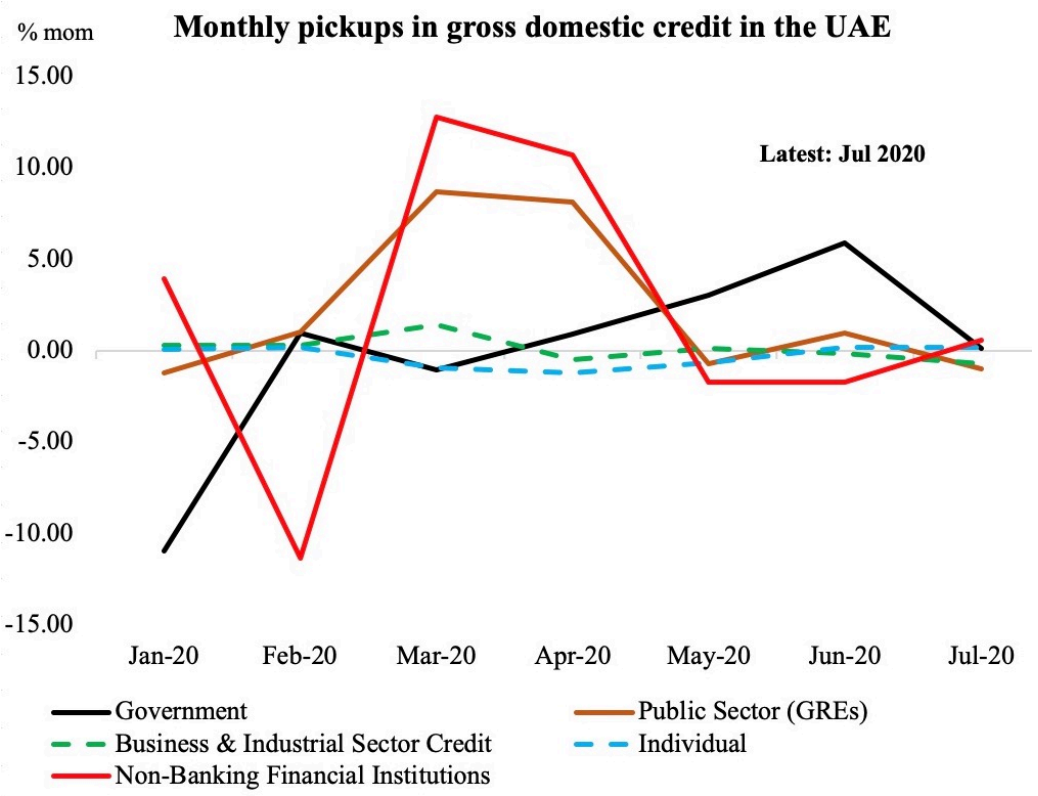
Weekly Insights 29 Sep 2020: Supporting the recovery of UAE's private sector (focus on SME finance)

[This is an edited version of the post issued originally on 29th Sep; Table 1 & related text have been updated]

Supporting the recovery of UAE's private sector: focus on SME finance

To support the UAE economy in the backdrop of Covid19, the central bank (since Mar 2020) has rolled out a number of measures including liquidity injection via loosening of banks' capital requirements, loan repayment deferrals and the Targeted Economic Support Scheme (TESS) among others. According to the UAE central bank, as of end-Jul, banks and financial institutions had availed AED 44.72bn worth of interest-free loans (89.44% of total) as part of the TESS facility. It needs to be highlighted that banks used close to 95% of these funds towards postponing loan payments for the affected sectors. It was also disclosed separately that 300k individuals, 10k SMEs and more than 1500 private sector firms had used the economic stimulus.



Source: UAE Central Bank, Nasser Saidi & Associates

The latest data from the UAE central bank shed some light on the broader credit movements: the accompanying chart shows the monthly changes in gross domestic credit. The dotted lines are credit to businesses and individuals (the private sector) which show no substantial increases – in fact, it increased by an average 0.9% year-to-date (ytd) for businesses and dropped by 2.1% ytd for individuals. The uptick in lending to the public sector (government related entities) and government have been discussed previously here and here, but the non-bank financial institutions (which include private equity & venture capital firms, other investment firms, alternative asset managers, insurance firms and others) has also witnessed a 11.8% rise in credit ytd. There is not much visibility of the activities of NBFIs in the UAE (in terms of publicly available data), and it is not clear if the SME customer segment, important for recovery, was catered to (via consumer finance, SME financing & credit card products, to name a few).

However, at the risk of sounding like a broken record, the question is whether the package has achieved its goal of supporting the economy or whether it resulted in a crowding out of the private sector (businesses and individuals) in favour of the government, public sector & also the financial

institutions? The UAE central bank's latest quarterly report does mention that MSMEs (Micro, Small and Medium Enterprises) benefitted from the economic package – highlighting the 10.4% yoy increase in lending in Q2 this year. But, at the end of the day, share of SME lending in total domestic lending was at 5.7% in Q2 (Q2 2019: 5.6%), lower than 5.9% share as of end-Q1.

Table: Bank lending to MSMEs in the UAE

in AED bn, unless specified	Dec-19	Mar-20	Jun-20	% qoq (latest)	% ytd
Microenterprises	11.4	10.9	10.5	-3.7%	-7.9%
Small enterprises	28.2	29.4	29.6	0.7%	5.0%
Medium enterprises	49.9	53.1	52.3	-1.5%	4.8%
Total lending to MSMEs	89.5	93.4	92.4	-1.1%	3.2%
Total lending to private sector	1134.6	1148.9	1139.4	-0.8%	0.4%
Total domestic lending	1592.6	1595	1626.9	2.0%	2.2%
Share of MSMEs as % of private sector lending	7.9%	8.1%	8.1%		
Share of MSMEs as % of domestic lending	5.6%	5.9%	5.7%		

Source: UAE Central Bank, Nasser Saidi & Associates

Additional data is beneficial: the tables below provide more details of bank lending to the MSMEs, segregated by micro, small and medium enterprises[1]. Within the MSME segment, as of end-Q2, the largest share of loans was disbursed to medium-sized firms (56.6%) and close to 1/3-rd to the small enterprises.

The number of MSMEs in the UAE have increased by 3.9% qoq to 124,935 as of end-Jun – not surprising given the central bank's mandate of reduced duration for opening new SME accounts (all banks need to open accounts for SME customers within a maximum timeframe of two days, provided documentation and AML/CTF obligations are met). The number of accounts in the micro- and small segments increased by 4.6% and 5% qoq in Q2. Nevertheless, if we consider the amount disbursed per firm, medium enterprises pocketed AED 1.76mn in Q2: this is 3.7 times the amount disbursed per small firm and more than 5.3 times the amount disbursed to microenterprises.

Table: Number of MSMEs accounts at banks operating in the UAE

	Mar-20	Jun-20
Microenterprises	30625	32021
Small enterprises	60150	63147
Medium enterprises	29137	29767
Total MSMEs	120272	124935

Source: UAE Central Bank, Nasser Saidi & Associates

The results are quite eye-opening, but not surprising (unfortunately): the GREs have benefitted in terms of the pace of overall domestic lending during the Covid19 period (remember that many of these firms are part of the sectors most affected by the pandemic!) and while lending to the SMEs has been dismal, within the SMEs, the medium-sized firms have benefitted the most. Considering how significant SMEs are to the UAE[2], it is imperative that financial institutions support them to bring the economy back on track. Some of the policies rolled out by the central bank had a 6-month deadline, and since no announcements have been made (yet) regarding extensions, anecdotal evidence points to banks winding down loan repayment deferrals and similar policies (for businesses/ individuals).

