Asia-Pacific
Economic Cooperation

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APEC Public-Private Dialogue on Sharing Economy and Digital Technology Connectivity for Inclusive Development

APEC Policy Partnership on Science Technology and Innovation

June 2020

APEC Project: PPSTI 01 2018A

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APEC#220-PP-01.3

ACKNOWLEDGEMENTS

The Project Overseer Mr. Ma Leju, along with PO team, hereby would like to extend the sincerest gratitude to all who made contributions to the completion of the project:

- Project co-sponsoring economies: Chile; Indonesia; Malaysia; Mexico; Papua New Guinea; Russia, Chinese Taipei; Thailand
- Seminar co-host organizations:
  National Commission for Scientific and Technological Research of Chile (CONICYT)
  Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) of Malaysia
- External research partner: The Association of Pacific Rim Universities (APRU)
- APEC Secretariat for all support provided
- PPSTI members for nominating best practices and offering all suggestions during the whole project
- All speakers, participants and representatives for sharing best practices and valuable insights
- All staff who made this project possible

We highly value the best practices and perspectives shared by all speakers and participants regarding fostering public-private partnerships and enhancing digital connectivity in the digital future. We will continue to engage experts, scholars, industry and government representatives in follow-up projects as part of the concerted efforts to advance inclusive development in APEC region.

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PART ONE EXECUTIVE SUMMARY

This report summarizes a series of cases presented at two seminars held under the auspices of the *APEC Public-Private Dialogue on Sharing Economy and Digital Technology Connectivity for Inclusive Development* (hereinafter abbreviated as the APEC PPD Project). The objective of the Project is to help APEC member economies leverage sharing-economy development and digital technology in support of APEC's vision of building an inclusive APEC community by 2030.

The seminars were held in Chile in 2019 and in Malaysia in 2020 respectively. Almost 50 invited speakers, participants, and representatives from 14 economies, including Chile, China, Republic of Korea, Thailand, the United States, Malaysia, the Philippines, Indonesia, Peru, Australia, Russia, Canada, Chinese Taipei and Hong Kong, China, exchanged opinions during the two seminars. Additionally, 18 speakers and participants from universities, research centers, international organizations and other institutions shared their best practices and opinions as well. Meanwhile, given the Project's key effort on gender balance, it is worth noting that 20 of these speakers and participants are female, accounting for over 40%.

The first seminar, *APEC Public Private Dialogue on Science Technology and Innovation*, was co-hosted by the National Commission for Scientific and Technological Research of Chile (CONICYT) in August 2019 in Chile (hereafter referred to as Seminar 2019). Seminar 2019 focused on public–private partnerships (PPPs) in China, Chile, Malaysia, and Thailand, and also emphasized the role and improvement of digital skills in the sharing economy. Cases presented at Seminar 2019 suggest that smaller emerging economies within APEC can leverage PPPs for the greater good, given their broad relevance and applicability across the gamut of economies, irrespective of socio-economic or developmental status.

The second seminar, *APEC Public Private Dialogue on Science Technology and Innovation: Capitalize on Research and Development* was co-hosted by Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) of Malaysia in February 2020 in Malaysia (hereafter referred to as Seminar 2020). Seminar 2020 focused on building the innovation economy through collaborative networks and enterprising future technologies through PPPs. Cases presented at Seminar 2020 provided both a macro-level perspective (pertaining to large economies) and a micro-level perspective (pertaining to smaller economies), each demonstrating certain value-added features of PPPs.

As the foundation of sharing economy, information and communication technologies (ICTs) provide essential infrastructure for sharing platforms. APEC PPD Project fosters emerging engines of economic growth and inclusion while avoiding disruptions in industrial transformation and ineffective digital technology innovation.

The two seminars were sub-themed according to priorities of APEC Connectivity Blueprint for 2015–2025: a) Physical Connectivity: Digital infrastructure financing bottleneck through public private partnerships (PPP); b) Institutional Connectivity: Regulatory outlook for sharing economy and more secure and trusted digital economy ecosystem; c) People-to-People Connectivity: Platforms and enabling technologies for people mobility in digital future.

The two seminars yielded six sets of policy recommendations as follows: a) enable a sound innovation network to foster PPPs and adopt 'Intelligent' implementation of policies for PPPs; b) maximize stakeholder involvement; c) eliminate the skills gap by building strong PPPs; d) adopt open-data practices and shift the focus of PPP policies to measure impact/output (away from measurement of performance); e) ensure the development of the sharing economy in a safe and healthy manner; and f) take industry's lead in adopting PPP policies.

PART TWO INTRODUCTION

2.1. The "Sharing Economy"

The spread of the "sharing economy" when combined with the connectivity enabled by digital technology seems to be leading the way into the digital future, bringing opportunities and challenges to inclusive development in the APEC region.

The expression "sharing economy" usually refers to a different approach of purchasing goods and services rather than the traditional corporate business model wherein businesses hire employees to produce goods to sell to consumers. Instead, in sharing economy, individuals hire out their possessions or assets, such as cars, homes, and personal time—usually on a temporary basis—to other individuals in a peer-to-peer fashion (Hamari et al. 2016). This popular characterization of the sharing economy reflects a capitalist economic phenomenon that is deeply intertwined with (digital) technology,[1] especially information and communications technologies (ICTs).[2]

Digital technologies precondition sharing economy because sharing activities are mediated by ICTs. In this case, ICTs mitigate the "tragedy of the commons" because they facilitate effective supervision and feedback between parties involved in sharing-economy transactions. In 'capitalistic' definitions of the sharing economy, the online platforms enabled by ICTs (not only as components of the platforms but also as the infrastructure which enables wide usage of the platforms) serve as the foundation of the business model.

2.2. The APEC PPD Project

The APEC PPD Project (Project Number: PPSTI 01 2018A) comprises two seminars. These seminars focused on regulatory and policy cases, with a view to developing policy recommendations. The Project supports APEC's vision of building an inclusive APEC community by 2030 (APEC Economic Leaders' Meeting, (AELM) 2017)). It supports the vision by developing a public–private cross-sector approach to developing a sharing economy with digital technology connectivity, calling for stronger public–private partnerships (PPPs) which foster emerging engines of economic growth and inclusion and meet challenges such as disruptions in industrial transformation and ineffective digital technology innovation.

The APEC PPD Project invited all member economies in the Public–Private Partnership in Science, Technology, and Innovation (PPSTI) to nominate best practices and invited experts (with public–private project experience) from both the public and private sectors to discuss specific cases, extract common visions, and develop policy recommendations which will help all members, especially developing economies, to achieve economic growth in the digital age and to make APEC a more inclusive community.

