent extraction and electrowinning. Secondary production is linked to copper scrap. The outputs of the refining process include cathodes, wire bars and continuous cast rod, among others (Tamvakis 2007). The 2018 trade value of copper ore amounted to $64.2 billion and $67 billion for refined copper (OEC 2020).

At the outset of the past decade, commodity reliant export economies seemed set for historically high revenue flows. However, the sweetness of the large financial flows lessened in 2014 and remained below the 2010 mark until 2020. The new decade has now started in the reverse order, where larger flows are to be expected after the crisis of year 1.

Table: Commodity Price Index in constant USD | 2010=100 | World Bank (2019)



	2010	2011	2012	2013	2014	2015	2016	2017	2018
Agri	100.0	109.4	103.7	96.3	94.1	89.8	93.0	89.4	85.1
Energy	100.0	115.9	115.7	116.1	109.3	66.2	58.5	70.0	85.4
Metals	100.0	102.2	87.2	82.7	78.3	68.4	67.0	80.4	81.0

Demand from the Asian region, specifically China, is a critical component of the world's metals market. China's share of the metals market increased from 10% in the pre-2000s to 50% of consumption in 2015 (World Bank 2020). The country is a major export market for Chile, the leader in reserves and production. Chile accounts for 49.4% of copper ore imports and 34.6% of refined copper imports (OEC 2020).

Copper is primarily in demand for its use in electrical and electronic products and building construction, on aggregate 70% of global consumption (CME Group 2016). Transport equipment, consumer and general products and industrial machinery and equipment each contribute circa 10% of the remaining 30%. A significant share of China's demand, excluding building construction and industrial machinery and equipment, is export oriented and the end users are important to understanding demand-side developments. Building construction demand has slowed from the US and EU-28, but China's economic progress has led to its 33% share of construction copper.

World copper mining production in 2018 was 20.3 million tons, a 26% increase from 2010 (World Bank 2020). The South American duo of Chile and Peru, home of porphyry copper deposits, has a joint account of 41% of the world's copper mine production and 33% of world reserves. Chile produced 5.8 million tons in 2018. China is the third-ranked mine producing country in 2018. However, China achieved a staggering 6.8 times expansion in the refined production of copper from 1.3 million tons

in 2000 to 8.9 million tons in 2018. The growth in China's refined production contrasts with the US regression from double-digit percentage contribution in 2000 to a mere 4.7% contribution in 2018, down 700,000 tons. Chile's share of refined production has also declined to circa 10% in 2018, down 235,000 tons from the start of the century.

Chile is home to some of the largest copper mines. The Escondida mine, majority owned and operated by BHP, is the world's largest mine, with a yearly production often in excess of 1 million tons, followed by Anglo American and Glencore's Collahuasi mine, which produces around the 500,000 ton mark (Global Business Reports 2018). The state-owned Codelco has long been the global leader in copper production; however, slumping production has led to BHP's challenge to the status (Reuters 2020). In boom times, Codelco has contributed approximately 30% of total tax revenues (ADB 2016).

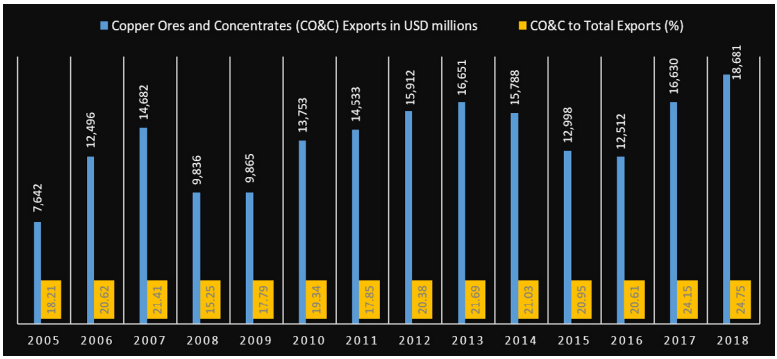
The energy transition provides fertile ground for copper consumption growth. Copper consumption will grow due to increasing investments in renewable energy and electrification aims per end use sectors. The progression from 100% internal combustion engine vehicles (ICEV) to hybrid vehicles and 100% battery-operated vehicles requires higher copper inputs.

Per an International Copper Association study, 23 kg is used in an ICEV as compared to 40 kg per unit in hybrid vehicles. A battery-operated vehicle uses 83 kg per unit with 40 kg required for the battery pack (DBS Group Research 2018). The uptake of EV vehicles will also enhance the need for cobalt. A noteworthy extent of the cobalt market is currently linked to the mining of copper. Demand for copper will be facilitated by the growing demand from the EV infrastructure.

The price fluctuations of the copper market largely mirror the movements of the overarching commodity market. The non-ferrous classification and attractive physical characteristics of conductivity, corrosion resistance and malleability, among others, of copper underscore its premium pricing. Copper-reliant economies were flushed with revenues in the price booms following World War II and over the 2002 to 2008 period. The price spike in the first half of 2008 is a deviation from the more gradual growth registered during boom pricing. Further, copper attracted a

higher price than other non-ferrous metals such as aluminium over the 2002 to 2008 price boom due to tighter supply-side dynamics.

Copper's price per metric ton registered a 123% increase from January 2005, at $3,170, to January 2008, at $7,061 (World Bank 2020). From January to April 2008, copper's price spiked by 22% to its period peak of $8,685 per MT. The Global Financial Crisis triggered the copper price collapse of the second half of 2008. By December 2008, copper's price was 65% off its April high, ending the year close to $3,000 per MT. Chile's copper ores and concentrates, a fraction of total copper-related exports, contributed $4.8 billion less in 2008 (YTY). Prices recovered in 2009 and entered rarified territory at $9,868 per MT in February 2011. However, a price slump occurred from the 2013 to 2016 period with $1,000 per MT being erased over the first eleven months of 2013 and a further $3,000 per MT drop to February 2016. The last quarter recovery of copper prices in 2016 continued to mid-2018 when it touched the $7,000 per MT mark before displaying a generally downward trend to December 2019. About $900 was shed between January to March 2020 as copper's price was set to sink below $5,000 per MT.



Chile's Copper Ores and Concentrates (CO&C) Exports in USD millions and CO&C to Total Exports (WITS 2020)

Sovereign Wealth Fund Profile: Trinidad's Heritage and Stabilization Fund

Kezia Bridgewater

The need to avoid the fiscal deficit bias and mitigate oil price volatility led to the introduction of Trinidad's Interim Revenue Stabilization Fund (IRSF) at the turn of the twenty-first century. The Interim Fund (IMF) was replaced in 2007 by the Heritage and Stabilization Fund (HSF).

The HSF aims to generate savings and provide fiscal support. The Fund serves as an inheritance for future generations while ensuring that present-day needs, such as the economic stimulus to address the COVID-19 pandemic, are supported in the form of sustainable withdrawals. The HSF's governance structure is guided by the international best practices as embodied in the Santiago Principles. The IMF (2012) states that the fund "compares favourably to other Sovereign Wealth Funds in transparency and governance."

Investments are made in external assets according to the strategic asset allocation. The constraints listed in the 2007 HSF Act are as follows:

1. The fund cannot be used to finance Government capital expenditure or used as collateral for borrowing. This suggests that the country would like these funds to serve as working capital and earn dividends or profits.
2. The fund should be invested mostly in medium- to long-term foreign assets. This allows the country protection against domestic shocks.
3. The fund should be invested in assets not directly related to oil and gas. The returns from these investments are then deposited into the fund and act as savings, which can then be withdrawn to cushion shocks in the economy.

While the HSF Act does not explicitly reference the incorporation of environmental, social and governance factors in the fund's investment approach, these factors can be engrained in the investment strategy.

According to the rules outlined under the HSF, deposits will be as follows:

1. Where quarterly actual revenues exceed budgeted (surplus) petroleum revenues by 10%, the equivalent must be deposited into the HSF following the end of the quarter.
2. A minimum of 60% of surplus petroleum revenue is to be deposited into the HSF in a fiscal year.

As for withdrawals, the rules are as follows:

1. If actual revenues are at least 10% less than budgeted revenue, withdrawals cannot exceed 25% of the Fund in a given fiscal year.
2. There is a capital floor of US$1 billion, at which no further withdrawals are allowed.

As at the end of June 2020, the total net asset value of the HSF was US$5.8 billion while withdrawals are at a total of US$900 million for the fiscal year 2019/2020 keeping within the predetermined floor of US$1.5 billion (MoF Republic of T&T 2020).

Given the ongoing pandemic and its adverse effects on the economy, there is increasing pressure to amend the fund's provisions to facilitate a larger withdrawal amount. However, arguments against a potential change emphasize the importance of the savings objective. As of April 2020, a $1.1 billion USD withdrawal for COVID-19-related support is pending (US Department of State 2020).

Sovereign Wealth Fund Profile: Singapore's GIC

Kezia Bridgewater

Singapore houses three separate sovereign institutions with distinct mandates: the Monetary Authority of Singapore (MAS), Temasek, and GIC. The Monetary Authority of Singapore, the country's central bank, guides economic development via its monetary policies. GIC invests and diversifies Singapore's other reserves. Temasek, founded in 1974, employs an active investing approach. Its mandate can be gleaned by its tagline: "We are a generational investor, seeking to make a difference always with tomorrow in mind."

GIC was founded in 1981 with the aim of managing Singapore's foreign reserves. It operates as an investment management company and is the world's first non-commodity financed Sovereign Wealth Fund (SWF). The company strategically established its first international office in San Francisco to tap into Silicon Valley's tech-centric brain pool. It now has ten offices in key financial capitals around the world. According to the Ministry of Finance (MOF), the SWF is sourced from the proceeds of the issuance of government debt and special government securities, government budget surpluses, and proceeds from the government's land sales. Preqin data places GIC's total assets at approximately $359 billion in March 2018.

GIC is among the 10 largest SWFs in the world. The actual Asset Under Management (AUM) figure is unknown, in keeping with the secretive nature of many SWFs. The government's rationale for the limited disclosure is aligned with the protection of the domestic currency. The assets of MAS and Temasek are published; revealing the AUM of GIC would disclose Singapore's financial reserves.

The government's GIC mandate is to achieve long-term returns above global inflation and for investments to be diversified across multiple asset classes while being strictly external. Investments are made across both public and private markets. The fund's allocation is rooted in two portfolios: the policy portfolio and the active portfolio. An inhouse GIC team executes the policy portfolio. The pursuit of active investment strategies is guided by a minimum level of risk-adjusted outperformance to the policy portfolio.

The Constitution of Singapore stipulates a spending rule that allows up to 50% of the long-term expected real return on the net assets invested by GIC, the Monetary Authority of Singapore, and Temasek Holdings, to be taken into the government's annual budget (IFSWF 2020).

SWF Powered Economic Diversification: Saudi Arabia's Vision 2030

Kezia Bridgewater

Vision 2030 announced, in April 2016, is Saudi Arabia's ambitious plan to diversify its economy away from a reliance on oil revenues. The expansive program is imbued with central features of a McKinsey Global Institute study on Saudi Arabia, entitled "Saudi Arabia Beyond Oil: The Investment and Productivity Transformation." The key driver in this transformation is the country's Sovereign Wealth Fund, the Public Investment Fund (PIF). The aim is to make the PIF into the world's largest investment vehicle, amounting to $2 trillion in assets.

The Public Investment Fund has been in existence for half a century and has played an integral role in the economic development of the country. The fund has been strategically investing in projects and companies that are of importance to its specific economy. In 2015, the Council of Economic and Development Affairs (CEDA) took over management of the PIF from the Ministry of Finance. Two years after the move, the Public Investment Fund program was announced detailing the PIF's restructuring and financing. The retooling of the PIF placed it as an active investor in both external and domestic assets, a step away from its passive financing and lender role to companies in the domestic economy. The program details the intention to hold half of the total investments externally by 2030 and to be the world's most impactful investor. The PIF has since acquired interests in big-ticket projects and institutions, such as the Blackstone Infrastructure Fund, Virgin Galactic, and the Softbank Vision Fund. The most recent development has been its plan to invest about $1.3 billion in Mukesh Ambani's retail unit (Bloomberg 2020).

The objectives as outlined by the PIF Program, offer some insight into how SA will reinforce economic power and achieve diversification. There are four main objectives of the PIF. The first is to grow the assets of the Public Investment Fund. It aims to increase its assets to SAR 1.5 trillion by 2020 and these assets are expected to generate between 4% and 5% in average annual total shareholder returns over the period. The second objective is to unlock new sectors through the Public Investment Fund. The launch and development of new sectors, including but not limited

to, industrial and manufacturing, entertainment, and waste management will create new companies and ecosystems and develop large-scale infrastructure and real estate projects. Thirdly, they aim to build strategic economic partnerships through the Public Investment Fund. The PIF Program aims to develop PIF's assets in international markets as well as grow its role both regionally and globally. Finally, they aim to localize cutting-edge technology and knowledge through the Public Investment Fund by supporting the localization of technology and know-how through the launch of new sectors, as well as through the strategic partnerships it forms with global partners. The PIF will, as an active investor, stimulate and encourage its portfolio companies in Saudi Arabia to expand their research and development efforts.

Another noteworthy SWF in Saud Arabia is SAMA Foreign Holdings. SAMA Foreign Holdings was established in 1952 and is managed by the central bank (Al Arabiya 2019). Its primary goal is to help shelter the domestic economy from volatility and external shocks. It operates as a company and invests in low-risk bonds, equities, and deposits (Bloomberg 2020). According to SWF Global, SAMA has $448 billion in Assets Under Management (Global SWF 2020).

The Resource Curse, Dutch Disease, Natural Resource Funds and Direct Transfers

Chaitram Mohamed

Concerns have existed since the 1950s that natural-resource-based economies would be disadvantaged in their quest of economic advancement. This became known as the resource curse. The resource curse phenomenon is used to characterise the worsened economic performance in resource-rich countries compared to resource-poor countries.

The Dutch Disease effect is an economic explanation for the natural resource curse. The term "Dutch Disease" refers to a macroeconomic process in which a natural resource shock causes the real exchange rate to appreciate, resulting in a reallocation of production factors and deindustrialisation. In the case of the Netherlands, the country's natural gas boom resulted in a currency appreciation, making Dutch exports more expensive abroad, and led to the decline of the manufacturing sector.

