World Trade Report 2020:

Government policies to promote innovation in the digital age
Starting point

• Resurgence of government policies/intervention in economy. Different phases overtime, variance across countries.

• For over a decade, countries adopted new kinds of policies, labeled “New industrial policies”, “Industry 4.0”, “digital development plans”, etc.

• Such government policies are reflecting a duality inherent to all policy phases, aiming to address difficult modernization of traditional industries and supporting the new economy.

• However, clearly this time, there is a focus on technological upgrading, digitalization of production and innovation.
Questions

• What has changed with the digital economy?
• What are the policy implications of such changes at the national level?
• What is the role of trade and the WTO?
Key findings

• What’s changing with the digital economy?
  • Special features of digital economy lead to re-thinking of policy-making.

• What are the policy implications of such changes at the national level?
  • Today’s digital-oriented policy toolkit includes new tools and adapt old ones, reflecting the unique characteristics of the digital economy. Hence policies focus on:
    (1) encouraging innovation and knowledge;
    (2) developing data policies and regulation;
    (3) supporting the development of enabling infrastructure and access to it; addressing winner-takes-all dynamics and employment concerns.

• What is the role of trade and the WTO?
  • Open trade policies conducive to innovation;
  • WTO rulebook and commitments contributed to innovation: ITA, standards, TRIPS, e-commerce, etc. Many national policies already covered in WTO rules.

• Looking ahead: what reforms are needed?
Questions

• What has changed with the digital economy?

• What are the policy implications of such changes at the national level?

• What is the role of trade and the WTO?
Special features of the digital economy

• Data as key inputs in the digital economy
• Digital technologies are general purpose technologies
• Goods and services are increasingly integrated
• Firms are more scalable in the digital economy
• Dramatic changes take place rapidly
Digital technologies spread rapidly to all sectors

Source: Authors’ calculation based on data from the US Bureau of Economic Analysis.
The relative price of computers has declined drastically in the past decades.

Source: Authors' calculation based on data from the US Bureau of Economic Analysis.
Innovation in AI cover a wide range of fields

Top patent applicants by AI application field

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Source: World Intellectual Property Organization (WIPO)
Manufacturing employment declines while factory output continues to grow

Rebased 1972=100

Source: Author’s calculation based on data from US Bureau of Labour Statistics
Questions

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• What is the role of trade and the WTO?
What does this mean for policies?

- Data key input: data availability (policies) matter; less capital intensive model (less upfront capital needed to build a new sector), more knowledge/IP/education intensive
- Digital: how to generate innovation (*new in country* or *new in the world*)
  - Large focus on R&D – more horizontal support
  - Use of tech hubs and attraction of talent; start-up and entrepreneurship
  - Software industry can develop cheaply on open source tech
  - Benefitting from “importing knowledge”, remaining importance of FDI, immigration and integration in shifting supply chains (integration of digital processes in manufacturing)
- Digital economy requires a network/access to network (goods, standards, telecom infrastructure). Allows potentially all countries to develop a local app industry
- Flip side of digitalization of production (quick changes): need to retrain workers
- Scalability: companies can quickly become global; winner-takes-all effects (negative spill-overs)
What do we find?

• Government support in innovation and the digital economy – mix of “known tools” and “new tools”
  • R&D support to promote innovation
  • Tariff liberalization supports digitalization and ICT sector expansion
  • New policy instruments to foster digital innovation (tech clusters, data policies, regulatory sandboxes)

• Investment policies are a central piece of government policies (investment incentives, investment facilitation)

• Industrial policy tools are still widely used to support traditional economic sectors (metals, chemicals…)
Government R&D funding key to promote innovation

Source: Author's calculation based on UNESCO data
World exports of ITA products almost quadrupled

Source: WTO Secretariat based on UN Comtrade (reported data, complemented by mirror estimates).
Increasingly, tech clusters are used as an innovation policy

Number of clusters established in 27 economies’ innovation policies

Source: European Commission and OECD (2019)
Data regulations are widely used

Data laws and regulations affecting cross-border data flows, 1972-2019

Source: Casalini and López-González (2019)
LDCs are behind in access to digital infrastructure

Indicators of ICT access per 100 inhabitants, 2018

Source: Author’s calculation based on data from International Telecommunications Union (ITU).
Questions

• What has changed with the digital economy?

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Rationales for government policy

• Why government innovation policy? Market failures in innovation activity, especially in the digital sector
  • Public good aspect of technology and data
  • Economy-wide benefits of general purpose technologies
  • Financial frictions
  • Coordination failures
  • Network externalities, technology lock-in
  • Winner-takes-all dynamics
The public good nature of knowledge, financial frictions, coordination failures and positive externalities lead to under-provision of innovation relative to socially optimal levels.

Innovation policies that enlarge market size, increase the productivity of R&D, and ensure the appropriability of research investments reduce the gap between the social and private returns to innovation, increasing innovation investment.

Network externalities can provide incentives for firms that have managed to capture large shares of the market (the "winners") to engage in anti-competitive behaviour, and to lock-in their technology.

Policies that ensure that markets are contestable, and policies that regulate the abuse of dominant position, address these issues.
Innovation policy tools

• **Open trade policies** contribute to innovation through improved access to foreign markets and increased competition

• Governments have a role to play in **funding innovation**

• The importance of **intellectual property rights (IPR) regulation** is bound to increase in the digital age

• Education and open immigration help enhance **human capital**

• **Policies to increase competition** benefit innovation

• Other complementary policies include **telecommunication infrastructure, technology clusters**, etc
Cross-border effects of innovation policy

• Domestic innovation policies can have international effects
  • Knowledge spillovers and technology diffusion
  • Strategic government policy
  • Inter-industry linkages
  • Competition for scarce resources
  • Supply and demand effects
• International cooperation key to limiting negative spillovers and maximising positive spillovers
International cooperation: where does the WTO fit?

• Cooperation in the multilateral trading system contributed to the expansion of digital sectors
  • Tariff elimination and reduction in some sectoral agreements
  • Technical standards
  • Government procurement
  • Trade in services
  • Trade-related aspects of intellectual property
  • Subsidies
  • TRIMS
  • Aid for Trade

• Cooperation at the bilateral, plurilateral and regional level

• Other forms of international cooperation (other international organizations)
Do we need more cooperation on innovation policies in the digital age?

• The rising importance of data leads to increasing demands for new international rules on data transfer, data localization, consumer protection and national security.

• More liberalization of digital trade would contribute to digital innovation:
  • Open up and stimulate competition in digital service sectors (mode 4, telecom and internet services)
  • Facilitate investment in broadband infrastructure

• Do we need more flexibility in R&D subsidies?

• International dialogue and cooperation on competition policies
Thank you!