With the economy not yet back on the pre-Covid19 track, and the central bank's own call of a 4.5% decline in non-oil GDP this year, targeted policy stimulus measures need to continue. With rising indebtedness of both individuals (due to job losses or pay cuts) and businesses (directly and indirectly affected by Covid19), there are likely to be spillovers into the financial sector via rising non-performing loans.

Furthermore, as companies wind down operations in the near- to medium-term, nascent insolvency and bankruptcy frameworks in the UAE are likely to be tested. According to the World Bank Doing Business 2020 report's resolving insolvency sub-category, the UAE's recovery rate was 27.7 cents on the dollar (vs OECD high income nation's average of 70.2 and MENA average of 27.3), at a cost of 20% of the estate (vs 9.3 in OECD and

14% in MENA), taking 3.2 years to resolve (vs OECD's 1.7 and MENA's 2.7)[3]. However, the strength of the insolvency framework – given recent but untested legislation – stood at an impressive 11 (out of a total score of 16; compares to the OECD average of 11.9 and higher than MENA's 6.3).

Support of the private sector is critical for economic recovery

To provide adequate ongoing backing to the private sector (including the SMEs) is essential. What policy measures need to be in place? (a non-exhaustive list)

- Banking sector continues to support the private sector via reduced bank charges and fees, reduction in minimum balance requirements, zero-interest instalment plans etc.; of course, banks' compliance/regulatory departments need to ensure that firms they lend to follow practices of good financial reporting and governance.
- Limited funding to SMEs from the banking sector is likely to continue, given the current status of opaque information/ reporting/ data. Lack of collateral and issues of transparency are oft-cited constraints to SME lending in the region. The recently announced *credit guarantees* for loans to SMEs is likely to provide support and if successful, could be continued at a nominal rate. Open lines of communication with the credit bureaus can help manage credit risks and ease SME's access to credit. Two ways to resolve the issue of collateral: 1. Expand the nature of acceptable collateral to both movables and immovables; 2. Establish transparent, blockchain-based collateral registries/ platforms. Furthermore, an SME rating agency (like in India) could provide additional information to lenders. Resolving this constraint alone could kickstart a new wave of entrepreneurship in the country.
- Backing from the government can come via a simple move

like reducing the cost of doing business (various free zones have reduced fees and related charges for a short period) or ensuring no payment delays or boosting specific sectors (Abu Dhabi's recent announcement to develop AgriTech) or through a wider mandate by instructing the various sovereign wealth funds to invest in local companies, through a dedicated fund, based on best practices.

- Leapfrog on the massive changes Covid19 has brought about in the adoption of technology: varied e-commerce offerings, such as helping SMEs establish interactive websites, to creating innovative payment systems to neo-banking options. Alongside embracing the technology and greater digitalisation, it is necessary to also invest in and create the right ecosystem (bringing together the necessary skillset, retraining existing employees, reducing set-up and ongoing/ recurring business costs etc.).

[1] The UAE central bank expanded the definition of SMEs so that a larger segment will be in a position to qualify for SME lending.

[2] According to Ministry of Economy, the SME sector represents more than 94% of total firms operating in the UAE, accounting for more than 86% of the private sector's workforce. In Dubai alone, SMEs make up nearly 95% of all companies, employing 42% of the workforce and contributing ~40% to Dubai's GDP.

[3] https://www.doingbusiness.org/content/dam/doingBusiness/country/u/united-arab-emirates/ARE.pdf

How Can the UAE Minimize Vulnerability to the Next Crisis, Article in the Dubai Policy Review, Jan 2019

The article, "Breaking the Cycle: How the Great Financial Crisis Can Prepare Us for the Next One", written by Dr. Nasser Saidi for the inaugural issue of the Dubai Policy Review (published in Jan 2019) can be downloaded in both English and Arabic.

Breaking the Cycle: How the Great Financial Crisis Can Prepare Us for the Next One

"It takes all the running you can do to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that"

– the Red Queen in Through the Looking Glass by Lewis Carroll

What can policymakers learn from the painful times of the Great Financial Crisis (GFC) that hit the region hard a decade ago?

This article examines the economic landscape in the UAE prior to the Great Financial Crisis (GFC), the factors leading up to the crises, and the ongoing economic & financial policies that must be addressed to minimize economic downturn in the future.

It extracts lessons and recommends responses to remedy identified policy gaps and fortify economic development while striding towards the future. Economic diversification, digitalisation, strengthening monetary and fiscal policy toolboxes, improving STEM education and looking East in foreign trade and investment strategies, are a few critical responses identified. These policy responses provide valuable lessons for policymakers across the region, while preparing for uncertain economic times in a region going through socio-economic and geopolitical turbulence.

A Decade Ago..

.. the Great Recession and the Great Financial Crisis (GFC) reverberated globally, with its destructive waves enveloping both advanced and emerging economies. Ten years later, the global economy is yet to fully recover, with the financial sector facing a debt bubble generated by ultra-loose monetary policy, historically low interest rates and quantitative easing (QE). The aftermath has seen sovereign states, corporations, and households build up debt in excess of $250 trillion worldwide. The Gulf Cooperation Council (GCC) countries were not immune to the Great Recession and the GFC, left vulnerable and exposed through their large foreign direct and financial investments, and the oil market. Despite being the most diversified economy among its GCC counterparts, the United Arab Emirates still experienced a major hit from the sudden downturn. Ten years on, it remains oil-dependent and vulnerable to financial and oil market shocks. Oil exports and revenues in 2017 accounted for an estimated 34 percent of total exports (excluding re-exports) and 43 percent of government revenues, while the sovereign wealth funds (ADIA, DIC, Mubadala and others) are directly exposed to international financial market risks. Given the size of the oil sector and the dependence of government funding and spending on oil revenues, the economy of the UAE, is sensitive to commodity price shocks: boom-bust cycles driven by oil

price volatility, as evidenced by the high correlation between oil prices and real economic activity.
In addition, the Dubai development model, which is partly dependant on a “build-it-and-they-will-come” attitude to economic development, is subject to real estate and housing induced business cycles. Evidence of this can be found in the aftermath of the GFC and in the current downturn since 2016. Given the UAE’s exposure to international as well as region-specific and domestic shocks, are there lessons that can be learned from past crises? What policy adjustments are required to mitigate the risks of another crisis?

Exuberance, the 2008-2010 crisis and aftermath

Prior to the Great Recession and the GFC crisis, the Dubai/UAE economic development model was based on supportive demographics driven by a liberal policy of international labour mobility and high domestic population growth. The UAE economy also depended on investment in infrastructure – such as ports, airports and logistics – that facilitated international economic integration and development of the services sector (retail, trade and tourism). Business friendly policies, as well as an industrial policy based on economic clustering embodied in a multitude of Free Zones allowing 100 percent foreign ownership, with low or no taxation, resulted in large foreign direct investment flows, competition and economies of scale and economies of scope (generating a wider variety of goods and services). High population growth fuelled the construction industry, the real estate, housing and retail sectors as well as health and education to serve a young, fast-growing consumer base. Dubai’s economic growth, with its low direct dependence on oil (about 1% of GDP), was supported by a high contribution from its services sector – trade, retail, hospitality, tourism and transportation. Liberal domestic economic policies, along with political and macroeconomic stability, benefited from a supportive global