The resource boom harms the manufacturing sector in two channels: the resource movement effect and the spending effect. The resource movement effect occurs when the positive shock to the natural resource sector pulls resources away from the manufacturing sector. With the spending effect, the natural resource sector increases the demand for nontradeables, increasing the prices for inputs and thereby squeezing the manufacturing sector more. This contraction in the manufacturing sector results in the poor performance of resource-rich countries. The manufacturing sector loses its competitiveness and fails to develop, while the non-tradeable sectors expand.

Governments tend to close their trade policies to combat some of the effects of the Dutch Disease. Protective trade policies are counter-productive because they stifle competition, making the economy less flexible and susceptible to a recession. Sudden drops in commodity prices, such as those experienced by the global economy from 1973 to 1985, can cause such growth collapses. They harmed resource-abundant nations where governments had exacerbated the effects of Dutch Disease by expending their natural resource revenues too quickly. The economic explanation of the resource curse has an important shortcoming; that is, it suggests

a direct link between the abundance of natural resources and poor economic performance. But resource-rich Botswana, Malaysia, Indonesia and Norway, among others, are anomalies that experienced rapid per capita GDP growth. These cases show that the institutional and political explanations are pivotal in determining whether natural resources are a blessing or a curse.

Another popular explanation of the natural resource curse is rent-seeking behaviour. In rent-seeking models, natural resource wealth is treated as economic rents that can be dissipated. Economic rents occur when the value of a resource exceeds the costs of bringing it into production. In the political economy paradigm, rent seeking occurs when economic agents attempt to grab or increase their share of current wealth without boosting productivity. This kind of behaviour results in decreased economic efficiency, rising income inequalities, and poor economic performance through the poor allocation of resources.

In developing nations, rents are often dissipated through corruption, bureaucratic inefficiency, and policies that support special interest groups. Patronage may be used to convince such resource-rich administrators to remain in power by paying off supporters. As a result of these concerns, there is less accountability and a poor allocation of public funds. To minimise the harmful effects of rent-seeking behaviour, institutions or coordinated actions of power groups are required.

Institutions refer to the formal rules governing political and economic exchange. The quality of institutions determines how the resource rents are distributed. In the distribution of rents, some countries have institutional arrangements that reward producers, while others have institutions that favour unproductive grabbers. As a result of resource abundance, poor institutional arrangements divert scarce entrepreneurial resources out of production and into unproductive activities. The features of such institutions (grabber-friendly) are malfunctioning bureaucracy, high risk of expropriation and corruption in the government. On the other hand, countries with producer-friendly institutions attract entrepreneurs into production, causing an increase in economic prosperity. Good economic performance is due to good institutions. For instance, Norway is one of the least corrupt countries in the world, and it has many favourable productive enterprises. Today, Norway has transitioned to become one

of the richest countries in Europe due to its vast natural resources. In contrast, the poor economic performance following significant oil windfalls in countries like Venezuela and Nigeria is due to their dysfunctional institutions that promote grabbing.

The experiences of Norway, Chile and Botswana illustrate that the ability to avoid the natural resource curse is dependent on the optimised use of anticipated windfalls. The effects of the natural resource curse can be best mitigated by the following solutions: (1) sound fiscal and monetary policies; (2) economic diversification; (3) natural resource funds; (4) transparency, accountability and public involvement and (5) direct distribution to the population.

From the moment resource-revenue windfalls arise, the negative economic impacts of the Dutch disease are unavoidable. Resource-rich countries should gather income-producing foreign assets to prevent the real exchange rate from appreciating. This will help to sterilise the local economy from the inflows created by the natural resource sector. In addition, resource-abundant countries can smooth out their spending during the boom periods and avoid borrowing during bust periods by accumulating budget surpluses and avoiding large-scale foreign debt. When combined, these policies protect the domestic economy from the volatility in commodity revenues and maintain fiscal stability. Resource-rich countries are also encouraged to invest their windfalls in economic diversification to prevent the booming export sector and the non-traded goods sector from crowding out the non-booming export sectors. Consequently, these countries will be able to protect their economies from market-volatility-induced shocks.

Botswana is one of the few developing countries to have successfully combated the Dutch disease phenomenon. Botswana was able to do this because it developed sound economic policies and managed its resource windfalls effectively. Two key goals guided the economic policies implemented: minimising foreign debt levels and stabilizing economic development on one hand, and increasing economic diversification on the other. Botswana's government achieved these goals by avoiding excessive increases in spending during boom times, accumulating international reserves, and running budget surpluses during lean times. This allowed the government to maintain its spending levels throughout downturns,

which helped to keep inflation at bay. In addition, the accumulation of international reserves largely allowed the government to manage the nominal exchange rate, thereby avoiding the real appreciation of the local currency. By preventing the appreciation of its local currency, Botswana ensured other tradeable goods gained competitiveness on the world market, so economic diversification was promoted. Venezuela has been suffering from the natural resource curse due to its distorted policies. During its oil boom periods, Venezuela overspent on disintegrated diversification projects and social welfare programs that are unproductive. In addition, it failed to manage its resource windfalls effectively and experienced instability in its fiscal expenditures.

The volatility in commodity prices is one of the key causes of the resource curse in countries with abundant natural resources. In a case where a country is heavily dependent on its resource export earnings, any significant changes in the natural resource price on the international market cause a collapse in the domestic market. Natural Resource Funds (NRFs) are arrangements made to stabilise the situation in resource-rich countries and to produce a buffer between changes in the international and domestic market. A Natural Resource Fund is sometimes referred to as a stabilisation fund. Stabilisation funds are designed to reduce the economic impact of commodity price volatility and, as a result, improve budget predictability by stabilising spending patterns. They prevent overspending when prices are high and borrowing when prices are low. This is because when prices rise, excess revenues are transferred into the fund, but when prices drop, revenue comes out of the fund to cover any shortfalls.

Over the years, other forms of Natural Resource Funds have been created, for instance, the sterilisation fund and the savings or development fund. The goal of a sterilisation fund is to decouple the national economy from the large income surpluses resulting from an increase in the price during a boom period. The accumulated funds are invested in the foreign market rather than the domestic market. Some of the funds are used to purchase stocks and bonds, while some funds are invested in highly liquid assets. According to the idea mentioned above in the case of a stabilisation fund, some of the natural resource revenues are invested in the country. This method of investing the fund's accumulated resource revenues serves as both a sterilisation and stabilisation function, as it ensures quick recovery

of money if the price of natural resources drops and for covering any deficit created. A savings fund exists to ensure that wealth is kept for the future generations, even after the natural resources are depleted.

For NRFs to be effective, resource-rich countries should have well-established institutions—that is, institutions that are transparent and accountable. In designing a Sovereign Wealth Fund, the following should be considered:

1. Legal framework: the fund should have a clear purpose, that is, the purpose can either be a stabilisation fund, pension fund, development fund or mixed-objectives fund.
2. Institutional framework and governance: the Sovereign Wealth Funds need to be operated independently. There must be a clear description and separation of tasks and procedures between ownership, management and oversight.
3. Administration of risks and investments: to minimise conflicts of interest or the leaking of confidential information, it is critical that the fund implement incentives and control systems, as well as high ethical standards for its executives.

The Sovereign Wealth Fund of Norway is the largest in the world with US$1.3 trillion in assets under management. It incorporates good corporate practices, including an ethics council and risk and achievement reports. The Fund was originally known as the Petroleum Fund and was established in 1990 to insulate the economy from the boom-and-bust cycles of oil. It provides for future generations' pensions, prevents overheating of the economy by investing overseas, and lessens the dependency on natural resources, which are heavily influenced by output and price fluctuations. Revenues from the oil exports of Norway are not converted into its local currency, thereby avoiding any exchange rate pressure on it, and so, the government budget is not dependent on oil revenues. The accumulated revenues in the fund can be invested in the international financial markets. A budgetary restriction prohibits the Norwegian authorities from withdrawing more than the Fund's annual estimated returns, ensuring prudent domestic use and maintaining the size of the Fund.

Chile's Copper Stabilisation Fund (1985) was created to stabilise the exchange rate and revenue streams throughout the boom-bust cycle.

When the copper price fell below the predicted long-term equilibrium, the difference is passed to the state budget, which helps to maintain resource revenue stability. This fund was later replaced by the Economic and Stabilisation Fund (2006) and the Pensions Reserve Fund (2006). Like the Norwegian Fund, Chile's Economic and Stabilisation Fund insulates the economy against the effects of both copper and economic business cycles. The Pension Reserve Fund is for future pension contingencies. Some other examples of Natural Resource Funds are the Alaska Permanent Fund (1976), the Timor-Leste Petroleum Fund (2005), the Alberta Heritage Savings Trust Fund (1976), Kuwait's Future Generations Fund (1976) and Kuwait's General Reserve Fund (1953).

In dealing with the political consequences of relying on external rents, international non-governmental organisations and international financial institutions have joined forces in recent years to enhance transparency, accountability and public awareness in the management of oil revenues. For instance, financial institutions such as the World Bank and International Monetary Fund (IMF) are using their leverage to encourage nations to provide accurate information to the general public regarding resource revenues earned and spent. In addition, multinational oil companies are encouraged to publish what they pay to the host government. In resource-rich countries, the NGOs have urged the authorities to reveal all their transactions with external extractive firms and their expenditures. Transparency, accountability and public oversight are all fostered in Norway. Government spending and oil extraction contracts are monitored by political parties, the National Parliament and independent oversight councils.

Direct distribution of windfall revenues to the general public has recently been recommended as a way to combat Dutch Disease, reduce corruption, enhance democratic government and improve institutional quality. This strategy is based on the concept that if people directly benefit from natural resource riches rather than through public works projects or state subsidies, they will make better investment decisions and have a greater incentive to save these windfall rents than government officials. Some argue that direct distribution will further compel citizens to participate in politics and will allow oversight and accountability agencies to monitor revenue movement. There are two types of direct distribution: (1) the Alaska model (Birdsall and Subramanian 2004), in which the interest

from the oil fund is immediately transferred to the people, and (2) one that eliminates the requirement for a savings and stabilisation fund (Sala-I-Martin and Subramanian 2003).

Natural resources may and should be viewed as a blessing rather than a curse. The natural resource curse can be explained in two ways: (1) economically, by looking at how resource booms effect pricing and economic production, and (2) politically, by looking at rent-seeking behaviours and institutional quality. Botswana's, Chile's, and Norway's experiences can be used as lessons for resource-rich countries suffering from the natural resource curse. Several strategies, such as natural resource funds, economic diversification, openness, accountability, public knowledge and direct distribution, can be used to combat the resource curse. Botswana was able to avoid the natural resource curse by implementing strong economic policies and properly managing its resource windfalls effectively. Norway is another country that has managed to avoid the negative consequences of the natural resource curse. The country has an effective tax collecting system, fiscal stability, and competent resource management, as well as institutions that are devoid of corruption. Norway's policies allowed the country to grow and develop at a faster rate than most other countries.

SUSTAINABLE INVESTING

Towards a Carbon-Neutral 2050

Alex Armogan

The Paris Agreement, negotiated in 2015 and ratified by approximately 190 countries, establishes the long-term aim to mitigate the threat of climate change by "holding the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels." It is expected that greenhouse gas emissions will be reduced to zero within the century. The implementation is based on nationally determined contributions (NDCs). NDCs are intended to be progressively updated every five years, and 2020 marks the first update period.

The need for enhanced urgency in mitigating climate-related risks is highlighted in the UN Intergovernmental Panel on Climate Change (IPCC) 2018 Report on global warming. The report updates the state of scientific knowledge on climate change based on an examination of over 6,000 peer-reviewed publications and expounds on the stark difference between holding the increase to 1.5°C as opposed to 2°C above pre-industrial levels. The European Union, shortly after the IPCC's Special Report, stated its intentions to achieve net-zero greenhouse gas emissions by 2050. The document outlining the EU's aim for a prosperous, modern, competitive and climate neutral economy references the IPCC's warning that without the enhancement of climate action, the global average temperature could hit 2°C shortly after 2060 given the +1°C above pre-industrial current level and a 0.2°C-per-decade growth rate.

In 2019, the United Kingdom became the first developed country to cement in law its net zero greenhouse gas emissions target by 2050. Country-level commitment to a net zero economy represents a major transformation. The UK's Committee on Climate Change estimates that the emissions target will cost approximately 1% to 2% of GDP annually. The Chancellor of the Exchequer, at the time, warned on the delicate balancing act of value, jobs and government spending. To date, over 70 countries have heeded the call for stronger emission targeting and have committed to net-zero emissions by 2050. Japan and South Korea are two of the recent countries to announce a 2050 carbon-neutral pledge. China, a key contributor to global carbon dioxide emissions due in part

to its greater than 50% reliance on coal in its energy mix, pledged to reduce emissions to nearly zero by 2060.

Companies face climate-change-related risks due to shifting regulation, technology and demand. Stranded assets are a front-burner issue, and 2020 has underscored this reality. The increasingly ambitious country targets have triggered revised company-level action. The GHG Protocol is the most widely used standard by private and public sector organizations to identify, measure and report emissions, subdivided into Scope 1, Scope 2 and Scope 3. Emissions produced directly from owned or controlled sources are grouped into Scope 1, while Scope 2 represents indirect emissions from the generation of purchased energy. Scope 3 accounts for all other indirect emissions from activities across a company's value chain, such as procured goods or services and business travel. Several companies have progressed beyond targeting Scope 1 and 2 emissions. Uncertainty over the pace of the transition has led some companies to monitor changes in regulation instead of progressively re-orienting for a carbon-neutral world by 2050.

Microsoft and Apple are amongst the companies most active on climate risk management. The companies have revealed targets inclusive of Scope 1 to 3 emissions, but Microsoft has further announced a 2050 carbon-negative target to account for the company's history of emissions. Scope 3 emissions are the most difficult to measure and the largest source (over 80% of lifecycle emissions for oil and gas companies).

Many companies in the Oil and Gas sector remain focused on Scope 1 and 2 emissions. There has been a slow and tentative march toward the inclusion of Scope 3. In June 2020, Carbon Tracker analysed and ranked the emission targets of several oil companies. BP placed amongst the top three sample companies. The company's strategy toward a 2050 net-zero target is inclusive of Scope 3 emissions. The company's third-quarter announcement entails a lower expectation for oil price, a pause to exploration activities in new countries, a targeted decline in production, and annual multi-billion-dollar investments to position the company as one of the largest renewable-power businesses. Eni, Shell, Total and other European-based oil companies appear to be more aligned to the climate agenda than US based companies, due in part to the varying regulatory pressure.

