Atlantic Council
RAFIK HARIRI CENTER
FOR THE MIDDLE EAST

ECONOMIC RECOVERY AND REVITALIZATION

CO-CONVENERS
SHERIF KAMEL
CHRISTOPHER M. SCHROEDER

A WORKING GROUP REPORT OF THE MIDDLE EAST STRATEGY TASK FORCE

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The Atlantic Council is a nonpartisan organization that promotes constructive US leadership and engagement in international affairs based on the central role of the Atlantic community in meeting today's global challenges.

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FOREWORD

The Middle East is seeing a century-old political order unravel, an unprecedented struggle for power within and between states, and the rise of extremist elements that have already exacted a devastating human and economic toll that the world cannot continue to bear. That is why we, in partnership with the Atlantic Council, have undertaken an effort to seek to advance the public discussion in the direction of a global strategy for addressing these and other, longer-term challenges confronting the region.

To that end, we convened in February 2015 a Middle East Strategy Task Force to examine the underlying issues of state failure and political legitimacy that contribute to extremist violence, and to suggest ways that the international community can work in true partnership with the people of the region to address these challenges. Our emphasis is on developing a positive agenda that focuses not just on the problems of the region, but recognizes and seeks to harness its vast potential and empower its people toward a constructive and solutions-based approach.

Drawing on previous successful bipartisan initiatives, we are pleased to serve as Co-Chairs for this project. We have undertaken this effort together with a diverse and high-level group of senior advisers from the United States, Europe, and the Middle East, underscoring the truly international approach that is necessary to address this global problem and the need, first and foremost, to listen to responsible voices from the region. We all approach this project with great humility, since the challenges facing the region are some of the most challenging and difficult that any of us have ever seen.

Engaging some of the brightest minds in the region and beyond, we organized five working groups to examine the broad topical issues that we see as essential to unlocking a more peaceful and prosperous Middle East. These issues include:

- Security and Public Order
- Religion, Identity, and Countering Violent Extremism
- Rebuilding Societies: Refugees, Recovery, and Reconciliation in times of Conflict
- Governance and State-Society Relations
- Economic Recovery and Revitalization

Over the course of 2015, each of these working groups discussed key aspects of the topic as they saw it, culminating in each case in a paper outlining the individual working group convener's conclusions and recommendations based on these discussions. This paper is the outcome of the working group on Economic Recovery and Revitalization, convened by Christopher M. Schroeder, an author and entrepreneur who has devoted much time to exploring the economic potential of the Middle East, and especially of its youth, who are empowered as never before. We are extremely grateful to Chris for the time and dedication he offered to this project, as well as to Sherif Kamel, Vice President for Information Management at the American University of Cairo, who served as Co-Convener.

This paper represents Mr. Schroeder's and Dr. Kamel's personal conclusions in their capacity as Co-Conveners. While the content and conclusions were greatly informed by the debates within the working group, it is not a consensus document and does not necessarily represent the views of each individual group member. Nor does it necessarily represent our views as Co-Chairs, or those of the Senior Advisers to the project. Instead, this paper is intended as a think piece to spur further discussions of these matters.

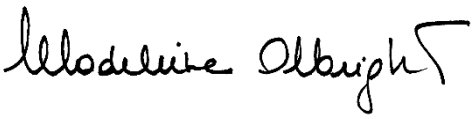
We greatly appreciated Mr. Schroeder's and Dr. Kamel's realistic but hopeful approach to the region, which is too often viewed only through the pessimistic prism of recent events. Mr. Schroeder's enthusiasm for the people of

the region, and the data and examples that inform his and Dr. Kamel's conclusions, tell a story of a region that has the potential for enormous, youth-led economic transformation, driven largely by advances in technology that are now for the first time empowering young people who are eager to learn, innovate, and thrive. Mr. Schroeder's emphasis on entrepreneurship is important not because every person can or should become a small business owner, but because an economy that encourages and enables start-up ventures creates an ecosystem that facilitates other types of productive economic activity.

We especially wish to associate ourselves with the emphasis that Mr. Schroeder and Dr. Kamel have placed on the importance of education reform, and harnessing technology to meet current educational needs. Using creative tools and technology to ensure not only that every student has access to an education, but also an education of high quality and relevance to the needs of a twenty-first-century economy, is essential to a positive future for the Middle East.

We have embraced a number of Mr. Schroeder's and Dr. Kamel's ideas, which will appear in our concluding Co-Chairs' report in 2016. It is our hope that this final report will represent a constructive, considered, and above all, solutions-oriented approach to a region that we see as vital to American interests, global security, and human prosperity. We hope that the broad, collaborative approach we have emphasized throughout this project can serve as a model for future problem-solving on issues of the Middle East. We also hope that our final report will not be an end point, but instead will be the first part of an ongoing conversation amongst the global network of stakeholders that we have assembled for this Task Force.

The situation in the Middle East is difficult but progress is not impossible. It is our desire that this Task Force might serve as the first step toward better international cooperation with the people of the Middle East to set the region on a more positive trajectory, and to realize its incredible potential.



Madeleine K. Albright
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Co-Chair

INTRODUCTION

Even as the specter of political instability weighs heavily on the region, the Middle East is quietly experiencing a technological and societal transformation that could hold the key to a better future. The foundation of this change is based on two powerful components: the rapidly increasing access to technology in the Middle East and the region's comparatively young population, over 30 percent of which are between the ages of fifteen and twenty-nine.[1] The interaction of these two ingredients, combustible as it is, is likely to provide a historic and unparalleled opportunity.

Despite the potential, policymakers poorly understand this interlinked phenomenon of a young, increasingly technologically connected population. While no one can say with certainty what the political or economic situation in Syria, Egypt, or Tunisia might look like in five years, one can predict comfortably that by the year 2020, over two-thirds of people in the Middle East will have an Internet-capable, or "smart," mobile device. Indeed, most Arab countries already have more than 100 percent simple mobile penetration, meaning that people have access to two or more devices or SIM cards. But the potential of a smart device is transformational. A modern smartphone has more processing power than what the National Aeronautics and Space Administration (NASA) had in 1969 when it put a man on the moon. In a matter of only a few years, most people in the Middle East will have that supercomputing power in their pockets. Indeed, in the more developed countries of the Gulf, most already do, and this is a trend that is playing out around the globe.

This means we have entered an era in the Middle East (and globally) that we call a "Participation Revolution," where a new generation not only demands direct roles in their economic, political, and societal futures but also has the capabilities to implement them. Universal access to technology means universal access to the world around them, having the same knowledge at their fingertips as anyone, anywhere, despite borders or social station. A new demographic is sharing ideas and collaborating digitally, creating economic opportunity and empowerment in parts of the world once broadly dismissed by the West as "third." They have less fear of centralized authority and of anyone telling them to "wait a generation" to take on challenges. The phenomenon is strikingly organic. Never has there been greater access to free knowledge and educational tools or greater ability to start and expand a business while affordably reaching a wide base of customers—opening a new era of innovation, entrepreneurship, and economic opportunity.

This report examines how the Arab world can best capitalize on emerging technologies to make its demographic structure a globally competitive asset rather than a political and economic liability. What would have to happen to take full advantage of these changes and to transform existing economic systems? What is required—and how can these tools help—to build a legal, regulatory, and educational ecosystem conducive to new enterprises and attracting investment? What lessons and even advantages might exist as nations like Syria and Iraq one day emerge from conflict and leverage the possibilities to use technology to leapfrog outdated infrastructure and outdated regulation?

While trends highlighted in this paper are indeed transformative and impactful, it is necessary to clearly highlight five caveats.

First, technology is not a silver bullet that solves decades of challenges overnight. At the same time, there are unprecedented tools to help people innovate solutions rapidly and independently. The Participation Generation is impatient and is using these tools within institutions or outside of them regardless. Yet, this unique potential will remain hindered, perhaps untapped, in the absence of responsible governments and stakeholders implementing policies to unleash it. Such absence of prioritization and action also risks ceding best practices in technological capabilities to bad actors.

Second, technology is not merely a tool of the elite. The largest mobile payment country on earth, in aggregate dollars, is Kenya. Sixty-three percent of Kenyans transact regularly through mPesa, a simple way to text money that has allowed a once under-banked society

1 "Youth Movement," *Washington Post*, 2011, http://www.washingtonpost.com/wp-srv/special/world/middle-east-youth-population/.

to move cash across the country.[2] The ramifications on businesses and entrepreneurship, large and small, in simply moving money could not be more significant as existing businesses expand and new ones are created across segments of the market that were previously inaccessible.

Third, this paper treats the entire Arab world as a whole, with a focus on the countries of the Gulf, the Levant, and Egypt. While the region does reflect a strong market potential of over 350 million people with shared language and cultural ties, each country and community has its own unique and rich heritage, ways of doing business, challenges, and opportunities. Notwithstanding, there are a host of lessons that cut across these national borders.

