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WHAT IS ON THE GLOBAL AGENDA FOLLOWING THE G20 HANGZHOU SUMMIT? AND WHERE DOES TURKEY STAND IN THIS AGENDA?

1. The Chinese G20 Presidency ended with the Hangzhou Summit held on 3-4 September, 2016. It is important to assess the highlights of the global agenda as set by the Hangzhou Summit in view of recent events which include an increasing number of terror attacks and security issues as well as political developments such as Brexit and the US elections all the year round. At the same time, it is important not to keep in mind that the framework agreed upon at the G20 Hangzhou Summit is a shared vision of the global agenda that was developed against the backdrop of recent global developments and in spite of the busy domestic agendas of individual countries participating in the summit. All the messages conveyed by the Summit this year –that began with the Chinese President Xi Jinping’s speech and ended with the Hangzhou leaders communique- point to an effort to turn the G20 into a platform to address 21st century challenges.

2. During the Chinese Presidency in 2016, the G20 took an important step towards reinventing itself. The need to develop a new approach for strong, balanced, inclusive and sustainable global economic growth was the central theme of this year’s Summit. In addition to issues such as financial market volatility and the low growth rate of international trade and investments, the central issue at the Summit was weak global growth. Global growth remains below growth levels before the 2008 financial crisis. While the G20 took successful steps to prevent further deepening of the global financial crisis from 2008 onwards, actions that are needed to drive global economic growth are different now.

¹ <http://www.tepav.org.tr/tr/ekibimiz/s/1280/Selin+Arslanhan+Memis>

At this year's Summit, the G20 was fully aware that there was a need to adopt a new approach to accelerate global growth. For this reason, G20 countries sent out a set of messages to spearhead global growth including a new strategy to address current global issues.

3. The fact that the G20 has once again come to the fore of global governance is because its agenda has been reshaped by recent global trends. Recent trends in technological transformation led to a change in the factors that accelerate economic growth. In parallel, they paved the way for structural transformation. One of the most significant steps the G20 has taken towards reinventing itself, are the new messages it gave that largely center around innovation driven sustainable growth. In addition to addressing stagnant global economic growth, the consensus on adopting a new innovation based approach pointed to solutions that technologies can provide to mounting economic and social pressures fueled by global demographic trends such as aging populations and population growth. Identification of new engines of growth, building an innovative global economy through cooperation, have been the most significant steps taken in recent years by the G20.

4. Diffusion of new technologies for sustainable development and growth was the main emphasis of the T20 spearheaded by TEPAV under the Turkish G20 Presidency in 2015. The innovation debate within the T20 was launched with a focus on technology transfer and diffusion. Both solutions to address global issues such as climate change and infectious diseases and securing global growth through the design of mechanisms to unleash technological transformation were emphasized in the G20 agenda through T20 publications and ^{2,3} during the T20 2015 Berlin innovation seminar and the Antalya Innovation-20 Summit ^{4,5} The Chinese G20 Presidency, took these discussions a step further. The new innovation and technology agenda, along with broader diffusion of technologies within countries, were part of the main message set of the G20 in 2016. Yet, what continues to be missing in G20's approach is the link between innovation and global growth on one hand and sustainable development, on the other. One of the highlights of the Chinese G20 Summit was the G20 action plan for the implementation of the 2030 agenda for sustainable development. However, the sustainable development agenda was not effectively linked to the new innovation framework. When the link between these two agendas is strengthened and concretized, possibly during the upcoming German G20 presidency, a highly solid and inclusive framework will be put in place for global growth and sustainable development.

5. Official documents of the Chinese G20 Summit were not limited by the Hangzhou Leaders' Communique. In addition to the communique, a number of action plans and thematic framework documents were published. One such document, the Hangzhou Action Plan outlines actions to implement the new strategy for driving global growth. It provides a roadmap for a strong, balanced, sustainable and inclusive growth. First of all, the action plan lists a number of measures for short term growth and stability, which can be regarded as highly limited in scope. It then provides a roadmap that will help trigger medium term growth. The most important component of this chapter is the Agenda for Structural Reform. For this

² <http://www.t20turkey.org/eng/pages/research/r22.html>

³ <http://www.tepav.org.tr/tr/haberler/s/3970>

⁴ Selin Arslanhan Memis, "G20 Ülkelerinde Bilim, Teknoloji ve İnovasyon", TEPAV April 2015.

http://www.tepav.org.tr/upload/files/1428321964-8.G20_Ulkelerinde_Bilim_Teknoloji_ve_Inovasyon.pdf

⁵ <http://www.t20turkey.org/images/pdf/Regional%20Seminar%20on%20Innovation%20and%20Technology%20Diffusion.pdf>

purpose, the G20 Agenda for Structural Reform document was prepared. It includes a number of steps to be taken in areas ranging from innovation to infrastructure as part of G20 members individual structural reforms commitments . For instance, the subheading of innovation includes “Fund of Funds” arrangements that was implemented by the Turkish Undersecretariat of Treasury last year to create funds to help finance early stage economic initiatives. Both the Hangzhou Action Plan and the leaders communique, along with the messages conveyed throughout the Summit, strongly underline the need for structural reforms to achieve sustainable global growth.