The Project addresses the capacity-building needs of developing economies especially Chile and Malaysia where the seminars were held, confronting opportunities and challenges brought by sharing-economy and digital technology connectivity. Each seminar was organized around three sub-themes covered according to priorities specified in the APEC Connectivity Blueprint for 2015–2025, including:

[1] This popular definition of the sharing economy is neither the only one nor the original one. Originally, "sharing economy" referred to a type of non-monetarized economy which is not based on a capitalistic system. Specifically, under an earlier definition, goods and services are provided for free (or sometimes for a very low subscription fee). Such activities are said not to be intended to generate an income or a profit for participants. As Nadeem et al. (2015) and Sundararajan (2016) have pointed out, a sharing economy was thought originally to consist of a community of actors using digital technologies to facilitate nonmonetary exchanges.

[2] Concretely, within this framework, a company usually provides a mobile app, which serves as an online platform on which suppliers and consumers buy and sell goods or services. For this reason, some scholars refer to the sharing economy as "crowd-based capitalism" (Sundararajan 2016).

a) physical connectivity (i.e. digital infrastructure), b) institutional connectivity (i.e. a regulatory outlook as well as a more secure and trusted digital economy ecosystem), and c) people-to-people connectivity (i.e. platforms and enabling technology for personal mobility).

The Project aims to meet two of APEC's capacity-building objectives: 1) to conduct best practice studies which give useful references to assist member economies in enhancing capacity for fostering closer PPPs and achieving sustainable growth and equitable development; and 2) to enable domestic knowledge-sharing pertaining to public–private cooperation from one economy to another to help members participate more fully in the regional economy (given, especially, that the sharing economy and digital technology connectivity involve a growing range of cross-border activities).

As PPSTI's first public-private dialogue project, the Project also offers an innovative and sustainable approach to enrich the sub-group's discussions on science capacity-building and connectivity.

PART THREE SUMMARY AND ANALYSIS OF CASES FROM TWO SEMINARS

Seminar 2019: APEC Public Private Dialogue on Science Technology and Innovation, held in August 2019, in Chile, comprised eight cases.

Seminar 2020: APEC Public Private Dialogue on Science Technology and Innovation: Capitalize on Research and Development, held in February 2020, in Malaysia, comprised fourteen cases.

Altogether, 22 cases were presented and each is summarized and analyzed individually.

3.1. Summary and Analysis of Cases presented in Seminar 2019

3.1.1. Case 1/8: Innovation Policy in China by the Ministry of Science and Technology of China

The Deputy Director General of the Ministry of Science and Technology of China presented the first case in Seminar 2019. In this presentation, the Deputy Director General offered a comprehensive introduction to science, technology and innovation (STI) policies in China as well as five new science and technology (S&T) programs.

STI policies began to play a major role in the Chinese economic policy in 2005 with the issuance of *National Medium- and Long-Term Program for Scientific and Technological Development (2006–2020)*. This initiative called for establishing a technological innovation system with enterprises as the main players in collaboration with actors from related industries, academia, and research institutes, with a view to enhancing the economy's innovation capability. This was followed by the issuance in 2016 of the *Plan for Implementing the National Strategy of Innovation Driven Development* and the *13th Five-Year National Science Technology and Innovation Plan (2016–2020)*, in a bid to help the economy develop its comprehensive innovation capabilities to a level that would place it among the top in the world. Guidelines released in 2016 set three milestones for innovation-driven development: to achieve the status of as an "innovative nation" by 2020, to become an international leader in innovation by 2030, and to solidify its position as an STI powerhouse by 2050.

The five new S&T programs include: a) the National Natural Science Foundation of China: supporting free exploration in basic research, emphasizing the importance of balanced development of disciplines, and providing support for personnel training and team building; b) the National Major Science and Technology Project, focusing on the economy's major strategic objectives, giving full play to the advantages of the domestic mobilization system and carrying out integrated and coordinated research to tackle key challenges; c) the National Key R&D Program: forward-looking deployment of R&D with a focus on major scientific frontiers that affect the economy's competitiveness, supporting the scientific basis for the development of key technologies for which the economy has strategic needs, and carrying out major scientific research around key scientific and technological facilities while coordinating the conduct of basic research in key projects with whole-chain design in various fields; d) the Technological Innovation Guiding Program: encouraging local governments to contribute funds with central-government guidance, supporting a key laboratory of provincial ministerial partnership and strengthening local basic research; and e) the R&D Bases and Talent Program: improving overall planning, supporting the construction of science and technology innovation bases and capacity building, promoting the opening and sharing of S&T resources, supporting scientific research by innovation talents and teams, and providing better conditions for supporting China's STI development.

Overall, China's rapid rise as a global STI power can be attributed to: a) a strong, unified and decisive government leadership, b) an advanced and pragmatic education system that provides human resources for STI sector, and c) a healthy and sustained market and private sector that curate STI competition and improvement. To begin with, the Chinese leadership's emphasis on STI policies

and measures is visionary in timing and comprehensive in magnitude. The concerted focus on S&T was initiated when China was still acclaimed as a 'developing' or 'emerging' economy. Although the *National Medium- and Long-Term Program for Scientific and Technological Development (2006–2020)* was launched in 2005, its planning and more generally the attention to S&T began several years prior. Also, the government's attention on STI is of not only an early one, but also a concerted and strong one, with large funding on STI and growing spending on R&D. Meanwhile, the Chinese education system with a strong STI-focused curriculum has been providing the STI sector with a sustained supply of human resources. With a practical approach, the economy's education administers and designers have shaped a STI-focused education environment, wherein science and technologies became not only compulsory elements of secondary education, but also popular fields of study within Chinese universities. In addition to government leadership and education, China's STI growth has been co-fuelled by a proactive, competitive and well-regulated private sector, wherein corporates, start-ups and other market-oriented organizations compete in R&D and create sustained STI development.

3.1.2. Case 2/8: Interaction Among Public, Private and Academic Sectors by National Electronics and Computer Technology Center, Thailand

The second case presented in Seminar 2019 involved a study conducted by a researcher from 'National Electronics and Computer Technology', Thailand. In this presentation, the researcher discussed interaction between the public, private, and academic sectors, specifically the drivers behind the transfer of technology across the three sectors. According to the researcher, public policy plays an important role in facilitating technology transfer across the three sectors. Three particular mechanisms used by the government include: a) tax incentives for R&D expenses, b) tax exemptions for start-ups, and c) support for the eco-system and basic infrastructure through the setting of standards and regulations as well as through the provision of seed funding. Two case studies presented by the researcher covered digital technology's role and Thailand's smart-city plan.