Fourth, this paper will not offer answers as much as a road map to guide policymakers as they contemplate their strategic choices and policies to drive economic growth in this new century. We focus on technology-enabled start-ups as a central engine, but believe all the phenomena we describe here have equal ramifications on creating globally competitive enterprises from small traditional businesses to the largest enterprise. In the twenty-first century, every enterprise will be tech-enabled in some form. In addition, while the significant impact of sustained low oil prices on energy-producing nations is well covered in other studies, we believe this period presents a particular and unique opportunity for economic diversification.

Finally, this paper will offer a caution. We believe that with the rapid increase in global access to technology, and the unprecedented speed of innovation it offers, nations left behind will not only miss this unique opportunity, but face the reality that it will become progressively harder to catch up over time.

This paper's main argument is that the promotion of a culture of entrepreneurship is not just important but the only realistic economic strategy going forward for many countries in the region. The current rentier structure of economies is not going to produce sufficient growth to employ the many millions of youth streaming into the labor force because of the region's demographic bulge. The fall in oil prices will make it difficult for the region's oil producers (and those countries that rely on financial support from them) to provide the kind of social benefits to citizens that have maintained social peace. Entrenched interests have stymied most attempts at limited economic reforms because they threaten the rentier structure of the state.

Only a "big bang" reform focused on creating an economic ecosystem conducive to high-tech entrepreneurship and its broader ramifications across the economy, with the dramatic changes in regulatory, financial, trade, and educational systems it will entail, will be ambitious enough to overcome such entrenched interests and succeed. It is not that every citizen will become a high-tech entrepreneur, but—like the proverbial canary in the coal mine—by creating the environment where an entrepreneur will thrive, you create the economic conditions for all to thrive.

2 Susan Johnson, "Kenya Mobile Money and the Hype of Messy Statistics," DevLog@Bath, Center for Development Studies, https://cdsblogs.wordpress.com/2014/05/15/kenyan-mobile-money-and-the-hype-of-messy-statistics/; "FinAccess National Survey 2013: Profiling Developments in Financial Access and Usage in Kenya," FinAccess, October 2013, http://www.fsdkenya.org/finaccess/documents/13-10-31_FinAccess_2013_Report.pdf.

I. THE PROBLEM: A REGION ILL-PREPARED FOR THE TWENTY-FIRST CENTURY

Economists have conducted many great and important analyses of Middle Eastern economies. Traditionally, and rightfully, they have focused on natural resources and services as the region's greatest assets. Concurrent with this dependence, analysts have explored an economic machinery that, for decades, has created significant political instability, sectarian violence, and legacies of nepotistic and corrupt business environments.

One must be careful in considering aggregate regional statistics because nuance matters. For example, Syria and Iraq have long been isolated economically from the rest of the region and pose unique challenges. In addition, the Gulf Cooperation Council (GCC) is actively pursuing a unique, growth-oriented and regionally integrated agenda different from some of its neighbors. At the same time, however, Middle Eastern economic performance compared to other emerging growth markets is revealing. Outside of oil exports, real GDP growth rates in the 2000-11 period averaged almost 5 percent for the Middle East—much lower than that period's average growth rates for high-performing countries like China (10.4 percent), India (7.7 percent), and Southeast Asia overall (8.9 percent).[3] In terms of real per capita growth, the Middle East/North Africa region as a whole performed the weakest among all regions in the world over the past two decades, with the exception of sub-Saharan Africa. In addition, as the United Nations Development Programme notes in its 2011 Arab Development Challenges Report, against a poverty line of two dollars per day, the Arab region has a 19 percent poverty rate—60 percent higher than the rate of Latin America.[4] Moreover, the region holds the highest overall unemployment rate among developing regions, and more than double the global average of the youth unemployment rate: a stark 24 percent.[5]

When one considers other recent and relatively successful growth markets, two factors appear critical to achieving their economic momentum: robust efforts in education . . . and the full—rather than piecemeal—opening of legal and regulatory frameworks.

Government-driven rules and limits that protect the economic prosperity of the relatively few often compound the region's weaker economic performance. Accepting this "business as usual" system has meant the difference between success and failure—or, at its extreme, imprisonment. In most of the countries in the region, government is the largest source of jobs and job creation, often with low performance expectations and little reward for those who take extra initiative. In Saudi Arabia, for instance, 71 percent of nationals believe the government "provides stable jobs" in the public sector, compared to 25 percent who believe this applies to the private sector.[6] The upside, such governments have long argued, is "stability." Growth may be slower, economic reform more gradual, but that is preferable to the chaos seen in places like Syria, Libya, Iraq, and other post-Arab uprising countries. What, for years people argued, is the choice?

When one considers other recent and relatively successful growth markets, two factors appear critical to achieving their economic momentum: robust efforts

3 "Regional Economic Outlook: Middle East and Central Asia Report," International Monetary Fund, November 2012, pp. 88-90, https://www.imf.org/external/pubs/ft/reo/2012/mcd/eng/pdf/mreo1112.pdf. See also IMF World Economic Outlook online database, October 2012.

4 "Arab Development Challenges Report 2011: Towards the Developmental State in the Arab Region," United Nations Development Programme, 2011, http://www.undp.org/content/dam/undp/library/corporate/HDR/UNDP-ADCR_En-2012.pdf.

5 Ibid. See also Jihad Fakhreddine and Travis Owen, "Lure of Government Jobs for Saudis," Gallup, August 20, 2015, http://www.gallup.com/businessjournal/184748/lure-government-jobs-saudis.aspx.

6 Fakhreddine and Owen, "Lure of Government Jobs," op. cit.

in education focused on critical thinking, math, and science, and the full—rather than piecemeal—opening of legal and regulatory frameworks to encourage the successful movement of ideas, people, goods, and capital. At the moment, the Middle East has been painfully slow to embrace these factors.

By certain measures, many governments in the Middle East have not fully neglected their education systems. A 2007 International Bank for Reconstruction and Development/World Bank report found that, on the whole, countries in the Middle East spend a higher percentage of their GDP on schooling than almost any emerging market with similar levels of per capita income. They devote, on average, 5 percent of total GDP to education (just behind North America and Western Europe, and above the averages of most countries in Latin America and East Asia), and often as much as 20 percent of total government expenditures overall.[7] Access to education is high, reaching almost every child at the primary school level, with a rapid increase in attendance at the secondary and tertiary levels. Perhaps most surprising, gender parity in educational enrollment is almost complete. In fact, in some GCC countries there is a "reverse gender gap" as more women receive college degrees than men—though fewer women find equal employment. Illiteracy has been more than halved in recent decades.[8]

But, as the report found, focusing entirely on these accomplishments obscures the fact that the significant growth is from a low baseline and that to this day there is a dearth of spending in sectors where it is most critical. Secondary and tertiary education enrollment, while growing, lags persistently behind rates in East Asia and Latin America. Illiteracy rates in the Middle East are double those in other emerging markets. In international tests such as the Trends in International Mathematics and Science Study and the Program for International Student Assessment, countries in the Middle East regularly fall below global averages, and well below growth economies in Asia and Latin America. "Given that technological innovation and adaptation is increasingly playing a prominent role in the development process," the World Bank concluded, "[Middle East and North Africa] schools may be producing the wrong mix of competencies."[9]

BOX 1: SELECTED GLOBAL RANKINGS OF MIDDLE EASTERN COUNTRIES IN EASE OF DOING BUSINESS

According to the World Bank's 2014 Doing Business report, the best overall ranking position achieved by any country in the Middle East is the United Arab Emirates (UAE) at 23, followed by Saudi Arabia at 26. Other countries fall significantly below: Bahrain at 46; Oman at 47; Qatar at 48; Tunisia at 51; Morocco at 87; Kuwait at 104; Lebanon at 111, and recent uncertainty in Egypt and Jordan putting them even lower. Equally interesting are the region's average rankings by topics that are most relevant to tech-enabled start-ups, determined by calculating the combined mean of the rankings of all the countries in the MENA region. The average ranking in ease of starting a business was 117; insolvency protections 113, protecting investors 119, trading across borders 98, registering property 86, getting electricity 76, and enforcing contracts 122. While these averages obviously reflect a wide range of country-by-country performance, it is revealing that no Middle Eastern economy made it to the "Top 10 Improving the Most."

Often lost in this analysis is the cycle of missed opportunity in a "brain drain" of the best talent. This is the most mobile generation in history—not only in terms of the devices they use but also in their ability to physically move where talent can succeed. It is a worthy caution that in so many countries in the region that have high unemployment, tech and engineering jobs are abundant. This reflects both the rise of the tech economy and the talent willing to move abroad—often to the West. As a further point of caution, a 2014 Gallup poll found that several countries in the region have a substantial portion of their population reporting a desire to emigrate. This includes 21 percent of Egyptians, 26 percent of Iraqis, 28 percent of Lebanese, and 31 percent of Jordanians.[10]

On the regional business environment, overall, the figures equally speak for themselves. As box 1 shows, at a time when other emerging growth markets have expanded business practices and grown their middle classes, little movement has occurred in the Middle East in terms of improving the broader business climate across the region. According to the World Bank's 2014 Doing Business report, the Middle East ranks among the lowest across all categories.[11]

7 "The Road Not Traveled: Education Reform in the Middle East and North Africa," World Bank, 2008, http://siteresources.worldbank.org/INTMENA/Resources/EDU_Flagship_Full_ENG.pdf.