6. The G20 Innovation Action Plan shows a consensus among G20 countries that innovation is one of the most important driving forces behind sustainable development and global growth. This action plan was prepared to respond to the need for a new approach to accelerate global economic growth. The action plan can be understood as a serious motive on the part of the G20 to reinvent itself, to materialize its novel approach to growth introduced by the Chinese presidency. The recommendation made during last year’s T20 summit to create a global platform where innovation policies of the G20 countries are shared, methods for measuring the effects of technology on overall productivity are developed and the concrete effects thereof are both shared and assessed, was included in the action plan developed during the Chinese presidency.⁶ The creation of a G20 Innovation Platform under the leadership of the OECD and World Bank is one of the proposed actions. Another proposal that has been put forward is the preparation of a G20 Innovation Report by the OECD for sharing feedback and experiences. Furthermore, one of the concrete steps identified in the G20 Innovation Action Plan is the establishment of a database for sharing publicly financed research publications among G20 countries and initiating joint research among G20 countries– these recommendations were continuously made during last year’s T20 meetings and at the Innovation-20 Summit.⁷ Moreover, the action plan prescribes the establishment of cooperation mechanisms that will enable various stakeholders to develop and make available technologies intended for the realization of Sustainable Development Goals (SDGs). The sustainable development focus included here once again needs to be linked with the growth agenda .

7. Another complementary action plan in the innovation agenda is the G20 New Industrial Revolution Action Plan. Having been prepared with an aim to adapt to emerging technological developments, the action plan is a critical step towards transforming the G20 into a 21st century platform. It outlines mechanisms and policy steps in various areas ranging from the protection of intellectual property rights to establishing coordination for existing standards and new industrial infrastructures. Moreover, as is the case with innovation, a G20 New Industrial Revolution Report will be jointly published by the OECD, UNIDO and UNCTAD.

8. The Sustainable Development Goals (SDGs) that were adopted last year –as well as the G20 development agenda that was strengthened during the Turkish G20 Presidency - continued to be central in during the Chinese G20 presidency. The most important indicator of this was the publication of the 2030 Agenda for Sustainable Development Action Plan. The Action Plan includes top level principles that G20 leaders agreed on, contributions and objectives of individual G20 countries with respect to the themes and actions

⁶ Selin Arslanhan Memis, “G20 Ülkelerinde Bilim, Teknoloji ve İnovasyon”, TEPAV April 2015.

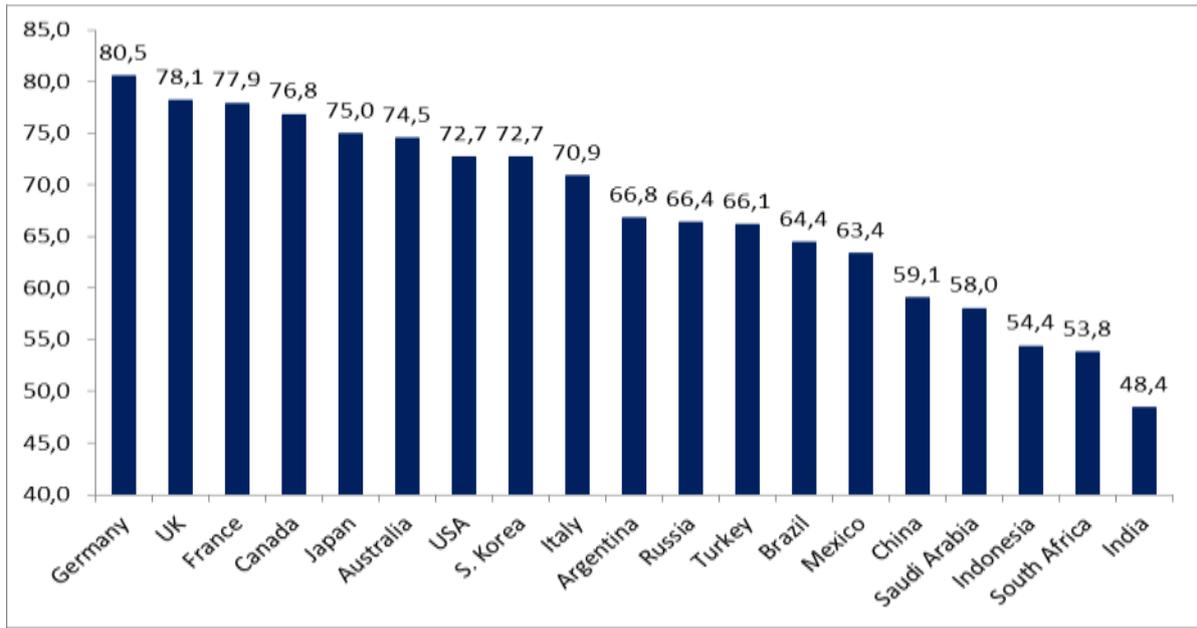
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⁷<http://www.t20turkey.org/images/pdf/Regional%20Seminar%20on%20Innovation%20and%20Technology%20Diffusion.pdf>

