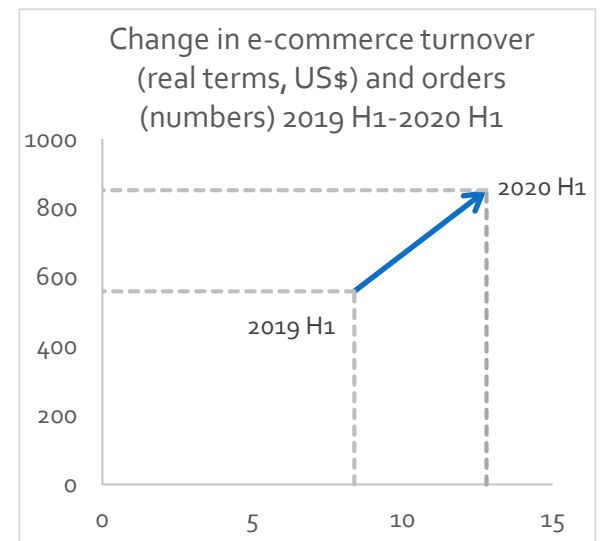
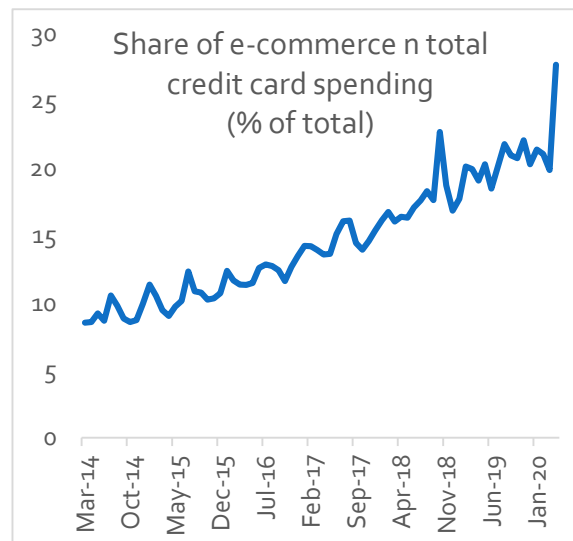
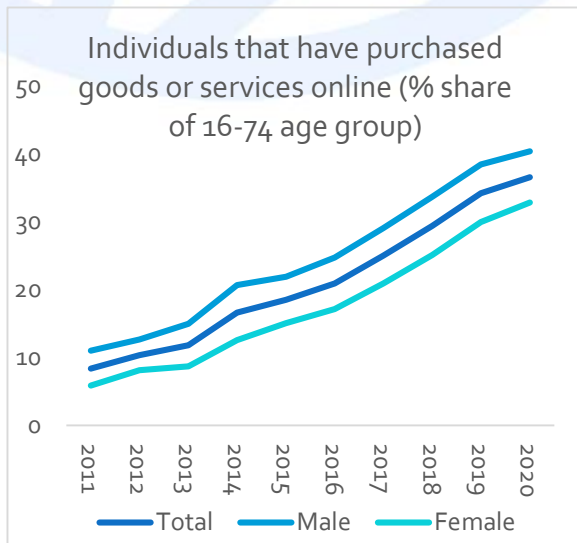
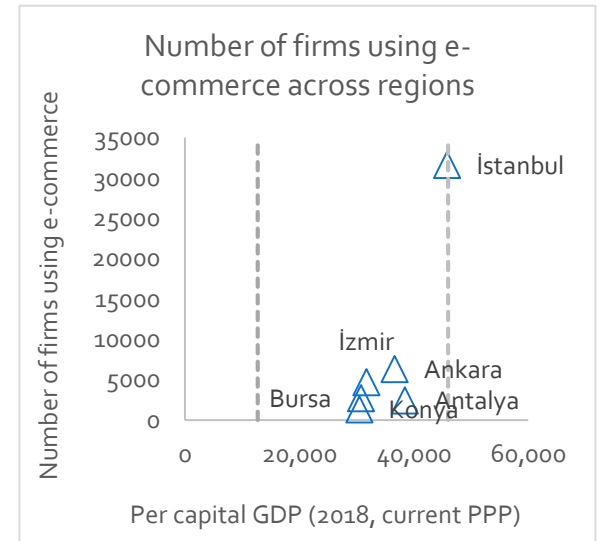
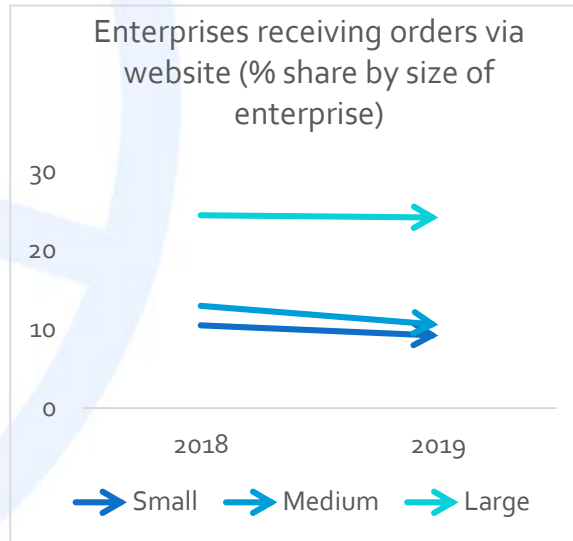
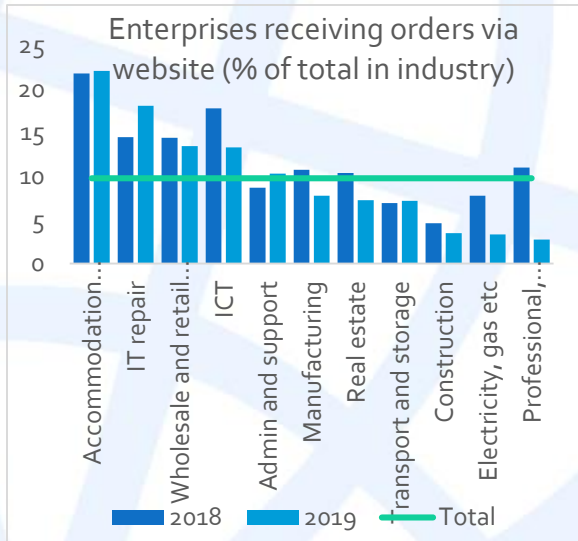