8 Ibid. See also "Education for All: Global Monitoring Report 2012," United Nations Educational, Scientific and Cultural Organization, 2012, http://unesdoc.unesco.org/images/0021/002175/217509E.pdf.

9 "The Road Not Traveled," World Bank, p. 4, op. cit.

10 "Desire to Move," Internal Gallup Research, 2014.

11 "Doing Business 2015: Going Beyond Efficiency," World Bank Group, October 29, 2014, http://www.doingbusiness.org/reports/global-reports/doing-business-2015.

II. PRINCIPLES AND OBJECTIVES GUIDING A NEW CHOICE: UNLEASHING HUMAN CAPITAL THROUGH TECHNOLOGY

There is a new choice already emerging in the region that is in line with global trends in universal access to technology. The success of this motion will depend on two core factors: improved education and more open societies and business environments.

To put this change in perspective, as the region catches up with the world in terms of broadband Internet penetration, the number of Internet users in Arab countries has been accelerating, increasing 23 percent annually versus a global average of 14 percent; the number of total Internet users in the region is expected to surpass 140 million in 2016.[12] Those who are currently online already showcase a remarkable reality. Eighty-three percent use the Internet daily—half of them for five hours a day or more. Seventy-eight percent prefer the Internet to television, and 44 percent reported spending more time socializing with their friends online or on mobile devices than they did face-to-face. Ninety percent of young citizens in the region believe that access to the Internet can help them realize their personal ambitions for employment and entrepreneurial opportunities, and more than 40 percent aspire to start their own businesses.[13]

These trends are both accelerating and irreversible. In fact, as the Middle East moves in line with global trends, there is potential for the region to leapfrog intermediary phases and catch up with the rest of the world. Thus, three interconnected opportunities are available that could not have been seriously discussed even five years ago: the rise of scaled, tech-enabled entrepreneurship; the opportunity for greater, faster reach in improved education relevant for the twenty-first century; and the necessary regulatory environment to allow for its rapid adoption.

A. The Ramifications of Tech-Enabled Entrepreneurship

It is important to offer clarity on terms that are often used in discussing the impact of tech-enabled entrepreneurship. "Start-ups" focus on companies that start from scratch, require small amounts of capital, and emphasize technology to either reduce costs or reach customers. In contrast, "small- and medium-sized enterprises (SMEs)" are small businesses—usually with below $10 million in revenue—that are significantly slower growing than start-ups. Both significantly impact the economy in the region and both—as well as most large enterprises—are compelled to change rapidly in the new era. We believe the impact and potential in embracing this change is best illustrated with a focus on start-ups.

The ramifications on entrepreneurship for economic growth and job creation are readily apparent in examples across the world. Such enterprises not only experience higher and faster growth because of the low costs inherent in starting a business and reaching and marketing to new customers, but offer a multiplier effect in what is known in Silicon Valley as the "PayPal effect." As new enterprises scale quickly and create wealth, they spin off both new entrepreneurs and investors to support them. In the case of PayPal, hundreds of former employees have left to create their own enterprises, including notable successes like LinkedIn and Tesla, which have also subsequently created further enterpreneurs. This phenomenon took root globally, even in challenging markets, where e-commerce juggernauts like Tencent and Alibaba in China not only created hundreds of thousands of jobs themselves, but have spun out thousands of businesses that have grown and succeeded on their platforms. MercadoLibre, the e-commerce leader in Latin America, Skype from Eastern Europe, community traffic app Waze in Israel, and search engine Yandex in Russia have had similar region-wide ramifications. Gallup found that in the region, opportunity entrepreneurs—business owners that did not start their businesses because they needed jobs but for other reasons—are more than twice as likely to be thriving as entrepreneurs who started businesses out of necessity alone.[14]

Already in the Middle East we have seen similar three-part job creation engines we might call the "Maktoob

12 Karim Sabbach, Mohamad Jourad, Wassim Kabbara, and Ramez Shehadi, "Understanding the Arab Digital Generation," Booz & Company/Google, Fall 2012, http://www.wamda.com/2012/10/understanding-the-arab-digital-generation-report. See also internal Gallup research.

13 Ibid.

14 "Opportunity vs. Necessity: Entrepreneurship and the Positive Benefits," Gallup Internal Analysis, 2011-12.

Effect." Maktoob, the "Yahoo! of the Middle East," was a job creator in its own right, having at its peak over four hundred employees. When Maktoob was acquired by Yahoo! for nearly $170 million, some of its employees spun out their own start-ups—regional e-commerce leader Souq.com (recently valued at over $1 billion with 1,500 employees) and the mobile payments company CashU, now part of Souq—and funded these start-ups in large part with wealth the employees and investors attained in the initial sale of Maktoob. No doubt these enterprises will spin out additional, experienced entrepreneurs. In addition, enterprises often build platforms that, facilitated by technology, allow existing businesses to reach new customers and new businesses to launch. Apple, while employing sixty-six thousand people, released a study of how over six hundred thousand additional jobs were created by other new and established businesses using its Apple Store and other Apple platforms, and over three hundred thousand additional jobs were created due to their annual spending and growth.[15] The Souq.com platform similarly became one of the primary online resources for over seventy-five thousand existing and new businesses around the region that reach new customers across regional borders because of its technology. Wamda.com, the leading database on Middle East start-ups, estimates that for every ten new successful enterprises, over $1.4 billion in new valuations and more than 2,500 jobs are directly created. One of Egypt's leading tech enterprises over the past two decades, Itworx, documented no fewer than two hundred former employees who spun out to create new companies.

These examples are now only a fraction of the opportunities rising in the Middle East. The hyper-demand for the products of e-commerce over the past year has generally tested the logistics infrastructure across the region. Over the past three years, e-commerce in the region has been growing over 30 percent per year (as compared to 17 percent globally) to over $15 billion in sales.[16] Namshi, the Zappos-like fashion and clothing retail platform, now serves consumers in seven countries across the region. Amazon-like book seller Jamalon offers over ten million titles, 75 percent of which are in Arabic, and the company is on the path to being the largest book retailer in the region. Kharabeesh is the leading regional online video creator, which not only has produced ten thousand of its own short films, but has built a platform for other creatives across the region—amassing over one billion lifetime views on YouTube. Up-and-coming Saudi online video platform UTURN, which boasts a Daily Show-like program, has over three hundred million views on YouTube and eight million followers on Facebook and Twitter—most of them from Saudi Arabia. Careem, the "Uber of the Middle East," is helping to lead a series of sharing economy platforms rising in the region. Infrastructure workarounds like the traffic navigation app Beyollak in Cairo, recycling solutions platform Recylobekia across Egypt, and multiple platforms that allow users to report crime and harassment have spread across the region.[17]

For countries long under-banked yet also fundamentally mobile-first, innovation in mobile payments has been on the rise. In the last two years, this activity has caught the attention of local and global investors, with over $500 million in new investment capital raised, and an additional $500 million deployed.[18] Interestingly and importantly, according to the *Economist*, women founded over 25 percent of these start-ups—a much larger percentage than usually found in Silicon Valley today.[19]

It is important to understand, however, that a world-class, tech-enabled business environment reaches well beyond tech-based entrepreneurship. Today, around the globe, almost every company is tech-enabled in some, often significant, form. Order a cup of coffee with a credit card in any café, look under the hood of any new car, book even the most basic travel, and software plays an ever-increasing role. The skills required to embrace tech-enabled entrepreneurship, thus, touch equally any traditional, established enterprise seeking to be globally competitive. Tech-focused education policies and rule of law are the rising tides that rapidly raise all boats.

15 "Creating Jobs through Innovation," Apple, http://www.apple.com/about/job-creation/. See also Chris Arnold, "How Many US Jobs Does Apple Really Create?" *NPR,* March 6, 2012, http://www.npr.org/2012/03/06/148049517/how-many-u-s-jobs-does-apple-really-create. He cites University of Berkeley Professor Enrico Moretti's book, *The New Geography of Jobs* (New York: Mariner Books, 2013): "My own research suggests five additional jobs are created outside that firm in local communities." However, this would not include businesses created on Apple platforms.

16 Simeon Kerr, "Online Retailers Celebrate Ramadan Lift," *Financial Times*, July 16, 2015, http://www.ft.com/intl/cms/s/0/01ca50dc-2ba4-11e5-acfb-cbd2e1c81cca.html#axzz3inenWsGl. The largest logistics company in the region, Aramex, believes the figures are closer to 50 percent.

17 See http://harassmap.org/en/.

18 Estimates from research organization Wamda.com. With Souq.com raising over $300 million, region-wide restaurant delivery business Talabat acquired for $165 million, and the Bank of Lebanon supporting venture capital funds at $300 million all in the first half of 2015, these aggregate investment figures are likely under-reported.