that they are working on to implement the SDGs and initial frameworks for G20 countries to develop national action plans that aim to align their policies with the SDGs. It should be noted that such an action plan is only the beginning of a process, which will be improved in the future, both in terms of its scope and contents. The purpose of the Action Plan is to contribute to the 2030 Agenda and to global efforts for implementing the Addis Ababa Action Plan by incorporating the Sustainable Development Goals into national policy frameworks of G20 countries. The G20 underscores that it aims to contribute to three dimensions of sustainable development (economic, environmental and social) through its existing and future actions. The framework that has been presented includes 15 subheadings ranging from healthcare to infrastructure, explaining which G20 themes and actions are likely to contribute to which SDG. Moreover, such efforts are defined as a starting point for more concrete actions to be taken at the G20 Summit in 2017. The plan also outlines national action plans of G20 countries in relation to the SDGs on a country by country basis. Moreover, follow up reports will be published on an annual basis.

9. While differences in G20 countries' frameworks regarding their respective national plans for Sustainable Development as prescribed by the 2030 Agenda Action Plan is yet to be seen, at present G20 countries show differences in terms of where they stand with respect to the SDGs. As is the case with what countries can learn from one another or some group of countries, what is required for achieving the established goals are different for each country. In order to establish a roadmap for achieving the goals during the preliminary stage of the national action plans, it is important to determine the current situation first. For this reason, both the UN and the international nongovernmental organizations such as OECD have various methods to measure and assess the current situation and to monitor developments as countries move towards the goals. One such method was published in July 2016. The chart presented below -prepared with the SGD Index data that is created by various indicators intended for the 17 SDGs - demonstrates differences among G20 countries in terms of the goals. Although there are differences in country performance for each individual SDG, when the SDGs are considered as a whole, Germany is the top performer while India is the worst performing country in the G20. It is also possible to point out a differences between advanced countries and developing countries based on the index values. The difference between advanced G20 countries and developing ones appears to be resulting mainly as a result of their level of performance in four SDGs: SDG 3 (Health), SDG 4 (Education), SDG 9 (Sustainable Industrialization and Innovation) and SDG 12 (Waste Management). It is not possible to make a generalization about differences and policies that need to be implemented with respect to the SDG 3 (Health), SDG 4 (Education) and SDG 12 (Waste Management) in developing countries as there are significant variations among them. The low scores of developing countries as a whole for these three goals are resulting from the poor performance of Argentina, India, South Africa and Indonesia. On the other hand, for SDG 9 (Sustainable Industrialization and Innovation) there is a clear distinction between the performances of advanced countries and developing ones. Hence, a more inclusive effort is needed to eliminate the difference observed in SDG 9.

Figure 1. SDG Index Scores of the G20 Countries



Source: SDG Index&Dashboards, Global Report, July 2016.

10. The 17 SDGs set within the 2030 Agenda for Sustainable Development framework were signed and approved by 193 countries at the UN Meeting held in September 2015. Maintaining a consensus on the sustainable development goals that range from energy to health, from environment to production, has placed sustainability at the top of the global agenda. Sustainable development has made it to G20 agenda both during the 2015 and 2016 summits, and efforts have been launched to prepare an action plan for the SDGs and to implement the 2030 Agenda. Such efforts are expected to be detailed further during the German G20 Presidency in 2017. As I mentioned above, the most important shortcoming of the Chinese G20 agenda this year was its failure to make the connection between sustainable development and growth in spite of the fact that the new technology and innovation framework provided an important opportunity to establish such a link. In a year where innovation and new industrial revolution successfully became main themes in the G20 agenda - as new drivers of global economic growth - and development remained a top priority, the aforementioned relationship could not be established in a strong and sufficient manner. Considering that important initial steps have already been taken, the German G20 Presidency next year needs to follow up on the G20's new approach for the G20 to truly reinvent itself. New technologies, providing the basis of many recent global trends, enable the establishment of a positive relationship between growth and sustainability.