ExxonMobil ranks last among the nine companies considered by the Carbon Tracker's late June analysis. The company's approach to tackling Scope 1 and 2 emissions and omission of Scope 3 coverage limits access to the increasing sustainable investing flows in the financial markets. Sustainable investing, defined as the incorporation of sustainability-related insights in the pursuit of lower risk exposure and a higher expected level of return, grew to an Asset Under Management of approximately US$31 trillion in developed countries per the 2018 Global Sustainable Investment Report. Negative or exclusionary screening is the most popular sustainable investing strategy, $19.8 trillion out of the $31 trillion. Asset allocation along a sustainable investment pathway incorporating Environmental, Social and Governance (ESG) factors is the second most followed strategy.

BlackRock, the largest investment firm in the world with over US$5 trillion in Assets Under Management (AUM) inclusive of a major holding of ExxonMobil, exercised its ownership rights by seeking changes to ExxonMobil's board of directors at the 2020 Annual General Meeting (AGM). BlackRock itself has faced scrutiny over the lack of actions to mitigate climate change; however, the company enhanced its warning in 2020 over the investment risks caused by climate change. BlackRock acknowledged that ExxonMobil's strategic decision to not diversify toward renewables, based on considerations of competitive advantage and scenario analysis to determine expected profitability, is within the board of directors' discretion. The company nevertheless expressed dissatisfaction over ExxonMobil's emissions disclosures and climate risk management.

The following is an extract from BlackRock's Voting Bulletin (2020) on ExxonMobil:

> "We continue to see a gap in the company's disclosure and action with regard to several components of its climate risk management. We see this as a corporate governance issue that has the potential to undermine the company's long-term financial sustainability . . . When effective corporate governance is lacking, we believe that voting against the re-election of the responsible directors is often the most impactful action a shareholder can take."

The niche-to-mainstream leap of sustainable investing presents an uphill battle for companies such as ExxonMobil. Investors will continue to

demand a more climate-friendly approach. Companies leading the preparation for a carbon-neutral world on the back of enhanced country-level emission targets, carbon pricing policies and the risk of stranded assets will reap the magnified sustainable investing flows in the primary and secondary markets.

The Sovereign Wealth Fund Link

Recent research from the Inter-American Development Bank (2020) and the BlackRock Investment Institute (2020) provides evidence that sustainable investments can generate expected returns in line with traditional investing.

The IADB study focused on the Sovereign Wealth Funds of Chile. SWFs generally have a long investment horizon and the probability of ESG risks manifesting is high. The authors utilized counterfactual analysis with the basic ingredients of the fund's portfolio weights, actual performance and performance of its associated benchmarks sourced primarily from the Ministry of Finance's monthly reports. An ESG portfolio was created with the portfolio weights, and appropriate ESG benchmarks were identified. The calculated returns over the full sample period, August 2013 to May 2020, for the Economic and Social Stabilization Fund and, February 2012 to May 2020, for The Pension Reserve Fund are illustrated below.

Based on the IADB's findings, it is difficult to justify the wealth of nations flowing toward low-scoring ESG companies if it can reinforce positive actions against GHG emissions, among others, while achieving the expected risk-return target. The study also performed the counterfactual analysis on split samples to isolate the volatility of 2020. The claim that portfolio construction, using ESG factors, can mitigate volatility in crisis environments, downside risk protection, is challenged by studies such as Demers et al. (2020). One of the most recent studies executed by Morgan Stanley's Institute of Sustainable Investing corroborates the IADB's findings. The institute examined approximately 11,000 mutual funds over the 2004 to 2018 period and found evidence of lower downside risk and the absence of inferior performance from sustainable funds versus traditional funds.

"Going Green" in the Investment Industry

Saumya Poddar

"Going green" is a concept that has been gaining popularity in recent years. One of the main ideas behind this concept is sustainability. In the investment industry, sustainability refers not only to environmental factors, but also to other social or management aspects. Using sustainability as a criterion while investing is referred to by a number of different names: sustainable investing, socially responsible investing (SRI), or impact investing; there is a lack in standardization of terminology. Globally, sustainable investing assets in the five major markets stood at $30.7 trillion at the start of 2018, a 34% increase in two years.

BlackRock defines sustainable investing as "investing in progress, and recognizing that companies solving the world's biggest challenges can be best positioned to grow." This draws a contrast between the reasons behind the adoption of sustainability in other industries and the investment industry. Investors implement sustainable investing strategies for reasons that go beyond care for the environment or society—they do it to lower risk exposure and increase returns.

A popular approach to sustainable investing is the use of Environmental, Social, and Governance (ESG) factors in combination with traditional strategies used to evaluate companies. McKinsey outlines ways in which these factors add value to companies, which include a positive effect on top-line growth by attracting and retaining customers, reduced costs with tactics like lowering energy consumption, minimized regulatory and legal interventions, higher employee productivity, and optimized investment and capital expenditures. In 2019, the credit rating agency Fitch Ratings launched ESG Relevance Scores that display how particular ESG issues affect the credit ratings of the companies in question. This expresses the increasing importance being given to sustainability in company analysis.

ESG is only one approach under the wider umbrella strategy of sustainable investing. There are a large number of terms and ideas that stem from Sustainable Investing and focus on different aspects of sustainability:

- Corporate social responsibility focuses on the companies and their responsibility to the society within which they operate.

While it is not usually an obligation, a number of countries are taking steps to ensure that companies carry out their responsibility to society. Countries like Denmark have come up with mandatory disclosures regarding CSR policies; India is the first country to mandate a minimum CSR spend for certain companies. CSR activities can take many different forms, ranging from minimizing the impact made by operations of the business to charitable donations made to other organizations working toward the betterment of society.

- Triple bottom line is a framework that expands the bottom line of a business (the accounting profit) to the 3 P's: people, planet, and profit. In the words of John Elkington, who coined the term, "the idea was [to encourage] businesses to track and manage economic (not just financial), social, and environmental value added—or destroyed."
- Social return on investment is an accounting method for companies to measure the monetary value added (primarily environmental and social) by the operations of their business.
- Ethical investing is a strategy that focuses on the ethical values of the investor as the primary objective in addition to financial returns. These could be moral, social, or religious values.

As can be seen from the barrage of terms and concepts, there is a wide array of strategies being used by companies and investors to gauge and incorporate sustainability into their operations.

Concepts surrounding "going green" are sometimes seen as a fad that customers, in this case investors, are following. This is not true; even though the focus on sustainability seems like a relatively new notion, there have been records of ethical investing dating back to the 1700s, like when John Wesley preached about it to his followers and encouraged boycotting of industries in which workers were treated poorly.

In the last few years, there have been major steps taken towards sustainability. For instance, the United Nations Member States adopted the Sustainable Development Goals (SGDs) in 2015 that aims at development, keeping in mind social, economic and environmental sustainability. It is part of the 2030 Agenda plan, which is a plan of action focused on people, planet, and prosperity; this plan has been mainstreamed by the

Economic Commission for Latin America and the Caribbean (ECLAC). The ECLAC is currently providing technical assistance to Member States in the development of integrated long-term development planning that incorporates the SDGs. Many countries are aligning their policies with the SGDs, like Barbados, where Prime Minister Mottley has renewed commitment to investing in the green and blue economies to save the country's ecosystem.

Sustainable Investing in Pre-Modern Times

Saumya Poddar

Sustainable investing is often referred to as a "fad," an idea that is new and will not last for a very long time. However, the recorded origins of sustainable investing date back centuries. The reasons for investors to follow sustainable investing practices today are quite different from the motives of investors in pre-modern times. Today, investors follow sustainable investing strategy because they are environmentally or socially conscious, or to chase higher returns that are sometimes associated with sustainable investing. On the other hand, the origin of sustainable investing was chiefly due to investors following the beliefs of their religion or communities while managing their money.

One of the first instances of sustainable investing comes from the Torah, which is part of the Jewish Bible, said to be written around 539 BCE. It offers guidance on aligning capital with Jewish values through a number of commandments and mitzvot; ethical investing is part of traditional Jewish morality. One of the mitzvahs, Bal Tashchit or "thou shalt not destroy" links directly to the environmental aspect of sustainable investing. When King Hezekiah stopped the fountains in Jerusalem by blocking the Gihon spring during the war against the Assyrian siege by Sennacherib, the Rabbis regarded denying water to a fruit tree as equivalent to chopping it down and declared Hezekiah a sinner. Similarly, investing in a company that harms the environment would be considered a sin.

Sharia, which is the Islamic religious law derived from the teachings of the Quran and Muhammad, also lays out principles for finance. The classic Sharia took shape around the year 900 CE. Islamic finance prohibits investment that could harm other people (either physically or emotionally) or that could harm the environment, which includes investment in businesses that generate a major portion of their income by selling alcohol, tobacco, pork, weapons and other military equipment; gambling; and producing pornography.

Sharia law also prohibits the use of interest (or Riba) as well as investment in companies that deal primarily in Riba. The concept of interest is very common today; it is simply the cost of borrowing money and is not normally associated with unethical or unsustainable investing (exorbitantly

high interest rates could be seen as unethical). Back in the 4th century BCE, Aristotle spoke out against usury. Today, usury means "the lending of money at extremely high interest rates," but Aristotle defined it as "all lending with interest" and stated that when usury happened there was an "unnatural breeding of money from money" and deemed it unethical.

In the 1700s, the Quakers (also called the Religious Society of Friends) were prohibited from associating with slave trade on ethical grounds. Slave trade was a big part of the economy in this period; a number of commodities, like cotton, sugar, and tobacco, were slave produced. In the mid-18th century, there was a Quaker movement against slavery, with the goal being the elimination of Quaker involvement in the slave trade as ship owners or investors. In colonial North America and the Caribbean, there were many Quakers who owned slaves; these Quakers had to choose between owning slaves and continuing to be Quakers in 1774.

John Wesley, founder of the Methodist Church, is often credited with the conceptualization of ethical or moral investing. The Methodist Church was the first religious body to invest in the stock market, which was previously viewed as a form of gambling. This was done with the condition that investments would not be made in certain types of companies, such as those involved in alcohol or weapons. This is what is called ethical or moral investing today.

As the groups evolved, the investment managers started offering ethical investment funds where they offered to manage the investors' money based on the strategy of ethical investing. An "Ethical Unit Fund," started by Charles Jacob of the Methodist Church, and the Friends' Provident were some of the first few funds that were started in the late 1900s. The first fund was the Pax World Fund, started by Rev. Dr Elliot "Jack" Corbett and United Methodist minister Rev. Dr Luther Tyson. The fund was started as a reaction to the harmful weapons manufactured and used in the Vietnam War, like Agent Orange, the use of which caused deformations in babies who came in contact with this spray. The fund used social as well as financial screens to make investments.

As technology and world economies have advanced, so has the way investors view sustainable investing. The concept has grown from religious beliefs to caring for the planet and society as a whole. Today, there are a large number of ways for companies to make their instruments attractive to sustainable investors and for investors to gain exposure to sustainable investing.

Net-Zero Asset Managers

Saumya Poddar

On December 11, 2020, the Net-Zero Asset Managers initiative was launched representing $9 trillion in Assets Under Management (AUM) in a bid to do their part toward achieving the goals of the Paris Agreement. It was initiated by six founding partner investors and 30 founding investor signatories, all working toward the common goal of net-zero greenhouse gas emissions by 2050 or sooner across all AUM.

The Intergovernmental Panel on Climate Change defines net-zero emissions as "[the state] achieved when anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period." This means that the GHGs being removed from the atmosphere by the investments of the signatories should be equal to or greater than the GHGs emitted by them.

Specifically, the initiative commits to the following:

- Partnering with asset owner clients on decarbonization goals, consistent with an ambition to reach net-zero emissions by 2050 or sooner across all assets under management.
- Setting an interim target for the proportion of assets to be managed in line with the attainment of net-zero emissions by 2050 or sooner.
- Reviewing the interim target at least every five years, with a focus on ratcheting up the proportion of AUM covered until 100% of assets are included.

The Net-Zero Asset Managers commitment acknowledges that there are certain industries where, due to current technological constraints, it is not possible to significantly cut down on GHG emissions (like cement, steel, plastics, aviation, shipping, and heavy road transport). The initiative does not prohibit investments in these sectors. The commitment refers to the need to "embark with determination and ambition on a journey, and to challenge and seek to overcome the constraints we face." It suggests that investments in long-term carbon removal be used to offset these emissions.

There are many innovations being developed to tackle these problems, and the signatories could invest in them to reach the goal of net-zero emissions. Areas of electrification, hydrogen, biochemistry and synthetic chemistry, material efficiency and circularity, alongside new materials, the ability to carbon capture and carbon use, the restoration of forests, and direct air capture and storage (DACS) technology are some of them.

Reaching the goal of net-zero emissions by 2050 will require significant public policy. As of June 2020, 20 countries/regions have explicitly adopted net-zero targets. These countries include Austria, Bhutan, Costa Rica, Denmark, the European Union, Fiji, Finland, France, Hungary, Iceland, Japan, the Marshall Islands, New Zealand, Norway, Portugal, Singapore, Slovenia, Sweden, Switzerland and the United Kingdom. It will also require private investment to push for innovation and solutions. The Net-Zero Asset Managers initiative could make a big difference given its wide research and resources.

ESG Investing and the COVID-19 Pandemic

Saumya Poddar

There is no question about the recent rise of ESG and sustainable investing. While the entire population of the world was locked in their houses, investors were pouring more money into ESG-related assets than ever before.

Numerous corporates took a step in the direction toward sustainability, for instance:

- A group of global asset managers announced the launch of the Net Zero Asset Managers initiative in December 2020 with the goal of cutting net greenhouse gas emissions to zero by 2050 or sooner.
- BPN Paribas Bank integrated ESG criteria into all their operational processes. According to an interview with S&P global market intelligence, they are prepared to lose customers in the process: "But if we go back to the coal policy we just announced, it's obvious that we will have to exit the relationship with at least 30% to 50% of our current clients in the power generation business."
- Deutsche bank announced its plan to link management pay to ESG-related targets: "It is our ambition to be a leader on sustainability in the financial sector, and contribute to an environmentally sound, socially inclusive and well-governed world."