environment of the “Great Moderation”, of decreased macroeconomic volatility and reduced volatility of business cycles. Altogether, this resulted in a dynamic business environment and high growth rates. Investors, businesses and consumers were exuberant – but vulnerabilities were building. Buoyant economic activity, supported by the oil price boom of 2003-08, rising consumer and investor confidence, and abundant liquidity led to credit growth, inflation, and asset price inflation, including real estate. But, investor exuberance and ‘animal spirits’ faced legacy institutional and policy vulnerabilities: an absence of a fiscal and monetary framework and policies geared at economic stabilization; an absence of coordination and lack of guiding strategy on foreign investment by State Owned Enterprises (SOEs) and Government Related Enterprises (GREs); a real estate market bubble financed by foreign borrowing (in US dollars); and absence of centralized oversight and control over foreign borrowing by SOEs & GREs and the absence of a public debt policy and management. The stage was set for a domestic economic and financial crisis. At the onset of the GFC in 2008, banks in the Middle East, and more so in the GCC, were not highly leveraged and did not have any direct linkage or exposures to the US sub-prime crisis which triggered the GFC. Financial instruments like mortgage-backed securities (MBS), collateralized debt obligations (CDOs), collateralized loan obligations (CLOs) and other instruments that became toxic assets, were absent from the local markets. Though the UAE banks were adequately capitalized and profitable, the fast pace of growth of personal, consumer and real estate loans, along with the uncertain outlook for asset prices in the UAE were worrisome signs alongside growing concerns about counterparty risk. Real, inflation adjusted, average credit growth was a blistering 26 percent a year during 2003–08 fuelling growth and the accompanying real estate bubble. Credit to the private sector rose by 51 percent year-on-year by Sep 2008, up from 40 percent in December 2007, driven by the economic boom and highly negative real interest rates –

with credit, financed by strong deposit growth and large foreign borrowing in 2007. On the corporate sector side, the boom was associated with a sharp rise in leverage, including inter-company and supplier debt, increasing the sector's vulnerability to funding availability, rollover risk and cost. Eventually, the bubble burst. Project cancelations, postponements and amendments amplified in the fourth quarter of 2008 and first quarter of 2009. About $39 billion of GCC debt (half from the UAE) was maturing, to be repaid or refinanced in 2009, at a time when liquidity had evaporated from the international and regional markets.

Twin Oil and Financial Shocks

The collapse of oil prices accompanying the GFC and the Great Recession was a twin shock, both economic and financial. The oil price shock directly impacted government and export revenues and the current account, with a spill over and an direct impact on financial market, banking and corporate liquidity. Funding costs jumped as speculative capital inflows reversed and investor confidence collapsed. Asset prices plunged, and when the Nakheel/Dubai World issues surfaced in Q4 2008, Dubai's CDS rates (credit default swaps) skyrocketed, trading at nearly 2000, while Saudi Arabia's rates were at 125. Pressures on bank funding and liquidity led to tight credit conditions. Dubai was engulfed in the GFC tsunami. What followed, with a lag, was the rollout of short-term policy measures including deposit guarantees, monetary easing and injection of liquidity which helped stabilize interest rates and liquidity conditions, alongside medium-term measures like real estate regulations geared to countering leverage and speculation. Ultimately, the crisis highlighted vulnerabilities related to the unsupervised leverage and foreign borrowing of SOEs and GREs, classical asset-liability mismatching, banks' exposure to asset markets and their growing dependence on foreign correspondent bank financing, and a general weakness in their liquidity and risk management

frameworks. It also exposed instances of weak regulatory and supervisory frameworks and enforcement at both banks and non-bank financial institutions. The crisis also brought to the forefront the need for greater government revenue diversification, given the macroeconomic and systemic risks of high dependence on volatile oil revenues. Last, but not least, the crisis uncovered the near absence of sound corporate governance practices and transparency, especially in the case of SOEs and GREs.

The ‘New Oil Normal’ Crisis

Oil prices have dipped from the three-digit heights of 2014 to as low as $30-40 per barrel in the past few years before a partial recovery in 2018. This “New Oil Normal” reflects new realities: technology and high oil prices have driven improving growing global energy efficiency (energy/GDP ratios are falling), COP 21 policy commitments are changing the energy mix away from fossil fuels, while disruptive technological innovations are making shale oil and gas, along with renewable energy sources like solar and wind, directly competitive with fossil fuels. In short, both demand side and supply side factors imply downside risks for oil prices, despite short-term supply disruptions due to geopolitical developments or attempts by OPEC to limit production, including through unsustainable non-OPEC alliances. Over the medium and long-term, the UAE and other oil exporters run the risk of owning stranded fossil fuel assets, which are not economical to exploit. Developing and investing into higher value-added uses of oil & gas, downstream activities, and privatization through the public listing of energy assets should be part of a national fossil fuel de-risking strategy.

Pro-cyclical fiscal policy exacerbates oil price boom-bust cycles

Oil boom-bust crises, including those in the UAE, were

exacerbated by the pro-cyclical fiscal policies followed by oil exporters: driven by a balanced budget policy stance, governments tend to increase spending when oil prices are high and scale back spending when prices dip. This has direct and spill over effects on the non-oil sector (in particular infrastructure, construction, real estate) which experiences a slowdown in economic activity. The current mix of monetary tightening due to the 'normalization' of US monetary policy and the onset of Quantitative Tightening (QT) and fiscal austerity directly conflicts with the need to conduct a counter-cyclical stabilization policy. In order to adjust to the New Oil Normal, the policy mix should be changed to one that is monetary easing with lower interest rates along with fiscal stimulus, combined with structural reforms. However, monetary policy is constrained by the tight peg to the US dollar and the classical policy trilemma: you cannot simultaneously have monetary policy independence, fixed exchange rates and freedom of capital flows. The downside risk for oil prices weighs on the growth prospects for oil exporters, making greater economic diversification a policy imperative and requiring structural policy reforms and enabling and supportive fiscal policy.

Economic Diversification is a Policy Imperative

Economic diversification leads to more balanced economies and is crucial for more sustainable economic growth and development. For the UAE (and other fossil fuel exporters), diversification is critical to reducing exposure to the volatility and uncertainty of the global oil market and related boom-bust cycles. Greater diversification is needed across three dimensions: structure of production (supporting the non-oil private sector), trade (developing non-oil exports) and at the fiscal level (diversifying sources of revenue). A successful diversification strategy would: re-orient the economy towards more knowledge based and

innovation-led activities (including higher value-added in the energy sector), raising productivity growth and creating new jobs; directly support greater private sector activity, including in the tradable sector; provide more sustainable public finances that are less dependent on revenues from natural resources; generate greater macroeconomic stability and gradually de-risk fossil fuel assets through gradual privatization and divestment in the financial markets.

Economic policy and Reform: Minimizing Vulnerability to Next Crisis

Build local currency financial markets and develop a counter-cyclical fiscal policy toolbox for economic stabilization to allow for deficit financing, along with the institution of fiscal rules for long-term fiscal sustainability. A major lesson from the GFC and from the Asian crisis, is the danger of over reliance on foreign currency bank financing for cyclical sectors like housing, real estate and long gestation infrastructure investment. The UAE needs to focus on developing local currency financial markets starting with a government debt market to finance budget deficits, infrastructure and development projects, along with a housing finance/mortgage market. Market financing for infrastructure and development projects is more appropriate for longer-dated investments than bank financing.

Unification of local financial markets. There are three operational financial markets in the UAE – the Abu Dhabi Securities Exchange, the Dubai Financial Market, and Nasdaq Dubai in the DIFC. These fragmented markets should be consolidated to create a deeper, broader, and more liquid and active market, regulated and supervised by an Emirates Capital Markets Authority.