11. While previous industrialization processes led to an increase in carbon emissions, new technologies allow for productivity increases across various industries and can help minimize carbon emissions. New technologies do not only help minimize carbon emissions, but also offer new options for waste management and enhancing energy efficiency. As we have seen in the last G20 Summit, there are two main themes of the global agenda. One is to accelerate global economic growth, the other is to implement the sustainable development agenda. Other items, components and tools fall under these two headings. One of the main reasons why global growth falls short of expectations is the productivity bottleneck. Maintaining a concurrent productivity increase in various industries in

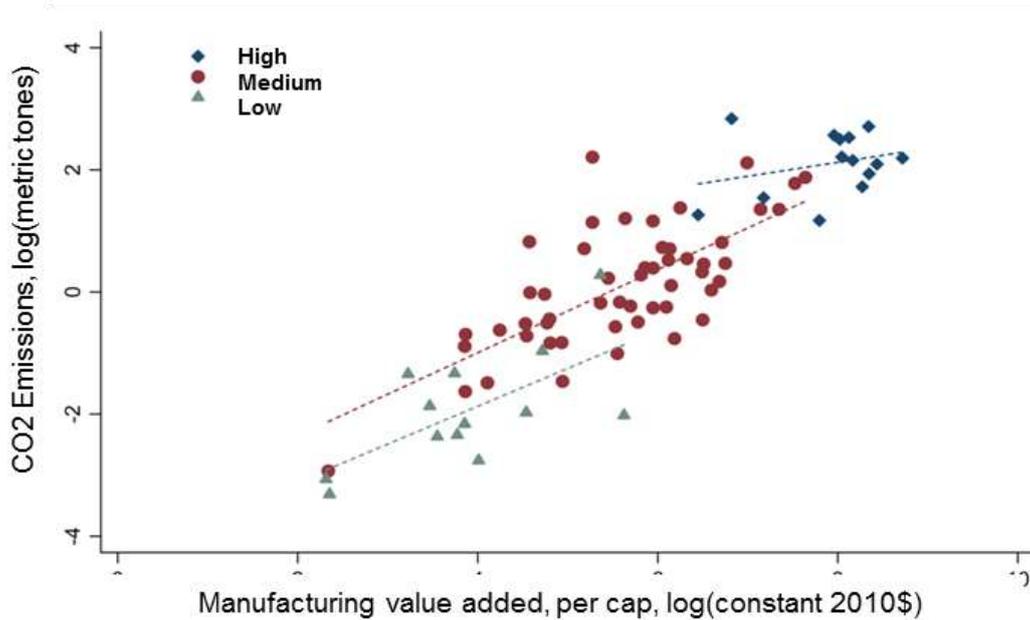
way that is inclusive of traditional industries across various countries is regarded as one of the fundamental requirements for accelerating global economic growth. There are three main sources for the increase of total factor productivity. The first one is increase through technological renewal. The second one is productivity increases driven by intra industry labor migration, which was so far the real source of growth in Turkey characterized in the form of transition from agriculture to industry and services.⁸ The last one, is the productivity increase based on more efficient distribution of resources among industries.⁹ Both the sources of productivity increase and productivity related gaps between companies have been subject to debate in recent times.

12. Irrespective of ongoing debates on such issues, the productivity increase that technological innovation can enable across various national industries is regarded as one of the primary drivers of global economic growth. The main difference from previous periods of industrialization, is that growth driven by increases in productivity based on new technologies -which lay the foundation for the new industrial revolution- actually makes a positive contribution to sustainability. This is precisely why the relationship between growth and sustainability should be strengthened and concretized through an approach that focuses on the diffusion of new technologies. As advanced economies undergo a technology oriented new industrial revolution, we can observe a positive relationship between growth and sustainability. Figures 2 and 3 below demonstrate this point. Figure 2 shows the relationship between the added value of per capita production industry and CO₂(carbon) emissions in 1980. The dots marked in three different colors represent different country groups based on their level of income. In 1980, there was a positive relationship between added value of the production industry and carbon emissions in all three low, middle and high income country groups. However, this particular relationship appears to be the strongest in middle income countries where industrialization gained momentum. On the other hand, in the year 1970, we see a stronger positive relationship between added value of the production industry and carbon emissions in high income countries; although access to data dating back to the 1970s is fairly limited.

⁸ World Bank (2014). Turkey's Transitions. Washington, D.C.: World Bank Group.

⁹ Nguyen, H., Taskin, T., Yilmaz, A. "Resource Misallocation in Turkey". World Bank, Policy Research Working Paper. August 2016.