Analytically, one distinguishing feature of this presentation from the first presentation on China was the critical role played by the government (i.e. public policy) in leading the way for establishing the correct incentives to encourage the public, private, and academic sectors to interact with one another. In the absence of such incentives, the interaction is likely to be limited—more so in developing economies where the maturity levels and sophistication of each of the public, private, and academic sectors is lower (as compared to their better-funded counterparts in developed economies). Nevertheless, as this Thailand case neatly demonstrated, even in developing economies, some relatively easy-to-implement measures such as tax incentives for R&D expenditures, tax exemptions, and provision of seed funding are in fact possible to implement with low overheads. In this way, such policy interventions can be considered as 'low-hanging fruit', providing a springboard for developing economies to encourage interaction among public, private, and academic sectors.

3.1.3. Case 3/8: School-enterprise Cooperation Model of Vocational Colleges by Zhejiang Normal University, China

The third case at Seminar 2019 revolved around the school–enterprise cooperation model of vocational colleges, presented by a lecturer from Zhejiang Normal University in China. This case illustrates the ways in which cooperation was achieved between Zhejiang Normal University and various enterprises. Through in-depth integration of "production, learning, research and application", Zhejiang Normal University and the participating enterprises carry out all-round strategic cooperation in scientific research and personnel training which comprehensively enhanced their competitiveness, achieved brand advantages and social visibility, and achieved complementary advantages and a mutually beneficial situation. The cooperation between Zhejiang Normal University and the participating enterprises was achieved through three mechanisms: a) personnel training, which jointly builds high-level scientific research platforms, R&D bases, collaborative innovation bases and technical service centers, laboratories and practical teaching bases; b) academic

conferences and industry skill competitions that enhance the communication and sharing of information on the economy, industry, and science and technology; and c) in-depth technical cooperation in the transformation of enterprises with scientific and technological achievements and vocational education. A case study of cooperation between Zhejiang Normal University and Shenzhou High-Speed Rail Technology Company Limited was also presented, embodying the three aforementioned mechanisms.

This case neatly illustrated two of the issues raised by the seminar's preceding two cases. Empirically, this case illustrated—with the use of a local example (Zhejiang Normal University in China)—how public partnerships can occur. Furthermore, by highlighting three mechanisms through which cooperation between Zhejiang Normal University and participating enterprises was achieved, this case offers concrete lessons for institutions elsewhere with aspirations to promote public-private dialogue. Finally, and equally noteworthy, is the fact that case study presented (of cooperation between Zhejiang Normal University and Shenzhou High-Speed Rail) is particularly insightful insofar as the high-speed railway is a high-tech field in which China has achieved widely acclaimed success, so much so that they are able to demonstrate global leadership. Such technological excellence bodes well for the fate and future of public-private cooperation.

3.1.4. Case 4/8: Public Policies for Innovation and Tech Transfer, by Science and Technology Policy Institute, Korea

The fourth case at the Seminar 2019, presented by the Head of Office for Multilateral Cooperation Project, Science and Technology Policy Institute from Korea, discussed on two broad issues. To begin with, the case analyzed policies for encouraging innovation and technology transfer. In this regard, the key element for public-private partnerships is the condition or maturity of the prevailing innovation ecosystem (a network of innovation actors—such as the government, research institutes, universities, the private sector—that are producing, diffusing and using new knowledge). The healthier and more mature the innovation ecosystem, the more likely public-private partnerships will come into shape. The health of an innovation ecosystem is dependent on the number of actors participating in the system, their size and role, and crucially, the existence and strength of their linkages—particularly, in this case, those linkages between the public and private sector actors. The extent to which public-private cooperation in policymaking on digital technology is considered depends directly on the maturity of the innovation ecosystem: the more mature the system, the more likely public-private cooperation is going to be. The second broad issue discussed regards how and when academia can contribute to policymaking, and the role that academia plays in PPD. Academia can contribute to policymaking by providing the policymaking sector with capably trained STI human resources (i.e. researchers), and also in terms of being a source for STI-related knowledge. In the age of the digital economy, academia plays an important role insofar as it is a main actor in the innovation ecosystem and thereby can influence the type of ecosystem (open, flexible, or balanced) that we see.

The conceptual contribution of this presentation was to help us zoom out from the 'trees' to refocus on the 'forest'. In other words, if the overall state of the forest is unhealthy, individual trees within the forest are also likely to be so. Therefore, to ensure the health and growth of an individual tree within a forest, it is necessary to ensure the healthiness of the overall system. In refocusing our attention to the aggregate level, public-private partnerships are but one element of a broader system and to strengthen those partnerships, it is equally important to strengthen other elements within the system (for example, the strength and capacities of other actors, the surrounding legal or political framework, etc.). By falling back on the innovation ecosystem approach, the presentation helped us remember the four key advantages of this conceptual approach: The approach goes beyond just R&D to explain innovation dynamics within a society; it encompasses institutional elements that strongly influence growth dynamics of an ecosystem; it recognizes that the organization is not the sole vector of technological innovation; and most important of all, the innovation ecosystem approach is well-suited to analyzing innovation policy (as it draws attention to systemic features of the innovation process, cautioning against simple policy prescriptions).

3.1.5. Case 5/8: Closing the Digital Skills Gap Initiative, by Wiley, USA

The fifth case at the Seminar 2019 was by presented the Vice President for Society and Strategy and Marketing, Wiley, USA, on APEC's 'Closing the Digital Skills Gap' initiative. The APEC Closing the Digital Skills Gap Forum took place in Singapore on 19 July 2019, gathering representatives from 16 APEC economies to explore policy options that can strengthen digital skills and the digital economy. At the Forum, participants finalized a roadmap to support and scale up upskilling and reskilling programs carried out by employers, governments, and educational institutions across APEC. Implementation of the roadmap builds upon the work of APEC's Data Analytics and Raising Employment initiative, or Project DARE, which developed and implemented a set of industry-driven recommended actions to strengthen data science and analytics competencies, or DSA.

The Project DARE framework has informed the work of eight universities, companies, and associations to date, including the Analytics Association of the Philippines, Hong Kong University of Science and Technology (HKUST), and Ho Chi Minh University of Technology and Education (HCMUTE). The roadmap also recommends sharing government statistical methodologies and best practices, as information on how governments track and organize workforce data is insufficient. More sharing of information and best practices can facilitate to establish a more standardized approach to upskilling. Project DARE sets the following two targets: a) measuring the digital skills gap by 2020, decreasing the digital skills gap by 50% by 2025, and eliminating the digital skills gap by 2030; b) understanding the state of digital skills readiness by 2020, improving digital skills readiness by 50% by 2025, and achieving full digital skills readiness by 2030.