19 "Untraditional Choice: The Middle East Beats the West in Female Tech Founders," *Economist,* July 13, 2013, http://www.economist.com/news/business/21581740-middle-east-beats-west-female-tech-founders-untraditional-choice.

B. Education for the Twenty-First-Century Economy and New Roles for Technology, Application, and the Private Sector

The quality, relevance, and applicability of an economy's education sector is essential to its vibrancy. By necessity, any educational reform must be viewed with an eye to both long-term considerations as well as new possibilities available to speed up progress in the short term.

The good news, as noted in our recommendations below, is that ideas for the medium and long term have been well constructed—though they remain poorly implemented. There is a remarkable consensus, especially among teachers and parents, of what is required, and it is instructive to understand why implementation has been lacking. There appear to be at least three factors.

First, there has been a significant lack of continuity of educational leadership in governments in the region when reforms have been passed. Education ministers in many Arab countries have shifted regularly—replacing people quickly when results have not been immediate.

Second, attempts at reform have often been piecemeal, focusing on reforming standardized tests that emphasize rote memorization while ignoring teacher training, or vice versa. In Jordan, on average only 16 percent of questions on the college entrance exam test critical thinking.[20] Governments, in the worst instances, have shown little interest in changing this as historically some have feared "critical learning" was inconsistent with obedient citizens.

Third, as the World Bank study suggested, there is little accountability for how money is spent. "New" initiatives cannot be well implemented by simply spending money and purchasing technology without training or clear and measurable objectives. A bad teacher with a tablet is still a bad teacher.[21]

There is strong agreement that, at a foundational level, any educational system must embrace three needs in order to be globally competitive.

First, the basis of education strategy must be the need for students to learn critical thinking and other skills relevant to the twenty-first century, as opposed to policies that emphasize rote memorization geared toward passing national tests. Quantity of curriculum—simply adding new courses—is not a substitute for embracing critical thought. In addition, this requires focused and stated goals, including assessing economic trends to strategically evaluate what sectors high school, university, and graduate students must be prepared for, and identifying what clear deficiencies can be systemically fixed.

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Second, no matter how well designed, an educational curriculum is only as successful as the teachers available to implement it. Nations need to attract top talent and retain it with different incentive structures. Even with Egypt's raise of minimum wage in 2014 to $150 a month,[22] teacher salaries are not only barely above the poverty line, but this abysmal rate of compensation also sends a tacit signal to society about the importance of education. In fact, there is virtually no financial incentive for teachers to innovate. In Jordan, where teachers are similarly compensated, the highest performance-based raise the best teachers can hope to make is $80 per year—hardly a motivating force. The low pay of educators is in some instances creating rent-seeking or corrupt behavior; teachers require their students to take "private tutoring" lessons at the expense of the students and parents, lest the teachers hold their pupils back.

Finally, it is necessary to acknowledge that passing a student to the next grade successfully has little meaning if the student is ill-prepared. The region has tended to focus on measuring access to education without a real emphasis on quality and readiness. According to university faculty, high schools graduate students who too often still cannot truly read and write by globally competitive standards.

20 Lina Ejeilat and Nicholas Seeley, "Failing Tawjihi," *JO Magazine*, October 2006.

21 "The Road Not Traveled," World Bank, op. cit.

22 "Egypt Minimum Monthly Wages 2012-2015," Trading Economics, http://www.tradingeconomics.com/egypt/minimum-wages.

What is to be done right now? There are three significant opportunities to seize: education technology can leapfrog existing infrastructural challenges in the shorter term; curricula revision can focus on critical thinking and enhance what is most applicable for jobs today and in the future; and greater involvement and partnership with the private sector can provide resources and visions for paths to new futures.

Opportunity in Education Technology

In the short term, the sheer math on student need is daunting. Last year, in Egypt alone, approximately 1.8 million children entered first grade, and 2.6 million were born.[23] Even if the physical infrastructure resources to handle this population boom existed, one would have to build several schools every day for the next five years to merely keep up—putting aside challenges of teacher hiring, curriculum development, and performance metrics. Nevertheless, while that kind of infrastructure may be all but impossible to build in the immediate term, technology offers an unprecedented opportunity.

"Ed tech" in the United States has had both successes and challenges to date, but the trajectory is clear. Over the past decade, private investment in education technology has risen to over $2.5 billion, and there are thousands of educational apps on iTunes alone. Khan Academy, a crowd-sourced aggregation of short tutoring videos across almost any area, now reaches over nineteen million people in the United States and eight million more around the globe.[24] Coursera, which hosts complete college curricula of the leading universities around the world, also has massive reach, to the tune of 22.2 million users.[25] Over 75 percent of American public high school students have access to course curricula, assignments, and videos online; 89 percent have smart devices (over one-third of which are issued by the schools); and students use group chat capabilities like Skype and Google Hangouts to collaborate.[26] Platforms like 2U have given major universities the ability to attract world-class talent from people who simply cannot physically attend a campus class. And "distance" learning can be in one's backyard—40 percent of the online master's students at American University's School of International Service come from Washington, DC, and its surrounding suburbs, enabling the participation of high-quality students who cannot leave military installations or get out of the office in time for 6:00 p.m. classes.[27] These and many other platforms are already reaching global audiences thanks to the expansion of smart mobile devices. Over 22 percent of Coursera's viewers, for example, are from Latin America alone.[28]

The potential for the Middle East is similarly rising, not only through access to these tools but in the frustration of parents, teachers, students, and employers seeking work-around and self-teaching mechanisms that not only enhance skills but seed a belief that timely change is possible. While anecdotal, it is also instructive of the broad understanding of the opportunity that a driver in Cairo interviewed for this research shared three observations on the role that technology and education now play in his life. With a computer, he noted that his wife can now improve her own reading skills at the same time as his children; women in their apartment building gather children around the computer to help them with their lessons as a group; and learning from home helps his kids who, in an overcrowded public school, not only have trouble concentrating but sometimes cannot even find a place to sit.

Although these are still the early days of Arabic and Middle Eastern regional education technology, significant progress has been made. This progress underscores the remarkable reach technology can drive—all but impossible in the physical world. For K–12 students along with teachers, Ahmed Alfi's *Nafham* ("We understand," in Arabic) is a platform where parents and students can upload supplemental education videos for the existing Egyptian school curricula. Within just two years of its launch, its record is impressive. Over twenty thousand video lessons have been uploaded, garnering over 105,000 views per day. Over 36.5 million videos have been viewed in total, and the site averages five hundred thousand unique monthly users. While focused on Egypt, a third of *Nafham*'s traffic comes from around the region, and they are working on building curricula for additional countries as well

23 See "Population Clock," Egypt Central Agency for Public Mobilization and Statistics; Andrey Korotayev and Julia Zinkina, "Egyptian Revolution: A Demographic Structural Analysis," Entelequia, Revista Interdisciplinar, 2011; and "The Long-Term Economic Challenges Egypt Must Overcome," Marketplace, February 1, 2011, http://www.marketplace.org/2011/02/01/world/new-egypt/long-term-economic-challenges-egypt-must-overcome.

24 "You Can Learn Anything," Khan Academy, https://www.khanacademy.org/youcanlearnanything.

25 "Community," Coursera, https://www.coursera.org/about/community.

26 David Nagel, "Over One Third US Students Use School-Issued Mobile Devices," *Journal,* April 8, 2014, https://thejournal.com/articles/2014/04/08/a-third-of-secondary-students-use-school-issued-mobile-devices.aspx. See also: "The New Digital Playbook: Understanding the Spectrum of Students' Activities and Aspirations," Project Tomorrow, 2014, http://www.tomorrow.org/speakup/SU13_StudentReportTEXT.html.

27 James Goldgeier, Dean of American University School of International Service, email interview, August 2015.

28 Omar Tellez, "Why Ed Tech Is Taking Off Across Latin America," TechCrunch, July 11, 2015, http://techcrunch.com/2015/07/11/why-ed-tech-is-taking-off-in-latin-america/.

as organizing workshops on digital education to help train teachers. Similarly, for-profit start-ups have also entered the education market. To supplement needed skills for young adults entering the workforce, Jordan's Queen Rania Al-Abdullah, in partnership with Abu Dhabi Crown Prince Mohammad Bin Zayed al Nahyan, launched *Edraak*, the first Arabic "massive open online course" (MOOC) platform. Its curriculum, targeted at nineteen– to twenty-eight-year-olds to enhance skills desired by both learners and employers, offers courses in science, technology, engineering, and mathematics; entrepreneurship; employability skills; pedagogy; and citizenship education—reaching over two hundred thousand young adults across the region in its first year.

Opportunity in Making Education Immediately Applicable

Any education system is as useful as its curriculum's applicability to current and future employment requirements. Effective curricula should consist of creative and timely content and use cutting-edge methodologies that emphasize critical thinking and have a strong focus on preparing students for the global job market. Universities and professional institutions around the world offer training programs to nurture an entrepreneurial spirit and provide potential business leaders with the right tools and methodologies to launch their start-ups. This is coupled with multiple informal settings such as advisory sessions, mentorships, and networking events.