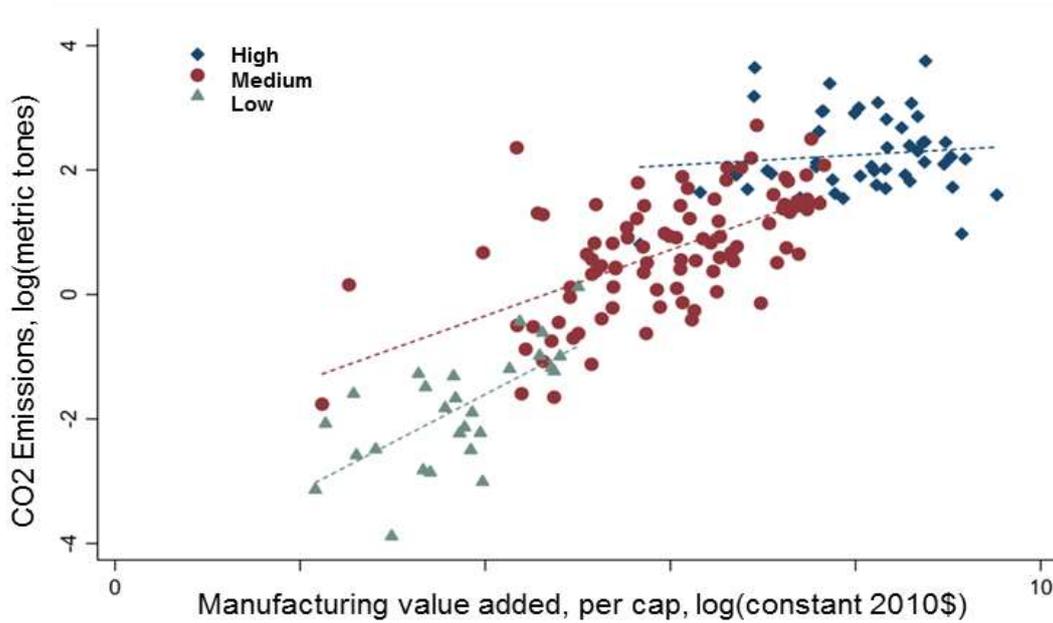
Figure 2. CO₂ emissions and manufacturing value added, 1980 (countries divided based on income groups)



Source: WDI, TEPAV calculations

13. In the year 2010, we can observe a further decline in the positive relationship between the production added value and carbon emissions in high income countries (Figure 3). This provides evidence that increases in the added value of production industry does not lead to an increase in emissions – a development that can be attributed to the new industrial revolution. In fact, if we drew this particular chart based on available data we could observe a reverse trend. We also note a decline in the relationship between the emissions and added value in middle income countries in 2010. On the other hand, the positive relationship seems to have strengthened between 1980 and 2010 for low income countries, as these countries have industrialized using old technologies.

Figure 3. CO₂ emissions and manufacturing value added, 2010 (countries divided based on income groups)



Source: WDI, TEPAV calculations

14. While it was difficult to maintain environmental sustainability throughout processes of industrialization in the 20th century, new technologies offered by the new industrial revolution makes environmental sustainability easier in the 21st century. What are these new technologies? We can broadly identify three horizontal technology platforms to describe recent technological transformation: Biotechnology, Nanotechnology and Information and Communication Technologies (ICT). New industrial policy that is designed based on these technologies have the potential to influence multiple industries at the same time rather than focus on individual industries.¹⁰ These three technology platforms have altered processes across sectors from industry to services, from agriculture to energy. New technologies are fundamentally different from previous ones because they hold the potential to provide productivity increases in various industries simultaneously while contributing to emission reduction, waste management and energy efficiency. There is an increasing number of studies that estimate the impact of such technologies in various sectors on productivity and carbon emissions. According to studies conducted by the EU Commission and the OECD,^{11,12} when traditional practices are replaced by industrial biotechnology applications, there is a 10 to 20 percent productivity increase in various industries while CO₂ emissions are reduced by

¹⁰ Selin Arslanhan Memis, 'Teknoloji Platformları Yaklaşımıyla Yeni Sanayi Politikası', TEPAV Policy Note, 2015.

¹¹ OECD, 'Industrial Biotechnology and Climate Change: Opportunities and Challenges', 2011.

¹² EC, Key Enabling Technologies (KETs) Observatory, December 2015.

20 to 40 percent.^{13,14} We can observe similar trends looking at the impact of other technology platforms. The commercial applications of nanotechnology have recently been made available in various industries, hence we will soon be able to make similar estimates on its impact.

15. In order to accelerate global economic growth and achieve the sustainable development goals, international organizations and countries should focus on transfer and diffusion of new technologies. The reinvention of the G20 is conditional on its ability to follow through with its new approach to growth during the German Presidency and beyond. Taking note of the significance of evaluating G20 countries' current performance with respect to the new three technology platforms, the T20 published a note during the Turkish G20 Presidency in 2015.¹⁵ Figure 4 (originally published in the aforementioned note) compares technological supremacy of the G20 countries in terms of biotechnology, nanotechnology and ICT. Technological supremacy is estimated by the OECD based on the ratio of a country's share of patents obtained in a specific technological field in total patents globally and the country's share of total patents within total patents globally. The technological supremacy and focus areas of G20 countries show significant variations. According to the analysis, South Korea comes second in nanotechnology while maintaining an undisputed dominance in ICT. It has yet to claim a similar supremacy in the area of biotechnology. The USA and Australia claim dominance in biotechnology while Russia has made headway in nanotechnology.

