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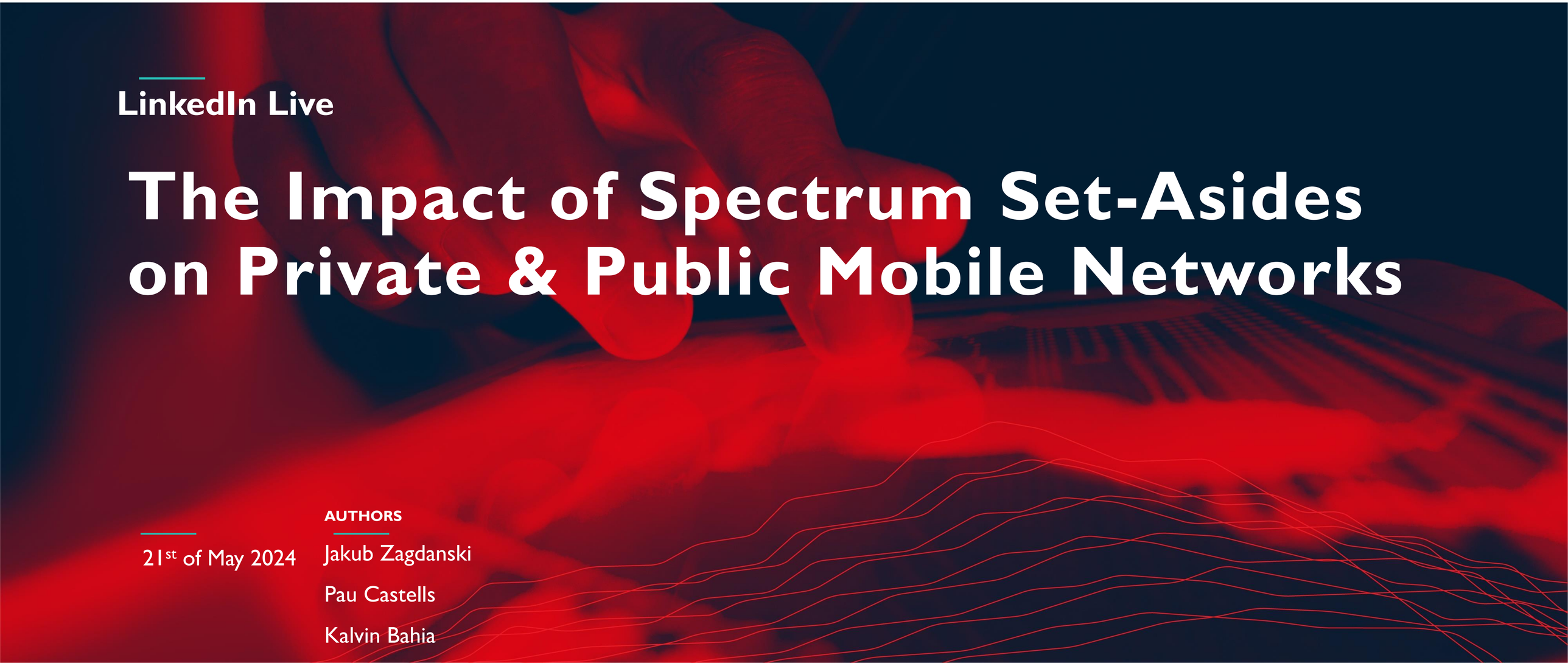

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The Impact of Spectrum Set-Asides on Private & Public Mobile Networks