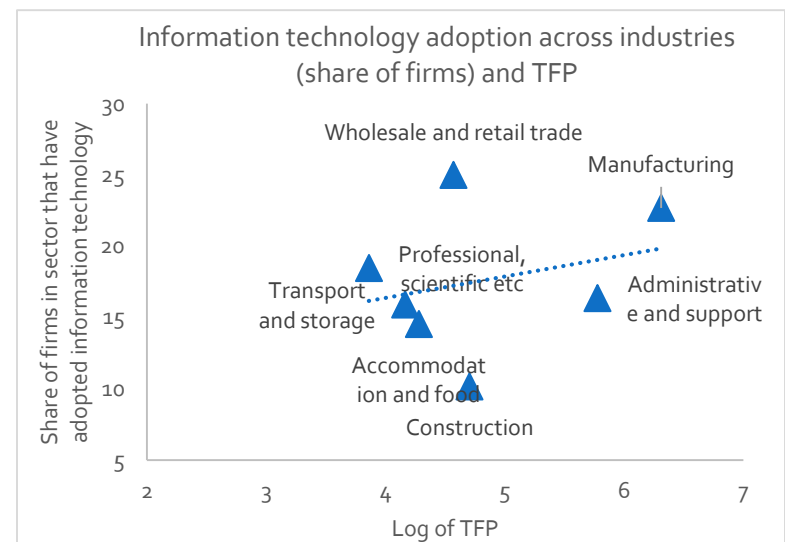
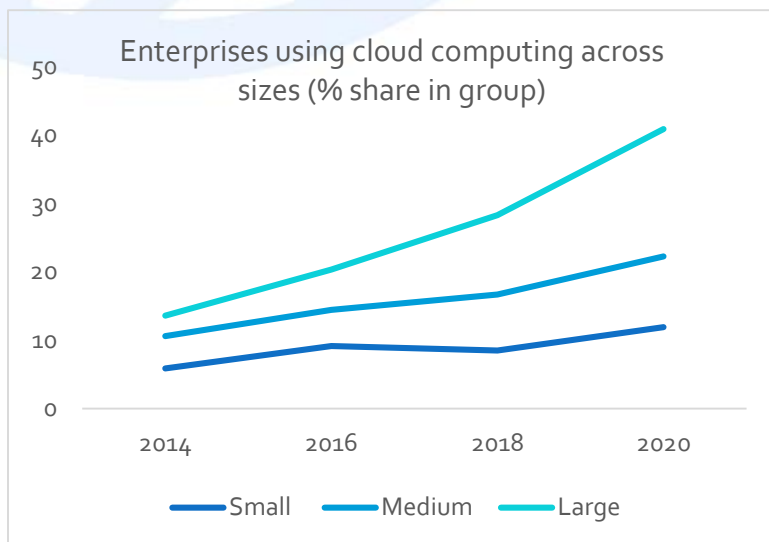
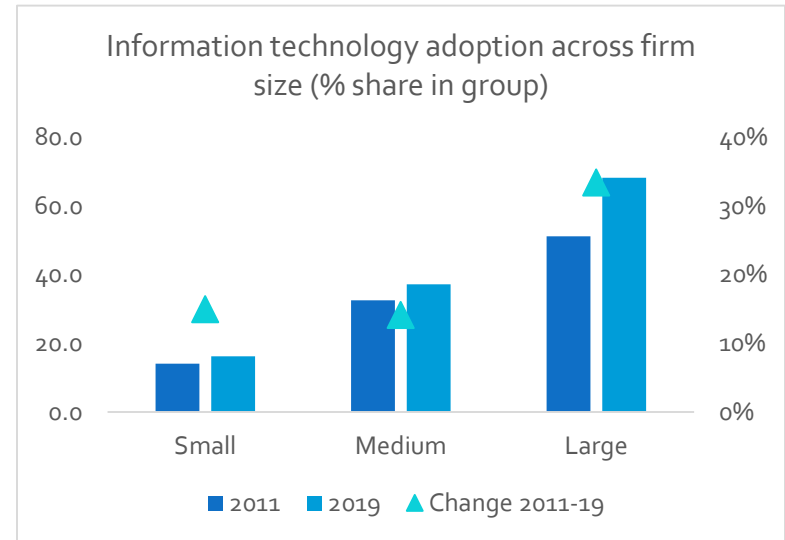
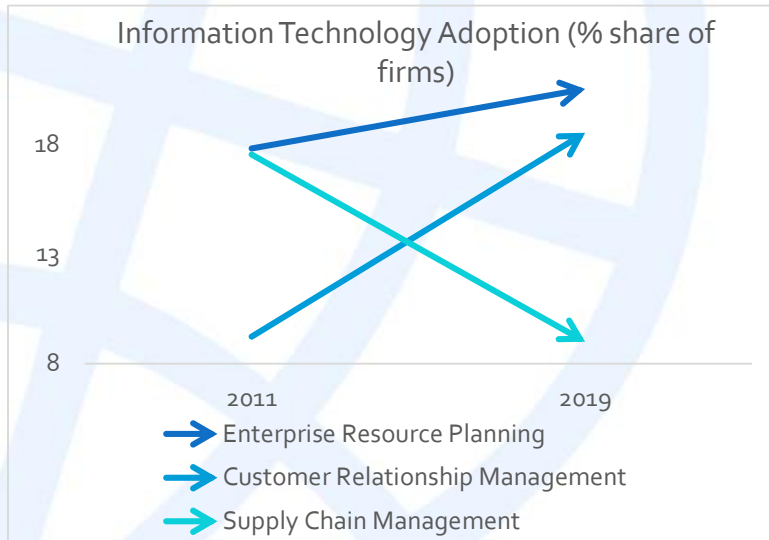
Europe 4.0: Addressing the digital dilemma – Applying the framework in Turkey