Unlike the massive shock that was caused in most other industries, the pandemic added to the momentum of the ESG movement. The most obvious result of the pandemic was the focus on healthcare to tackle the virus. Governments and corporations alike have had to balance this social interest with the economic interest, which has also been hit hard by the pandemic. 15.5% of GDP in the Caribbean region comes from tourism, which plummeted to a halt for most of 2020. The IMF in January 2021 estimated that the economy of the LAC region contracted by 7.4% in 2020.

Fighting the virus has become top priority for most, even above economic profit. For instance, GSK is collaborating with competitor Sanofi to create a vaccine. GSK has stated, "We do not expect to profit from our vaccine collaborations during the pandemic. We will re-invest profits made on sales of our adjuvant during the COVID-19 pandemic phase to

support coronavirus related research and long-term global pandemic preparedness."

The pandemic has forced companies and investors to look beyond the traditional risk factors. Incorporating sustainability into operations became a necessity to survive for many companies in 2020. Investors looked at a number of new ESG factors relating to measures taken by companies for the welfare of employees, and society as a whole, during this unprecedented time. Employees also found a louder voice, demanding better health and safety, pay and benefits.

The ESG focus, which earlier was more on the environment, shifted to social and economic considerations due to the havoc caused on human life as well as the world economy. The pandemic caused the entire population to change the way they lived in order to safeguard their life and livelihood. Oxfam estimates the global financial cost of COVID-19 to be $12 trillion. On the other hand, the Intergovernmental Panel on Climate Change estimates that failing to address the carbon emission issue could cost $149 to $791 trillion by the end of the century:

"Climate change affects the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter."

This highlights that there are many ESG-related issues that the world has to deal with to create a safer economy and world for us to live in. The pandemic required quicker action, but we are reaching a point where so do the other issues. And the world is finally starting to realize that, as can be seen with the rise in ESG considerations.

Implementation of Sustainable Investing

Saumya Poddar

Sustainable investing is a very broad term. The way that the strategy is implemented varies with the characteristics of the investor, their risk profile, and their reasons for applying this strategy to their portfolio. It could be used as an investment strategy for funds, for individual investors, or even for businesses. The strategy used and the kind of screening the investor carries out on the available universe of investments depends on the restrictions they want to place on their investments.

Many funds around the world use sustainable investing as their unique selling point. For instance, eco.business Fund lends to businesses and producers who are committed to sustainable practices. They use their "green list," which are practices that align with the Fund's mission, along with internationally-recognized standards to screen businesses; this is a negative screen—the Fund does not invest in businesses that do not align with its definition of sustainability standards: *"The eco.business Fund aims to promote business and consumption practices that contribute to biodiversity conservation, to the sustainable use of natural resources and to mitigate climate change and adapt to its impacts, in Latin America, the Caribbean, and sub-Saharan Africa."*

Negative screening is also sometimes associated with specific industries. "Sin stocks" are shares in companies involved in activities that are considered unethical, such as alcohol, tobacco, gambling, adult entertainment or weapons; this is a common negative screen for ethical investors.

Another example of a fund is Deetken Impact Sustainable Energy Funds. The fund invests in clean energy technologies, renewable energy, resilient energy infrastructure and energy efficiency projects in Central America and the Caribbean region. This is a positive screen for green energy businesses: *"Deetken Impact manages a diversified portfolio of investments in high impact businesses—businesses that deliver financial, social and/or environmental returns."*

Positive screening leads investors to invest in businesses that are considered "best in class" on ESG factors. The PRI defines ESG integration as "the explicit and systematic inclusion of ESG issues in investment analysis and investment decisions."

Many banks are now offering green services to businesses like green loans, securitization, IPO support for green offerings, etc. Banco Bilbao Vizcaya Argentaria closed the first green corporate loan in Latin America, a US$400 million syndicated product for energy firm Iberdrola México in 2018. In 2019, Satander Chile gave out the first ESG-linked loan to a Chilean unit of Spanish infrastructure firm Acciona for US$30 million.

Individual investors can invest in funds with investment mandates that are in line with their strategies. Alternatively, there are many instruments that investors can directly invest in to gain exposure to assets in sustainable businesses. A green bond is a fixed income instrument that is used to specifically raise money for projects related to climate or environmental sustainability. The first Sovereign green bond in Latin America was issued in Chile to raise funds for development of electrified public transport, renewable energy, and green building projects. There are also other financial products, like green credit cards, green mortgages, and auto loans, that incorporate sustainability into their service offerings.

The rise of sustainable investing has obvious benefits to investors, businesses, and society as a whole, but there is a flip side. A study by Pieter Jan Trinks and Bert Scholtens in 2015 titled "The Opportunity Cost of Negative Screening in Socially Responsible Investing" concluded that there is an opportunity cost of screening, as it makes the investible universe considerably smaller. They found that a market portfolio that screened for stocks that are considered unethical, like alcohol and tobacco, significantly underperformed the unscreened market portfolio after accounting for conventional risk factors.

Sustainable investing will also have an impact on particular industries that are seen as fundamentally unsustainable, like the oil and gas industry. ExxonMobil, Apache Corp., and French oil major Total, among others, have discovered substantial hydrocarbon reserves off the shore of Guyana and Suriname in the last few years. In the words of Trinidad Prime Minister Rowley, the Caribbean is "being heralded as the next major oil and gas province." But the boost to the economies in the region won't be without serious social and environmental costs. Policymakers, investors and businesses must balance economic advancement of the entire region and the conservation of the environment.

Sustainable Reporting

Saumya Poddar

Reporting traditionally involved disclosures of financial and other operational data by companies for the benefit of stakeholders. Sustainability reporting expands the scope to include the ESG (environmental, social, and governance) factors as well as the long-term view of the company's operations in relation to sustainability matters. Per Morningstar's Global Sustainable Fund Flows Report, US$45.7 billion of net inflows is accounted for by sustainable funds in Q1 2020 even though investors pulled out $384.7 billion from the wider universe of funds. Sustainable investing has been rising and with it, so has the push for ESG disclosures from investors, including some influential institutional investors such as BlackRock, Vanguard, and State Street.

Companies stand to benefit in many ways, internally as well as externally, by disclosing their ESG activities. Gathering and presenting the data will help companies analyse their sustainability activities in a manner that might not have been done otherwise. With better insight into their current activities, the company will be in a better position to manage sustainability-related risks, improve performance, identify areas of inefficiency and save resources. The increased transparency will also add to staff morale and satisfaction. Communicating this information with the external stakeholders will help build a positive image and improve accountability and trust in the company.

Currently, there is no one sustainability standard that is globally accepted; there are many organizations that are moving toward creating such frameworks, like the Sustainability Accounting Standards Board, which sets industry-specific standards for financially material sustainability topics, and the Task Force on Climate-Related Financial Disclosures, which develops recommendations for effectively reporting climate-related disclosures. These standards will make sustainability disclosures easy for stakeholders to understand and compare. Due to the number of standards being developed, companies will still have a fair amount of liberty in choosing the framework they want to follow, which might make the disclosures less comparable.

The regulators of some countries have made certain ESG related disclosures mandatory, like in the United Kingdom, where listed companies are required to report greenhouse gas emissions, and in France, where many listed companies have to incorporate information related to the social and environmental consequences of their activities into their annual reports. The European Union law requires large public-interest companies, like listed companies, banks, and insurance companies, to disclose certain information on the way they operate and manage social and environmental challenges. In June 2017, the European Commission published guidelines to help companies disclose environmental and social information, but these are not mandatory, and the required companies can choose any international, European or national guidelines to produce their sustainability reports. As is evident from the uncoordinated steps being taken by countries and organizations, there is no standardization in the disclosure frameworks. Even within each of the countries, the disclosure requirements are limited and only enforced on certain companies.

There is no assurance that once companies do start disclosing this information in a clear and comparable way, they will make improvements in their policies and practices. In fact, there is evidence of the opposite happening. Greenhouse Gas (GHG) reporting by companies in the S&P Global 1200 index increased from 45% to 61% in the last three years, but the median emission of these companies went from 591,000 metric tons to 786,000 metric tons of GHGs. A similar trend was seen in companies that disclosed water consumption. The push by investors might also lead to "reporting fatigue," which means the companies will prioritize reporting over actually dealing with the underlying sustainability issues. These issues have to be addressed by the companies and investors as well as the organizations and authorities who are taking responsibility for creating and enforcing the sustainability frameworks. Companies have to balance the demands of the external stakeholders with the additional costs of increasing the scope of the disclosures such that their reports communicate the right information that is relevant and valuable for all their stakeholders.

Sustainable Reporting Standards

Saumya Poddar

Reporting standards are a set of rules followed by companies around the world so the financial statements prepared are consistent and comparable globally. They also ensure transparency in reporting, as the standards cover all the relevant information that should be communicated to the stakeholders. In the last few years, there has been a push for companies to include sustainability factors in their reports as well. A key difference in financial reporting and sustainability reporting is that the latter focuses on the sustainability goals of the company as well as the progress made toward them and the outlook the company has toward these goals.

Currently there is no one framework or standard that companies can follow to disclose information relating to their sustainability activities. There are a number of organizations working towards this, each focusing on a slightly different view of Sustainability Reporting:

- ***Sustainability Accounting Standards Board (SASB)***

  "SASB connects businesses and investors on the financial impacts of sustainability."

  SASB focuses on the investor perspective and the financial impact of the sustainability data. The standards are "a complete set of globally applicable industry-specific standards which identify the minimal set of financially material sustainability topics and their associated metrics for the typical company in an industry." For instance, SASB sets a Sustainability Accounting Standard for "Oil & Gas – Exploration & Production" which lays out the disclosures that should be made by companies operating in this industry. It includes topics like greenhouse gas emissions, air quality, water management, etc. and how oil and gas companies should disclose data related to them.

- ***Task Force on Climate-Related Financial Disclosures (TFCD)***

  "Financial markets need clear, comprehensive, high-quality information on the impacts of climate change. This includes the risks

and opportunities presented by rising temperatures, climate-related policy, and emerging technologies in our changing world."

The TFCD was established by the Financial Stability Board to develop recommendations for effectively reporting climate-related disclosures. It aims to help incorporate this information into investment, credit, and insurance underwriting decisions and help investors price climate-related risks and opportunities correctly and in turn empower the markets to channel investment to sustainable and resilient solutions, opportunities, and business models. Authorities in the United Kingdom, European Union, and others have incorporated these recommendations into these guidelines and are on the path to make these disclosures mandatory.

- ***Global Reporting Initiative (GRI)***

"The GRI Standards create a common language for organizations—large or small, private or public—to report on their sustainability impacts in a consistent and credible way. This enhances global comparability and enables organizations to be transparent and accountable."

Unlike many of the other standards that focus on the financial impact of sustainability matters, GRI aims at highlighting the importance and consequences of the impacts made by issuers on the economy, environment and society. The GRI starts with a set of universal standards that are applicable to all companies. It then has a set of topical standards which are selected based on the company. For instance, in July 2020, it published a proposal for sustainability reporting standards for oil and gas companies, which if found to be relevant, complete, and feasible, will identify topics covering climate change, the environment, health and safety, employment, communities and governance and how oil and gas companies can disclose information relating to them.

- ***Carbon Disclosure Project (CDP)***

"[CDP focuses] investors, companies and cities on taking urgent action to build a truly sustainable economy by measuring and understanding their environmental impact."

CDP is aiming to create awareness about the negative impact on the climate and the environment through its global disclosure system amongst investors, companies, cities and governments to steer their decisions to sustainable ones. The CDP gives "scores" to companies and cities and publishes an "A-list" that has companies that are leading in environmental transparency and action (for instance, in 2020, Empresas CMPC got an A for forests and water security and Vina Concha y Toro got an A for water security) and cities that are leading in environmental performance (for instance Municipalidad de Montecarlo, Alcaldia de Rionegro, Santa Fé Ciudad, and 85 others were in the 2020 Cities A-list).

- ***International Financial Reporting Standards (IFRS)***

  In September 2020, the trustees of the IFRS published a Consultation Paper to assess whether action needs to be taken in the direction of creating global sustainability standards for sustainability reporting. If they conclude that this standard is required, the paper proposes setting up a Sustainability Standards Board to build on existing developments and collaborate with other bodies and initiatives in sustainability, focusing initially on climate-related matters.

Most of these organizations and frameworks are in the initial stages of being established, and the world is some distance away from having a globally accepted standardized framework for Sustainability Reporting.

TRADING

A Caribbean Stock Exchange

Matthew Gaul and Nirav Chetty

The idea of an integrated regional securities market was initially championed by Jamaica in the lead-up to the Grand Anse Declaration. The relevance of a regional stock exchange and its economic implications continue to guide calls for its achievement. Bruce Golding, former Prime Minister of Jamaica, made an early call for such an exchange and expounded that it would stimulate "real economic growth in the region through capital investments in the creation of new businesses."

There are currently nine stock exchanges in the CARICOM region (the main exchanges are highlighted below). While there are several functioning stock exchanges in the region, they are individually small and illiquid, and their combined market capitalization is low relative to other emerging markets.

Despite progressive efforts on the movement of capital across the Caribbean region, the execution of a regional exchange has proved elusive to date. Early efforts targeted the information asymmetry on capital market development and economic growth, evidenced by CARICOM's work on capital market education and awareness. The Caribbean Single Market and Economy has benefited from cross-border trading and cross-listing equities. However, cross-border activity remains low.

In 2018, CARICOM completed national consultations on a regional securities market. Momentum continued in 2019 with the July Montego Bay Summit decision to advance capital integration via the finalization of a model securities legislation. The model securities market law is an important step toward a common legal market space and the adoption of a common approach related to the authorization of issuers and securities, prospectus disclosure rules, and the licensing of market intermediaries.

The Jamaica Stock Exchange

The JSE is the first stock exchange to be established in the Caribbean. Operations commenced in February 1969. Its performance lagged behind Trinidad and Tobago Stock Exchange for many years.