21st of May 2024

AUTHORS

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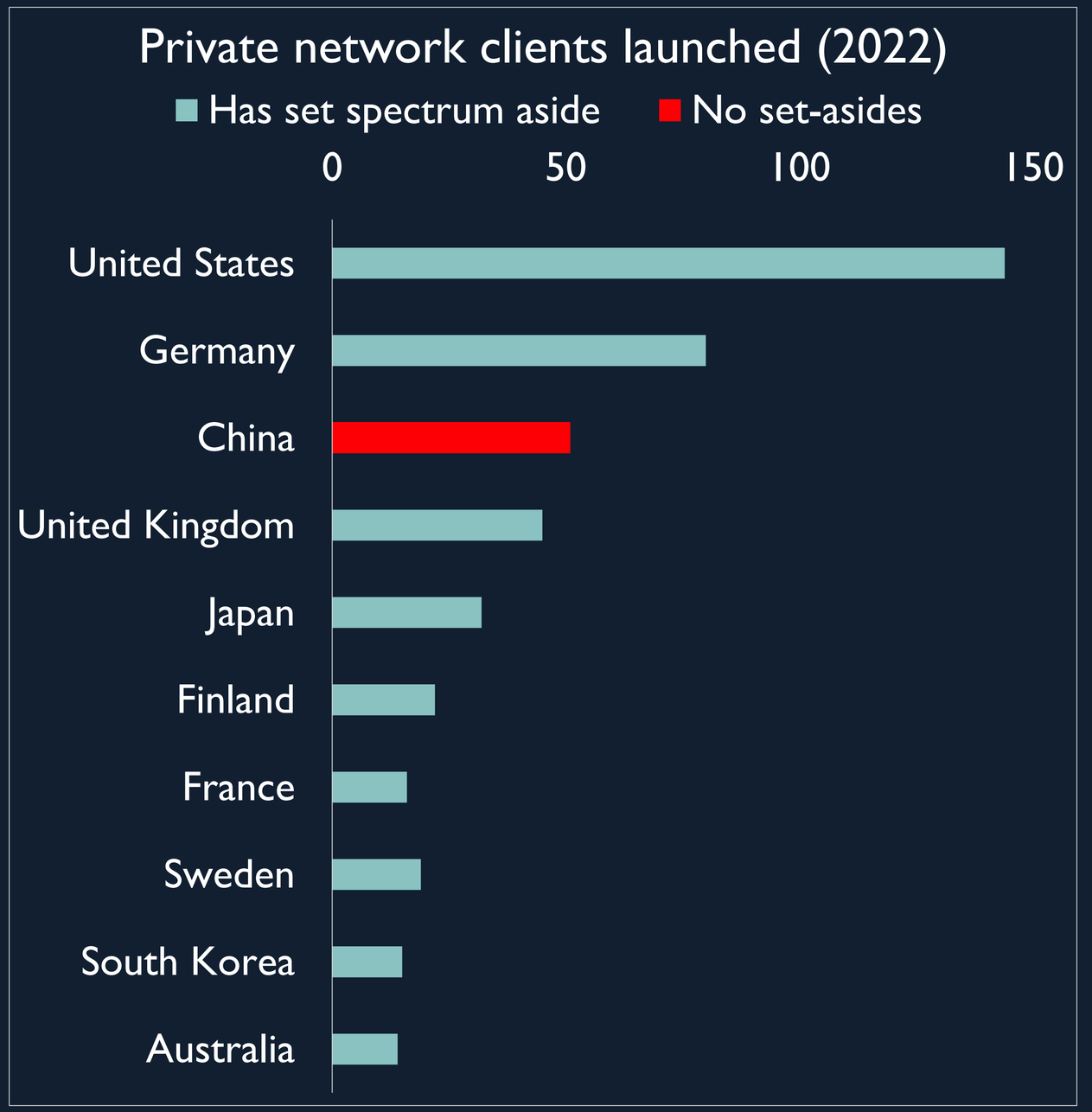
Our interest is motivated by recent claims

- *"… there is a **strong positive correlation** between private wireless network deployment and governments making spectrum available for industrial purposes or private wireless networks."*

Australian Communications and Media Authority, 2023



Source: GSMAi analysis of GSA data (2023)

Regulators' objective is to enable digitalisation of enterprises through access to spectrum, but what are the options:

- Set-asides
- Spectrum sharing frameworks
- License conditions for public MNOs to enable access

GSMA (2023)

Set-asides as a spectrum licensing option:

Impact on industry users:

- \+ Geographic (local) licensing
- \+ Certainty of access and tenure
- ? Interference management

Impact on consumers:

- — Reduced spectrum availability
- — Inefficiency of spectrum use
- — Associated economic cost

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GSMA (2023)

Are set-asides worth it?

Credit: Z z

Are set-asides worth it?

Part 1 (The benefit):

Is there evidence of an impact on adoption of private networks (and enterprise digitalization more generally) beyond loose associations?

Credit: Z z

Are set-asides worth it?

Part 1 (The benefit):

Is there evidence of an impact on adoption of private networks (and enterprise digitalisation more generally) beyond loose associations?

Part 2 (The cost):

What is the magnitude of the negative impact on public networks quality?

Credit: Z z

Correlation does not mean causation

Set-asides policy

Policy effect

Private network adoption

Correlation does not mean causation

Set-asides policy

Policy effect

Policymakers seeking to accommodate the needs of large industry base via policy change

Private network adoption

Correlation does not mean causation

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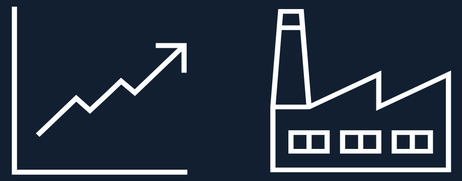
Policymakers seeking to accommodate the needs of large industry base via policy change

Effects of other confounders:

5G-driven growth trend in adoption of set-asides and adoption of private networks



Larger, more technologically-advanced countries were the initial adopters of set-asides

Examples of confounders at play

Set-asides policy

5G enterprise capabilities ignited interest in set-asides among the regulators

Private network adoption

5G enterprise features became available in the same period, resulting in adoption by enterprises