- Transactional, informational, and operational technologies in Turkey
- Factors impacting adoption of digital technologies
- Market inclusion, competitiveness, and convergence

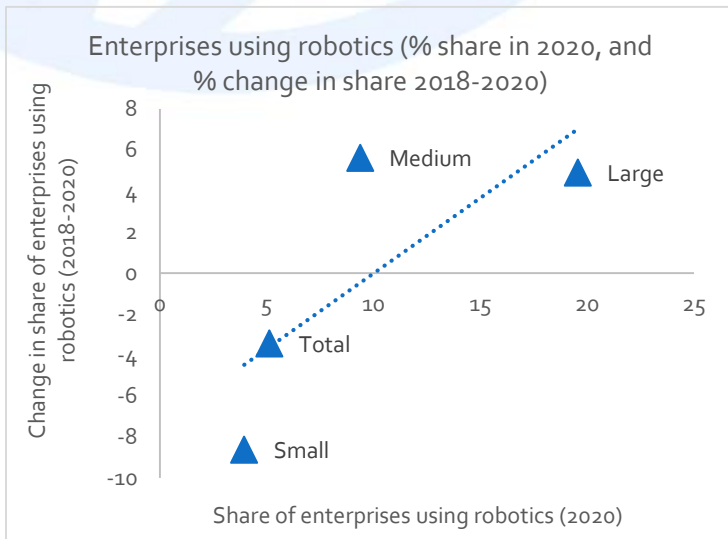
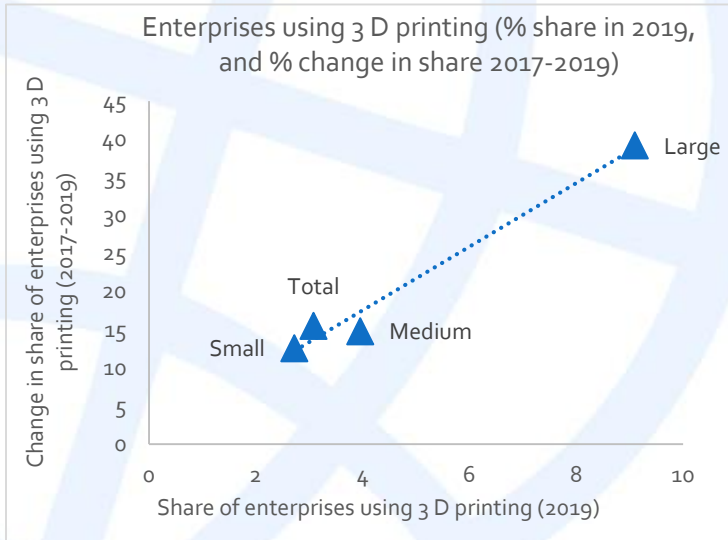
Use of transactional technologies growing from a low base and most prevalent among large enterprises



Adoption of informational technologies increasing very gradually overall and more quickly among large firms



Operational technologies concentrated in a few breakout, high productivity industries