16. It is important to determine the right priorities for the upcoming period to reap the benefits offered by the links between the G20 growth and development agendas. The focus of the new agendas set by the G20 in 2015 –namely innovation, new industrial revolution and sustainable development- should be based on a clear understanding of which of these technologies are to be transferred to which country, what kind of mechanisms will be used to ensure technology transfer and how will technologies be absorbed across domestic economies. Moreover, such technologies should be evaluated in terms of how they will influence the global growth objective and sustainable development goals. In light of such evaluations, the costs of technology transfer should be calculated and ideas should be developed with respect to financing models to cover technology transfer costs.

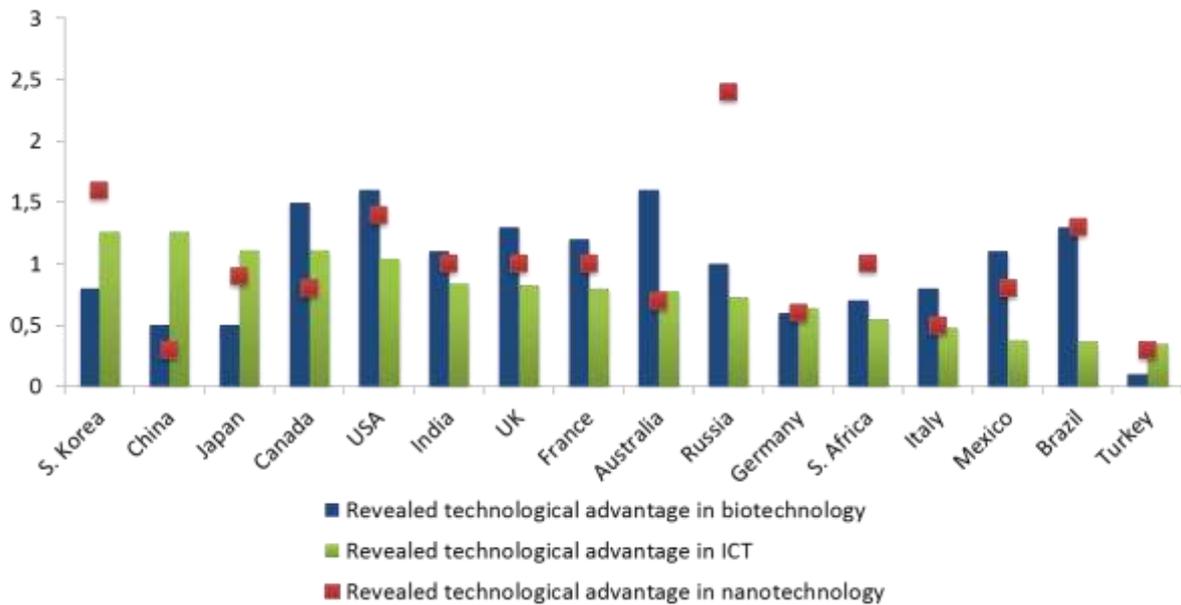
¹³ EU, BIO4EU Project, 'The Biotechnology for Europe Study: Modern Biotechnology in Industrial Production Processes, energy and the Environment', 2007.

¹⁴ WWF, "GHG Emission Reductions With Industrial Biotechnology", 2009.

¹⁵ Selin Arslanhan Memis, "G20 Ülkelerinde Bilim, Teknoloji ve İnovasyon", TEPAV April 2015.

http://www.tepav.org.tr/upload/files/1428321964-8.G20_Ulkelerinde_Bilim_Teknoloji_ve_Inovasyon.pdf

Figure 4. A Comparison of the Revealed Technology Advantage of the G20 Countries in terms of Biotechnology, Nanotechnology and ICT, 2013