A set of Recommended APEC DSA competencies was developed to enable academia and training providers to align the development of curricula, courses, and programs with industry needs, as a valuable resource that policymakers can use to manage skills development within their workforces and design policies that support the development of skills in data science and analytics. The competencies were developed by a 50-person Advisory Group (comprising business leaders who oversee data science and analytics needs for their organizations, academic leaders who oversee data science inter-disciplinary initiatives and curriculum, and government officials involved in human resources development) composed of 14 APEC member economies, co-chaired by the global skills and knowledge company Wiley and the Business Higher Education Forum (BHEF).

One standout feature of the aforementioned case is its relationship to the other cases presented in Seminar 2019, particularly the case from the Academy of Sciences Malaysia (case seven, below). While Malaysia's "Industry4WRD" strategic enabler focuses on strengthening digital skills, the APEC Closing the Digital Skills Gap Forum sought to achieve a similar objective. The most noteworthy analytical takeaway from the APEC Closing the Digital Skills Gap Forum is the need to have long-term coordinated measures (rather than ad-hoc initiatives and short-term activity) to strengthen digital skills and the digital economy. Therefore, a 'roadmap' is necessary in a sense that it not only facilitates coordination of long-term concerted measures but also highlights roles played by various actors including employers, governments, and educational institutions.

3.1.6. Case 6/8: Reducing Traffic Congestion by Public-Private Cooperation in China, by DiDi, China

The sixth case at Seminar 2019, presented by the Head of Government Affairs at DiDi, China, demonstrated how the company worked with the Jinan Municipal Government to ease traffic congestion through a Smart Transportation System.

With 7.3 million residents, Jinan is the capital of Shandong province in eastern China with severe traffic problems due to increasing population. However, the city's congestion has been reduced by 6.5% following a public–private joint project launched in 2016 by Jinan's Traffic Police, which oversees the City's traffic control, and DiDi, a private company with the world's leading mobile

transportation platform. The project established a big-data–based smart transportation system for traffic control in Jinan, which combines and coordinates innovative tools such as traffic light optimization, reversible lanes, and guidance screens.

Used effectively and extensively in its ride-hailing business, DiDi smart transportation platform is able to flag abnormal areas of congestion and to suggest solutions. Based on this technology, the Project developed an optimized platform for Jinan installed in the city's traffic control center with an independent server and other hardware designed to address data security concerns. This new platform is able to combine archived data from Jinan and real-time data from the DiDi platform and run more comprehensive analysis, enhancing the overall efficiency of traffic control as well as increasing capacity, which leads directly to higher average vehicle speed and indirectly reduces pollution.

According to the traffic analysis report on major cities in China in the first quarter of 2018, traffic congestion in Jinan has (as noted above) decreased by 6.5%. The project was particularly effective in providing downtown rush-hour solutions. In the downtown central area (the lake area), the average delay decreased by 10.73% during the morning peak time and by 10.94% during the evening peak time. Average vehicle speed was increased by 17.1% on weekdays and 31% on weekends. The project also set an example of public-private cooperation in the transportation sector, which is generally highly dominated by the public sector. The project enables the public sector to leverage private-sector knowledge and resources to provide better service to the general public. The project also empowers private companies to develop feasible and sustainable business models. Moving on from the Jinan project, DiDi is now collaborating with more than 20 other cities in China and is extending its know-how to other economies, including Brazil, Mexico, and Chile.

Overall, this case is of special significance for its demonstration of the private sector's crucial role in transport infrastructure. While transportation infrastructure is an area that has historically and contemporarily been the purview of the public sector, newly emerging high-technology-oriented private companies can, and are, playing a larger role in leading the way towards the development of advanced and updated technology innovation and data processing capabilities. Thus, this case showcased how these private-sector-led activities can in turn be synergized with public sector efforts to aid in city-management efforts (by making quicker and more precise decisions) leading to an overall increase in city-management capabilities.

3.1.7. Case 7/8: Public-Private Dialogue in Policy Making on Digital Technology by Academy of Sciences Malaysia

The seventh case at Seminar 2019 presented by the Chief Executive Officer of the Academy of Sciences Malaysia outlined the facilitating role that the Academy in offering a public–private dialogue–based platform for policymaking. As the "Industry4WRD" strategic enabler was discussed in depth, it is Malaysia's initiative to transform manufacturing sector and its related services towards smarter and stronger, with the rubric of People, Process and Technology. The Policy component encompasses strategic enablers of **F**unding, **I**nfrastructure, a **R**egulatory Framework, **S**kills & **T**alent, and Technology (FIRST).

Two insights are of special significance in the 'FIRST' initiative. Firstly, in terms of the 'R' that represents 'Regulatory Framework', one strategy is to increase awareness of the need for, benefits of, and opportunities in Industry 4.0 technologies and business processes among manufacturing firms. This is noteworthy as Industry 4.0 represents a pathway through which emerging developing economies such as Malaysia can catch-up, or even optimistically leap-frog their more advanced (western) counterparts by exploiting its public–private and dialogue–based platform to upgrade its manufacturing sector and its capabilities. Secondly, in terms of the 'S' that represents 'Skills and Talent', the focus is not only on traditional education—which represents the older approach to skills—but also on upskilling. Conceptually, upskilling matters as it acknowledges that obtainment or loss of skills are lifelong (rather than only in school through the 'early' years of an individual's

life). Practically, this translates into an awareness that skillsets need to be retooled. To ensure the availability of future talent (for example, for the Industry 4.0 environment), upskilling needs to be strongly promoted.

3.1.8. Case 8/8: How to Receive Information When Networks Are Down, by Emercom, Chile

The eighth case at Seminar 2019 presented by Emercom, Chile an Emergency Information System that uses infrastructure already available for radio broadcasting—namely, high frequency signals that are used to encode information and send it to smartphones—to achieve a low-cost and highly scalable solution that facilitates communication in the absence of an internet or cell network. This system was developed by a multidisciplinary team composed of experts in software development, electronics, and business.

Analytically, this case showcased how public-private partnerships can be effectively deployed in a developing-economy setting. Although many have vaunted the advantages of public-private partnerships, concrete cases of how such partnerships have yielded meaningful results on-the-ground for citizens of a particular economy are relatively less common. Against this background, the Emercom case demonstrates how a multidisciplinary team of public and private actors can come together to give birth to a technology that suits the context and needs of an economy like Chile.