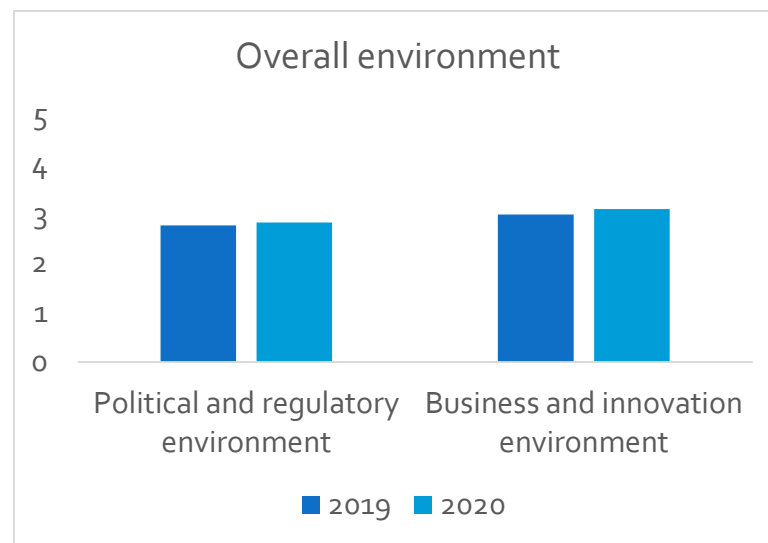
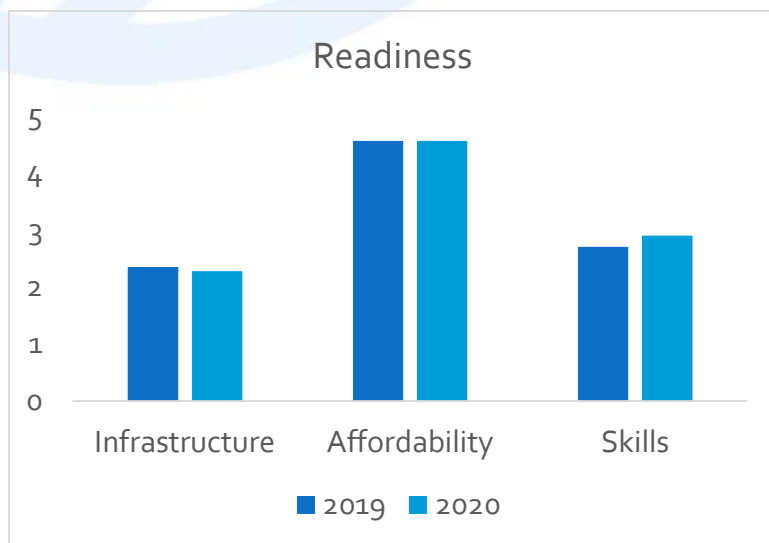
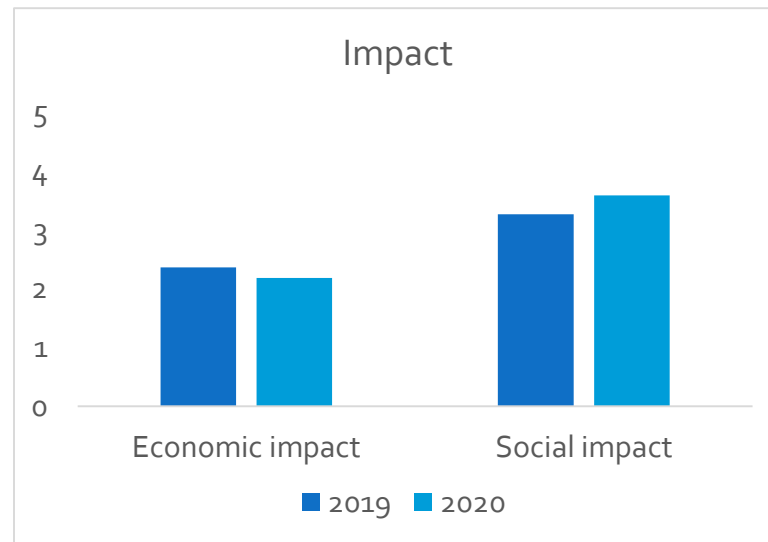
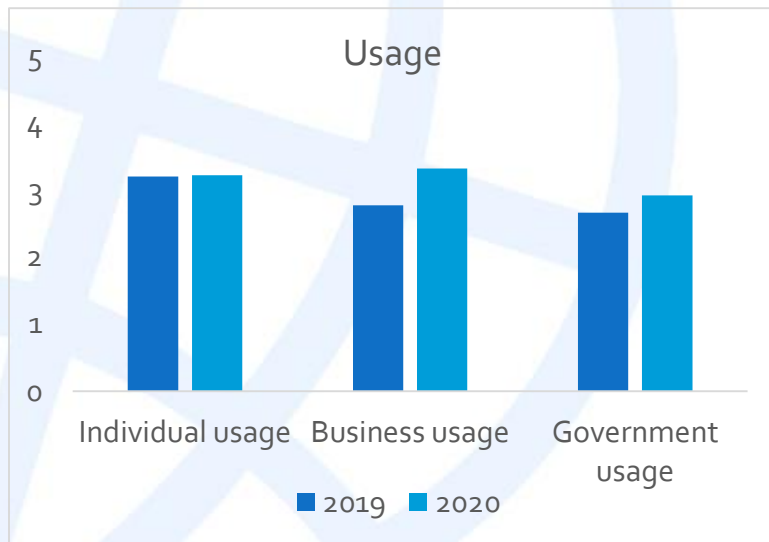


Examples of operational technologies used in Turkey

Industry 4.0 lever	Company	Examples
1 Integrated, automated and optimized production flow	Home appliances	Integrated quality management <i>Tracks products within the manufacturing process and correlates failure data from testing after front-end-production to reduce waste and improve processing</i>
	Machinery	Integrated design data <i>Utilizes vertical data integration from design to the end-of-line of its semi-automated manufacturing process for optimization of operations</i>
	Home appliances	Horizontal data integration <i>Enabled its suppliers to view selected ERP data to tie them closer to an integrated production process</i>
2 Virtual product design	Automotive	Virtual factory and product design <i>Offers a joint solution to integrate factory and product design to optimize manufacturing through factory simulation based on the actual manufacturing needs</i>
3 Flexible manufacturing	Home appliances	Flexible manufacturing robots <i>Implemented a manufacturing line which communicates with RFID-based smart products and adjusts tools and manufacturing tasks to product type</i>
4 Automated logistics	Automotive	Laser-guided automated guided vehicle (AGV) <i>Operates a laser-guided AGV logistics system, where the host computer controls inventory and schedules, controls deliveries and routes the AGVs</i>
5 Learning and self-optimizing	Chemicals	Self-optimizing process flow <i>Works on an IT algorithm to optimize the quality of the end products process through recognition of disturbances in the basic materials mix</i>

Source: Boston Consulting Group and TUSIAD "Industry 4.0 in Turkey as an Imperative for Global Competitiveness"

Use of digital technologies increasing though economic impact still limited.





Conclusion

- Priority: informational technologies for competitiveness and market inclusion
- Transactional technologies for market inclusion
- Operational technologies most relevant in the short-term in selected high potential industries