Examples of confounders at play

Set-asides policy

Private network adoption

5G enterprise capabilities ignited interest in set-asides among the regulators

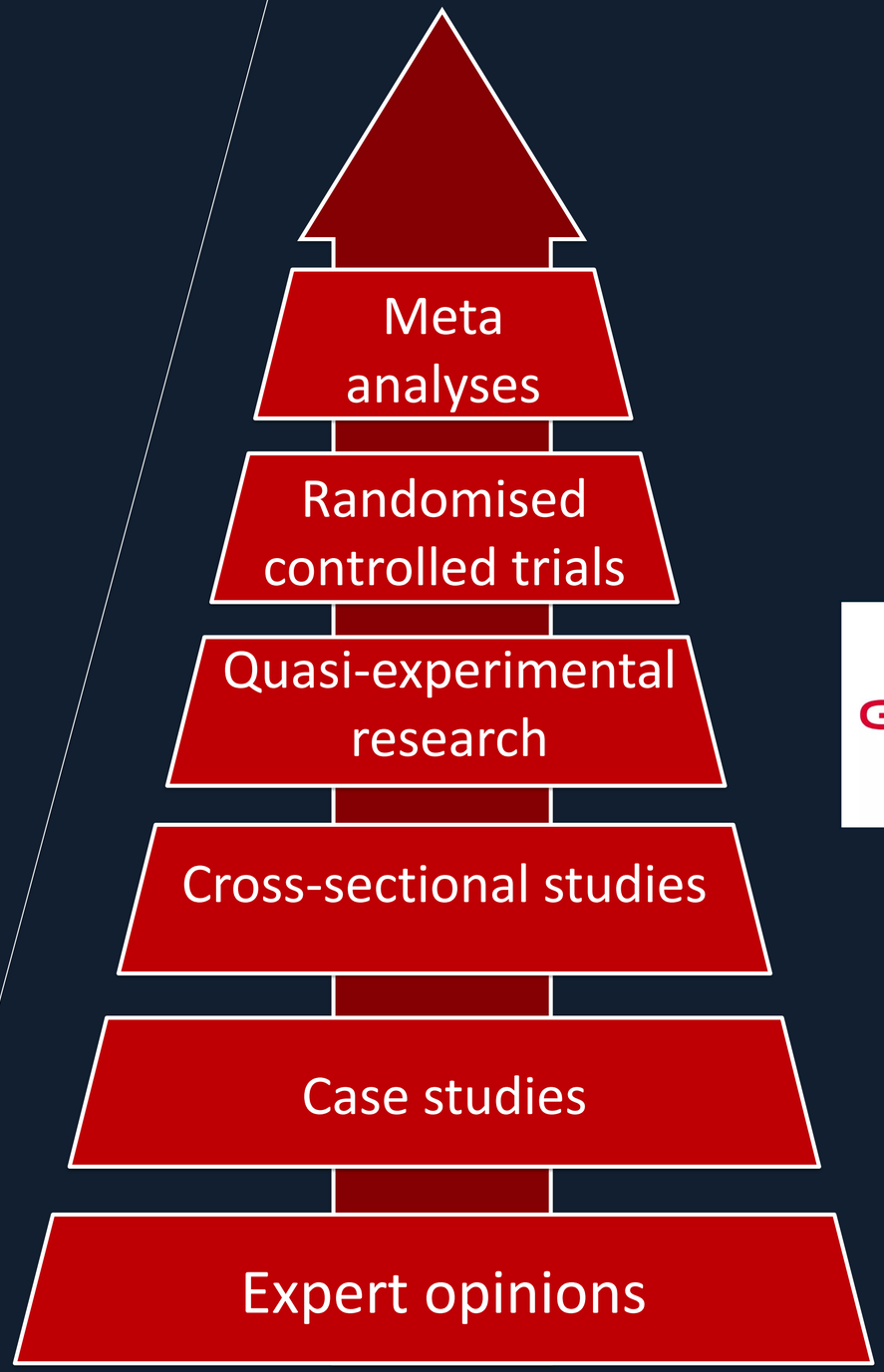
5G enterprise features became available in the same period, resulting in adoption by enterprises

Seemingly, larger, and more advanced countries were early to introduce set-asides

Larger, advanced countries naturally have more high-tech enterprises, skewing the comparisons

We use robust statistical methods to find answers in data

- Relying on GSA data on private network customer launches
- Own data collection on the presence of set-asides and spectrum available to public networks
- Additional controls for GDP and general innovativeness to address confounding



