Evaluating the Long-term Effects of Parameters on the Characteristics of the Tranco Top Sites Ranking

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KU LEUVEN DistriNet

Security researchers rely on top websites rankings

"We perform a comprehensive analysis
*on **Alexa's Top 1 Million** websites"*

"We collected the benign pages
*from the **Alexa top 20K** websites"*

"The list of websites we chose for our evaluation comes
*from the **Alexa Top Sites** service,*
the source widely used in prior research on Tor"

[Kon18, Kha18, Rim18]

Impact of rankings is not well-known

- **Unannounced changes** to methods
- Little **agreement** on most popular domains
- Potentially very **volatile**
- Easily **manipulated**
- **Unknown effects** in composition

Rankings can have a **large impact** on research

[LeP19, Sch18, Rwe19]

We proposed Tranco as a research-oriented ranking

- **Transparent** methods
- **Reproducible** rankings
- **Improved** properties

Daily updated default ranking + custom rankings

https://tranco-list.eu/

[Le Pochat et al. Tranco: a research-oriented top sites ranking hardened against manipulation. NDSS 2019]

We now **evaluate** Tranco's properties and parameters

Comparison with existing rankings

Researcher assumptions

Stability

Anomalies

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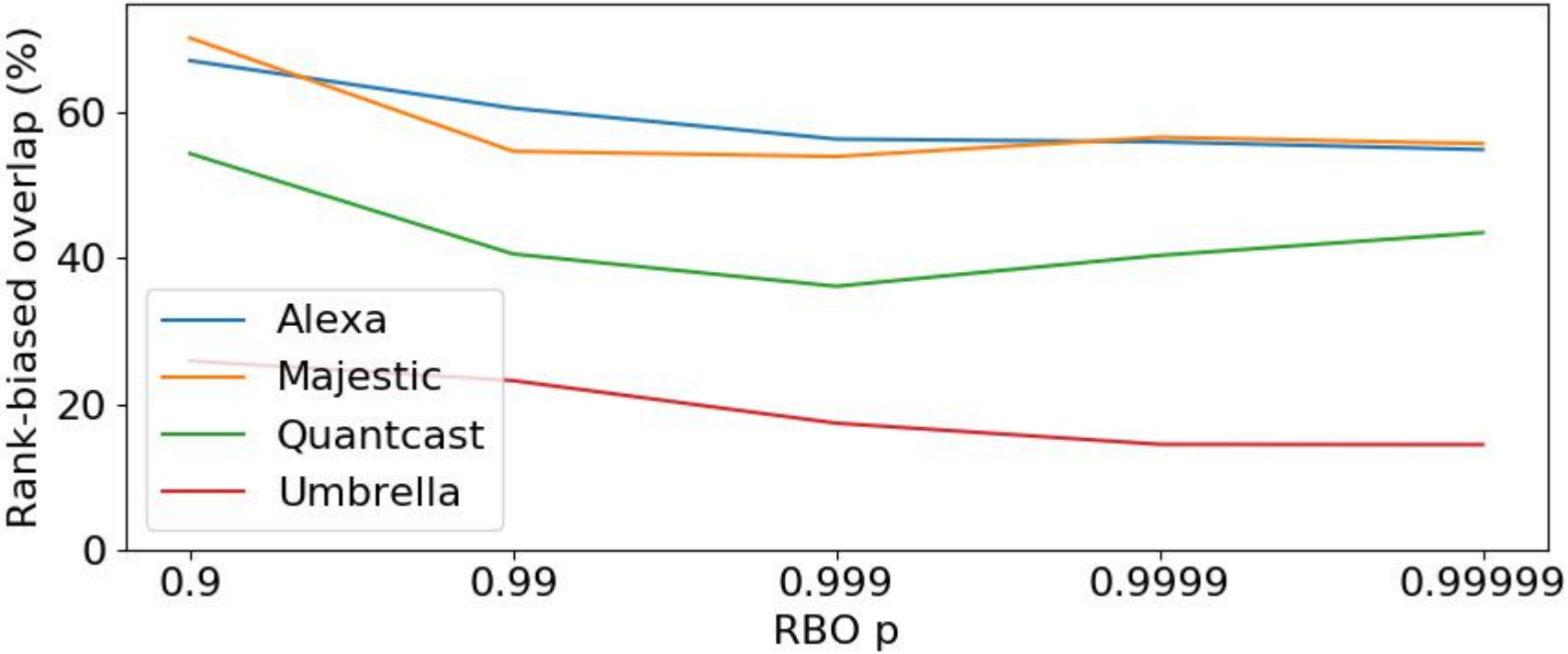
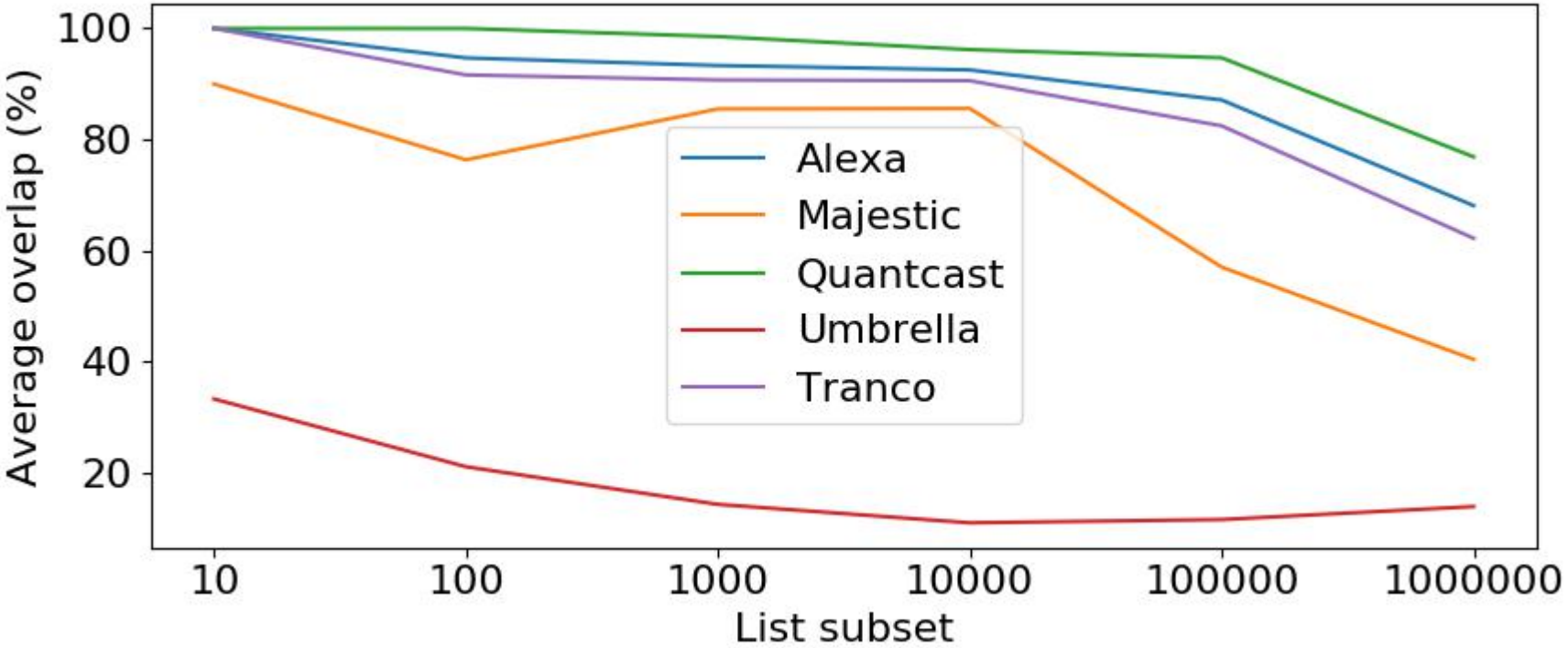
Tranco has some **similarity** with each component