Establish a modern and credible legal and regulatory financial infrastructure. Enhance debt enforcement regimes by decriminalizing bounced cheques and building the capacity of the courts; develop insolvency frameworks to support out-of-

court settlement, corporate restructuring and adequately protect creditors' rights. Introduce laws to facilitate mergers and acquisitions, as well as securitization to support the development of asset backed and mortgage backed securities and other structured debt instruments.

Develop a counter-cyclical fiscal policy toolbox for economic stabilization. This requires reforming the budget law framework, inherited from colonial days, to allow for deficit financing, along with the institution of fiscal rules for long-term fiscal sustainability. Given the recent passage of the UAE Federal Debt Law, the government should accelerate the set-up of the public debt management office.

Favour greater exchange-rate flexibility and monetary independence. The peg to the US dollar has exacerbated the negative impact of pro-cyclical fiscal policy. While the policy peg gives the UAE dirham policy credibility, it has prevented real exchange rate depreciation and fails to reflect the deep structural changes in the UAE's economic and financial links over the past three decades – particularly the shift away from the United States and Europe and toward China and Asia. The timing is opportune to move to a peg to a currency basket including the euro, Yen and Chinese Yuan, along with the US dollar.

Trade policy reform to adapt to the new global economic geography. Given the global shift in trade and investment patterns towards emerging markets and Asia, the UAE (with or without the GCC) should aim to negotiate trade and investment agreements with Asian countries (China, India, ASEAN-Plus-Six) as well as the COMESA countries. India is the UAE's largest trading partner, while China is the strategic economic partner going forward (notably in light of the recently announced $10 billion UAE-China investment fund and the win-win potential from participating in China's Belt & Road initiative).

Labour market reforms. The UAE has taken the first steps towards creating a more efficient labour market with the establishment of visas for part-time work/internship/apprenticeship and long-term residence rights

(for selected professionals). The next steps would be permitting greater labour mobility, as well as flexible hours and the ability to work from home facilitated by modern technology. Abolishing the Kafala system may not be realized anytime soon, but is a necessary and important structural reform to retain expatriate human capital. The other major reform is continuing to break down the barriers to the economic participation and empowerment of women.

Education market reforms and building knowledge human capital. The educational system continues to focus on preparing students for public sector jobs, with a persistent skill mismatch and low educational quality compared to market requirements. Though spending per capita is high and student-teacher ratios are comparable to OECD levels, the outcomes are not strong. The PISA scores, for example, reveal that UAE students are placed 47th in math, 46th in science, and 48th in reading. Radical modernisation of education curricula is essential for creating a 21st century able workforce. It is time to invest in 'Digital Education-for-Digital Employment', vocational, and on-the-job training. Increasingly the focus should be to promote STEM (Science, Technology, Engineering and Mathematics) – especially given the official policy focus on innovation and a shift to the digital e-economy and -services in the UAE and the region.

Competition and liberalisation of rights of establishment: Effective implementation of the new Investment Law (2018) to remove barriers to FDI by allowing 100 percent foreign ownership and the protection of property rights would galvanise the benefits of competition. It would encourage expatriates to invest locally, reducing the outflow of capital and remittances. Dubai's free-trade zones are a testament to the success that comes with liberalization and the removal of barriers to foreign ownership and management. Permitting companies in the free zones to also operate in the "domestic economy" would stimulate investment and create jobs. Some companies have completed this transition, given recent regulatory changes in the DIFC, DED, and more recently in Abu

Dhabi. Phasing out of the commercial agency system needs to be the obvious next step.

Digital transformation: The UAE has been the first mover in the region in embracing new digital technologies, including Blockchain/DLT (Distributed Ledger Technologies) and Artificial Intelligence. However, the Blockchain/AI movement needs regulatory support with the passage of enabling laws to facilitate AI, Blockchain, Big Data, and related technologies. Integrate and link public and private sector e-services databases through Blockchain (similar to Estonia's X-Road). Leap ahead by teaching coding in kindergarten, to securing digital identities for every citizen and resident, allowing an "e-citizen" programme, an "onshore" Fintech regulatory sandbox, and eventually a UAE Digital Currency to facilitate digital transacting. Supporting and financing start-ups with incubators and accelerators and co-investing with the private sector (seed, VC, Angel and PE investors) would help drive the UAE's digital transformation. Digitalisation also requires broad, deep, unencumbered and cheap access to digital highways: the telecoms sector should be open to competition both in the backbone and in services. China provides a good example of what can be achieved.

New energy & industrial policy: the UAE should rapidly diversify its energy mix by ramping up investment in clean energy (wind and solar) and technology (including desalination) which can become the basis of a new export industry. This frees up oil for export and contributes to decarbonisation and reducing pollution levels. Diversification should be private sector based to create new jobs. This requires liberalisation and competition for SOEs and GREs and establishing the legal and regulatory framework needed for privatization and public-private partnerships (PPPs). Privatization and PPPs in infrastructure, new and old energy, health, education, transport, telecoms and logistics would could attract massive domestic and foreign investment. Similarly, SWF investment strategy should shift to further support economic diversification policies and co-invest with

domestic and foreign investors in new technologies and innovative sectors including clean energy, robotics, AI, Blockchain/DLT, Machine Learning, Fintech, and related tech.

Principles of Stabilization in Turbulent Times

Arab countries and oil and natural resource based economies face multiple economic, geostrategic, and climate change challenges as they seek to adapt and integrate into a rapidly changing global economic landscape and geography. The high level of dependence of both oil exporters and oil importers on oil revenues and oil assets poses an existential risk. The "New Oil Normal" and global move to decarbonisation imply permanently lower real oil prices and the risk that oil assets become stranded assets, with marginal economic value, in the absence of new innovations and new, clean, uses for fossil fuels. The UAE's experience and economic diversification achievements provide a broad policy framework for Gulf oil producers. However, there is no 'one-size-fits-all'. Moving forward, five principles should guide strategists and policy makers: (i) Economic diversification is a strategic imperative encompassing production, trade and government revenue diversification; (ii) Facilitate and enable the rapid digitalisation of the economy and society by, among other, removing barriers in the telecoms sector; (iii) Pivot policy towards emerging economies, towards India, China, ASEAN and the COMESA countries through innovative trade and investment agreements. The UAE and the region needs to participate in the new global value chains emerging from the Belt & Road and its ramifications. (iv) Education curricula require radical reform towards STEM and enabling 'Digital Education for Digital Employment'. (v) Develop a modern economic – monetary and fiscal – policy toolbox allowing policy makers to undertake economic stabilization and counter-cyclical measures.

"Central Bank Governance: Looking Back, Looking Forward to Disruption & Transformation", Keynote Presentation at the IMF-Hawkamah Central Bank Governance Forum, 28 Jan 2019

Dr. Nasser Saidi presented the opening keynote at the IMF-Hawkamah Central Bank Governance Forum held in Dubai on 28th Jan 2019.

Titled “Central Bank Governance: Looking Back, Looking Forward to Disruption & Transformation”, the presentation looked at lessons learned from past crises, and identified the need to look forward to plan and manage disruption and transformation. Focusing on the new global economic and financial geography, the talk identified some key implications for central bank governance, including from recent trends in technological disruption and transformation.

Click here to download the presentation.