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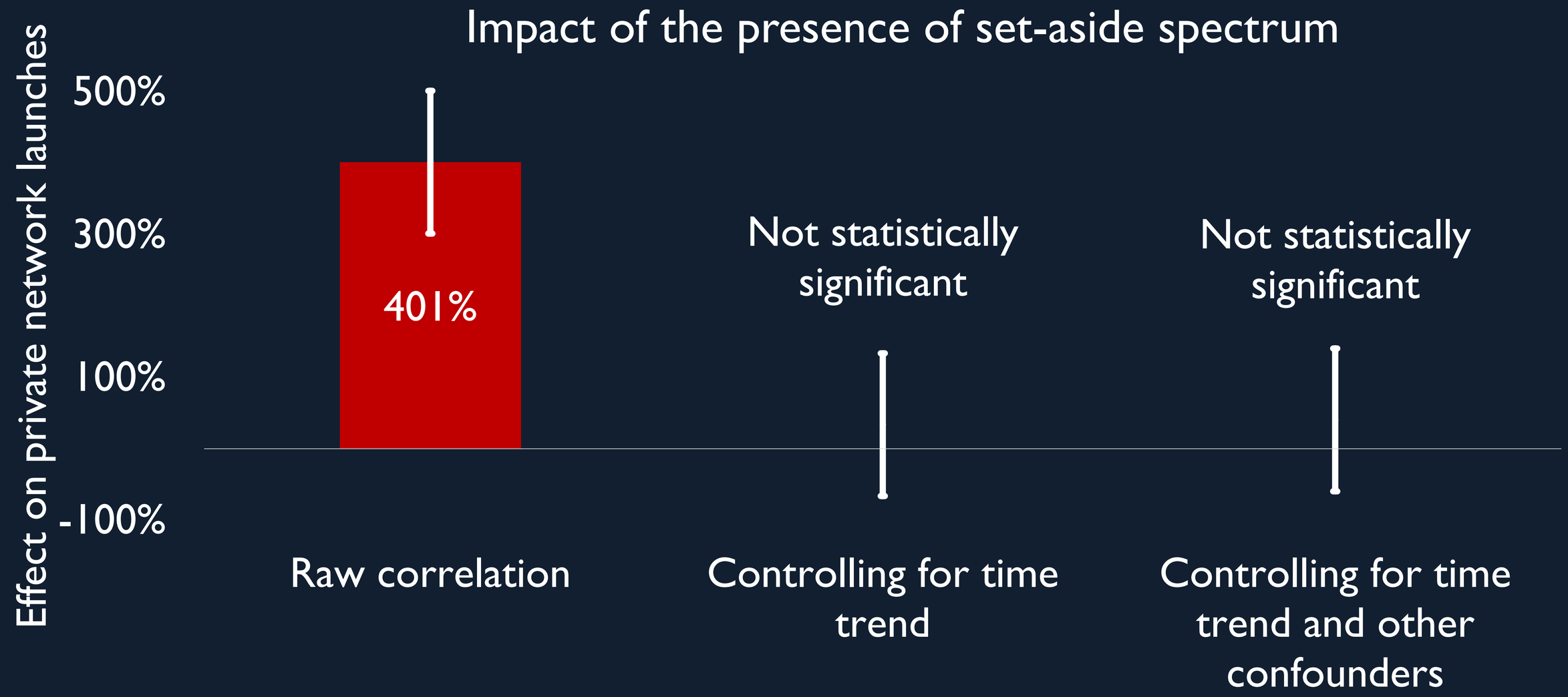
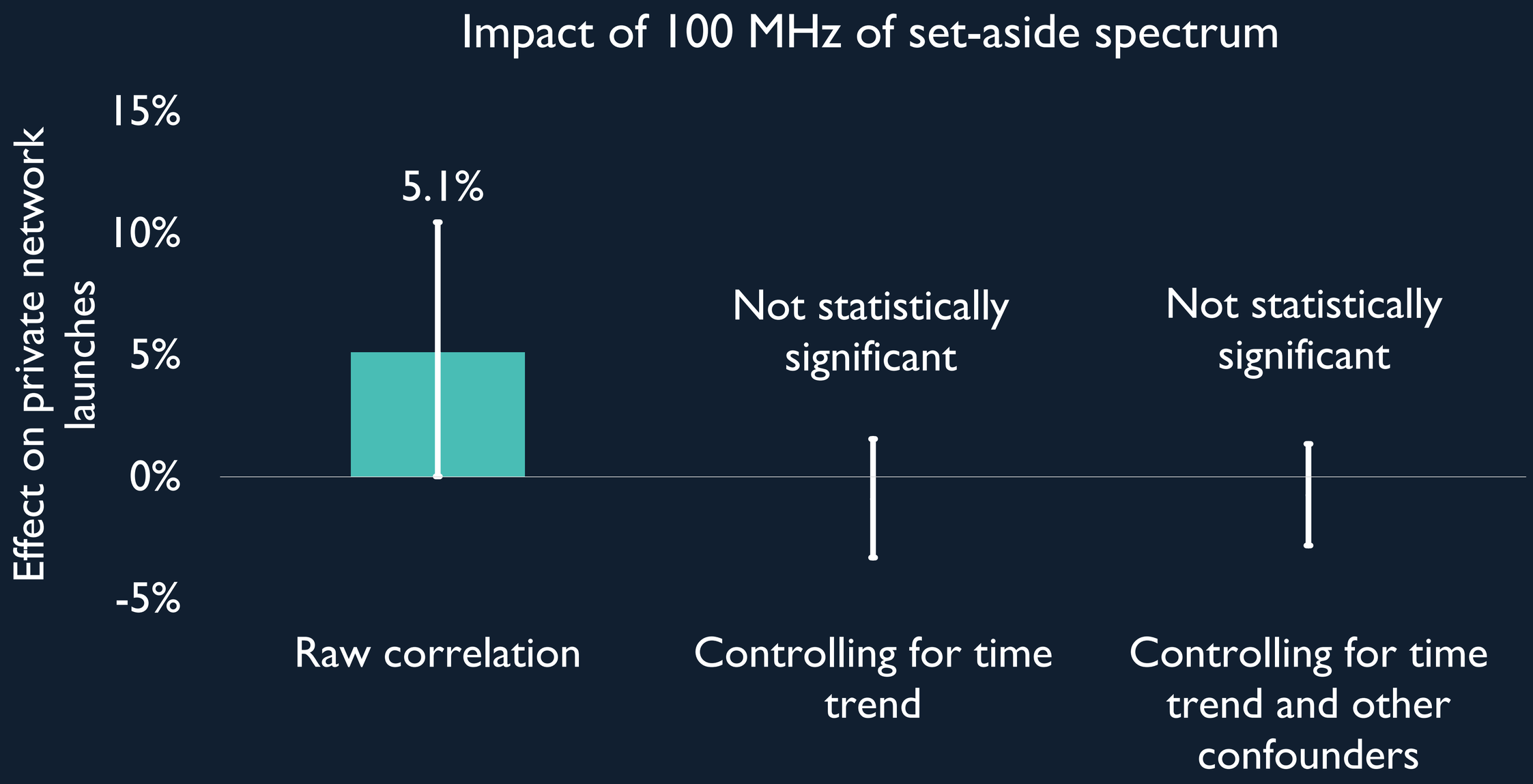