Over the last five years, there has been a rise in university-based business accelerators to both teach and create a new generation of entrepreneurs. Access to university facilities, faculty, staff, mentors, library resources, and student support is provided, while "entrepreneurship clinics" provide free advice, counseling, and mentorship on campus anytime, day or night. The benefits of these models go both ways, however. While students gain access, advice, and experience, volunteers and mentors are able to study and assess a range of start-ups, helping them to identify potentially lucrative new partnerships and investment opportunities. Furthermore, the learning environment on campus helps to nurture an entrepreneurial culture among the youth.

The American University in Cairo (AUC) launched the first full-fledged effort of this kind in Egypt in 2013, called Venture Lab. It incubates, connects, and supports talented youth, giving them access to experienced mentors and facilitating their success beyond AUC. Over the last four years, more than five thousand entrepreneurs from Egypt and other Arab countries have benefitted from Venture Lab and similar efforts through a variety of programs and activities that promote entrepreneurship and innovation.

Outside academia, both off- and online initiatives and organizations that promote the culture and skills of entrepreneurship to build sustainable enterprises have proliferated throughout the Middle East in the past decade. These include Wamda, Oasis 500, Berytech, various Endeavor Global initiatives across the region, Education for Employment, the region-wide accelerators Flat6Labs and AstroLabs, among many more. These programs, in addition to offering training and resources, have launched and funded hundreds of companies. Shared work spaces like the GrEEK Campus in the downtown campus of The American University in Cairo, and efforts on the New York University Abu Dhabi campus are gathering youth by the thousands. The Gyem in the UAE, a program to teach youth how to solve problems in their communities, has trained over twenty-five hundred young people in empowerment, innovation, and best practices in social entrepreneurship. Global technology companies like Google, Facebook, Twitter, and LinkedIn have helped mentor, build skills, and create business opportunities in the region, though the existing potential is still enormous. The Middle East has not yet been the priority to them that it deserves to be.[29]

Opportunity in Engaging and Partnering with the Private Sector

The involvement of the private sector in these educational issues is essential—few have a bigger stake in having a skilled and innovative workforce. Businesses in the region are beginning to take this responsibility more seriously. There is a new kind of dialogue taking shape as private sector leaders, post-Arab uprisings, appreciate more that they have societal obligations, and that to reach the region's potential they need to bring creativity, new players, and resources to bear. There is growing appreciation that the private sector has increasing influence across societies. Small businesses employ over 70 percent of the labor force in Egypt, for example.[30] Business leaders are likewise beginning to understand that they can apply business best practices toward getting the talent and labor pool they require, and that doing so is possibly even existential in a progressively competitive

29 Currently, however, as a powerful example of public-private partnership here, Google and leading massive open online course (MOOC) Udacity is working with the Egyptian Ministry of Communications and Information Technology (MCIT) to enroll two thousand students in Egypt to train them in mobile app development skills and enterprise creation.

30 Hala El-Said, Mahmoud Al-Said, and Chahir Zaki, "Small and Medium Enterprises Landscape in Egypt: New Facts from a New Data Set," *Journal of Business and Economics*, February 2014, http://www.academicstar.us/UploadFile/Picture/2014-6/201461435324791.pdf.

world. Likewise, many correctly recognized that the uprisings of 2011 implicated them too, and that they—like governments—are increasingly subject to increased citizen demands for more transparent and responsible engagement in society.

There have been several successful, and often technology-enhanced, models demonstrating positive public-private regional partnerships in the education sector. INJAZ al-Arab was one of the earliest, beginning in the late 1980s with a United States Agency for International Development (USAID) grant that matched contributions from local businesses. Choosing public schools in conjunction with the partner country's Ministry of Education, INJAZ facilitates additional afterschool lessons focused on encouraging and enabling entrepreneurship. Local business leaders teach children as young as middle school-age basic professional skills like effective communication, teamwork, résumé building, business plan writing, and financial literacy. They also compete in local and regional business competitions. Across the region, there are over three hundred thousand students currently enrolled in the program and over 1.5 million alumni, and partnerships are expanding, with entrepreneurship programs in over 140 universities.

Ruwwad al-Tanmiya, literally "pioneers for development" in English, is an example of a private sector/community partnership with less emphasis on the public sector. Established by Aramex founder Fadi Ghandour, the organization has a mission to build community centers both staffed by and serving people living in lower-income areas. Begun in Jabal al-Natheef, it is a hub run by the community to help its youth and families take ownership of their own challenges and opportunities. To do this, it has elements of many types of community service centers, including services usually provided by health clinics, schools, or afterschool programs. The sense of civic engagement and ownership this partnership instills in all who interact with it helps volunteers build skills and knowledge not traditionally taught in schools. But there are no handouts. The organization's guiding principle is that everyone who comes to Ruwwad must give back to the center in some way. While businesses might contribute money, computers, or school supplies, individuals can pay back in more modest means. Professionals teach job skills, and others might give whatever they can in terms of their time and labor. The mission is to inspire the community to find solutions to their own local challenges. The group therefore builds a culture of citizenship that values merit over nepotism; leadership through service over leadership through connections, or *wasta*; and human and women's rights over practices that discount women and individuals. In doing so, it works as an incubator for forward and creative thinking, respect for diversity, and positive values.

Through its presence in East Amman, Ruwwad has impacted over seventy-five thousand people. Fifteen hundred primary school children have enrolled in its reading programs. Parents, teachers, and students together founded a "Six Minutes" reading campaign to encourage regular public readings; they have already organized more than sixty-six hundred events. More than seven hundred college scholarships have been disbursed to deserving youth. Ruwwad's program has been so successful that it is now expanding to other towns in Jordan, as well as internationally to cities including Cairo, Egypt; Budrus, Palestine; and Tripoli, Lebanon. Additionally, the Ruwwad Micro-Venture Fund was launched specifically as a platform to facilitate community entrepreneurs, helping local citizens translate their ideas into profitable businesses that address communal needs while generating employment opportunities.

Another important similarity in these efforts, particularly by INJAZ and Ruwwad, is recognizing the importance of beginning their touchpoints with entrepreneurs at an early stage of development. Gallup took the same conceptual approach of early stage entrepreneurial identification and development by way of its Entrepreneurial Profile 10 (EP10) identification tool.[31] The assessment helps respondents identify and develop their entrepreneurial talents. While much has been written on the importance of entrepreneurial development in the region, such approaches lack the ability to more effectively target their efforts on those with real entrepreneurial potential. Such a tool could be helpful as a starting point in making sure such efforts are reaching the right potential talent that can truly grow a business and have a larger economic impact on job markets and beyond.

C. Stepping Up and Getting Out of the Way: The Importance of the Right Legal and Regulatory Climate

Four factors maximize a tech-enabled, entrepreneurial business climate: consistent, understandable, and predictable rule of law; the free movement of ideas, goods, and people across markets; world-class technological infrastructure; and easy access to growth capital. The four, in fact, are interrelated. It is hard to have one without the others.

31 For more information on Entrepreneurial Profile 10, see https://www.gallupstrengthscenter.com/EP10/en-US/About.

If this is so well known, what has stood in the way? We believe, beyond the legacy left by rentier economics and crony capitalism, which create little incentive to grow or share prosperity, there are two additional factors today.

First, in many countries, there is confusion about the needs of tech start-up companies versus the demands of SMEs. The former require smaller amounts of capital but have flexible legal structures, while the latter tend to be established, profitable enterprises that primarily require new business as opposed to the expansion of existing enterprise. Governments, especially in the Gulf, have passed procurement laws intended to encourage domestic business, such as requiring that local SMEs fulfill 10 percent or more of all government contracts, and granting SMEs exemptions from customs taxes for equipment, raw materials, and goods for production purposes. Important as these measures are—in most countries in the region well over two-thirds of non-oil and nongovernment jobs are in SMEs—they have no impact on tech-enabled start-up opportunities. However, initiatives such as the UAE's eGovernment effort—which puts most government services, information, regulatory filings, and fee payments online—are encouraging steps that make often-confusing and unclear processes more transparent for knowledge-based businesses.