Speaker at the Arab Strategy Forum, 12 Dec 2018

Dr. Nasser Saidi participated in the Arab Strategy Forum, held in Dubai on 12th December 2018.
Part of the panel session discussing the State of the Arab World Economy in 2019, Dr. Saidi spoke at length about the volatile prospects for oil market, impact of US-China economic war, and how the risks of a new global financial crisis in 2019-2020 are rising (thanks to global debt, high interest and low growth rates).
Below are some key quotes from the panel session:
"Arab countries should focus on digitization because it is the future of the world, infrastructure, and work to transform our economies into digital economies"
"The economic war between China and America – the two biggest engines of growth globally – goes beyond just trade & will negatively affect the world"
"Renewable Energy policies should be a priority: need to invest in it and export it abroad"
"The Arab region needs new trade & investment agreements to reflect the shift in trade partners- "pivot East & South"

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Trends in trade and investment policies in the MENA region: Policy Brief prepared for the OECD MENA-OECD Working Group on Investment and Trade, Nov 2018

The **MENA-OECD Working Group on Investment and Trade**'s 2018 meeting was held in Dead Sea, Jordan on 27-28 Nov, 2018. *(More: http://www.oecd.org/mena/competitiveness/investment-and-trade.htm)*
A policy brief titled "Trends in trade and investment policies in the MENA region" was prepared by Nasser Saidi & Associates to aid discussions during this meeting.
The executive summary is shared below; the paper can be downloaded here.

Executive summary

The Middle East and North Africa (MENA) region accounted for only 5% of global exports and 4.3% of total imports in 2017. Merchandise exports from the MENA region to the rest of the world stood at 893bn USD in 2017 (up from just under 250bn USD at the start of this century). MENA countries are particularly vulnerable to terms-of-trade shocks because of the volatility of their export earnings, caused by the high concentration of exports in primary commodities and exacerbated by the high

concentration of export markets. The region can achieve greater economies of scale if each country can better use its comparative advantage through production sharing networks and integration into global value chains.

There has been a significant shift in the region's trade patterns toward Asia over the past few decades. Asia now accounts for about 55% of the region's total trade compared to around 40% in 1999. **Regional trade remains dismal at under 10%.** MENA oil importers' share of trade within the region remains relatively high: Lebanon (44% of total exports in 2017) Jordan (43%), and Egypt (22%). Maghreb countries export the least within the region (under 10%), with much of their exports going to Europe.

FDI inflows into the region increased between 2000 and 2008, thanks to efforts to improve the business environment and investment climate and to related structural and institutional reforms. Slowdown appeared after the financial crisis in 2008 followed by regional turbulences, with limited recovery. **In 2017, investment flows into the GCC were 15.5bn USD, almost 3.5 times lower than in 2008 at their peak.** The bulk of FDI inflows into the region have gone into energy, real estate, financial services and consumer products.

Overall, the MENA region remains less regionally integrated in terms of trade and investment flows. **The main barriers to growth in trade and investment (including intra-regional) are multi-fold**:

- Though average tariffs have reduced over time, they remain very high; non-tariff barriers (e.g. burdensome technical regulations, import authorisation procedures, cumbersome customs clearance and border controls) are obstacles to both regional and global integration;
- MENA's trade facilitation performance – in terms of procedures, harmonisation, transparency, border agency cooperation and so on – leaves much to be desired;
- Though regional trade agreements are in place, their implementation and enforcement are lacking and benefits

are not visible;
- Lack of diversification is a serious drawback, given that oil and agricultural products remain by far the most important exports;
- Regional economic integration has seen very little progress due to different factors including weak institutions, the lack of infrastructure and state-owned enterprises;
- Cumbersome licensing processes, complex regulations and opaque bidding procedures create both business and investment barriers;
- Competition legislation is particularly needed in countries where markets are highly concentrated and where barriers to imports are still high;
- Trade has been negatively affected by the wars, sanctions and political barriers in the region; and
- The scarcity of quality data and statistics on both domestic and foreign investment means a lack of evidence-based public policy and increases perceived investment risk.

While the region has undertaken significant reforms to support trade and investment – ranging from lowering tariffs to improving infrastructure to protecting minority investments to institutional investment reforms – it is evident that there is **a long way to go for greater trade integration. In this context, it is recommended that the MENA region**:

- Invest heavily in trade-related infrastructure and logistics;
- Deepen intra-regional trade through trade facilitation;
- Invest in moving towards greater digital trade facilitation;
- Use GCC countries as engines of economic integration;
- Reflect the shift in trade partners in new trade and investment agreements;
- Improve legal and institutional framework to support

private sector growth and diversification
- Make a digital transformation in order to support trade and investment: from transport (electric vehicles), to banking and financial services (Fintech), commerce (e-commerce), to health and agriculture (Agrytech), and the government sector ;
- Ensure the availability, harmonisation and dissemination of regular, timely, comparable and quality statistics, which are essential to conduct sound trade and investment policies.

MENA-OECD Working Group on Investment and Trade meeting, 27-28 Nov 2018

Dr. Nasser Saidi participated in the MENA-OECD Working Group on Investment and Trade meeting held over 27-28 Nov 2018 at Dead Sea, Jordan.
Titled "Making trade and investment policies work for all", the meeting's first panel session discussed the state of play of investment and trade trends and reforms in the region in a changing world economy. It also took stock of the global debate on trade and investment, while analysing the impact on regional and national policies of the growing scepticism about the benefits of international economic co-operation, and looking at ways MENA countries and societies can better benefit from trade and investment.
Click here to download Dr. Saidi's presentation which focused on the findings of the policy paper prepared for the OECD titled "Trends in trade and investment policies in the MENA region".

The future of energy: innovation, technology and geopolitics, Panel discussion at Aspen Institute Italia, 3 Jul 2018

Dr. Nasser Saidi participated as a panelist at the Aspen Institute Italia event titled “Il futuro dell’energia: innovazione, tecnologia, geopolitica” (The future of energy: innovation, technology and geopolitics) on 3rd July 2018.

Innovation in the field of energy takes place at various levels simultaneously, resulting in a truly “disruptive” combination: new digital technologies (with the growing role of artificial intelligence and blockchains); “smart grids” that permit an improved and increasingly steady coordination between supply and demand; greater storage capacity (batteries of varying sizes) that will make it possible to overcome the problem of discontinuity among renewable fonts; the availability of low-cost abundant, clean energy (low environmental impact) for people and businesses. With the push toward digital technology generating more rapid transformations, it is not easy to accurately predict the timeframes and means of future efforts; but the direction is quite clear, as is its influence on the daily life of anyone who is going to be using electrical power – i.e. an unprecedented number of persons.

More: http://www.aspeninstitute.it/en/programs/future-energy-i

nnovation-technology-and-geopolitics

Making it Clean: Changing the Global Energy Mix, Article for Aspenia, Jul 2018

The article titled "Making it clean: changing the global energy mix" was published in the latest Aspenia Issue, July 2018, and can be downloaded in English and Italian.