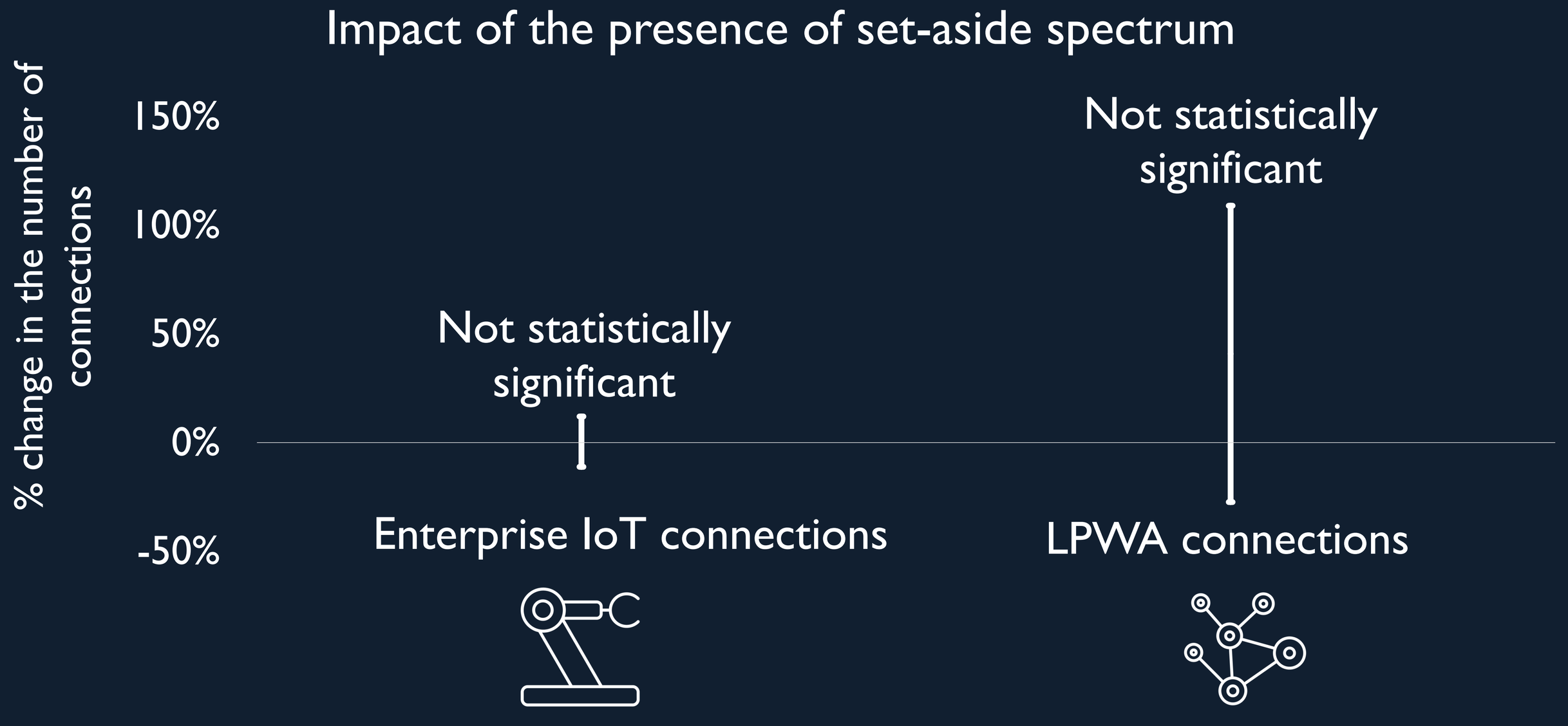
Impact of set-aside spectrum vanishes once controlling for time trends and other confounders