Second, governments often focus on creating and enabling businesses with investment capital and support services in "free zones"—areas like the Dubai Media City or Saudi Arabia's King Abdullah Economic City—with preferred tax status and special regulatory structures. While this can be a constructive first step, such isolated measures often displace or delay attention to broader, statewide legal and regulatory reform. Still, even in cases where good national laws have been ratified, they have taken an extremely long time to realize, and enforcement is often inconsistent. The GCC recently enacted laws to streamline customs formalities and allow visa-free travel between its constituent states; but they took nearly a decade to pass, and permits can still be costly and time consuming. Furthermore, the ability to freely and cost-effectively move goods and services from outside the GCC is still often constricted by bureaucrats who are uncomfortable or uninformed about changes, who require paperwork in highly literalist and obstructive ways, and who, some allege, demand special "fees" and other forms of corruption. In fact, the number one issue delaying the ratification of such laws has been implementing the appropriate mechanism for the distribution of customs revenues. One GCC official confided, "The fact is, entrenched status quo interests are unwilling to give up what, in their minds, are special privileges—[through measures] like openness to foreign ownership and more competitive real estate pricing—which works against start-ups."[32] A Dubai entrepreneur whose start-up founding took nearly six months to register in a free zone and cost almost $50,000 in fees, lawyers, and travel—nearly half of his first round of investment—added, "At times, you don't feel you're talking to smart people, people who care—they just follow the book exactly and don't want to think. They are not customer service-oriented. They are afraid to take any risk."[33]

Committing to providing consistent and predictable business environments—and doing so as quickly as possible—may be the single easiest and most impactful policy that regional leadership can enact.

Committing to providing consistent and predictable business environments—and doing so as quickly as possible—may be the single easiest and most impactful policy that regional leadership can enact. Although rapid regulatory transformation is rarely simple, it is important to recognize that a business environment in which start-ups can thrive is one in which larger, more traditional engines of state growth can also perform better. Thus, when assessing the benefits versus costs of the significant reforms that are required to create a healthier economy for entrepreneurs, governments would do well to recognize that such "big bang" reforms will benefit the economy beyond what might in many Arab countries still be a relatively narrow start-up sector.

32 Interview with Christopher M. Schroeder, Fall 2015.
33 Ibid.

III. ARE THERE LESSONS FOR SOCIETIES IN CONFLICT?

We are not blind to the fact that the perilous state of parts of the Middle East, particularly Syria and Iraq, perhaps makes our recommendations seem outweighed by the realities on the ground. But history is replete with examples of societies rising from seemingly impossible circumstances enabled by technology.

In light of South Korea's regional and even global economic and technological leadership, it is hard to imagine that fifty years ago it was one of the poorest countries in the world, with a GDP roughly equal to Ghana's.[34] As early as the 1960s and 1970s, a period marked by military dictatorship, nascent efforts were made to bring the country into global competitive technological and economic capacity through government-backed research and development efforts; emphasis on graduate education; and increased focus on IT, biotech, nuclear technology, and nanotechnology. These efforts laid the foundation for increased grants to, partnerships with, and an independent role of the private sector, and support from the international development community in the 1980s and 1990s. The country also proactively replaced its antiquated landline telephony with fiber-optics across its cities, thereby wiring nearly 70 percent of the population. This has helped make South Korea today not only the fifteenth largest economy in the world, but one of the leading exporters of consumer electronics and other hardware capabilities. South Korea is a world leader in patent activity and is poised to become one of the leading centers for start-up activity in Asia in the next decade.[35] And while transformative political choices surely complemented these improvements, the example is a positive one worth studying, with applicable lessons for the Middle East, even if the situations are not completely analogous.

With the rise of growth markets generally, and increasing access to technology, there are encouraging signs that such changes will happen much more quickly today. Long a byword for chaos and instability, the nation of Colombia has in a very short time become a fast-growing, well-educated, technology-savvy, and prosperous country. Mobile penetration is quickly approaching 100 percent, and two-thirds of the country will have broadband access within three years. Last year it had the fastest GDP growth in Latin America and the fourth fastest in the world. To be sure, large amounts of American military support in addressing the country's cartel problem greatly enabled these developments, and the significance of these operations should not be discounted. However, as security conditions progressed, they were solidified and reinforced by aggressive government policies in education and strengthened rule of law for business and technology. This allowed genuine economic development to sprout where the drug economy was uprooted. Especially in Medellin and Bogota, applications like iNNpulse and apps.co have been financing vehicles to encourage investments in start-ups, and eGovernment efforts are being sourced to young tech start-ups and universities.

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Examples of failure are equally instructive. In 2009, wrestling a difficult economy, Russia's then-President Dmitry Medvedev laid out a plan of reform in a four thousand-word treatise titled "Go Russia." As *Foreign Policy* noted, the goal of the plan was to harness technology "to equip Russia for the 21st century." It envisioned a Silicon Valley-like innovation hub to the tune of $4 billion that would attract tens of thousands of great technology minds and start-up entrepreneurs.

34 Joel R. Campbell, "Building an IT Economy: South Korean Science and Technology Policy," Brookings Center for Technology, September 2012, http://www.brookings.edu/research/papers/2012/09/12-korean-technology-campbell.

35 Ibid. See also Alan McGlade, "Why South Korea Will Be the Next Global Hub for Tech Startups," *Forbes*, February 6, 2014; and World Bank/IBRD overview on Korea, www.worldbank.org/en/country/korea.

Knowing of the engineering talent in the region, many in the global technology and investment communities watched this closely. However, due to a combination of mismanagement and corruption, nothing came of it. Combined with broader political ossification and crony capitalism, not only has there been little improvement in Russia since this time, the "brain drain"—officially around two hundred thousand and composed substantially of university graduates—increased by eighty thousand from last year, while Russian applications for the US green card lottery doubled.[36]

But what about societies like Syria, deep in conflict with millions of its population displaced both internally and externally?

It is intriguing that small deployments of technology have had significant impacts on refugee communities in recent years. The United Nations High Commissioner for Refugees (UNHCR) Innovation initiatives, for example, focus on creating and deploying new home environments and alternative shelters, and leveraging energy innovation and solar lighting to help improve lives in dire circumstances. In the Dabaab refugee camp on the Somali border, UNHCR tested "Instant Network Schools." In this camp of over 350,000 people, less than 9 percent had access to secondary education. In partnership with the Kenyan government and private tech providers like Vodafone, they launched thirteen "Network Classrooms" to provide twenty thousand students with computer tablets, solar powered batteries and generators, satellite/mobile connectivity, online education resources, and training for 378 teachers and guides. Because of technology, this relatively small staff can reach and assist thousands more than through traditional methods, and the program is already showing signs of increased student retention, though such efforts remain nascent and underfunded.[37]

There are additional examples of high-impact deployments of technology in refugee situations around Syria. Start-up 3D MENA Innovations has provided young people with simple Arduino open-source computing and prototyping platforms to help people in refugee camps create 3D-printed products to both serve their communities and help those who have suffered severe physical trauma. For example, in three days of programming and three weeks of testing, several locals learned and tested components for prosthesis that helped people without limb function—and at a cost of one Jordanian dinar (about $1.41), versus more than twenty-five dinars for similar products on the commercial market, which are also much harder to access. 3D MENA Innovations was recently approved to bring its capabilities to the Zaatari Camp in Jordan, the largest Syrian refugee camp to date.[38]

Though not obvious, technology could transform education efforts inside the refugee camps. Penn State University's College of Information Sciences and Technology found that 86 percent of young people in Syrian refugee camps own a mobile phone, and over 50 percent use the Internet at least once a day. WhatsApp and Google are the most popular products among this group as they try to connect with each other, reach friends and family outside the camps, and learn about news and the world around them. Researchers concluded that this situation presents enormous potential for employing remote educational opportunities to address the shortages of traditional classroom opportunities. Jordan has been particularly helpful in both providing technological access and encouraging education—any Syrian in the Zaatari Camp, for example, is eligible to receive a Jordanian high school degree. Mobile devices have further facilitated over three thousand businesses there, from barber shops to food delivery services and even travel agencies, creating employment opportunities and reducing the danger presented by large populations of idle young men. Electronic vouchers have made carrying money and aid certificates safer for grocery shopping trips, during which refugees are often vulnerable to thugs and thieves operating in the camps. Nevertheless, the amount of money spent on technology's potential in the refugee camp context remains a fraction of what is required.[39]

The Karam Foundation, an innovative children's education and support nonprofit for Syrians and refugees, has been offering for the past three years an interesting and perhaps scalable example. They have leveraged private support and skills to increase access to technology in the Turkish border town of Rehanli, as well as within Syria. Supporting five refugee schools in Turkey and ten inside Syria, Chicago-based cofounder

36 James Appell, "The Short Life and Speedy Death of Russia's Silicon Valley," *Foreign Policy*, May 6, 2015, http://foreignpolicy.com/2015/05/06/the-short-life-and-speedy-death-of-russias-silicon-valley-medvedev-go-russia-skolkovo/.

37 "Innovations: Instant Network Schools Open Up in a New World for Somali Refugees," United Nations High Commissioner for Refugees, February 4, 2015, http://www.unhcr.org/54d21aa26.html.

38 Maya Rahel, "Jordanian 3D MENA Initiative Brings Most Advanced Technology to the Most Deprived," Wamda, July 26, 2015, http://www.wamda.com/memakersge/2015/07/jordanian-3d-mena-advanced-technology-deprived.

39 Stephanie Koons, "IST Researchers Explore Technology Use in Syria Refugee Camp," *Penn State News*, March 26, 2015, http://news.psu.edu/story/350156/2015/03/26/research/ist-researchers-explore-technology-use-syrian-refugee-camp.