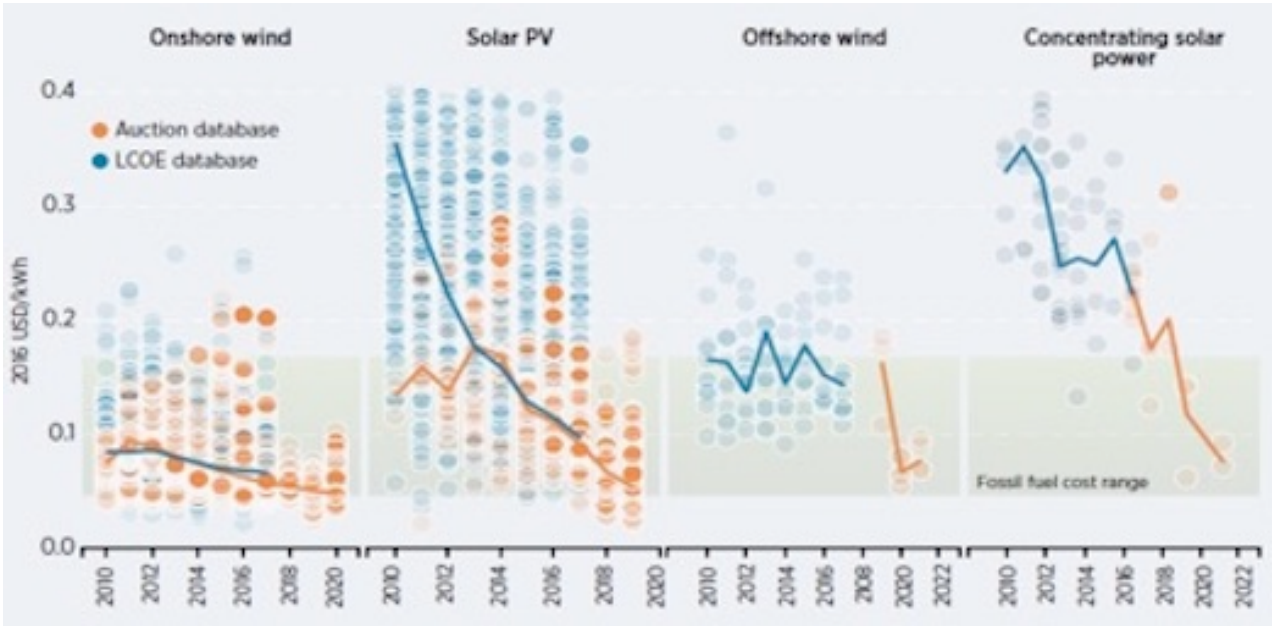
The speed of transition to a new global energy mix has accelerated in the past decade. A changing global economic geography with a shift towards fast growing energy-hungry emerging economies (China specifically) as the main growth engines meant a corresponding increase in energy demand that propelled energy prices upwards. Oil prices hit an all-time high of USD 145 in July 2008 before the Global Financial Crisis, and then later in August 2013 to around USD 115. High oil prices provided an incentive for nations (especially emerging ones that ran high oil trade deficits), households and businesses to find substitutes for fossil fuels and lower energy intensity. The EU provided subsidies for renewable energy investments. Concurrently, the OECD countries implemented energy efficiency policies aimed at energy saving, leading to a trend decline in energy used to GDP ratios by some 1%-2% per annum, and breaking the historical link between economic growth and energy demand.

Two additional factors supported the acceleration in energy transition: technological innovation and growing awareness of climate change risks. Innovation in hydraulic fracturing or fracking techniques to extract "tight oil, resulted in the shale revolution and a rapid growth of on-shore oil production

in the US. Fracking technology has diffused internationally and its cost has declined: the breakeven oil price for new shale oil wells ranges between USD 46-55, while an oil price between $24 and $38 would cover operating expenses in the US.[1] And the shale oil revolution is spreading internationally: Argentina's Vaca Muerta (Spanish for Dead Cow), is a shale gas and oil formation the size of Belgium, with technically recoverable oil reserves and shale gas of 27 billion barrels and 802 billion cubic feet respectively, the second largest in the world after China's 1.12 trillion cubic feet. Technology is changing the economic geography of energy and its global market!

Similarly, technological innovation and investment have dramatically cut the cost of renewable energy. Since 2009, the global benchmark levelised costs of electricity (LCOE) for solar PV has tumbled by 77%, and that for onshore wind by 38%, while lithium-ion battery price index shows a fall from $1,000 per kWh in 2010 to $209 per kWh in 2017[2]. Declining battery costs means falling energy storage costs, which addresses the problem of intermittency of renewable energy. The decline in battery storage costs also means a potential revolution of international trade in renewables-based chemicals and fuels. Government policies to curb climate change alongside technological advances and rapidly falling costs for solar and wind power[3] has meant that renewables are becoming increasingly more competitive, resulting in unsubsidized clean energy world records last year. There is no longer a need to subsidise renewable energy system solutions: global renewable energy prices will be competitive with fossil fuels by 2019 or 2020.

Fig 1: Global levelised cost of electricity and auction price trends for solar PV, CSP, onshore and offshore wind from project and auction data, 2010-2022 *(Source: Renewable Power Generation Costs in 2017, IRENA, Jan 2018)*



There has also been a massive shift in public opinion and awareness of the implications of global warming. Addressing the risks of climate change has become a key policy priority embodied in the COP21 commitments. All nations (except the US Trump administration) have committed to reduce emissions by at least 20% compared to business-as-usual by 2030. The subsequent COP 22, 23 commitments have all seen unwavering support from countries across the globe (ex-Trump's US).

A New Oil Normal

The implication of the above trends is that there will be a permanent and persistent secular downward shift in the demand for fossil fuels, putting downward pressure on oil prices. This is the New Oil Normal. For coal producers & coal based utilities and fossil fuel producers and exporters like the GCC countries, the risk is that their vast coal and hydrocarbon reserves will become 'stranded assets': they will no longer be able to earn an economic return.

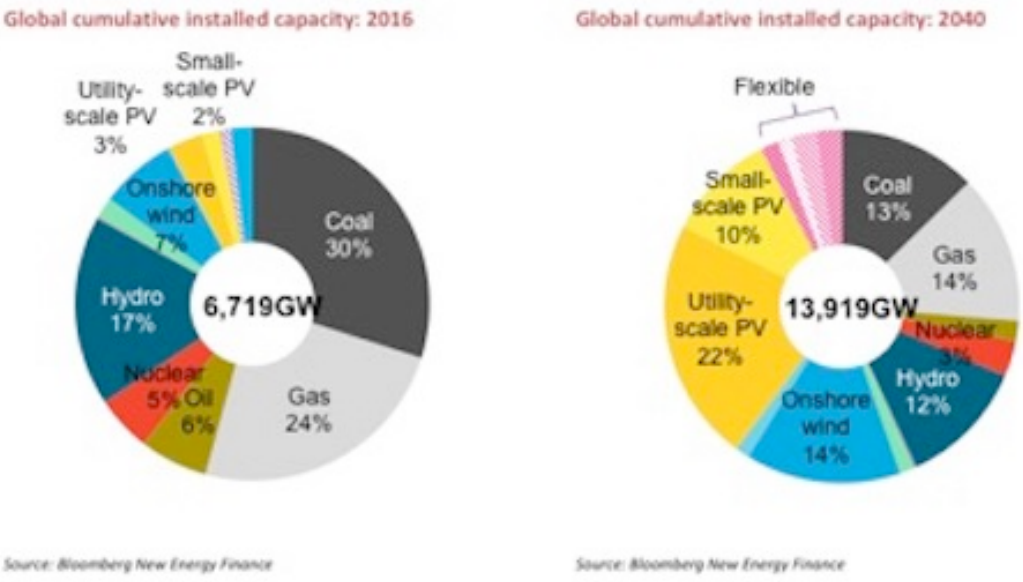
The bottom line is that the increasing prosperity of emerging nations, greater energy efficiency, technological innovation and policy commitments to reduce carbon emissions are resulting in a radical changes of the global energy mix and market. Looking ahead, given their size and demographics China, India and other emerging Asian countries will account for around two-thirds of the growth in energy consumption over

the coming decade, to be followed by Africa. Increasingly, these emerging economies are switching to renewable energy sources, given their economic and environmental competitiveness.