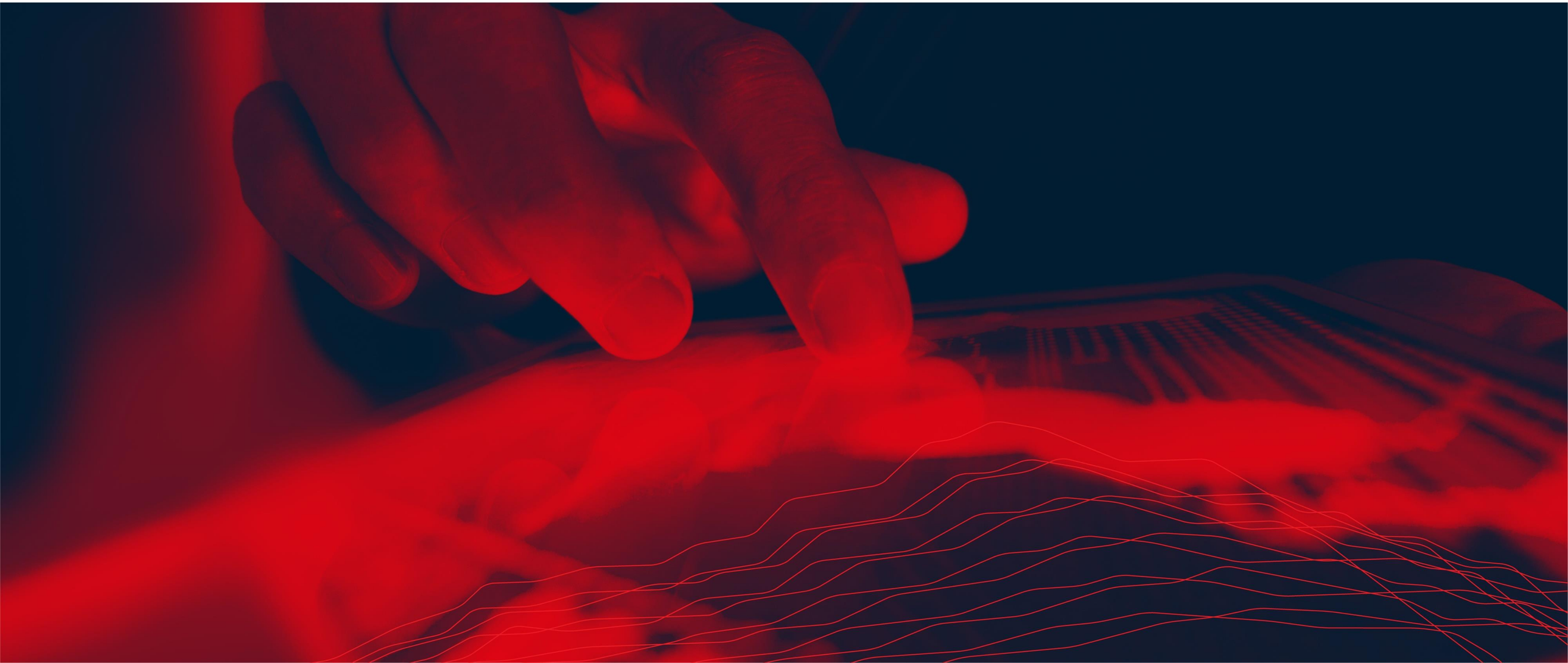
We also find lack of effect for set-aside spectrum amount