3.2. Summary and Analysis of Cases presented in Seminar 2020

3.2.1. Case 1/14: Emerging Technologies and the STI Outlook, by Organization for Economic Co-operation and Development (OECD)

The first case at Seminar 2020, presented by the Organization for Economic Cooperation and Development (OECD) speaker, demonstrated eight policy lessons on capitalizing on R&D through PPPs. To begin with, emerging technologies have broad-ranging impacts across many fields of application, some of which cannot be anticipated in advance. Secondly, given the unpredictability of technological change—including its impact on production and the pace of development and adoption—it is necessary to adopt an open and flexible perspective that supports a diversity of technology advances and applications. Thirdly, despite the increasing calls for more privately funded research, public research continues to play a pivotal role in emerging technologies. Fourthly, emerging technologies continues to depend on other technologies for their future development and exploitation. Fifthly, given the uneven pace of technology diffusion and its changeable direction, the gap between frontier firms at the cutting edge of emerging technologies and laggard firms (that merely keep pace with innovators) is widening. Sixthly, technologies do not function in isolation. To realize benefits of technologies, it is necessary that the introduction of a technology be bundled with investments in complementary assets such as new skills and organizational forms. Seventhly, emerging technologies carry several risks and uncertainties. For PPPs to succeed, the public or private sector must tackle with ethical and moral issues raised by the introduction of an emerging technologies. Eighthly, policymakers face the dual challenges of fostering and governing technological innovation, which sometimes conflict with one another, placing policymakers in the unenviable position of having to choose one side or the other (either fostering or governing technological innovations).

3.2.2. Case 2/14: The Future of Work, by the Association of Pacific Rim Universities (APRU)

The second speaker at Seminar 2020, from the Association of Pacific Rim Universities (APRU), described best practice for capitalizing on R&D through PPP as one that is built on multi-stakeholder engagement. To provide context for the APRU, member institutions will not initiate R&D projects in the conventional sense but rather focus on projects that explore the societal impact of technology. Through such projects, the APRU informs policymakers on key aspects to support relevant frameworks and policies. As such, one key benefit of APRU-backed projects is that the APRU

approach enables regional governments to react more quickly to the impact and influence of new technological developments than they otherwise would be able to.

With multiple stakeholders engaged in PPPs, certain opportunities arise to enhance the effectiveness of these partnerships, for example by maximizing the network effect (i.e. where multiple parties become involved with a view to improving the effectiveness of the system), increasing impacts (as a result of input from a diverse body of stakeholders), and marshalling additional resources (from each of the multiple stakeholders).

3.2.3. Case 3/14: STI Policy Governance in China, by Embassy of the People's Republic of China in Malaysia

The third case presented in Malaysia discussed China's STI policy governance, with the best practice for capitalizing on R&D through PPPs namely "Technological Innovation Guiding Program". The program encourages local government to contribute funds under central governmental guidance, supporting key state laboratories of provincial–ministerial partnerships, thereby strengthening basic research conducted locally.

The speaker also discussed international STI cooperation mechanisms which include inter-governmental STI cooperation projects, international S&T cooperation platforms, exchanges of S&T personnel, and foreign technical assistance, and China's participation in international mega-science programs which include the International Thermonuclear Experimental Reactor (ITER), the Square Kilometer Array (SKA), the International Ocean Discovery Program (IODP), and the Human Genome Project (HGP)). The overarching principles under which cooperation are equality, mutual benefits for all parties, outcome-sharing, and respect for IPRs.

3.2.4. Case 4/14: STI Policy Governance: Australia, by Department of Industry, Science, Energy and Resources, Australian Government

Seminar 2020's fourth speaker from Australia elaborated on the importance of capitalizing on R&D through PPPs to an economy where practical necessities (low population density, a competitive federalist system with each state having its own independent STI policies) dictate the creation of PPPs. In such a system, however, policy is not the end in and of itself but has to be geared towards engaging with the research community, and there has to be connectivity between research and industry.

To capitalize on R&D, one best practice relates to research-funding activities and collaboration and commercialization activities. In this regard, research funding has to be assigned to the economy's research sector, which works together with industry. Similarly, collaboration and commercialization activities (i.e. through collaborative research centers, industry growth centers, and R&D tax incentives) must focus on the industry sector, which is connected with the economy's research sector.

Two best practices in Australian programs for capitalizing on R&D through PPP include:

- Industry Growth Centers (IGCs) are designed to offer a number of key services to help Australian businesses grow and develop new innovations that can extend capabilities to other markets. IGCs work to optimize industry standards and harmonize regulations within certain sectors, identify knowledgeable partners to inform the research community about industry's needs, and provide advice regarding the skills needed within a given sector to take advantage of those new technologies. IGCs also provide 10-year competitiveness plans to the government indicating how they will achieve growth.
- Corporate Research Centers (CRCs) are challenge-based policy initiatives that industry, academia and, importantly, small-to-medium-sized enterprises (SMEs) bring to government, as the government funds certain rounds of applications. Instead of depending

on the government to identify a challenge, they work collectively to identify their R&D requirements, bringing together industry and the research community into one application.

3.2.5. Case 5/14: Amplifying the Impact of Research in the 21st Century, by Academy of Sciences Malaysia

Seminar 2020's fifth speaker from the Academy of Sciences in Malaysia demonstrated best practices for capitalizing on R&D through PPPs in the economy with an impact-focus (rather than output alone). In this regard, Malaysia's R&D priority is to connect R&D with socioeconomic development. To this end, the Academy has been creating a collaborative network with a platform called 'i-Connect' (similar to Australia's CRCs). This platform helps connect the public and private spheres with the industrial partner leading the way. However, the 'best practice' adopted by Malaysia is to involve a neutral entity that connects the public and private entities. The focus is on 10 technology drivers and 10 socioeconomic drivers.

3.2.6. Case 6/14: Research Connectivity through Open Science, by International Science Council (ISC) Regional Office for Asia and the Pacific

The sixth case at the Seminar 2020 was presented by the director of the ISC's regional office for Asia and the Pacific. The director elaborated on best practices for capitalizing on R&D through PPP. These include, fundamentally, three parallel initiatives: -

- World Data System (WDS) – promoting long-term stewardship of, and equitable access to, quality-assured scientific data and data services, products, and information.
- Committee on Data for Science and Technology (CODATA) – improvement of the quality and accessibility of data as well as of methods through which data are acquired, managed, and analyzed; facilitation of international cooperation; and promoting increased awareness.
- International Network for the Availability of Scientific Publications (INASP).

3.2.7. Case 7/14: Business Model & Prospects for Emerging Technologies, by ABAC Principal Advisor

The seventh case at the Seminar 2020 was presented by ABAC Principal Advisor for APEC PPPSTI, which focused on the 'wider agenda'. Specifically, with the objective of creating an enabling environment that stimulates innovation, promotes growth, drives the economy and recognizes STI as a critical pillar in economic planning, it is vital to consider a wider agenda which weaves the key elements of the innovation and technology ecosystem into city planning. Such an agenda represents a more holistic approach to creating integrated S&T districts and communities. With such an approach, parks and campuses have their role as individual components of the ecosystem but there is a need to address society's wish to live, work, play, and learn in a close-knit environment. As such, we cannot conceive of STI in isolation; we need to identify a much more comprehensive approach.