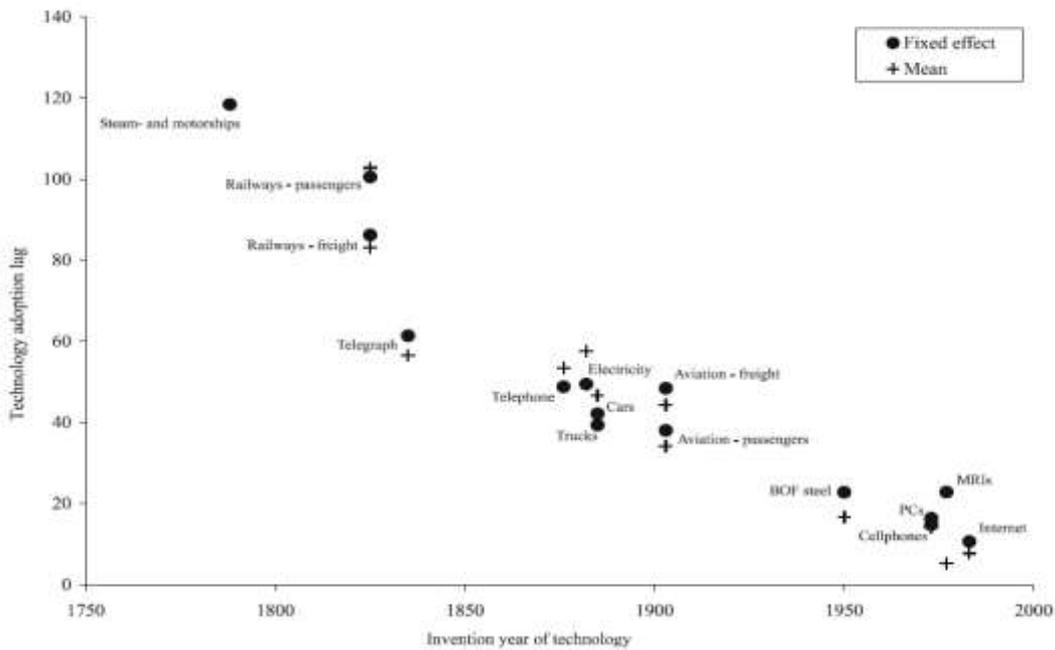


Source: OECD, 2015

17. New technologies differ from previous ones in that they diffuse faster across the world. New technologies spread across the global economy in short time frames when compared to old technologies. This is due to both the quality of new technologies and globalization of production networks. Figure 5 demonstrates that the duration in which technologies spread across the world has gradually shortened in the last 200 years. Advanced countries that are better integrated into the global value chains (GVCs) are able to incorporate new technologies into their production processes rather quickly. Developing countries, on the other hand, are able to achieve GVC integration and technology transfer only through foreign direct investment. The TEPAV analyses - based on the OECD-WTO TIVA database that enables analyses for country performance with respect to value chains - reveals the importance of foreign investment in terms of technology transfer and diffusion. Figure 6 demonstrates the correlation between countries forward link to GVCs and their FDI stock. There appears to be a positive relationship between foreign investments that countries receive and their contribution to GVCs.

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Figure 5. Invention year of technology and technology adoption lag



Source: Comin et. al, “An Exploration of Technology Diffusion”, 2008

Figure 6. Forward participation to GVCs and FDI

Forward Link: Contribution of Local Economies to GVC

Log (Embodied local domestic value in foreign exports, million USD \$)



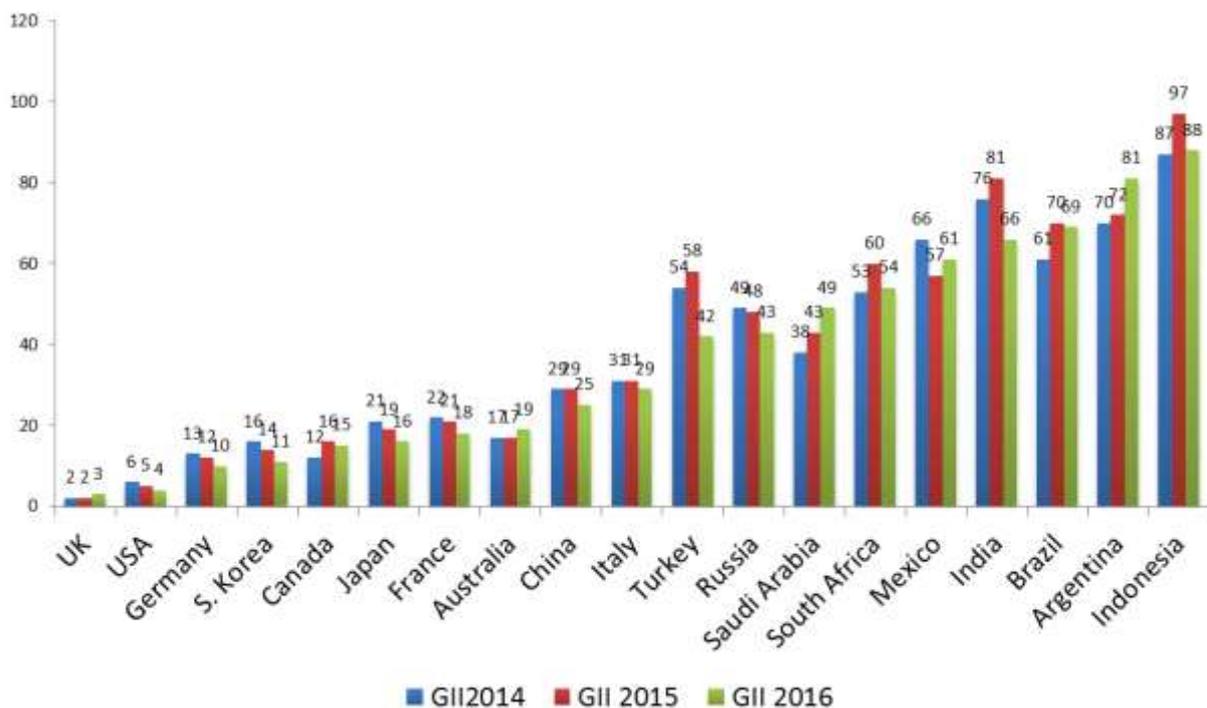
Source: OECD/WTO TiVA, TEPAV Calculations