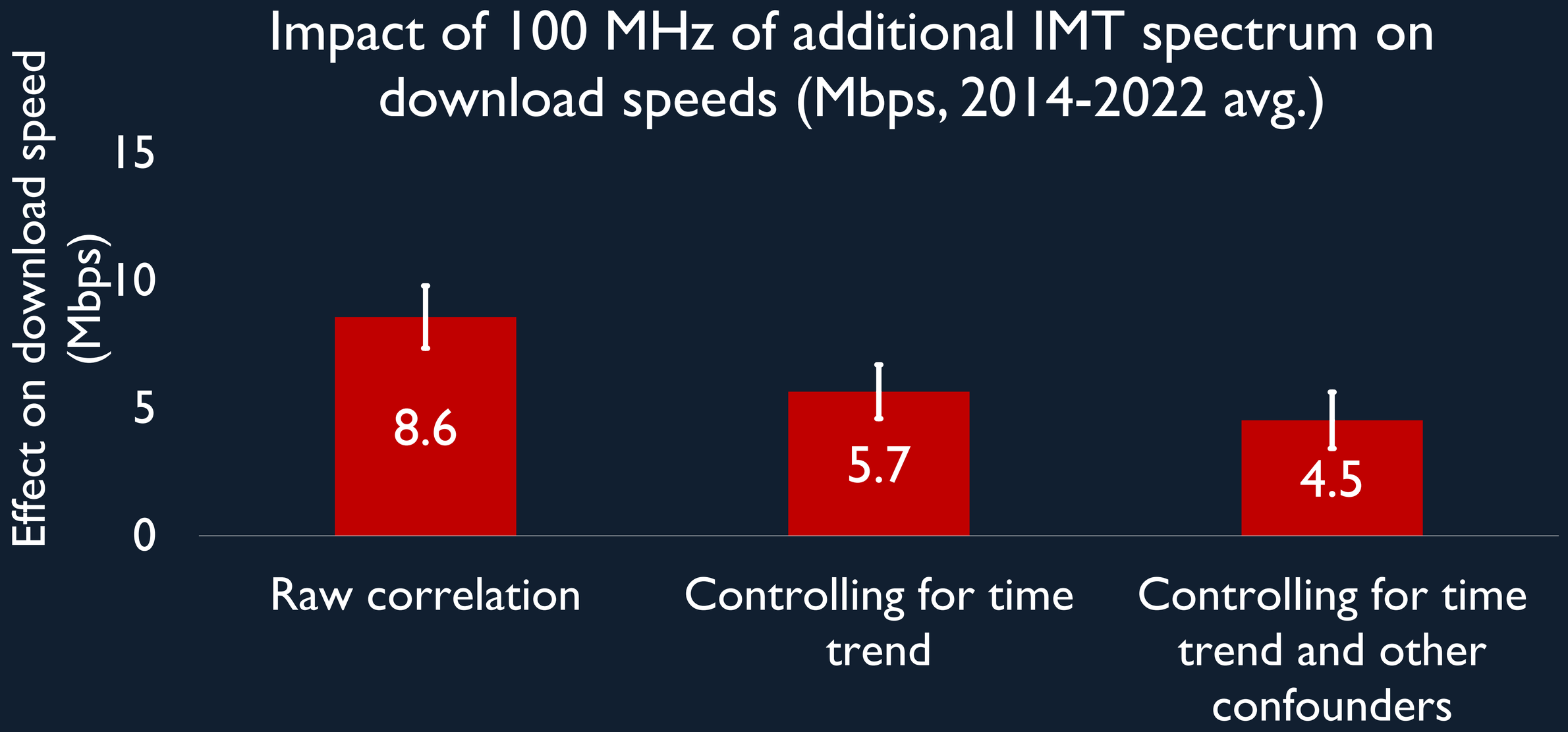
Alternatively, digitalization of enterprises can be measured by the number of IoT connections:



Part 2 (the cost): Impact of spectrum availability on public network speeds



More spectrum means faster public mobile networks



A typical set aside amount (100 MHz) would mean speeds 24% lower

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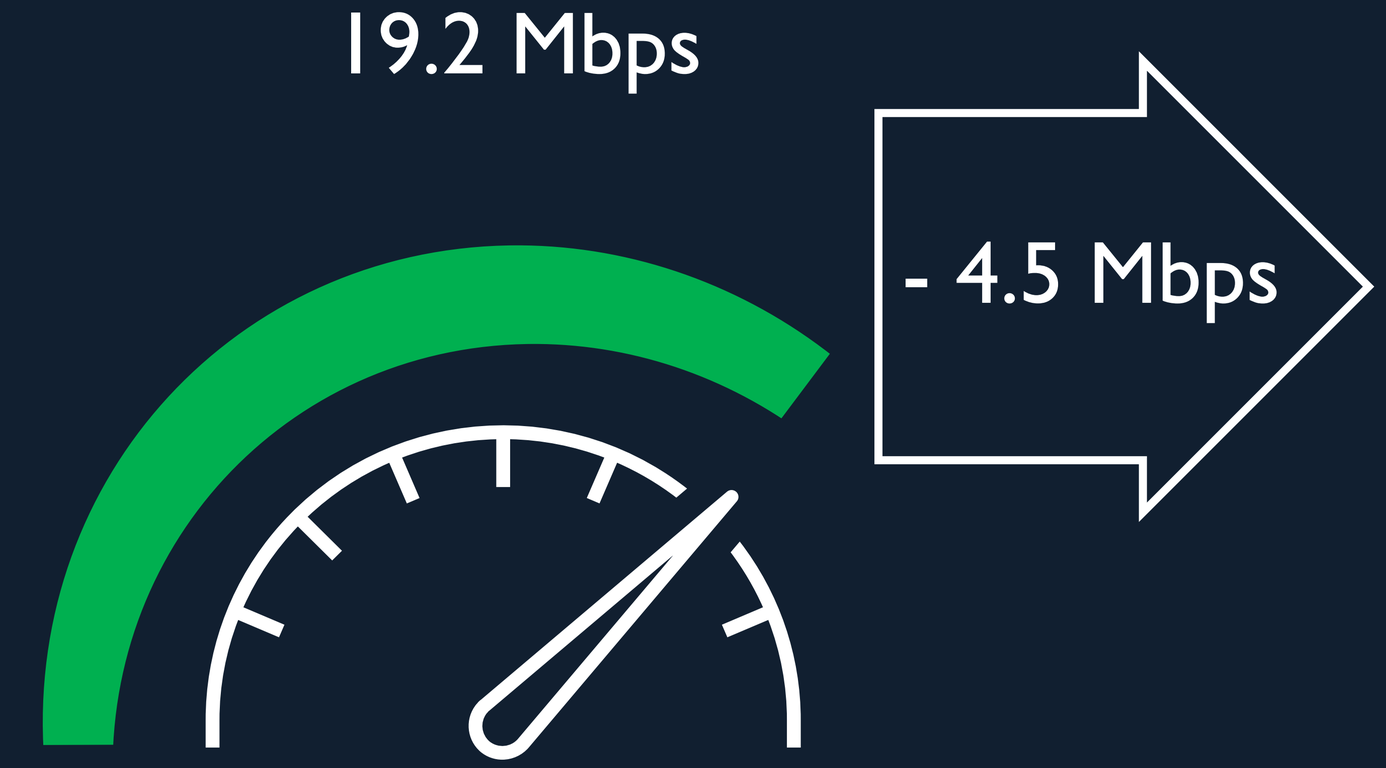

Average download speeds (2014-2022)

A typical set aside amount (100 MHz) would mean speeds 24% lower

19.2 Mbps

- 4.5 Mbps

24% lower
download speeds

Average download speeds
(2014-2022)

With 100 MHz less spectrum
(median set-aside amount)

Bottom line:

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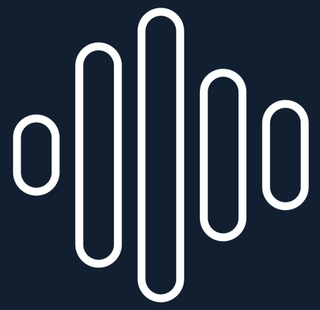
- Data do not support the arguments that setting aside spectrum boosts adoption of private networks or promotes a faster digitalisation of enterprises



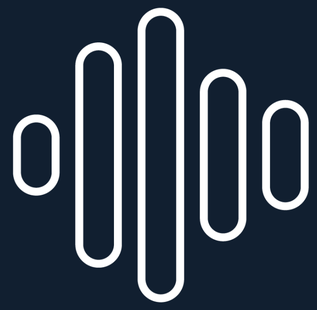
100 MHz of spectrum

Set-aside:

Uncertain impact on digitalisation of enterprises

Bottom line:

- Data do not support the arguments that setting aside spectrum boosts adoption of private networks or promotes a faster digitalisation of enterprises
- However, the trade-off is clear:
  Additional 100 MHz of spectrum was associated with 4.5 Mbps (or about 24%) higher public network download speeds



100 MHz of spectrum

Set-aside:

Uncertain impact on digitalisation of enterprises

For public mobile networks:

24% greater download speeds

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Bottom line:

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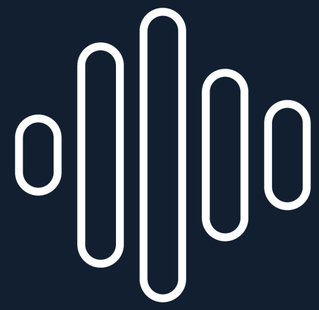
- However, the trade-off is clear:
  Additional 100 MHz of spectrum was associated with 4.5 Mbps (or about 24%) higher public network download speeds
- Policymakers **should not** base their decisions on naïve comparisons



100 MHz of spectrum

Set-aside:

Uncertain impact on digitalisation of enterprises

For public mobile networks:

24% greater download speeds

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The full study report is now available