However, the past decade has seen it gallop ahead of its closest regional competitor. Against the country's mountain of debt (well in excess of 100% of GDP during the early 2010s), the attraction of capital to the stock exchange is impressive, standing at an approximately $5.3 billion (USD) market capitalisation by December 2015.

Bloomberg ranked the JSE as a top-performing exchange in 2015 and 2019. The JSE has innovated with an online trading platform that allows the Jamaican diaspora and small retail investors to invest in companies in their home country and a junior market launched in 2009 (over forty companies listed on JSE's Junior Market).

In October 2019, the Financial Times labelled the JSE as the "world's best performing over the past year" due to a 35% one-year expansion to October 2019 and a 600% five-year expansion.

In pre-pandemic 2019, the JSE Junior Market Index increased by 3.15%. This market welcomed the listing of six new securities during the year, bringing the total listings to forty-four securities. Market activity on the Junior Market recorded an increase of 78.06% in the number of transactions, an increase of 134.52% in the volume traded, and an increase of 112.73% in the value traded.

Trinidad and Tobago Stock Exchange

The Trinidad and Tobago Securities Industry Act 1981 founded one of the most vibrant stock exchanges in the Caribbean region. It proves to be a key source of non-bank funding for public companies and assists in the country's development.

The Securities Industries Act of 1995 importantly created the T&T Securities Exchange Commission, the market regulator. A comprehensive update to the rules governing the capital market occurred in the Securities Act 2012.

The stock exchange can be decomposed into several sectors, such as energy, trading, property, banking, nonbanking, conglomerates and manufacturing. In pre-pandemic 2019, there were 44 listed companies in the first tier of the exchange. The Non-Banking Finance sector was the most active sector by volume with 32.96 million shares traded (42.9%

of the market's total volume) followed by the Banking Sector with 13.62 million shares traded (17.61% of the market's total volume).

The Cross Listed Index advanced by 19% in 2019—indicating the attractiveness of T&T's liquid capital market to external companies. *Cross-listing* refers to a company placing its shares on a stock exchange external to its primary listing jurisdiction. It differs from *dual listing*, which refers to the creation of two distinct legal entities managed as a single company.

For example, the metals, mining and petroleum organization formerly known as BHP Billiton is listed as the BHP Group plc (London Stock Exchange) and BHP Group Limited (Australian Securities Exchange).

Total Market Capitalisation as of December 31, 2019, stood at US$11 billion.

Barbados Stock Exchange

The Barbados Stock Exchange (BSE) emerged in 1987 under its former name, the Securities Exchange of Barbados (SEB). SEB's creation was facilitated by the Securities Exchange Act of 1982—repealed and replaced by the Securities Act of 2001. The Government of Barbados hoped that the exchange would improve access to capital and diversify the long-term finance matrix; the government possessed early insight that stock market development should be prioritized to resolve the region's excessive reliance on banking sector financing to propel economic growth.

BSE is the middle child of the CARICOM founding four. Jamaica is the region's firstborn and a leading example of stock market development. The Jamaica Stock Exchange has led the way in enhancing liquidity, the introduction of electronic trading and junior market development. The government of Jamaica has also spurred the conversation on the creation of a CARICOM Regional Stock Exchange (CRSE). The stock exchanges of Trinidad and Tobago and Barbados followed in the 1980s. Trinidad and Tobago, propelled by oil revenues, exceeds the Barbados market in liquidity but lagged the younger market in the introduction of electronic trading. BSE's electronic system was implemented in 2001 against mounting criticism of the auction method of trading.

In the lead-up to turbulent 2020, the BSE was the only major regional stock exchange that experienced a contraction in market capitalization. All

market indices registered a negative 2019 change. The Local Index recorded a decrease of 7.52%, while the Cross-Listed and Composite Market Indices recorded decreases of 17.24% and 9.17%, respectively. Year-end 2019 market capitalization measures recorded the following declining results: Local MC (-7.05%), Cross-Listed MC (-84.35%) and Composite MC (-17.41%).

Three companies experienced declines of more than 25% in 2019. Barbados Farms Limited and One Caribbean Media Limited declined by 55.88% and 54.39%, respectively, while Insurance Corporation of Barbados Limited's share price fell by 31.58% at the close of 2019. Goddard Enterprises Limited (13.07%), Eppley Caribbean Property Fund SCC (13.04%), Sagicor Financial Corporation Limited (8.2%) and First Caribbean International Bank (7.34%) were the other companies to experience declines.

Emera Deposit Receipt recorded the greatest price appreciation for 2019, climbing 33.57% from $15.73 at the close of 2018 to $21.01 at the close of 2019. However, the price movement is rooted in the external orientation of listed depository receipts. While Emera Deposit Receipt (EMABDR) trades similarly to a listed equity security, its price is determined by changes to Emera Incorporated's (EMA) movement on the Toronto Stock Exchange. West India Biscuit Company Limited (25%) registered the second-largest appreciation with its double-digit growth. Eppley Caribbean Property Fund SCC (1.82%) and Cave Shepherd and Company Limited (1.09%) were the only other securities to experience appreciation in 2019.

Guyana Stock Exchange

The Guyana Association of Securities Companies and Intermediaries Inc. (GASCI) is a self-regulatory organisation registered with the Guyana Securities Council to conduct business as a stock exchange and an association of securities companies and intermediaries. According to the Securities Industry Act 1998, persons engaged in the securities business are subject to the regulatory control of the Guyana Securities Council. This control extends to brokers, dealers, traders, underwriters, investment advisers, securities intermediaries and securities companies.

The Stock Exchange began trading on July 8, 2003, at which time the market value was approximately $17.7 billion. As of June 2021, the market

value of shares has grown to $439.6 billion (GASCI, 2021). Since its inception, there have been 921 trading sessions. Trading is executed on Mondays at 10:00 a.m. or on Wednesdays, whenever a public holiday falls on Monday. It is done through registered brokers who buy and sell shares on the stock market. These firms are The Trust Company (Guyana) Ltd, Guyana Americas Merchant Bank Inc, Beharry Stockbrokers Ltd and Hand-in-Hand Trust Corporation Inc (formerly GNCB Trust Corporation Inc). Trades are executed via word of mouth on the trading floor supported by an electronic limit order book.

To purchase shares on the Exchange, the investor deposits funds with the broker for the proposed purchase, and to sell, the investor deposits the share certificate and a signed transfer form with the broker. According to GASCI's website, there are currently 15 companies listed on the Stock Exchange, mainly commercial banks and rum distillers. Companies listed on the Stock Exchange include the following: Banks DIH Limited (DIH), Caribbean Container Incorporated (CCI), Citizens Bank Guyana Incorporated (CBI), City Jewellers and Pawnbrokers Limited (CJP), Demerara Bank Limited (DBL), Demerara Distillers Limited (DDL), Demerara Tobacco Company Limited (DTC), Guyana Bank for Trade and Industry Limited (GBTI), Guyana Stockfeeds Incorporated (GSI), Humphrey & Company Limited (HSL), J.P. Santos & Company Limited (JPS), Property Holdings Incorporated (PHI), Republic Bank (Guyana) Limited (RBL), Rupununi Development Company Limited (RDL) and Sterling Products Limited (SPL).

For the year 2021, Demerara Tobacco Company Limited has experienced the largest appreciation in stock price moving from $1,000 to $1,275 from January to June. This is a share price appreciation of 27.5%. Republic Bank Guyana Limited's stock price has appreciated from $400 to $500 for the year 2021, an appreciation of 25%. Additionally, the only company to experience a share price depreciation is Banks DIH Limited, moving from $80 to $79, a marginal decline (GASCI, 2021).

Demerara Tobacco Limited delivered earnings per share of $76.09 in 2020 versus $70.00 in the prior year, and a dividend per share totalling $1.652 billion was distributed for 2020. Demerara Tobacco Limited currently has the highest earnings per share on the Guyana Stock Exchange (GASCI, 2021). This indicates that the company has managed to

effectively combat the challenging business climate over the past year. It is essential to highlight that shareholders do not pay taxes on dividends and capital gains in Guyana.

There are currently limited benefits for small firms to list on the Guyana stock market. Jamaica offers fiscal incentives for small firms to list on the Jamaican Stock Exchange, including an income tax holiday for the first five years after listing and a 50% income tax holiday for the remaining years. However, progress can be observed, as the exchange is set to transform with the overall thrust of the domestic economy. In 2019, the stock exchanges of Barbados and Guyana signed a Memorandum of Cooperation providing the pathway for listed companies to trade in each other's countries.

Modern Financial Theory, Warren Buffett and John Maynard Keynes

Alex Armogan

Modern Financial Theory (MFT) tells a story of efficient markets and a mean-variance investing world: diversify to achieve a superior risk-return trade-off. We can eliminate the risk unique to the company underpinning a stock by holding a sufficiently diversified portfolio with the leftover risk captured in a mathematical term called beta. We can value securities using the absence of arbitrage argument, etc.

MFT emerged from an interplay of modern probability theory and economics in the early 1960s. Earlier economic research made tangential comments, such as research by Sir John Hicks on money demand, hinting at a model for risk. However, Harry Markowitz and Andrew Roy made the first leap. Both men released articles in 1952 that applied modern probability tools to the financial markets. Milton Friedman's comment on Harry Markowitz's defence of his PHD is telling: "It's not economics, it's not mathematics, it's not business administration."

Prior to the 1960s, finance was thought in American business schools from a practical standpoint. Warren Buffett is an example of someone who received training before Modern Financial Theory emerged. He schooled under Ben Graham, author of Intelligent Investor. Buffett wrote in the preface to the fourth edition of the classic, released in 1973: "I read the first edition of this book in 1950, when I was nineteen. I thought then that it was by far the best book about investing ever written. I still think it is."

Buffett's distaste for some of the central tenets of MFT can be gleaned. In response to a question on diversification at a Berkshire Hathaway Annual General Meeting, Buffett expressed that "diversification as practiced generally makes very little sense to anyone who knows what they are doing. Diversification is protection against ignorance. There is nothing wrong with that. It is a perfectly sound approach for somebody who does not feel they know how to analyse businesses. If you look at how fortunes were built in this country, they were not built out of a portfolio of 50 stocks."

Buffett provides the firepower based on a firm belief in pre-MFT teachings that a viable investment strategy can be based on studying individual investment opportunities and concentrating as opposed to spreading your wealth across numerous stocks. He places a disclaimer in his statement, "If you are not equipped with the necessary skills, diversification offers you protection." To better understand his statement, the 2004 Berkshire Hathaway Chairman's letter should be considered: he states that, "If you examine in 35 years since the 1960s ended, you will find that an investor's return, including dividends, from owning the S&P has averaged 11.2% annually. All they [investors] had to do was piggyback Corporate America in a diversified, low-expense way. An index fund they never touched would have done the job."

Before the Intelligent Investor's teachings propelled Warren Buffett, John Maynard Keynes blazed the investing trail for the King's College Endowment between 1921 and 1946. Keynes was an investment maverick given his early push to equities as an asset class for long-horizon investors. He convinced his college fellows to carve out a discretionary portfolio that registered performance superior to the British common stock index. Keynes utilized his economic awareness and research to guide investments. He acquired tin stocks in the mid-1920s on analysis that revealed the inelasticity of supply and strong underlying demand and his 1930s South African gold mining stocks selection based on early foresight of currency devaluation and its impact on earnings. The early half of his twenty-five years' experience where he employed active trading using monetary and economic indicators to guide holdings proved underwhelming and led to a buy-and-hold stock-picking strategy that excelled.

The investment approach employed by Keynes in the 1930s resembles the advice of Graham and Dodd. In fact, the same year as the release of 1934 classic Securities Analysis, Keynes stated: "As time goes on, I get more and more convinced that the right method in investment is to put fairly large sums into enterprises which one thinks one knows something about and in the management of which one thoroughly believes." Reflecting on his 1930s performance, he associated the careful selection of few investments and the consideration of intrinsic value as important factors to the success registered.

Perhaps if Keynes was present to read Buffett's quip that calling someone who trades actively in the market an "investor" is like calling someone who repeatedly engages in one-night stands a "romantic," he would have heartily chuckled due to his first-hand experience. The trip down memory lane should not detract from other Financial Giants that firmly extol Modern Financial Theory and the many investors who believe in timing the market.

Market Myths, Bubbles and the Psychology of Economic Man

Saumya Poddar

Investing is grounded in profits and price movements; investors try to buy low, sell high and make profits. They try to either estimate the value of an investment through fundamental analysis or predict the price movement through technical analysis. This is how traditional finance looks at the concept of investing; it assumes that investors are rational, i.e., they are risk-averse, self-interested utility maximisers (acting in accordance with decisions made by homo economicus or rational economic man).

The big assumption behind using traditional finance is that there exists a theoretic "true intrinsic price" and that the price of an investment will move to that price. This is in line with the Efficient Market Hypothesis, which states that at any given time in a highly liquid market, stock prices are efficiently valued to reflect all the available information. The rationale behind this is that investors can calculate the intrinsic price and will trade according to it (buying if the market price is lower than the intrinsic price and selling if it is higher than the intrinsic price, thus pushing the price toward this apparent true price).

Markets move with supply and demand, which means that the price of the investment asset will move along with investor actions, towards the price believed in by most of the capital in the market. For instance, if a few small investors trading an aggregate of $1 million believe that a stock is overvalued, but others trading an aggregate of $50 million believe that it is undervalued, and all the investors trade in accordance with their beliefs, the stock will rise in value due to the increase in demand. This will happen regardless of whether the smaller investors were right or wrong in their valuation. Thus, what moves markets is the investors' actions; this is ignored by traditional finance, as it focuses on what the action of a rational economic man should be.

Behavioural finance seeks to explain investor actions that go against rationality as per traditional finance. It addresses the limitations of traditional finance by incorporating psychology into investment analysis

by providing an explanation for market movements where traditional finance fails, like market bubbles.

Investopedia defines a bubble as an economic cycle that is characterised by the rapid escalation of market value, particularly in the price of assets. According to traditional finance, a bubble should not exist, because as soon as the prices rise above the intrinsic value, investors, being rational, will sell the asset, therefore pushing down the price. If we take investor behaviour into consideration, a number of factors, like overconfidence bias, herd behaviour, confirmation bias, etc., can explain the existence of bubbles.