A New Energy World is emerging

New investment in clean energy reached USD 333.5bn in 2017, up 3% from the year before but short of 2015's record-high USD 360.3bn, but higher in real terms. A record 157 gigawatts of renewable power were commissioned in 2017, up from 143GW in 2016, and far out-stripping the 70GW of net fossil fuel generating capacity added last year. Solar alone accounted for 98GW, or 38% of the net new power capacity coming on stream during 2017[4]. A regional comparison shows that the balance of investment has shifted from Europe as largest-investing region to Asia. China set a new record for clean energy investment in 2017, and the UAE was among those investing more than USD 1bn in clean energy along with 10 other emerging nations (from a total 20 countries). And Saudi Arabia announced a massive 200 gigawatts solar power development in the Saudi desert with Softbank that would be world's biggest solar project and would be about 100 times larger than the next biggest proposed development!

Fig. 2, Global cumulative installed capacity, 2016 and projected, 2040 *(Source: Bloomberg New Energy Finance)*



Renewable energy sources are set to repre

sent
almost three quarters of the USD 10.2trn the world will invest in new power generating technology until 2040, with solar and wind dominating the future of electricity (Fig 2). The world is also increasing investments in clean technologies. A transport and mobility revolution (electric vehicles) will lead to cleaner, healthier cities for increasingly urbanised populations. Not just 'smart cities' but also 'clean cities'.

Twin Revolutions: Renewables and AI & Blockchain

We are witnessing the birth of twin revolutions which will conflate: AI and Blockchain technologies are fusing with new energy. AI is supporting the 4th industrial revolution: think energy and water digitization, smart grids, smart meters, "deep learning"[5], demand management (i.e. manage demand response of different devices that run in parallel), and digital asset management (i.e. where machine learning algorithms collate, compare, analyze, and highlight risks and opportunities across a utilities infrastructure thereby providing an opportunity for power companies) among others. Blockchain technology has the potential to offer a reliable, low-cost way for financial and/or operational transactions to be recorded and validated across a distributed network with no central point of authority, leading to a greater decentralization of energy systems.[6] Applications lie across a vast spectrum: digital tokens to reward users for saving energy, adding smart contracts onto a blockchain, asset and inventory tracking, traceability of water, gas & electricity flows & maintenance, data sharing, fraud detection, electric vehicle charging, and so on. Peer to peer energy trading[7] , the ability of neighbouring homes, 'prosumers', to sell solar energy to one another as well as to a shared grid is already being tested.

The challenge to the widespread adoption of blockchain technologies will be to develop an enabling legal and regulatory framework. Country policy frameworks need to be developed to focus on cleantech investments, innovation and

commercial conversion, in addition to 'soft' and 'hard' investments to facilitate and integrate the twin revolutions of clean energy and AI and blockchain technologies.

Clean Energy & Economic Development

Energy, water and basic infrastructure are building blocks of economic growth and development. Some 1.1 billion people, of which some 600 million in Sub Saharan Africa, do not have access to electricity. In the absence of electricity they cannot have access to the internet and the digital economy, digital services, let alone participate in the 4th Industrial revolution. The renewable energy revolution offers a new hope to spur and enable economic development of Africa (with its largely untapped hydro and solar potential), India and Asia, using off-grid power systems and decentralisation that do not require expensive, centrally administered national grids. Renewable energy can be local, at village level.

A Renewable Energy Promise?

The IEA has recently warned that the world is headed for irreversible climate change in five years[8]. It is increasingly unlikely that we will be able to keep global warming below 2°C despite COP commitments. Our best hope is to accelerate the global adoption of intelligent renewable energy systems and clean tech for our cities and transport systems, to rapidly change the global energy mix and mitigate the risks of catastrophic climate change.

[1] See Federal Reserve Bank of Dallas https://www.dallasfed.org/-/media/Documents/research/econdata/energycharts.pdf?la=en

[2] See Bloomberg New Energy Finance (BNEF) https://about.bnef.com/blog/tumbling-costs-wind-solar-batteries-squeezing-fossil-fuels/

[3] IRENA estimates that renewable energy will cost less than fossil-fuel generated electricity by as early as 2020.

[4] http://fs-unep-centre.org/sites/default/files/publications/gtr

2018v2.pdf
[5] Google cut its electricity bill with AI: the DeepMind-powered AI coordinated datacenter tasks like cooling, and led to a 15% improvement in power-usage efficiency in 2016. Source: https://www.greentechmedia.com/articles/read/google-employs-artificial-intelligence-to-cut-data-center-energy-use#gs.SuwB65o
[6] See Exploring the Impact of Blockchain in the Energy Industry http://nassersaidi.com/2018/02/15/exploring-the-impact-of-blockchain-in-the-energy-industry-30-jan-2018/
[7] The Brooklyn Microgrid paroject: http://brooklynmicrogrid.com
[8] https://www.theguardian.com/environment/2011/nov/09/fossil-fuel-infrastructure-climate-change

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Enabling the transformative power of new technologies: Article in The National, 1 Jun 2018

The article titled "Enabling the transformative power of new technologies" appeared in The National on 1st June, 2018 and is posted below. Click here to access the original article.

Enabling the transformative power of new technologies

New technologies are disrupting regulated industries including finance, transport, energy, telecoms, health, defense & government

Technology has often resulted in disruptions (remember typewriters, fax machines, film cameras, desk telephones and floppy disks?) but also supported the process of globalization via digital transformations, cross-border flows of data and information, e-commerce and cloud computing.

New technologies have been disrupting many regulated industries including banking and finance, transport, energy, telecoms, health, defense & government. We now live in a world where the largest movie house no longer owns any cinemas thanks to Netflix, the largest accommodation provider, Airbnb, owns no real estate and where Skype, WeChat and WhatsApp exist without owning any telecom infrastructure.

Blockchain – which has become a buzzword and is associated by the public largely with Bitcoin – distributed ledger technology (DLT) and artificial intelligence (AI) are *general purpose technologies*, with widespread applicability in modern economies.

DLT applications can be used for digital identities of people and companies, maintaining patient records in healthcare, or sale and purchase of real (think property) as well as digital assets, or supply chain like IBMs' fully transparent food system use case for instance. AI will soon become ubiquitous, with applications in national security, data science, business intelligence, healthcare, entertainment and the list goes on.

The UAE's aspiration to support and become a leader in the 4th industrial revolution – with its blockchain and AI strategy – is likely to benefit it to help it transform and diversify its economy. Given its growing digitisation over the past decades, the banking and financial sector is a leading candidate for disruption.

Total global investment in the fintech sector was $122 billion over the past three years, with 2017 alone seeing investments to the tune of $31bn, ,according to Kpmg. The US remains the largest player, accounting for some two-thirds of the

investments, but China is fast catching up in this space. As the fintech grows, increased focus should be on its economic development potential: given widespread availability of smartphones, fintech is an enabler for financial inclusion and access to finance.

The Middle East is a ripe playing field for such initiatives, especially given the relatively high mobile phone penetration: among the *unbanked*, 86 per cent of men and 75 per cent of women have a mobile phone but only 35 per cent of women have a bank account. Not to mention how useful it could be for creating digital identities and thereby allow for access to finance and e-services for more than 15 million Syrian, Iraqi and other refugees and displaced in the region. All of this requires investment in infrastructure and an enabling environment.

Supportive Regulatory Frameworks for New Technologies

Current bank regulatory and supervisory frameworks generally predate the emergence of technology-enabled innovation. As regulators in the region start implementing new supervisory models, it is critical to avoid regulatory barriers to adoption and spread of new technologies, especially those that could stifle innovative ideas, while ensuring consumer protection and financial stability.