Lina Sergie Attar knew that Syrian children needed more resources, better networks, and a chance at a bright and self-sufficient future. In addition to their programs in education, arts, and physical wellness, Attar and her team created the Karam Foundation Leadership Program (KLP) to provide technology and mentors to Syrian refugee teens. Syrian students now participate in workshops on technology and entrepreneurship, providing them with needed skills and hope to one day make a living. The curriculum also emphasizes life skills like team building, and how to develop and follow a personal "life plan" for the future by setting out a student's goals, and the skills he or she will need to pursue to achieve them. Dozens of youths have already found work online helping businesses run by Karam volunteers or in virtual jobs they found online.

Displaced Syrians, and indeed anyone displaced in the world, can find the means to education and pathways to self-actualization and economic opportunity with the proper access to technology. Recent attention and significant commitments to the potential here are encouraging. Facebook CEO Mark Zuckerberg's commitment to work with relief agencies to assure universal access to technology is worth watching closely.[40] This offers a foundation not only in the present circumstances of refugees, but for whatever comes next in their communities when they are able to return and rebuild their home countries.

40 Somini Sengupta, "Mark Zuckerberg Announces Project to Connect Refugee Camps to the Internet," *New York Times*, September 26, 2015, http://www.nytimes.com/2015/09/27/world/americas/mark-zuckerbergannounces-project-to-connect-refugee-camps-to-the-Internet.html?_r=0.

IV. RECOMMENDATIONS

At a broad level we believe the very act of introducing seriously the potential and ramifications of universal access to technology in policy deliberations is a significant first step. Too often in our experience, both in the region and in the United States, tech is treated as a sideshow to conventional policymaking, as opposed to an engine for economic growth or societal problem solving. We believe at the very least it is a significant complement to the more powerful solutions that are being explored today—enabling both greater ownership and potential for action by those on the ground with the greatest stakes in successful change. As we have outlined in this paper, we believe that technology will only increase in salience as a foundation for reform and economic growth.

Any roadmap to maximize this opportunity begins with a strategic commitment among policymakers and other stakeholders to making a world-class educational system focused on the skills and critical thinking required for this new era and to offer it universally. In parallel, we believe such a roadmap has significant opportunities—right now—to open business environments to best leverage both better-educated talent and expanding access to the global marketplace.

Building a World-Class, Competitive Education System Targeted to the Needs of the New Century

It is encouraging how many interesting and often tested solutions/recommendations have been created around the region. However, there is a need for greater focus and commitment upon implementation.[41] Chiefly, we believe any efforts on *what* to teach is secondary to *how* to teach—with the goal of emphasizing critical thinking over rote learning and standardized tests. In addition, we would make the following suggestions:

Clearly communicate the challenges in education and the potential of new technology to address them.

It may seem obvious that the challenges of and best practices in leveraging technology for education need to be clearly articulated and prioritized. Nevertheless, it is staggering how many people in the Middle East simply do not believe they are facing a problem. For example, a Gallup study found that the countries in the Middle East that lag most in eighth-grade math and science performance have higher levels of satisfaction with their public school systems.[42]

Increase prioritization and financial support for recruiting and retaining world-class teachers.

Such prioritization certainly begins with a reassessment of teacher salary and incentives to allow outstanding teachers to innovate upon best teaching practices—and be rewarded for it. In addition, we believe that deeper association between public schools and any of the marquee universities of the region, such as the American Universities in Cairo, Beirut, and elsewhere, and New York University Abu Dhabi, is essential in attracting and training the best teachers. In fact, as these institutions have been hit hard financially by sharp reductions in foreign student enrollment post-Arab uprisings, governments (including that of the United States) could shore up these educational flagships, as well as subsidize attendance of poorer students, through scholarships with an emphasis on becoming teachers. A condition of the scholarships could include a requirement that students teach or work with teachers in the region for a certain amount of time after graduation. Furthermore, intellectual and financial incentives can be created so that the best teachers stay for longer periods of time. This "new blood" should be incorporated into a network that

41 "The Road Not Traveled," World Bank, op. cit., emphasized a move from "command and control" management style by central governments to encouraging more initiative at the local levels; emphasizing the role of the private sector; and making wider data efforts to measure and hold accountable most relevant education. "Higher Education Reform in the Arab World," Brookings, 2011, reaches similar conclusions and emphasizes government's role to set standards and goals, standards which assure in higher education students are receiving the education they are promised, and significant investment in teacher recruitment. "Re-dynamizing the Job Machine: Technology-Driven Transformation of Labor Markets in MENA," The Centre for Economic Growth, INSEAD, and SAP, May 2015, emphasizes many of the themes in this paper including the role of technology skills, data to measure and hold accountable better outcomes, training/application of education for critical thinking, job creation, and entrepreneurship. It also underscores policy options for the labor markets to focus on the greater work flexibility that technology enables, meritocracy and performance, empowering women, and regulation recommendations.

42 Internal Gallup data.

other reform-minded organizations could align with to offer best practices and mentoring.

Clearly prioritize encouraging local language teaching.

Many of the initiatives we have mentioned, worthy as they are, are offered only in English. We believe the most effective outcomes will be driven by the communities in the region on their terms and in their language. Using technology and MOOCs in Arabic to share best practices in teaching in the region, combined with easy translation platforms for learning from abroad, would offer a potent combination.

Promote greater experimentation with best practices in private schools.

It is valuable to consider creating parallel pilot programs in private or semiprivate schools, similar to the American charter system, to model best practices and see what is learned. There is greater flexibility for curriculum creation in private as compared to public schools, and early efforts in the UAE have allowed curricular emphasis on skills in technology and entrepreneurship, to good result, leading Abu Dhabi to recently privatize the management of some public schools.

Place greater emphasis on regulatory reform in education, allowing increased private sector innovation and engagement.

Some countries in the region, like Jordan, the UAE, and Saudi Arabia, have already implemented transformations in their regulatory environments that have allowed the education market to expand considerably. But the regulatory setting is still far from what is needed. It is not always transparent, and regulations in the region very often change. A successful private sector requires consistent rules regarding pricing, licensing, and accreditation. As some companies may be wary of being the only enterprise to engage in a sector that was traditionally a government domain, a more transparent process would create greater engagement.

Focus efforts on early identification of entrepreneurship talent.

In addition to improving educational curricula and the business ecosystem, two critical actions both state and nonstate actors can take in the region are instituting a process of early identification of entrepreneurial talent and building a path to develop such talent through education, mentoring, and either matching innovators with business creators or matching businesses with potential investors (as INJAZ and Ruwwad have done). Outside the region, in Mexico and the United States as examples, Gallup deployed EP10, a tool that identifies an individual's unique combination of entrepreneurial talents and provides a coaching and educational curriculum to better enable high-talent entrepreneurs to maximize their business potential. Incorporated through educational systems or by nongovernmental organizations whose efforts focus on young people, EP10 and other such assessments are an important way for efforts in the region to have a bigger impact with a more narrow target population: those few truly high-talent entrepreneurs.

Building an Economic Environment Conducive to Twenty-First-Century Global Needs

On the economic environment, the UAE (see box 2) offers perhaps the leading case studies in how the principles of openness and engagement might similarly apply in other countries in the region, even if they do not share the UAE's unique combination of a small population and high government wealth. Based on the demonstrated success of this model, we recommend the following:

Loosen trade restrictions.

Despite the rise of both physical and e-commerce in the Arab world, and decreases in tariffs over the last decade, substantial and unnecessary barriers remain as each country in the region maintains its own opaque and inefficient shipping regulations. The cost of trade even among neighbors is typically twice as high for Middle East and North Africa (MENA) countries as in Western Europe.[43] Consistently and cooperatively removing these barriers—such as streamlining company equity requirements and tariff regulations beyond the GCC would have unprecedented impact on economic growth. And, when reforms are passed, it is essential that there are rigorous efforts to ensure enactment.

Promote the joint flow of knowledge and technology.

Middle Eastern countries are lacking in ways to transfer the information and technology emerging from universities and research institutions to the private sector. The public-private synergies that exist in places like Massachusetts Institute of Technology (MIT), Silicon Valley, or Research Triangle in the United States don't exist in the Arab world.[44] Significant tech-

43 Mustapha Rouis and Steven R. Tabor, *Regional Economic Integration in the Middle East and North Africa*, World Bank, 2013, p. xxiv. See Chapter 1 for more details on the effects of open trade in the region.

44 MIT, in fact, has partnered with the Masdar Institute in the UAE to create collaborative research and degree programs and coauthor efforts for assessment and recruitment of faculty, students, and administration. This could be an interesting platform for tech transfer initiatives as well.

transfer programs based on global best practices should be enacted across the top universities in the region.

BOX 2: THE UAE EXAMPLE

The United Arab Emirates has taken unprecedented measures in recent years that will not only have ramifications across the Arab world but could offer a model for rule of law and regulatory reform in a variety of countries. Declaring a "National Innovation Strategy" as a top priority, the UAE government boldly and with specificity set public targets for 2020: to rise to the top twenty in the Global Innovation Index (up from rank thirty-five in 2013); to increase R&D expenditures to 1.5 percent of GDP from its current rate of 0.5 percent; and to ensure non-oil real GDP growth of 5 percent annually, up from 3.5 percent.