There are also various reasons in favour of participating in a bubble that will not be supported by traditional finance. During a bubble, traditional financial analysis would identify assets as overpriced, leading to investors having low or no allocations to equity during this time. Despite the risks, bubbles have given investors large returns before bursting. During the dot com bubble, between 1995 and 2000, NASDAQ rose from under 1,000 to over 5,000. An investor could identify a bubble and still cautiously participate in it to avoid the opportunity cost of staying out of it. Asset managers not participating in the bull markets during bubbles could very quickly lose clients.

As compared to the rational economic man followed by traditional finance, a more realistic concept is Bounded Rationality, which removes the assumptions of perfect information, fully rational decision-making, and consistent utility maximization, which is a more realistic scenario. This addresses the fact that there are limits to investors acting rationally.

Incorporating behavioural finance into investment analysis and recognising that there are various factors in addition to the concepts explained by traditional finance could lead to better investment decisions. In the process of investment analysis, an individual investor should keep in mind that there is no absolute truth regarding the intrinsic price of a stock and be open to the idea that there exist behavioural biases in himself and the other market participants. Asset managers should actively try to identify the biases in themselves and their clients and be aware of them while making investment decisions, to minimise the effects of these biases on their investment activity.

Efficient Market Hypothesis

Saumya Poddar

Efficient Market Hypothesis states that stock prices reflect all available information. It would hold through the actions of market participants, who would buy or sell based on the "available information." The theory implies that investors cannot consistently generate alpha (excess risk-adjusted returns above the market), which in turn implies that markets cannot be timed and that the best strategy for investors is to invest passively at the desired level of risk.

The term Efficient Market Hypothesis (EMH) was first coined in 1967 by Harry Roberts, after innumerous studies were conducted by economists trying to analyse price movements in stock markets. EMH sprouted from Roberts' finding in 1956 that a random walk will look very much like an actual stock series. However, others, including Cootner (1962) and Steiger (1964), have concluded that the stock market does not follow a random walk. There have been contradictory findings over the last few decades about the validity of EMH, and this article will try to set forth the economic rationale for both sides of the debate.

The first thing to consider is what is meant by "all available information." Roberts defined EMH as three different forms, each having different implications on the possibility of alpha generation:

- Strong form: states that all information, public or private, should be reflected in stock prices, there should be no possibility of alpha generation, and passive investing is the best strategy. Since private information can only be reflected in the prices through insider trading, which is unethical as well as illegal in most countries, markets cannot legally be considered strong form efficient.
- Semi-strong form: states that all public information should be reflected in stock prices and alpha can only be generated through insider trading.
- Weak form: states that all past price and volume data should be reflected in stock prices. It may be possible to generate alpha through fundamental analysis (although with limitations), but not through technical analysis.

An assertion of the theory is that if a stock moved due to a trade unrelated to any new information, for instance, an individual liquidating a large holding due to a medical emergency, other market participants should buy the stock as the price falls to get it to a level that is supported by "all the information."

In all the research, there is no clear definition or boundaries for "all information" or "all public information." This is exacerbated by information asymmetries, which is when either the buyer or seller has more information about an investment instrument, thus making the definitions more subjective. As per an article published by Academia Revista Latinoamerica de Administracion, there is increased risk of asymmetric information in Latin American stocks with lower trading volumes and lower market capitalization, implying that small cap stocks in these markets are not efficient. There is no equitable access to information, especially in developing countries which do not have access to and knowledge of how to use information and communication technologies (ICT), which blurs these lines even further. A study considering 33 countries over a 15-year period showed strong evidence that the degree of asymmetric information decreases as financial systems develop. This leads to information asymmetries wherein even "public knowledge" may not be common to all market participants.

Therefore, it can be said that markets at a global level are not efficient at present, although some forms of the Efficient Market Hypothesis might hold in the future, in an ideal market, as global economies develop.

Casino Capitalism or New Financial Derivatives?

Alex Armogan

Financial trading by non-professionals, popularly referred to as retail trading, has grown exponentially in the past decade. Spread betting and Contract for Differences (CFDs) are the two most popular retail products people use to trade on proprietary online platforms. Spread betting and CFDs are referred to as new derivative instruments. However, some financial market participants view these products, often used by amateurs with limited to no trading experience, as "Casino Capitalism."

The roots of financial derivatives can be traced back to the emergence of futures contracts over 3,800 years ago—used in the Babylonian grain trade. Futures are based on a commitment by a buyer and seller to transact at a specified time and for a specific location, a predetermined quantity of a given commodity. Futures grain trading on exchanges emerged in Japan during the 1600s; the standardisation of contracts was led by the Chicago Board of Trade in the 1860s. Futures expanded to non-agricultural commodities in the late 20th century and played a key role in the financialization of the energy markets.

Spread betting allows individuals to benefit from price volatility. Amateur traders speculate on the short-term price action of commodities (such as crude oil), forex, shares, indices and cryptocurrencies. CFDs also allow for trading on short-term price action and entail the parties to the contract exchanging the difference between the opening and closing prices of the underlying, such as Tesla stock.

A central question emerges on the difference between derivative trading and gambling—how should spread betting and CFDs be treated in the eyes of the law? The United Kingdom, London being a leading global financial centre, has led the online retail trading movement from innovation to the conducive legislative framework required. Before 2005, spread betting was overseen by both the gambling laws and financial regulations. The Gambling Act 2005 left spread betting to the Financial Services Authority, deeming the offering financial in nature. The EU Markets in Financial Instruments Directive (MiFID) also extended regulation of European financial services to cover CFDs, commodity derivatives and credit derivatives.

The first spread betting company opened shop more than sixty years ago in the United Kingdom and registered under the 1960 Betting and Gambling Act. Section 18 of the Gaming Act 1945 states that all contracts or agreements, by way of gaming or wagering, are null and void; the Act frustrates the winner of a bet from suing. Spread betting thrived due to the early legalisation of private gambling and removing the legal risk of off-exchange derivative transactions.

Some market commentators argue that spread betting and CFDs are purely speculative, aleatory in nature and a representation of opportunistic and non-productive behaviour. Regardless of the opposition, an online trading platform regulated by the applicable market regulator has superior beneficial market implications than the barring of such activity or the public's engagement in unregulated foreign services that are easily accessible due to the digital nature of the transactions.

Impact of Behavioural Finance in Investment Decision-Making

Chaitram Mohamed

Traditional investment theories are based on models that assume rationality; investors always act in a manner that maximizes their return. Finance has long been based on the idea of "efficient markets." The Efficient Market Hypothesis (EMH) of classical finance states that at any given moment in time, the price of any and all assets and securities being traded is correct and reflects all available information. However, a number of studies show that people are not always rational and markets are not always efficient.

The field of Behavioural Finance argues that behaviours and mood states of humans are principal factors affecting investment choices; emotions such as fear and greed often play a pivotal role in investment decisions. It is a new field that attempts to combine behavioural and cognitive psychological theory with conventional economics and finance to provide explanations for why people make irrational financial decisions.

Tversky and Kahneman, the fathers of behavioural finance, coined the prospect theory, which explains how individuals behave, on average, in the world of uncertainty and describes how people frame decisions in the presence of uncertainty. Under the prospect theory, value is assigned to gains and losses rather than to final assets: also, probabilities are replaced by decision weights. Investors are more strongly attached to the pain from loss rather than the pleasure from an equal gain. People tend to focus on the outcomes of their decisions, which distinguishes them from the expected utility theory that looks at the utility of the state of wealth.

Another important theory of behavioural finance is the regret theory. This theory was developed by Graham Loomes and Robert Sugen, David E. Bell and Peter C. Fishburn, among others. According to Bell, regret is an emotion caused by comparing a given outcome or state of events with the state of a foregone choice. Regret theory is about people's emotional reaction to having made an error of judgment, and investors may avoid selling stocks that have gone down in order to avoid the regret of having made a bad investment and the embarrassment of reporting the

loss. Other theories of behavioural finance include anchoring, which is the use of irrelevant information as a reference in order to evaluate or estimate some unknown values.

Some of the common biases or heuristics which affect investors' decisions are as follows:

1. Overconfidence Bias

This is baseless faith in one's intuitive reasoning, judgment and cognitive abilities. People tend to underestimate the imprecision of their beliefs or forecasts, and they tend to overestimate their abilities. Two main aspects of overconfidence are miscalibration and the better-than-average effect. According to Odean (1998), overconfident investors usually conduct more trade, as they believe they are better than others in picking up stocks and deciding when to enter or exit a position. It was found that this behaviour tends to cause investors to underreact to new information and so, receiving lower returns than the market.

2. Anchoring Bias

This exists when investors give unnecessary importance to psychologically determined anchors, which causes them to make irrational decisions. People tend to anchor their thoughts to a reference point, though it may not have any logical association to the decision being made. Anchoring prevails in situations where people deal with new concepts. Although a company is making more money, its stock price does not rise because investors assume that the change in earning is only temporary. Therefore, the investor remains anchored to their previous view of the companies' potential profitability because they have under-reacted to the new, positive information. This does not mean that investors will never move away from their initial reference point or anchor. They will realize that the company is likely to continue to be more profitable in the future and that its stock is probably an attractive potential investment (Choudhary, 2013).

3. Herding Bias

Herd behaviour is any mutual imitation in financial markets that leads to convergence of action. It is the most common mistake made by individuals who follow the actions of a larger group. Two main reasons that can

be associated with the herd behaviour of investors are the social nature of people and general tendency to seek acceptance from a group rather than being a standout, and the investor's tendency to think that a group is unlikely to be wrong when making a decision. This makes investors follow the herd under the illusion that the one whom they are following would know something that they, the investors, are not aware of. Welch (2000) found that analysts exhibited herd behaviour. He noticed that whenever an analyst revises his/her recommendations, the following two revisions would have a positive correlation with that of the initial ones. It was found that the revisions were heavily influenced by the prevailing market consensus.

4. Hindsight Bias

The tendency to overestimate one's ability to foresee the outcome of an event is the "I knew it all along" phenomenon. The hindsight bias can prevent investors from recognizing and learning from their mistakes. To guard against such bias, one can keep an investment diary. Comparing outcomes to the reasoning behind certain investment decisions is a good way to keep hindsight bias in check.

5. Confirmation Bias

This is people's desire to find information that agrees with their existing view. Any information that conflicts with the null is ignored, while information that reinforces the null is over-weighted. In investing, the confirmation bias suggests that an investor would be more likely to look for information that supports their original ideas about an investment rather than seek out information that contradicts it.

6. Availability Bias

This is the tendency of people to base their decisions more on recently available information rather than carrying out any detailed study of the events that occurred in the past. Investors often make decisions on the basis of information that is readily available to avoid the costs of doing any detailed analysis of past events.

Behavioural finance is in its infant stage of development, and there is a need for much more theoretical analysis and empirical testing in this

new field of finance. Behavioural finance offers many useful insights for investment professionals and thus provides a framework for evaluating active investment strategies for investors.

The Decision to Hedge Commodity Price Risk

Alex Armogan

The decision to hedge using financial derivatives is primarily based on the perceived effectiveness of the hedge to reduce commodity price volatility. If a government exposed to significant commodity price risk decides to create a hedging program, it must overcome the political challenge. In the corporate world, the economics of a hedge may be better understood, and management will be able to communicate the case to shareholders. If a government decides to hedge and its hedging program produces a loss, a political outcry over the opportunity cost, such as spending on health and education, will follow.

Hedging is a risk-management technique but is often quoted in the media as "speculation" when the outcome is negative and labelled as "insurance" if it succeeds. The two ends of the spectrum in the corporate world can be illustrated using the airline industry. Ryanair views financial hedging as highly effective in offsetting variability in future cash flows from fluctuations in the price of jet fuel, while Alaska Air believes that hedging jet fuel will make its operating results more vulnerable to fuel price movements. The pro-hedging companies are aligned with empirical evidence that establishes a link between financial hedging and the reduction in cash flow and accounting profit volatility, improvements in the availability of debt and cost of debt, tax benefits and a lower overall bankruptcy probability (Mayers and Smith 1982, Smith and Stulz 1985, Bessembinder 1991, Dobson and Soenen 1993, Dolde 1995, Gould and Szimayer 2008 and Beatty et al. 2012). Artez and Bartram (2010) and other studies question the impact of hedging on improving a company's value and note that the evidence supporting the case is impacted by methodological issues such as an endogeneity problem.

Some companies, such as Spirit, were left with a bitter taste from prior attempts and have paused their jet fuel hedging operation. Spirit ceased financial derivative fuel hedging in 2015, and recent annual reports indicate its reasoning; the company expounds that "its liquidity and general capital resources limit its ability to hedge . . . [and] even if capital availability allows for sufficient hedge portions of exposure, there is no guarantee of adequate protection." Ryanair and other hedge users, such

as Southwest, do warn shareholders of the possibility of hedging losses and the risk to liquidity. Southwest states that there is a risk that "cash collateral may be required to be posted to fuel hedge counterparties, which could have a significant impact on the company's financial position and liquidity." Futures and options are popular hedge conduits and involve up-front payments. A margin deposit is required when using a futures market hedge, and a premium is required when utilizing options. The costs associated with the implementation and maintenance of a hedging program may explain why small companies such as Alaska Air decide against hedging and adopt an anti-hedge stance. Brailsford et al. (2005) and Nance et al. (1993) support this reasoning; the studies find that hedging costs are barriers to small companies, and larger companies benefit from the economies of scale advantage when dealing with such transaction costs.

Aside from overcoming the political costs of hedging, a government must assess its capacity to design and successfully execute a hedging program, along with its associated credit implications. Similar to the struggle of a small company seeking to engage in a financial hedge, a less developed country may not have the sufficient know-how (ability to understand the counterparty's pricing methodologies and wider trading platform, ability to model for hedging effectiveness, managing the credit risk, among others) on financial derivatives, but it can receive support from external consultants. Further, if a government engages in the hedging of its commodity price exposure and fails to establish a robust framework, transparency and governance issues will ensue.

Mexico is the golden child when it comes to a country administering a successful hedging program. Mexico dabbled in financially hedging its oil price exposure (the public-controlled oil sector plays a critical role in its fiscal revenues) in the early 1990s and achieved early success. Ecuador's government tried the same in 1993 but became the poster for the political costs of hedging after its program failed. The government used a combination of options and swaps; the put options premium (the materialized spot price was higher than the strike price) in the unsuccessful hedge amounted to more than $10 million (Daniel, 2001).

