



Wi-Fi, return to speed, and consumer surplus

Numerous studies have shown a strong positive relationship between broadband speed and economic growth. Fixed broadband networks continue to improve performance, but consumers depend on Wi-Fi to connect to these networks. Without enough unlicensed spectrum, customers won't be able to benefit fully from those speeds using Wi-Fi.

The latest Wi-Fi technology can deliver these faster speeds. But it needs wide, contiguous channels to maximize its potential. The U.S. lacks these channels today and the FCC's proposals would enable them. In this study, Dr. Katz shows that by doing so, the FCC would produce substantial economic value:

- Opening the lower 45 megahertz of the 5.9 GHz band would create near-immediate benefits by creating the first widely usable 160 megahertz Wi-Fi channel and relieving network congestion. The increased speeds would add at least \$23.04 billion to GDP.
- The FCC's 6 GHz proposal would increase speeds over time by creating several more 160 megahertz and even 320 megahertz channels. These new channels would ensure that Wi-Fi can handle increasing Wi-Fi traffic as fixed broadband providers roll out even faster speeds, contributing at least \$13.25 billion to GDP.
- Dr. Katz also notes that consumers value faster Wi-Fi speed (\$5.10 billion attributable to faster broadband speeds enabled by 5.9 GHz and \$2.92 billion attributable to 6 GHz).



Producer surplus from equipment sales

Building on the findings of studies in 2014, 2017 and 2018, Dr. Katz calculates that the FCC's actions would lead to producer surplus related to the manufacturing and sales of new Wi-Fi equipment using the new bands. This would produce \$1.54 billion in surplus benefits to the economy.



Broader deployment of Internet of Things (IoT) devices

The FCC has proposed allowing a new class of Wi-Fi devices throughout the 6 GHz band: Low-Power Indoor or "LPI" devices. "These devices will operate at lower power levels than traditional Wi-Fi. Dr. Katz's analysis shows that opening the full 6 GHz band to LPI technologies will drive the market to produce more machine-to-machine devices and develop new use cases and applications for connected homes, healthcare facilities, factories and sensor-based communications. This will yield a \$44.03 billion contribution to GDP.



Savings in enterprise wireless traffic

By opening the full 6 GHz band to Wi-Fi, large office complexes, venues, industrial plants, stadiums, hospitals, and schools will be empowered to boost their communications networks and deliver 5G capable speeds indoors without having to rely on a cellular connection. Dr. Katz demonstrates that the cost savings to these enterprise customers will produce a \$54.04 billion surplus for the U.S. economy.



Producer surplus from AR/VR equipment sales and GDP spillover from AR/VR uses

The FCC has also proposed to open the 6 GHz band to Very Low Power or "VLP" technologies. These technologies will drive an emerging Personal Area Network, or "PAN," market segment, which includes AR/VR devices, body-worn sensors, and other low-power peripherals. Dr. Katz finds that the growth of firms producing just one type of these PAN technologies, AR/VR hardware, software, and content, will result in new revenues and value for the U.S. economy that will lead to \$13.74 billion in surplus.

In addition, Dr. Katz notes that these new AR/VR applications will lead to new use cases like health care diagnostics, visualizations and displays for remote surgery, training for pediatric emergencies, immersive entertainment at concerts and events, remote technical assistance, and training for dangerous professions like mining and search and rescue. Dr. Katz finds that these use cases would have a "spillover impact" on productivity, with the consequent growth of GDP (\$25.78 billion contribution to GDP).



5G CAPEX and OPEX savings

Finally, the study also examines CAPEX and OPEX savings to cellular operators from offloading mobile traffic, including 5G, onto Wi-Fi, finding that this use alone will yield \$13.60 billion in GDP contributions.