To facilitate innovation, regulators across the globe have focused on either building regulatory sandboxes – testing in a controlled environment, with tailored policy options – or developing accelerators or "boot-camps" for start-ups, ending with a pitch presentation, or just enabling an "innovation hub" that acts as a place to meet and exchange ideas. In the region, both the DIFC and ADGM are at the forefront with accelerators and regulatory sandboxes in place.

Given the cross-country applications of the technology like DLT and payment systems, coupled with global growth of some fintech firms, cross-country and cross-sector cooperation is essential between regulators. Ongoing discussions are needed, especially with respect to uncertainties: safeguarding data privacy, digital identity and its impact on the use of financial services, cyber security, compliance with anti-money laundering and countering financing of terrorism (AML/CFT), risk mitigation when there is a technology-governance gap and so on.

While incumbents and new entrants evolve and adjust to the disruptive potential, regulators are themselves starting to adapt within this ecosystem, leading to a branch called regtech. What is regtech? The Bank for International Settlements defines it as “any range of fintech applications for regulatory reporting and compliance purposes by regulated financial institutions. This can also refer to firms that offer such applications”.

Regtech could transform regulatory compliance by reducing its and risk management at financial institutions. It could also facilitate identity management (know your customer for onboarding, AML/ CFT checks) and improve fraud detection. Suptech – technology for supervisors – goes a step beyond and could increase supervisory effectiveness and efficiency. Some examples include algorithmic regulation and supervision (in areas such as high-frequency trading, algorithm-based credit scoring, robot-advisors) or real time supervision (look at the data as it is generated in the regulated institutions’ operational systems) or even moving towards machine-readable regulations. Together, these could result in major paradigm shifts as to how a regulator functions and a major challenge.

Enabling Innovation & Fintech

A new integrated, digital financial world is emerging. The region’s policy makers and regulators should support the burgeoning, innovative start-up culture, rather than being protective of incumbents, which are typically owned by governments and have been shielded from competition. Some guidelines and principles are:

1. Be supportive of technologies like DLT, AI and related innovations, and remove barriers to their use by undertaking a pro-active and regular review of regulatory regimes.
2. Create and support innovation facilitators like hubs, sandboxes, incubators, accelerators. The best practice is to review and create structural mechanisms to enable ongoing market engagements.
3. Coordination, collaboration and communication between domestic regulators is necessary. The emergence of innovations such as digital money, crypto-assets,

initial coin offerings (ICOs), digital financial and non-financial services, requires the development of new regulatory regimes and cooperation & coordination between regulators in different industries, such as telecoms.

4. Build staff capacity and knowledge of regulators and supervisors in the fast-evolving landscape
5. Digital finance has gone beyond cross-border to become borderless. This requires international coordination and cooperation by authorities to monitor macro-financial risks, mitigate of cyber-risks, and the managing of operational risks from third-party providers, such as cloud-based services.

"Blockchain and cryptocurrencies herald the demise of traditional banking", Article in The National, Oct 2017

The article titled "Blockchain and cryptocurrencies herald the demise of traditional banking", appeared in The National's print edition on 18th Oct, 2017 and is posted below. Click here to access the original article.

Blockchain and cryptocurrencies herald the demise of traditional banking

The UAE is leading the way in its embrace of blockchain and

other fintech innovations

The banking world – including central banks and regulators – is being massively disrupted by new technologies: artificial intelligence and machine learning, blockchain, fintech and cryptocurrencies.

Blockchain can enable financial and other transactions to happen in seconds, not days, and drastically reduce infrastructure costs. It is an encrypted, secure protocol for creating trust between contracting or transacting parties without going through a central authority such as a central bank, government or another agency. Blockchain underpins cryptocurrencies such as bitcoin, ethereum, ripple and many initial coin offerings.

The dollar value of the top 10 biggest cryptocurrencies is around US$150 billion, while UBS estimates that blockchain could add as much as $300bn to $400bn of annual economic value globally by 2027. Despite the Mt Gox hacking scare in 2014, that saw around $400 million worth of bitcoins go missing from a bitcoin exchange in Shibuya, Japan, the country's parliament passed a law in April this year making bitcoin a legal method of payment, and the nation's largest banks have invested in bitcoin exchanges.

An increasingly digital world and sharing economy require digital currencies. Paper currency is starting to look like an anachronism, a legacy of a bygone age.

What is a cryptocurrency?

Cryptocurrencies use blockchain decentralised ledger technology (DLT) to let users make secure payments and store value without the need to use their name or go through a bank or a payments company like MasterCard or Visa. The cryptographic function used in blockchain ensures the integrity of the record. Blockchain's distributed public ledger maintains an updated record of all transactions and assets held by currency holders. Unlike mobile payment solutions like M-Pesa, cryptocurrencies provide their own unit of account and payment systems.

Cryptocurrencies such as bitcoin or ethereum allow for peer-

to-peer transactions without central clearinghouses, without central banks and without reference to a national money. They are not the liability of anyone and effectively compete with national currencies.

Faced with such a challenge, central banks across the globe are busily preparing to issue cryptocurrencies. Singapore's Project Ubin is an ongoing collaborative project where the banking industry will explore the use of DLT for clearing and settlement of payments and securities.

Some 20 per cent of surveyed central banks in a recent study by the Cambridge Centre for Alternative Finance indicated that they will be using blockchain technology by 2019, and 40 per cent will have active blockchain applications within a decade.

Cryptocurrencies issued by central banks could either be a type of decentralised digital cash for consumers, or a wholesale tool to streamline settlements of transactions between financial institutions.

The choice is not trivial. Issuing retail digital cash would effectively mean the demise of fractional reserve banking. As Max Raskin and David Yermack noted in a paper for the National Bureau of Economic Research: "A sovereign digital currency could have profound implications for the banking system, narrowing the relationship between citizens and central banks and removing the need for the public to keep deposits in fractional reserve commercial banks."

Commercial banks and stock exchanges could become an extinct species within the next twenty years and monetary policy would have to be radically changed. The laws and regulations of banking, securities markets, credit markets and so forth will need to be radically overhauled to accommodate the disruptive, paradigm shift in technologies.

The UAE is a blockchain leader

Dubai launched its "Blockchain Strategy" last year with the ambition to become the first blockchain government by 2020. By shifting all transactions to blockchain, it plans to save 25 million work hours annually through paperless transactions. The Dubai Land Department this month became the world's first

government entity to adopt blockchain. It records all real estate contracts, including lease registrations, and links them with the Dubai Electricity and Water Authority, the telecommunications system and various property-related bills. Dubai is also preparing to issue emCash, an official state cryptocurrency to make Dubai the world's first blockchain city. Similarly, the regulators of the UAE's financial centres – ADGM and DIFC – are embracing fintech and its underlying technologies. ADGM's Regulatory Laboratory (RegLab), is providing a light-regulation sandbox environment for regional start-ups, one of the first programmes of its kind in the region. Both centres have held global competitions to identify and support innovators in fintech.

A 'Brave New World' is emerging

Blockchain and associated innovating technologies will massively disrupt the economic, banking, and financial landscape, with applications to identity management, smart contracts, securing supply chains, authenticating and assuring both "real" (real estate, art and diamonds) and digital assets (securities and media) and associated intellectual property rights. Stock exchanges could operate at much lower costs or disappear, fraud would become near impossible, accounting, auditing and assurance services could become redundant.

Given blockchain's data integrity, there will be a reduction in systemic risk and operational improvements. This is a wake-up call to our governments, central banks and regulators to embrace the new paradigm or have our economies waste away behind.