Mexico, as an oil exporting country, particularly due to the state-owned control of oil production, has a long position in the physical market. The

hedging program is generally executed in the form of buying put options versus futures and thus, securing the ability to sell crude at a pre-determined price. If the crude oil price for its exports collapses in the spot market, Mexico can exercise its right to sell at its strike price, an option in the money given that the country will benefit from selling above the market price. The cost of the options premium would have paid off.

Mexico's hedging program proved successful in the most extreme oil price environments; government revenues and balance of payments were boosted from the success of its hedging activity surrounding the oil price collapse of H2 2008 and 2014. The hedging program recorded approximately $5 billion in 2009 and $6 billion in 2015. According to Bloomberg, Mexico's spending on its oil hedging program has averaged $1 billion per year over the last decade, and the country generally hedges in the 200 million to 300 million barrels range (2019's output north of 400 million barrels).

The hedging program for 2020 locked in a crude oil price of $49 per barrel, and its Finance Minister expressed to Bloomberg in March that the extent of the hedging covered 100% of the country's oil income. However, doubts over its hedge structure (a supposed lack of sufficient correlation) raised questions over its likely effectiveness. The program often uses mainly options indexed to its heavy sour Maya, but in 2020 the majority of options relied on the Brent benchmark (a basket of light sweet crudes). The headline "Mexico Goes Ghost as Its Oil Hedge Bill Spirals" surfaced along with sceptics over the country's risky move in January. However, it appears that Mexico's hedging program has once again reigned supreme. The historic lows of the crude oil market, negative pricing of WTI and below $20 for Brent, have led Mexico's risk management strategy to yield over $6 billion (as of April 2020) in offsetting revenue.

Video Special: Guyana Stock Market Primer

A comprehensive Overview of the History, Market Capitalization, Return, Fees, Transparency, Market Mechanics, Frequently Traded Equities and Access to External Market

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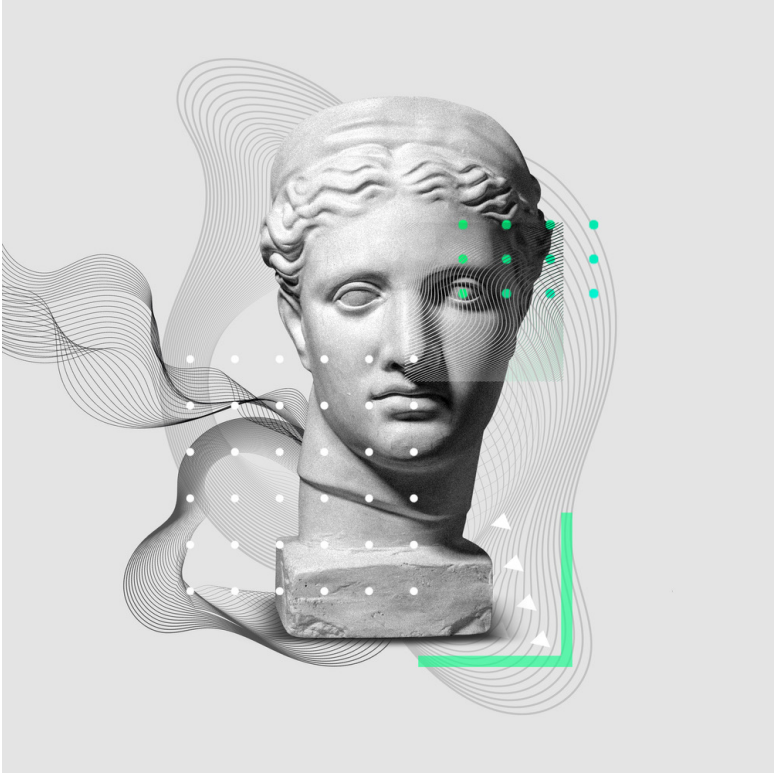


FINANCE AND DEVELOPMENT

Financial Inclusion and Development

Govindra Raghubansi

Financial inclusion refers to the access and ability to engage in the financial system or use related services for a country's vulnerable and disadvantaged groups.

A central focus of the World Bank is to improve access to the banking system through transaction accounts. These serve as a gateway to other financial services as the first step towards broader financial inclusion, as they allow people to store money and send and receive payments. Since 2011 major strides have been made, 1.2 billion adults around the world have gained access to a bank account, marking significant progress towards financial inclusion, and 69% of adults now have an account. However, close to one-third of adults or 1.7 billion are still unbanked.

Women from poor rural homes and those unemployed comprise half of the unbanked population. This makes it difficult for women to manage their money effectively and contributes to further inequalities.

According to a World Bank study, nations that implement a national financial inclusion plan boost the speed and effectiveness of reforms. Changes are accomplished when governments adopt a strategic approach and implement national financial inclusion programs including financial regulators, telecommunications, competition and ministries. These reforms have a direct impact on achieving the following Sustainable Development Goals: SDG1-No Poverty, SDG5-Gender Equality, SDG8-Decent Work and Economic Growth, SDG10-Reduced Inequality, SDG16-Peace and Justice Strong Institutions and SDG17-Partnerships to achieve the Goal.

More than 50 nations that face this problem of financial inclusion have committed or have initiated national strategies. Policies utilised by different countries include Universal Digital ID, India, Leveraging Government Payments—payments and wages made will only be facilitated via a bank account—allowed mobile financial services to thrive, for example, in Sub-Saharan Africa and China.

Guyana has attempted to improve financial inclusion through the National Payments System (NPS) Strategy launched by the Bank of Guyana in 2018 and set to be fully implemented by 2030. A 2018 Bank of Guyana

report indicates the desire to build a robust, efficient and inclusive NPS that meets the current and future needs of the economy, such that the system supports financial activity and financial sector development, advances the use of electronic payments, contributes to financial risk mitigation, achieves compatibility with international systems, and adheres to the relevant international standards, guidelines and codes.

Lack of access is a possible hindrance to financial inclusion in Guyana, given the scarcity of banks and their branches in relation to the population. The comparatively low level of urbanisation is one aspect contributing to this issue. In this context, just 28.5% of the population (2014 statistics) lived in urban areas, which have the highest concentration of service access points (bank branches), with 20.9 ATMs and 8.3 commercial banks per 100,000 adults. The median availability of bank branches per 100,000 adults is 80 (Mexico and Chile are LAC countries around this median).

Financial literacy refers to the level of knowledge and understanding of the banking system and personal financing. Financial literacy is strongly correlated with levels of educational attainment. 2014 data and tertiary education as a measure of the country's financial depth reflect that Guyana compared poorly in the past with an average of 0.01 years of tertiary education, which was comparable to Malawi, Mozambique, and Guatemala, based on a ranking of 143 countries for which data were available. This has certainly improved and will continue to be remedied with the massive investments in the education sector.

Correcting these shortcomings will not only allow financial inclusion but also further economic growth and innovation in several financial service sectors. The US Department of Commerce highlights the following as key investment areas in Guyana: financial technology, wealth management services and investment banking. Financial institutions will be needed to advise and help in the structure of agreements as the government and private sector attempt to undertake large projects.

Microfinance

Saumya Poddar

Microfinance is the mechanism by which financial services are provided to those who are excluded from traditional channels. These include small businesses and individuals who do not have access to financial services from banks because of high risk, lack of credit history or collateral, and minimum limits for borrowing, saving, and insuring that are too high. The microfinance industry has been growing since its inception in the early 1970s; approximately 600 microfinance institutions in Latin America and the Caribbean have lent around 12 billion USD to more than 10 million low-income clients.

The industry is especially important for the LAC economy because it is a developing region. The inclusion of the population in the organized financial sector is very low. Fifty per cent (50%) of the population is excluded from the formal banking sector, 46% of the adult population does not have a bank account (they are "unbanked"), and only 12% of the population has its savings deposited in formal financial institutions. There are many reasons for this, like the overpricing of risk by banks, leading to high charges and interest rates, a large requirement of paperwork and bureaucracy for accessing financial services, and different rules by individual institutions like some banks that exclusively cater to the individuals in the top 20% income bracket. The portion of the population included in the formal sector has been rising with the rise of microfinance, which is able to cater to the socially vulnerable part of the population.

Organizations that provide microfinance products, microfinance institutions or MFIs, deal with small dollar amounts, which means that they have to process more transactions than traditional banks for the same level of turnover. In 2015, the average size of microloans given out by regulated and non-regulated institutions in the LAC region was US$2,000. In the LAC region, MFIs tend to be private businesses that require a profitable business model, rather than not-for-profit organizations and government-owned MFIs. The high risks and costs mean that private MFIs have to charge high interest rates on microfinance products, going as high as 120% (charged by Compartamos Banco, which is the largest microfinance firm in Mexico).

Microfinance includes microloans, micro-savings, and microinsurance.

- Microloans, or microcredit, could be small loans given out to new businesses or for entrepreneurial projects by impoverished individuals. Microloans could also refer to loans that are given out by individuals rather than banks or financial institutions.
- Micro-savings are services to include the savings of the unbanked population into the formal banking sector. Depositing savings with MFIs is safer than keeping whatever little savings they might have in the form of cash at home or with other individuals, which may lead to loss of the money through theft or scams.
- Microinsurance is insurance aimed at the lower-income sector of society. These policies are tailored to insure specific things like health, death, or certain assets that may not meet the minimum insurance limit of traditional insurance providers. For instance, in a pay-as-you-go auto insurance policy, the premium is paid for the actual miles that the automobile is driven. Thus, someone who does not drive their vehicle too often can benefit from cheaper insurance as compared to traditional insurance.

The microfinance industry has grown over the years, in size and technology. Microfinance startups are replacing the smaller lenders and making it easier for customers to access microfinancing services. Since the core model of the businesses is the same as older MFIs, the interest rates remain high, but there are other improvements the startups are providing. They are leveraging the increasing smartphone penetration and offering microfinance services that can be applied for with a few taps online. They have also reduced the lead time for providing these services. The industry is growing and advancing and helping the progress of individuals and small businesses around the region.

Women and Microfinance

Saumya Poddar

Women's rights have been a popular topic of conversation over the last century. There have been huge strides in not only raising awareness about the opportunity loss to the economy by excluding women, but also in breaking some of the barriers that stood in their way. One step towards the goal of equality is being taken by microfinance institutions that are trying to provide financial opportunities to increase the inclusion of women in the economy.

Microfinance institutions (MFIs) provide financial services to sections of society who are excluded from the traditional channels, which directly or indirectly includes women in many parts of the world. New microfinance firms not only generate employment amongst women but also empower them, stimulating entrepreneurship and productivity from resources that were being underutilised. A study conducted in Pakistan in 2019 found that "access to microfinance has a significant impact on the poverty reduction and empowerment and social status of women." It also concluded that increasing women participation will "ultimately bring in prosperity in the family."

"Over 3,300 microfinance institutions reached 133 million clients with a microloan in 2006. 93 million of the clients were among the poorest when they took their first loan. Eighty-five per cent of these poorest clients were women."

There are various reasons why women are excluded from the economy—one of them being the rules and laws in countries that restrict women from participating. Other restraints come in the form of family pressures or obligations, like running the household or taking care of the children. This loss of productivity actually causes a net income loss to families as well as the economy.

The advantages of microfinance and the inclusion of women in the economy are widely accepted. However, a microloan given to a woman can turn out to be a bane.

Even though enterprising women might lend a hand in earning for the house, men may not engage in household work, which implies that to

succeed, women have to work much harder than their male counterparts. The lack of support from their families makes it difficult for women to reach their full potential in their professional lives.

There are also direct negative implications from microfinance firms lending to women: women falling into debt traps associated with high interest rates and high recovery rates expected by lenders.

Access to loans specifically for women has caused a growing demand for dowry and increased domestic violence. Men see women-focused microloans as a new source for dowries. Increased domestic violence comes from the microloans being perceived as the husband failing to provide for the family. In other cases, the violence stems from the husband forcing his wife to take on a loan as disposable income for him, which she might not be able to repay.

Thus, the outcomes of the MFI women's relationships are situational, and no one can tell whether a loan being given will improve the dynamics of the family or worsen the situation. Like any developing industry, the microfinancing industry will evolve, hopefully into a beacon of light for ambitious women who do not have many opportunities to achieve their dreams and prosper independently, invest in their children's education and health, and their communities.

ENERGY

Natural Gas: A Bridge Fuel?

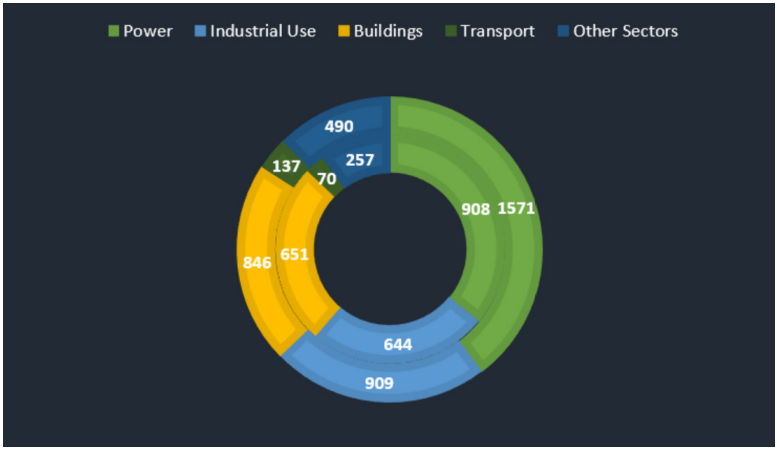
Alex Armogan

The need to shift away from fossil fuels to a low-carbon energy system has been high on the global policy agenda over the past decade. Renewable energy sources are deemed axiomatic to the fight against climate change and the achievement of sustainable development. However, some may argue that to cast all types of fossil fuels into the same category, at least from a mid-term perspective, will result in a misnomer for natural gas. To understand the viewpoint, an awareness of the power sector's emissions contribution and the technological shift from open-cycle gas turbines to closed-cycle gas turbines are necessary.