In addition, the UAE is working to establish a national culture that encourages innovation and entrepreneurship through partnerships between the public and private sectors with seven foci: renewable energy, transport, education, health, information technology/software, water, and space. Additionally, it created four parallel tracks with measured outcomes: First, stimulate innovation through institutional and legal reform. Second, encourage innovation in government by integrating world-class technology, requiring all agencies to reduce spending by 1 percent, and dedicating those savings to research and innovation. Third, encourage private sector innovation by urging companies to establish research and innovation centers, adopt new technologies, and develop new products and services. Finally, equip individuals with modern skills by concentrating on science, technology, engineering, and mathematics education, including the creation of new curricular material. The UAE is pushing specific education goals and initiatives in areas including robotics, innovation education, and entrepreneurship; implementing new metrics to evaluate student performance; and identifying talent at ages as young as five to seven years old. Finally, they have drafted laws to allow 100 percent foreign ownership of businesses and other benefits to spur the presence of top global tech enterprises.

A full detailed overview on their Vision 2021, where the UAE has set a goal to be among the world's most competitive nations by that year, may be found at http://www.vision2021.ae/en.

Reform investment laws to encourage tech-based innovation.

Most parts of the Middle East lack intellectual property protections. Additionally, a number of countries in the region constrain capital flows, disincentivizing companies from pursuing investment in those jurisdictions. Absent personal bankruptcy protections discourage entrepreneurs from taking necessary risks by criminalizing failure and making second chances impossible. Debtors' prison sentences are available in the law in many Arab countries for personal liabilities, which offers great disincentive for individuals willing to fund innovation beyond corporate bankruptcy. In addition, emphasizing transparent, rapid, and consistent dispute resolution processes will allow investors to feel protected against unethical behavior by majority shareholders and ameliorate risk.

Update financial regulatory law.

The Middle East is home to some of the most promising and creative innovations in mobile finance anywhere in the world. They are hindered, however, by legal regulations that are simply failing to move forward. No doubt governments wrestle with the complexities of how to monitor safe transfers to prevent fraud and the funding of bad actors. Yet the responsibility for this oversight is often the subject of confusion amongst government ministries, which must decide whether something like a mobile payment should fall under the jurisdiction of the telecommunications ministry, the ministry of finance, both, or something else entirely. Addressing these questions and updating the laws accordingly can smooth the way for what is fast becoming a new reality in finance, and therefore position Arab countries to take advantage of what may well be the next financial boom.

Protect and encourage early stage investors.

Foreign direct investment in strategic emerging markets is highly subject to the availability of products that can help mitigate the inevitable but manageable risk of such markets. This is why financial institutions such as the US Overseas Private Investment Corporation and the World Bank's Multilateral Investment Guarantee Agency have long offered political risk insurance and debt financing for companies that invest in these markets. In addition, programs like the Small Business Investment Companies program, administered by the Small Business Administration in the United States, can help investment funds have easier access to capital. Programs like these offer interesting examples worthy of consideration in the MENA region, though they would require tweaks to make sense in the start-up world. Still, many of these programs, even in the

United States, are focused on debt financing. Yet debt financing is usually irrelevant to small start-up firms, which tend to offer equity only as finance collateral; large multilateral organizations tend to emphasize loans, and are thus unequipped to take on start-up investments. Moreover, these institutions tend to deal in amounts of money that are much smaller than what is required to launch a typical tech start-up. Thus, multilateral aid organizations should be encouraged to examine how they can better support the emerging Arab start-up economy by focusing on "bottom up" investment products and strategies—recognizing that enabling start-ups may more closely resemble a form of microfinance than the type of macro loans these institutions are used to disbursing.

Recognize that what is good for start-ups is good for the economy as a whole.

Although macroeconomists might view the focus on entrepreneurship as a sideshow, without the heft to strengthen economies in a significant way, it is important not to view entrepreneurship as a panacea in itself—not everyone can start a business, after all. However, the types of reforms that benefit entrepreneurs are also necessary for the economy as a whole. Thus, the focus on cultivating entrepreneurship can have positive knock-on effects throughout the economy. However, in enacting these reforms, it is also useful to keep in mind that sweeping reforms tend to be faster and more effective than gradual or zone-specific ones. Governments that are serious about rebooting their economies must demonstrate a commitment to the reform project through both the speed and scope of change.

Acknowledge the US government's role, but recognize that the private sector must lead.

The US government can play a lesser but important role to encourage or open interconnection among the global tech communities. Over the last five years, the government has focused on its "convening capabilities" to host virtual and physical conferences. While efforts such as the annual Global Entrepreneurship Summit are well-intentioned, and generally well received, hundreds of these types of gatherings happen regularly in the region already. More importantly, it is still too difficult for young Arab entrepreneurs to attain even short-term visas to meet with investors in the United States or attend the best US conferences and build relationships in Silicon Valley. Most government efforts in development focus on large-scale, country-specific aid (like USAID programs) that has little application for the bottom-up, lower capital requirements of start-ups. Creating Overseas Private Investment Corporation (OPIC)-like political risk programs for equity, as they have for debt, is an interesting concept to explore. Similarly USAID's recent effort to match capital and equity guarantees in Lebanon (to the tune of $15 million) is interesting, but small, and must cautiously balance encouraging new investment against interfering with or altering market and pricing forces by taking risk out of smart investment decisions.[45] The foundation of any policy must encourage better engagement and bridge building among the best in entrepreneurs, investors, and educational institutions in both regions. Each has something to teach the other.

Facilitate bridge building to the diaspora.

Both the private sector and governments should partner to facilitate expanded, bottom-up connections between the tech and education communities in the United States and the Arab world. The fall 2015 visit of India's Prime Minister Narendra Modi to the United States underscored what many in Silicon Valley have long admired: The Indian diaspora, comprising over 3.2 million people in the United States alone, has not only a significant impact on innovation in this country, but also contributes greatly to making India one of the technology leaders of the world.[46] Key executives of many of the largest American corporations—including Microsoft, Google, Adobe, Pepsi, and MasterCard, to name but a few—are Indian-American and engaged in bridge building with the country of their ancestry. In anticipation of the sanctions being lifted, the large diaspora of Iranian-Americans in technology are working on plans to build bridges.[47] Private organizations such as TechWadi in Palo Alto have tapped similar efforts among the Arab-American diaspora with great potential—hosting networking events and conferences.[48] Many, however, are nascent and not well funded, and could benefit from additional support in order to extend their positive impact more thoroughly to the Middle East.

45 Stephanie D'Arc, "USAID Launches MENA-II in Lebanon Amidst Growing Landscape of Support," Wamda, April 8, 2015, http://www.wamda.com/2015/04/usaid-fraught-mena-ii-launches-lebanon-growing-support-landscape.

46 Drew Desilver, "Five Facts About Indian Americans," Pew Research Center, September 30, 2014, http://www.pewresearch.org/fact-tank/2014/09/30/5-facts-about-indian-americans/.

47 Erik Hesseldahl and Dawn Chmielewski, "Iranian-American Tech Execs, Investors Support Nuclear Deal," Re/code, August 10, 2015, http://recode.net/2015/08/10/iranian-american-tech-execs-investors-support-nuclear-deal/.

48 See http://www.techwadi.org.

CONCLUSION

It is clear that the trends of the "Participation Revolution" are not only irreversible, but are accelerating with unprecedented rapidity. Governments, inherently slow to embrace change generally, may try to ignore these trends, relegate them to the margins, or even control them. Similarly, analysts that look at them through overly restrictive disciplinary lenses risk historic narrative bias. As Erik Brynjolfsson and Andrew McAfee of MIT described, we are well into a "second machine age" and are only beginning to understand the speed of change and its consequences.[49] Indeed, what macro-economist at the time would have predicted the global economic impact of the automobile in the early 1900s, air travel in the 1930s, the Internet in 1992, or mobile technology in 2001? It is easy, in their early phases, to dismiss such innovations as fringe or elite, thereby failing to adequately account for their transformative potential and multiplying effects.

For those who choose to engage and harness these trends for pressing challenges like job creation, education, health, and the environment, opportunities exist now that were unavailable only a few short years ago. People in the Middle East literally have the tools in their hands to solve their own problems without waiting for government institutions, and they are deploying them. Governments that embrace this reality can coauthor changes that can better societies, and thus enhance their own credibility.

49 Erik Brynjolfsson and Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (New York: W. W. Norton & Company, 2014).

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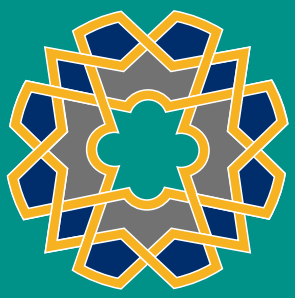

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