3.2.8. Case 8/14: Role of Policy Makers in Promoting Future Technology taking Autonomous Vehicle as Case Study, by Unmanned Vehicle Technology Innovation Experimentation Program Office, Chinese Taipei

Seminar 2020's eighth speaker, the deputy chief of Chinese Taipei's Metal Industries Research & Development Centre (MIRDC), discussed the role of policymakers in promoting future technology with the example of autonomous vehicles (AVs), who provide comprehensive guidance for and services to innovation. This policy guidance however should not—and does not—come from policymakers alone; rather, the guidance also comes from relevant private-sector stakeholders tasked with maintaining innovation.

3.2.9. Case 9/14: SMEs and National Economic Development, by Reddal Inc.

Seminar 2020's ninth speaker, from Reddal Inc., reoriented the focus towards the macro or aggregate picture of SMEs' involvement in domestic economic development. Employing empirical examples from across the Asian region (but mostly Korea and Viet Nam), the speaker delivered four key messages:

- To understand the drivers of domestic economic growth, we must understand the role of an economy's population, the nature of the economy's productivity, and the nature of its exports.
- The role of domestic policy impacts SMEs. In particular, Korea pursued import substitution (using interventionist/protectionist strategies to drive manufactured goods exports by subsidizing target industries and related chaebols), while Viet Nam pursued a complementary strategy (with government policy aiming to help local SMEs become multinational corporation (MNC) suppliers). Avoiding the original equipment manufacturing (OEM) trap is even more critical for SMEs in developing economies given that their advantage in manufacturing, arising out of cheap labor, will gradually diminish. Distinct domestic policy choices have varying impacts on SMEs.
- Korean SMEs are often trapped in a vicious cycle, accepting their role as local suppliers. The transition to a virtuous cycle requires engaging in more time-consuming, costlier, and uncertain R&D and internationalization. Without a dedicated entry strategy, many young companies fall into the pitfalls of relying on the 'sales' approach to achieve short-term gain. SMEs in developing economies need a path-creation strategy, where internationalization is an integral part of success.
- The role of a policy ecosystem and the need for end-to-end coverage must be emphasized, with the key point that economic success is not only about economics but also both political and economic institutions. Furthermore, innovation is driven by freedom and creativity and institutions can improve innovation by incentivizing more people to participate in innovative activity. Inclusiveness is a key element in the early stages of development, but the overall policy ecosystem must also meet requirements down the line. In other words, the policy ecosystem must be adapted in lock-step with the ever-changing innovation ecosystem. Even though Korea's economic policy has been actively extended across all development stages, it is yet adequately to address SMEs issues. The Vietnamese government's regulatory support has focused on improved credit access and reduced administrative burdens (with the impact of recent new measures to enhance SME capabilities yet to be seen). In Viet Nam, the various recent stimulus packages have encouraged the formation of new SMEs supported by bank lending; it remains unclear, however, whether their development is sustainable.

3.2.10. Case 10/14: Value Creation Through Academia-Industry Linkages, by Collaborative Research in Engineering, Science and Technology (CREST)

The tenth speaker from Seminar 2020, the CEO of CREST, an NGO dedicated to promoting collaborative research in S&T, demonstrated value creation through academia–industry linkages. CREST connects public and private entities, intervening in and solving common challenges faced by MNCs and local companies. The common challenges include:

- Mismatches in research areas at universities seeking to solve technical problems in industry
- Lack of supply of industry-relevant talent
- Lack of shared facilities to serve immediate industry needs

As a neutral entity, CREST enables both public parties and their private counterparts to help create a world-class ecosystem by

- Bridging the gap between academia and industry
- Offering a single platform that both academic and industrial partners can utilize
- Promoting demand-driven research in industry
- Helping generate a pool of domain experts
- Optimizing resource allocation

- Sharing knowledge to drive R&D and innovation in the electrical and electronics (E&E) sector

CREST fosters a collaborative R&D ecosystem through the creation of an industry-led collaborative platform for market-driven R&D. While CREST is industry-led, its member representation comprises the triple helix of government, industry, and academia. Since 2012, CREST has built a solid infrastructure of 145 approved R&D projects, 85 industry and university members, 14 shared facilities, 20+ hosted business starts at CREST's technology startup incubator, 2000+ databases of subject-matter experts, and 10,000 university and industry talents.

Key takeaways from CREST's experience are:

- To collaborate successfully, a neutral platform is essential. This yields transparency through strong governance structures and offers clear, concise messaging regarding activities that represent one's community. Furthermore, it is expedient.
- The support network can come from unexpected places. It is necessary to have a strong board with knowledge and foresight. A Triple Helix model integrates three kinds of stakeholders, each with its own needs.

3.2.11. Case 11/14: Financing and Incentivizing Green STI, by Malaysian Green Technology Corporation

Seminar 2020's eleventh speaker, the CEO of Malaysia Green Technology Corporation (MGCC), addressing the subject of financing and incentivizing green STI, government financing and incentives for STI R&D in Malaysia. Financing—especially in the early stages—is an important aspect and governments must be sources of new ideas as well as commercialization. Financing is a central issue for innovative entrepreneurs as well as policymakers. Startups and SMEs face financial constraints typically due to the potential risks to their innovation and the MGCC helps solve problems such as gaps between investors and entrepreneurs. Also, some entrepreneurs suffer from resource constraints, insufficient collateral, or lack of credit and the quality of a business plan is also influential in funding decisions. Meanwhile, other policies such as subsidies and tax deductions are also in place. Subsidies are very effective at mitigating financial constraints. Seed funding can not only help SMEs mitigate financial constraints but also help them navigate their initial stages when it is difficult to access capital.

The key best practice from the MGCC's experience is that policymakers have a key role to play on two fronts:

- Promoting a diverse set of innovative companies, covering the spectrum from basic research to companies engaged in commercialization activities.
- Offering a policy package to support all steps from basic research straight through to commercialization.

3.2.12. Case 12/14: Policies and Incentives Related to Green Manufacturing, by Malaysia Investment Development Authority (MIDA)

Seminar 2020's twelfth speaker from the Chemical and Advanced Materials Industries Division of the MIDA discussed its role and practices. Best practices adopted by the MIDA include offering companies in the manufacturing sector pioneer status and granting investment tax allowances, reinvestment allowances, and import duty/sales tax exemptions. Other incentives include automation capital allowances, domestic investment strategic fund (DISF) support, an intervention fund, and customized packages.

3.2.13. Case 13/14: Towards Digital Transformation: Productivity Through Industry 4.0 Adoption, by Inari Amertron Berhad

The thirteenth case at Seminar 2020 was presented by the COO of Inari Amertron Berhad. As a major private-sector corporation, Inari's major best practice consists in offering one-stop fully turnkey services to its clients, ranging from design and development to high-volume manufacturing to shipping. The goal is to offer clients—whether they are private firms, government agencies, or academic institutions—collaborative engagement opportunities.