The power sector is the first end-use sector increasingly targeted for a carbon dioxide shave due to its role as the single-largest source of emissions. In a 2020 report, IRENA notes that 100% renewable energy (RE) targets have been set in 61 countries—broken down into Asia and Oceania (25), Africa (19), Central America and the Caribbean (8), Europe (7) and South America (2). Many countries have set vague targets, but 18 out of the 61 specifically refine their focus on renewable electricity. At a sub-national level, half of the 318 cities or regions with a 100% RE target identify electricity. In the renewable energy transformation of the power sector, natural gas is currently labelled as the "bridge fuel." The term bridge fuel is controversial. A renewable energy purist would balk at its implied message, to transition to a 100% renewable energy, we must first use natural gas to defeat coal before shifting to a renewable energy state.

Coal is the leading source for power generation, responsible for 10,100.5 TWh in 2018; followed by natural gas at 6,182.8 TWh. Gauged by the 2018 fossil fuel makeup of electricity, above 60%, the gap between grey and green is expansive. The scale-up of renewable energy capacity from 754 GW to 2,537 GW (2010–2019) and the growth of non-hydro renewable energy generation from 2% to 9% (2010–2018) is impressive. Yet renewables are growing from a low base. The low base is driven home by China's and India's greater than 50% coal reliance in its fuel mix; coal accounted for 66.5% and 75.35% of the 2018 electricity mix, respectively. Coal has been extensively relied on to meet increasing electricity demand in these growth areas. India has one of the largest electrification success

stories, giving access to electricity to over 500 million from the turn of the 21st century. The country's gain in access to electricity has come with emissions cost, since coal was a main driver.



Natural Gas Demand (billion cubic meters) by End-Use Sectors in 2000 (inner circle) and 2018 (outer circle) | Source: WEO (2019)

Coal's future is dependent on China and India. The rebound of coal use in 2017 aligned with the end of three flat years of global carbon dioxide emissions and an increase to 2018. Both countries have indicated on the policy front to the shift away from coal, evidenced by their mid-2010s UNFCCC Nationally Determined Contribution. *China has eased coal restrictions when practical, such as during times of high natural gas prices. In late 2019, an announcement was made concerning a slowdown in the coal-to-gas switching program; a combination of factors led to easing coal restrictions, such as concerns over gas supplies satisfying demand, among others. The LNG-dominated imports and its price relative to coal and renewables could have also played a role.*

In the basket of fossil fuels, natural gas is the least environmentally damaging. The success of the combined-cycle gas-turbines (CCGT) over the traditional opened-cycle gas-turbines (OCGT) has further separated the environmental impact of natural gas generation from coal-fired generation. CCGT's efficiency over conventional fossil-fired generation resources can be gleaned from its approximately 50% less carbon dioxide

emissions, sizeable reduction in nitrogen oxides and near elimination of sulphur dioxide.

CCGT technology has made progressive leaps over the last decade. In 2016, GE and EDF unveiled a new-generation CCGT turbine in France that achieved 62.2% efficiency, in contrast to the 58% conventional CCGT and the 37% conventional coal-fired plant. The bar was once again shifted in 2018 by an improvement to 63% by a GE-led project in Japan. The disparity in the environmental impact of natural gas and other fossil fuels, its increasing supply due to the shale revolution and the technological developments on carbon capture and storage (pre-combustion, post-combustion and oxy-fuel combustion capture) explains the case for natural gas along the low-carbon journey, as it seems primed to replace a significant share of coal-fired generation. It is expected to erode coal's place in the power sector and overall assume the second place in the primary energy consumption mix, after oil.

A seminal MIT study in the early 2010s warned that natural gas could not only edge out coal but threaten renewables in the US. However, solar and wind generation costs have significantly declined over the 2010–2019 period; solar PV fell by 82% and onshore wind by 40%. One of the best measures of price competitiveness amongst varying energy generation technologies is the concept of Levelized Cost of Electricity (LCOE). The LCOE, is the present value of the total cost incurred in building and operating a power plant for a given financial life and duty cycle. It should be noted that the LCOE varies per region and based on the extent of intermittent RE in the electricity mix. IRENA estimates the 2010 weighted-average LCOE for utility-scale solar PV at US$0.378 per kWh; the LCOE declined to $0.085 in 2018 and in its latest report to $0.068. Onshore wind has fallen to US$0.053 per kWh. Solar progress can be seen in the US oil and gas hub, Texas, where a quarter of the 2020 industrial-scale US solar capacity installations are centred; shale has not excluded solar's march in the Permian Basin. A combination of factors has caused the UK to register its longest period of grid operation without coal in the first half of 2020. IRENA's Director-General, in a June 2020 press release, alluded to an inflection point in the energy transition to a state where renewables are the cheapest source of new electricity capacity and undercut all fossil fuel sources.

Renewable energy and natural gas power projects have driven the aggregate power sector investment above oil and gas supply investment. However, the gas-fired power generation market is increasingly under strain from renewables. Gas-turbine sales by generation capacity edged past 70 GW in 2011, but it has contracted and is currently hovering around the 30 GW mark, per McCoy Power Reports. Cost improvement in solar PV and onshore wind is making the case to switch from coal to these variable intermittent sources as opposed to natural gas.

The role of natural gas in the mid-term energy system is compelling as a generation source necessary for operational flexibility. Manufacturers are continuously developing their turbines' ability to balance supply and demand. The aforementioned GE and EDF 2016 turbine achieves a ramp-up rate in excess of 50 MW per minute and maximum power in less than 30 minutes. Flexibility is vital in an energy system characterized by a high share of variable renewable generation. Solar and wind generation are known for their intermittent supply. The level can be high during bright and breezy days but coincide with a period of low demand (and vice versa). A lack of effective storage results in surplus generation to the grid. Natural gas generation can, therefore, be ramped up or down to balance the system. The development of effective storage for utility solar and wind generation may dampen the flexibility role.

An important area that must be monitored for its impact on natural gas generation is the possibility of an economic case for hydrogen generation emerging over the coming decades. Technological advancements and carbon pricing policies, among other factors, may establish the feasibility to retrofit natural gas plants for green hydrogen generation.

Chile's Plan to Dominate the Green Hydrogen Economy

Maeva R. Raondry

An estimated 70 to 80 million tons of hydrogen are produced worldwide each year. This hydrogen is predominantly used in the production of ammonia in the chemical industry. It is also used as a feedstock in other industries, such as the food and beverage industry. Although the majority of the production is grey hydrogen (produced using fossil fuels), green hydrogen has caught the attention of several markets as they are trying to achieve a net-zero economy. Indeed, hydrogen can be used in the decarbonization of hard-to-abate sectors that are difficult to entirely electrify.

In November 2020, the Chilean Ministry of Energy released the country's National Green Hydrogen Strategy "Estrategia Nacional de Hidrogeno Verde," in which the country has set clear short- and long-term targets in order to win the race for the green hydrogen market. According to the IEA, Chile has a potential of 160 million tons of green hydrogen per annum. The country has decided to take advantage of this resource to capitalize on the developing green hydrogen market and put itself at the forefront of the international scene as a leading producer and exporter. The Chilean green hydrogen and derivatives market is expected to amount to US$5 billion in 2030 (of which US$2 billion represents domestic uses and US$3 billion exports) and, by increasing at an annual rate of 15%, to reach US$33 billion in 2050 (of which US$9 billion represent domestic uses and US$24 billion exports).

The scaling up of green hydrogen requires the support of governments and the implementation of a regulatory framework. Public-private partnerships in the form of policy changes and mandates are essential to encourage and support investments in technology and stimulate demand. The Chilean plan is composed of three different stages:

- ***Phase I (2020-2025): To develop domestic industry and exports.***

  Through the use of incentives and regulations, the country will focus on six areas for the application of green hydrogen that are close to where/or for which large and concentrated demand already exists. These include uses in refineries, domestic ammonia, mining trucks,

heavy-duty trucks, long-range buses and gas network injections of up to 20%. This stage aims to acquire knowledge and build infrastructure for future stages. By 2025, the country aims to invest US$5 billion and become the top investor in green hydrogen in the LATAM region, to develop 5 GW of electrolysis capacity, and to produce 200k tons per year.

- ***Phase II (2025-2030+): Using acquired knowledge to develop exports to the international market.***

  The phase involves a push in the production and export of green hydrogen and the value-added green ammonia, green methanol and synthetic fuels. They are exported mainly to Europe and China and, to a lesser extent, Japan, South Korea, the USA and the LATAM region (green ammonia only). By 2030, the objective is to invest US$2.5 billion per year, to produce the cheapest green hydrogen worldwide. If priced at less than 1.5 USD/kg, it would make Chile a leading global exporter in green hydrogen and its derivatives, with the largest production of green hydrogen via electrolysis of 25GW.

- ***Phase III: To benefit from economies of scale and synergies to become a global provider as technologies are developed and scaled up for the application of green hydrogen, such as in the maritime or aviation industry.***

  This plan will require substantial investment, including a new generation of 300 GW from renewable energy representing US$330 million. Chile benefits from abundant natural resources for producing green hydrogen using renewable energies estimated to be more than 1,800 GW (of which 65% comes from solar PV, 28% from Concentrated Solar Power (CSP), 10% from wind and 0.33% from hydro), which represents more than 70 times Chile's current energy demand. The decrease in the price of renewables such as solar PV and wind support the development of green hydrogen. According to BNEF, the price of electrolysers has also decreased by 40% between 2014 and 2019 in Europe, while China is producing at a price that is 80% cheaper. However, the technology is yet to scale up in order for its price to decrease to a levelized cost of production so it can compete with other fuels such as natural gas.

According to a study undertaken by McKinsey & Company for the Government of Chile, the Levelized Cost of Electricity (LCOE) of Chile's three main regions, Metropolitana (close to large consumption hubs, gas networks, road and port logistics centres), Magallanes (strong winds can allow 120-meters-high wind turbines to reach capacity factors equivalent to off-shore winds) and Antofagasta (the world's highest solar irradiation) could decrease from a range of 22–36 USD/MWh in 2020 to 10–20 USD/MWh in 2050, translating into a Levelized Cost of Hydrogen ranging from 2.6–1.7 USD/Kg H_2 to 1.1–0.8 USD/Kg H_2 for the same time periods.

In 2030, it is expected that green hydrogen produced in the Desert of Atacama in the Magallanes region will be among the cheapest in the world at 1.3 USD/Kg H2, compared to 1.8, 2.6 and 2.1 USD/Kg H2 in the Middle East, European Union and the US, respectively, for the same period.

Storage and transportation remain the main challenges to green hydrogen. Due to its low density, the molecule requires a larger space than fossil fuels to be stored. However, the limited availability of storage spaces such as salt caverns and depleted gas fields would require extensive investment in alternative storage technologies such as pressurized containers and liquid hydrogen, which are up to four times more expensive based on current benchmarks ($0.23/kg for salt caverns vs $4.47/kg for liquid hydrogen). Investment will also be required in the construction of new pipeline infrastructure and/or adaptation of current existing gas pipelines to connect production sites with consumption hubs.

The Chilean strategy has been underway since October 2020. Enel Green Power, in partnership with the Chilean AME, have announced plans for the first pilot project for green hydrogen production via an electrolyser fuelled by wind energy in Cabo Negro in the Magallanes Regions. Expected to be commissioned in 2022, this will be the first plant in the entire LATAM region.

Energy Survey: Suriname

Chaitram Mohamed

Suriname, which was once known as Dutch Guiana, is the smallest sovereign state in South America. The commodity-dependent country covers an area of about 64,000 square miles and has a population of about 558,300 people. The major sectors are agriculture (11.6%), industry (31.1%) and services (57.4%). The main industries include bauxite and gold mining, oil, fishing, lumbering and food processing. Its GDP is recorded at US$3.697 billion (World Bank, 2019).

The economy is dominated by the extractive industry, with exports of gold and oil accounting for about 85% of exports and 27% of government revenues. The country is energy self-sufficient, and this energy independence is due to a combination of the extraction of fossil fuels and hydropower.

According to the International Monetary Fund (2019), the economy is currently weak—it is characterized by low economic growth, large fiscal deficits, low international reserves, banking sector vulnerabilities, rising debt levels and disequilibrium in the foreign exchange market. The ongoing pandemic worsened these macroeconomic conditions. Suriname was amongst the countries in the region with the highest COVID-19 cases (Inter-American Development Bank, April 2021), and real GDP contracted by 13.5% in 2020 (IMF 2021).

The government also took some measures to support the socio-economic recovery in 2020. These included: devaluation of the exchange rate, establishment of an emergency fund, an increase in the provision of social benefits (financial assistance, child and old-age benefits etc.), maintenance of tax credit, intensification of controls on the prices of goods and services, introduction of a solidarity tax and improved targeting measures of tariffs on utilities.

The total primary energy supply in 2017 is composed of oil (87%) and renewables (13%). Of the renewable energy supply, 67% was represented by hydro/marine, 33% by bioenergy and the remaining 1% by solar. Primary trade statistics show imports of 20,246 TJ and exports of 15,826 TJ, resulting in an overall trade deficit of 4,420 TJ. The main sources of

renewable energy consumption were electricity (64%) and bioenergy (36%). The major consumption sectors were industry (49%), households (38%) and other (12%). Renewable energy accounted for 21.6% of total final energy consumption (IRENA Energy Profiles). Latest estimates show total oil import (BOE) per day and total oil export (BOE) per day were 9,028,550 and 2,775, 424. Fuel and oil imports as a proportion of GDP was 5.93% (Caribbean Centre for Renewable Energy and Energy Efficiency 2019).

The percentage of the population with access to electricity is 98.6%. The electricity generation mix is composed of hydropower (59.6%), fossil fuels (40.0%) and solar (0.4%), (National Renewable Energy Laboratory [NREL], Energy Transitions Initiative). The total electricity capacity in 2019 stands at 534 MW, with 345 MW from non-renewables and 189 MW from renewables. Latest statistics also show a total generation of 1870 GWh (IRENA Energy Profiles).

Suriname has a target of 20%, 28% and 47% renewable electricity generation to be reached by 2017, 2022 and 2027, respectively. Since 2014, it has been recognized as a carbon negative economy, which simply means that any global warming gasses produced are usually offset by its natural resources, which absorb these gases.

In its Nationally Determined Contributions (NDCs), sustainable and clean electricity is a priority. The country aims to maintain the share of electricity from renewable resources above 35% by 2030. It is also focused on climate-smart farming, which includes water resource management, promotion of sustainable land management, and adoption of innovative technologies—conversion of biomass into energy.

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