18. Related to individual countries' integration into global value chains through foreign investments and design of mechanisms to help accelerate technology transfer

for achieving G20 goals, is the ability of countries to absorb new technologies. A country's ability to absorb technologies is closely related to its level of readiness for technology transfer. A country's absorption capacity is measured by various structural reform components such as corporate competency, protection of intellectual property rights, research and industrial infrastructure, human capital, entrepreneurship culture. The absorption capacity of countries are highly important to achieve global growth and sustainable development targets in the upcoming years. It is necessary to design technology transfer mechanisms while ensuring that all countries' have well- developed innovation ecosystems . As the Chinese G20 Presidency took the first steps towards incorporating a new approach to drive global growth, it also focused on enhancing the G20 structural reform agenda to implement its new technology based approach to growth.

19. The Global Innovation Index assessing the current ecosystem status of various countries was announced in August 2016. Figure 7 lists G20 countries based on their performance in the the global innovation index. The index consists of 7 sub components - namely corporations, human capital and research, infrastructure, infrastructure, market sophistication, job sophistication, information and technology outputs and creative- and assessed 143 countries in 2014, 141 in 2015 and 128 in 2016. Taking into to account the change in the number of countries and changes observed in indicators and calculation methods, we can observe an overall improvement in the rankings of G20 countries in the 2016 index. The most noteworthy development is China's ascendance into the group of the world's most innovative 25 countries by rising 4 levels in 2016. Turkey improved its ranking the most among G20 countries, jumping 16 spots. Structural reforms to improve individual country's ecosystems are critical in ensuring that opportunities presented by the new G20 framework for accelerating global growth are seized.

Figure 7. Global Innovation Index scores of G20 Countries (2014, 2015 and 2016)



Source: Global Innovation Index, 2016-2015-2014

20. It is important that Turkey maintains the success it achieved in the 2016 Global Innovation Index and remains within the global growth and sustainable development debates that are the two central themes of the current global agenda. It is also vital Turkey leaves behind the global image that it may have developed following the failed coup attempt of July 15 which depicts the country as being largely secluded and preoccupied with its domestic affairs and detached from global developments. Despite the fact that Turkey has undergone a major economic transformation in the last 30 years, it has not yet completed its transformation. The most important source of growth of the Turkish economy has so far been the productivity increase that came about as a result of urban migration. It should also be noted that the Turkish economy is not growing fast enough. Right now Turkey is in need of a new growth strategy to secure increases in industrial productivity through structural transformation, hence, it has to develop a new approach to development and economic policy. The policies that helped boost per capita income from 1500 USD to 10.000 USD since the 1980s are different from what Turkey needs to do today to increase its per capita income from 10.000 USD to 25.000 USD. Getting back on track with a normal economic agenda after the 15 July affair and launching a new growth strategy focused on technological transformation should be the top priority of Turkey's national agenda.

21. Turkey has taken some significant steps towards improving its investment climate in recent years. Yet, these initiatives were not sufficiently focused. Although the 10th Development Plan and Transformation Programs presented good frameworks, the lack of focus led to these initiatives being shelved. Turkey should now promptly identify and implement a roadmap in view of the global agenda and current environment. It needs a technology based –as opposed to industry based- industrial policy framework that will both transform traditional industries and improve its high technology exports. It is possible to review policies for each industry –including not just industry but also the agricultural sector- with the same focus on technological transformation. The most important component of sustainable development and growth strategies of Turkey should be to rapidly increase the quality of its production and exports by making a technological leap. This is important both for boosting intra industry productivity increases and economic growth and for achieving the 'Sustainable Development Goals' through new technologies.

22. It is important that the G20 continues to reinvent itself through the new approach that it has launched this year with aim to achieve global growth and sustainable development and that Turkey should remain part of this global process. Benefiting from the G20's growth and development framework, driven by technological transformation, will largely depend on how ready each country is for innovation based growth. In order not to lag behind in this race, Turkey should now decide on which areas to focus on and how to build the relationship between its own growth and sustainability agendas. G20 offers important opportunities for mapping out a policy framework thanks to the steps it has taken this year towards becoming a 21st century platform. Turkey needs to design and implement its own structural reform agenda that is focused on a new growth and development strategy around the diffusion of new technologies.