Inari works with clients to develop packaging solutions, assembly processes, and testing processes. The captive and collaborative Out-Sourced Assembly and Test (OSAT) performed by Inari involves Inari's collecting information/requirements from customers that they use to execute and respond in collaborative, interactive, and real-time fashion.

3.2.14. Case 14/14: Waste-to-Wealth Technology Solutions, by Mensilin Group of Companies

The last case at Seminar 2020 was presented by the CEO of the Mensilin Group of Companies, who discussed waste-to-wealth technology solutions. Continuing with the Syngas case (by the MGTC), the CEO of Mensilin discussed the types of waste plastic that are converted into ultra-low-sulfur diesel fuel in Syngas conversion systems.

PART FOUR DISCUSSION AND FINDINGS

4.1. Seminar 2019

To divide the eight cases presented at the Seminar 2019 into two geographic categorizations, three concerned Chinese PPPs (i.e., a general broad-based overview of cooperation between Zhejiang Normal University; DiDi and the Jinan government), and four based on other APEC economies' experiences (Thailand, Malaysia, and Chile) and a conceptually-oriented discussion on digital skills. The conceptually-oriented talk on digital skills was particularly revealing as digital skills are necessary if APEC member economies are to appropriately leverage sharing economy (and avoid its pitfalls—discussed later). Given the ever-increasing pace of technological change, it is impossible for traditional institutions of learning—secondary as well as tertiary—to keep pace with the requirements and needs of the workplace in the sharing economy. As a result, new skills have to be learned on the job (after the completion of formal education through upskilling), old skills discarded (through deskilling), and an engagement in skill-changing (through reskilling).

With regards to skills, although mainstream discourse promotes digitization and robotization as an unstoppable trend that will lead to workers' upskilling and create new jobs (cf. Wu 2017; Xinhua Net 2015), this idea has to be taken with a small pinch of salt—not least because there is, as yet, asymmetrical attention given to the plight of workers who are directly or indirectly impacted by such technological changes. Therefore, workers might easily internalize a discourse of "progress" and view their sacrifice as an inevitable outcome rather than standing up to fight against it.

Overall, cases presented at the Seminar 2019 were of high quality. Each case offered unique perspectives from which audience members (and others) could learn from China's and other economies' experiences. Further, the cases did not address PPPs in a theoretical bubble, but rather tethered to actual economy-specific examples. These examples offered concrete ways in which other economies could learn, customize and implement policies that were formulated in their own 'backyards'.

Meanwhile, the final point made in the case on the emergency information system in Chile demonstrated that PPPs need not be the vanguard only of large, more rapidly developing economies such as China, Malaysia, Thailand, etc. Rather, smaller emerging economies within APEC can also look to leverage PPPs for the greater good. This case demonstrated that one of the key advantages of PPPs is their broad relevance and applicability across the gamut of economies irrespective of socio-economic or developmental status. The other economy-specific cases further demonstrated the potential for leveraging PPPs to promote R&D and growth. These insights should act as consolation even for economies that are striving harder to move up the developmental ladder across the world.

4.2. Seminar 2020

The 14 cases presented at the Seminar 2020 in Malaysia fell into two categories: the six presented in the first session focused on building the innovation economy through collaborative networks; and the eight in the second session focused on enterprising future technologies through PPPs. The cases in the first session largely reflected a macro perspective, expressing the viewpoint of international organizations such as the OECD, the APRU, and the ISC and individual-economy cases of China, Australia, and Malaysia. Meanwhile, the cases reviewed in the second session largely reflected a micro perspective, pertaining in scope to smaller economies (such as Hong Kong, China) or specific technologies (such as autonomous vehicles), certain economic sectors (such as SMEs and larger enterprises), particular linkages (such as academia–industry links), or particular types of technologies (such as emerging and green tech).

Overall, these cases were of high quality for their unique, non-overlapping vantage points. Combined together, they served adequately to address the overall conference theme. Also, given the wide variety of cases (in terms of economies covered as well as economic sectors), the cases complemented one

another well, each of which addressed a unique facet or feature of a way to capitalize on R&D (the seminar theme).

A few of the cases provided detailed suggestions for overcoming the challenges that stand in the way of capitalizing on R&D. The suggestions offered were necessarily more directly applicable from the unique perspective offered by each speaker but, combined, the suggestions highlighted a 'pathway' that can be taken to help relevant actors capitalize on R&D more effectively.

PART FIVE POLICY RECOMMENDATIONS

Based on the summary and analysis of all cases presented in the two seminars, the following policy recommendations are provided as to how relevant actors can foster closer PPPs in the sharing economy and digital technology connectivity within APEC economies and beyond.

However, the suggestions and policy recommendations should *not necessarily* be taken as specific, step-by-step instructions regarding what to do. It must be recognized that if policymaking is to be truly effective, individual economy-specific conditions must be fully considered. Rather, we intend the suggestions and policy recommendations to serve as guiding principles that enabling policymakers to steer the various actors within their jurisdictions/remits towards closer, and deeper, forms of PPPs. The spacing of the entries in the following list reflects relationships between the recommendations:

5.1. Enable a sound innovation network to foster PPPs and adopt 'Intelligent' implementation of policies for PPPs

- When implementing regulations, strike a balance between 'right regulations' and 'de-regulation'
- Embed governance 'upstream'

A well-developed innovation ecosystem involves multiple actors including multilevel government, research institutes, universities and businesses. The more mature the system and the more stakeholders engaged, the more likely public-private partnerships will empower digital technology and economy. To capitalize on R&D through PPPs, governments need to create conditions that are conducive to the development and diffusion of trusted technology with broad and beneficial impacts for the economy and society. Furthermore, a balance has to be struck in terms of when (and what kinds of) regulations should ideally kick in for R&D in the digital economy. If governments regulate too early in the R&D process, the full potential or impacts of a technology might not be fully apparent, raising the risk of misguided or inadequate regulation that constrains R&D and innovation. On the other hand, if governments regulate too late, changing course may become expensive, difficult, and time-consuming because a technology is already built into the market (the 'lock-in' effect). Furthermore, 'end-of-pipe' solutions can come too late and not be as effective (as earlier intervention). Additionally, governments have to move from 'deregulation' to the 'right kind of regulation'. This view is echoed even by the biggest private firms such as Facebook. Finally, preventing, correcting, or mitigating potential negative effects of innovation while still allowing entrepreneurial activity to flourish and reaping the benefits of innovation is a key challenge facing policymakers today.

5.2. Maximize Stakeholder Involvement

- When involving multiple stakeholders in PPP projects, focus on overcoming barriers to their involvement

Bringing together multiple stakeholders to maximize project impacts. Multi-stakeholder projects facilitate the flow of knowledge between engaged parties. While academic experts learn and benefit from engaging with colleagues across academic disciplines, these projects also increase understanding and knowledge across stakeholders and thus guide future research areas. With multiple stakeholders, it is also necessary to adapt to, and overcome the challenges brought about by the contrasting working cultures of the public and private sectors; flexibility is required most when other stakeholders have reached a tipping point where there is no room to maneuver. One way to ensure this happens is by identifying an experienced project lead who can corral and manage multidisciplinary experts and is committed to delivering the key project outputs is essential for success.

5.3. Build Strong PPPs to Eliminate Digital Skills Gap

To support upskilling programs across APEC, it is important to align the goals and information on digital skills gap among governments, educational institutions and employers through PPPs. Such an alignment facilitates the heightened tracking of workforce data, which in turn permits the digital skills

gap to be better measured, training programs better tailored to industry's needs, and policies better formulated so as to facilitate relevant activities for digital skills development.

5.4. Adopt Open-data Practices and Shift Focus to 'IMPACT'

- Adopt and build trust in open science
- Shift focus away from 'output' (or performance) to 'impact'

Given the crucial role of data in leveraging PPPs, well-established principles governing data usage are needed, which can be defined as FAIR (Findable, Accessible, Interoperable, Reusable) principles. As data become a commodity, privacy is of vital significance. In this regard, the OECD's principles for research data from public funding need to be remembered which include openness, flexibility, transparency, legal conformity, and protection of intellectual property. To implement these principles, it is necessary to build an open-science ecosystem (which fosters open data). Another approach to capitalizing R&D through PPPs involves the shift of our focus away from *performance* to *impact*. Impact means the effects on or benefits of a technological change on the economy, on society, on culture, on public policy, on public services, on health, on the environment, and on areas beyond academia. However, another definition of impact is the demonstrable (rather than expected) contribution to the economy and/or society. As such, the future of research is looking for KRIs, or Key Research Impacts rather than the outdated KPIs, or Key Performance Indicators. Concomitantly, research funding needs to change in terms of emphasizing the impact of research (rather than output only). This extends to how research is monitored, reviewed, evaluated, and etc. There are many ways of measuring impact, such as understanding whether any change has been made in people's attitudes, or in its influence on the economy, social aspects, policy, culture, policymaking, etc. This focus on impact is necessary because when impact is emphasized and measured, the *process* of a PPP or a piece of research is downplayed in favor of the overall focus or objective of that research or PPP. If a change in impact can be made then R&D can be better leveraged through PPPs.

5.5. Ensure the Development of the Sharing Economy in a Safe and Healthy Manner

Given that the sharing economy is a fairly recent, and therefore emerging sector, regulations governing its ascent are co-evolving with the development of the sector itself. In such a context, it is even more important for prominent sharing-economy enterprises and industry associations to play a leading role in accelerating the formulation of industry standards that meet both local authority requirements and industry needs. That is not to say, however, that the public sector is expected to be absent from such a process (of establishing industry standards). Far from it. The public sector can leverage the know-how and expertise encapsulated by leading enterprises and industry associations in the sharing economy so as to balance the needs of various stakeholders who stand to participate in, benefit in (or lose out from), or otherwise be impacted by the sharing-economy. This recommendation resonates closely with one of Australia's programs for capitalizing on R&D through PPPs, where industry growth centers (IGCs) optimize industry standards and harmonize regulations within certain sectors.

5.6. Take Industry's Lead

- Build an industry-driven R&D ecosystem and earn broad buy-in from stakeholders

In order to promote collaboration with industry and thereby promote industry-driven and market relevant R&D projects allowing technology transfer to industry (for example, through contract research or licensing arrangements), it is necessary to promote industry-driven R&D. Industry-driven R&D is in a better position to meet industry's needs. Further, such an approach necessarily helps bring the focus to commercialization of R&D. Commercialization of R&D is itself an issue that is dependent on a number of factors including changes in the market and the potential existence of other competitive technologies available in the market. Industry-driven R&D ecosystems for a specific region should be driven through an incubation platform started in one location and replicated in other locations. A strategy needs to be developed to earn everyone's buy-in and an execution plan that is pragmatic. To capitalize R&D through PPP, stakeholder buy-in is imperative and a program designed to involve all stakeholders must be customized as one size does not fit all.

5.7. Key Takeaway and Caveats

A key takeaway from all the cases is that the organizations must cooperate with various regional associations and groups that can harness funding for R&D projects that involve the private sector, various universities and government agencies. This may include, for example, R&D for biomedical devices (i.e. ventilators, respirators, etc.) and include a framework for fast-tracking mobilization of medical and/or emergency relief using the resources and expert laboratories of member economies. The overriding message must encourage all organizations to enhance their relevance, particularly to the needs of the times, and reallocate resources when necessary. Such agility will enable the organizations to build stronger ties and mitigate the impact of current or potentially future (emerging) crises.

In terms of policy recommendations derived from the two seminars, and for the sake of balance, it may be worthwhile to bear in mind some of the concerns pertaining to the broader concept of the sharing economy. An overriding feature of this discussion is that the sharing economy may be merely a souped-up version of a flexible labor regime disguised by a novel slogan that emphasizes "sharing".

These concerns relate, first, to downplaying the community and sharing ethos embedded in the business model. As scholars such as Sundararajan (2016) have pointed out, the original version of the sharing economy has been crowded out by capital, which aims to create centralized, standardized, one-size-fits-all, universal platforms that regulate rather than mediate the activities of workers and customers. Anthropologists (cf. Frost 2020) advance similar criticisms, arguing that the capitalist sharing economy that has developed is unconnected to the social relations that constitute the fundamental building blocks of the sharing practice.

Secondly, concern with the sharing economy relates to the unethical treatment of workers. Sharing-economy firms commonly claim to be mediators rather than employers although they use algorithms to enforce rigid labor controls. Such a claim allows employers to escape responsibility (pertaining to labor welfare) for employees. This issue has led to the rise of labor exploitation problems which, in some cases, are even more serious than those that trouble non-sharing-economy sectors and firms (Rosenblat 2018).

The third concern of the sharing economy reflects the perspective of governance. Scholars such as Morozov (2014) have been critical of the methods used by sharing-economy firms to obtain profits, claiming in particular that the bulk of profits gained by sharing-economy firms are derived from bypassing existing laws and regulations in areas including taxation, labor protection, and licensing. Both the so-called convenience provided by their business model and the profits they derive from that model does not originate from an increase in efficiency or productivity.

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