Tranco contains domains popular in **Chrome**



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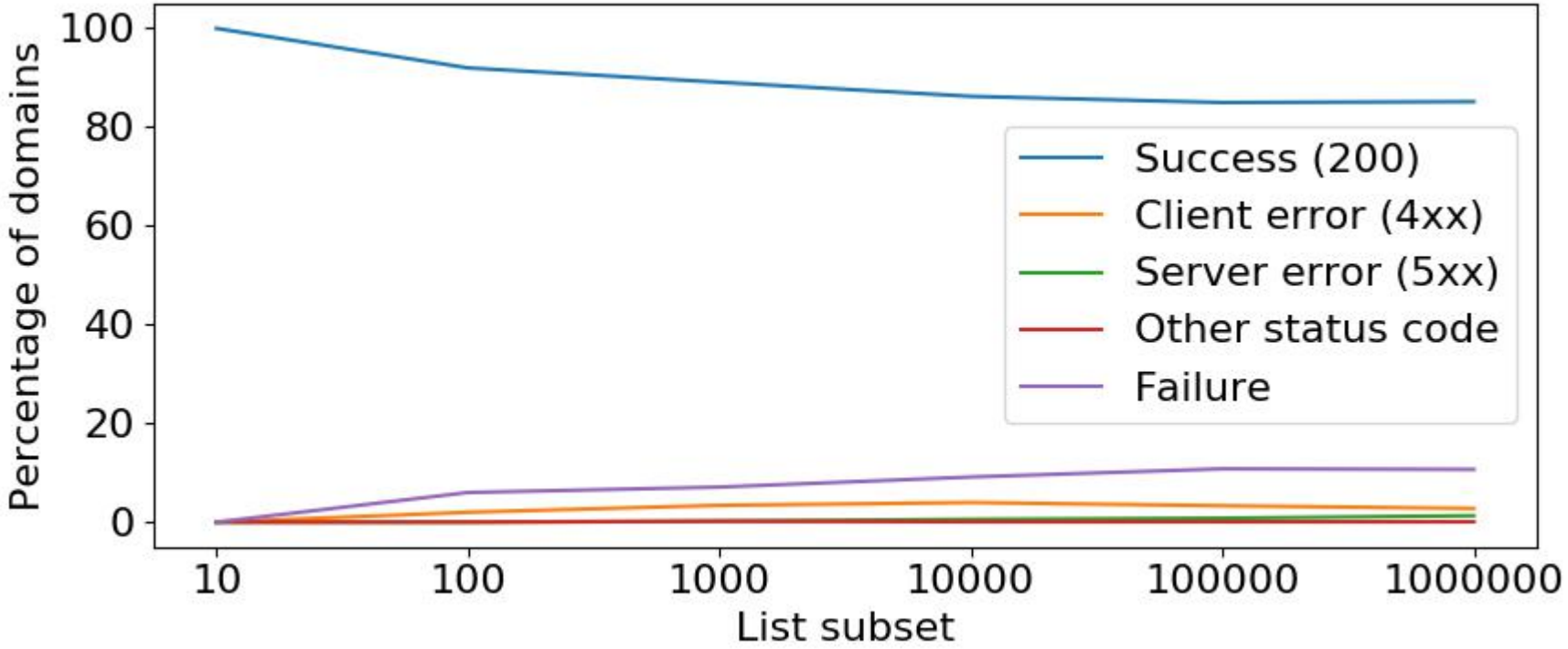
Responsive domains guarantee a sufficient sample



Some **malicious** domains are present, but can be filtered out using Google Safe Browsing

	10K	100K	1M
Malware	1	24	187
Social engineering	1	21	1,486
Unwanted software	2	34	189
Potentially harmful application	0	0	8
Total (unique domains)			1,851

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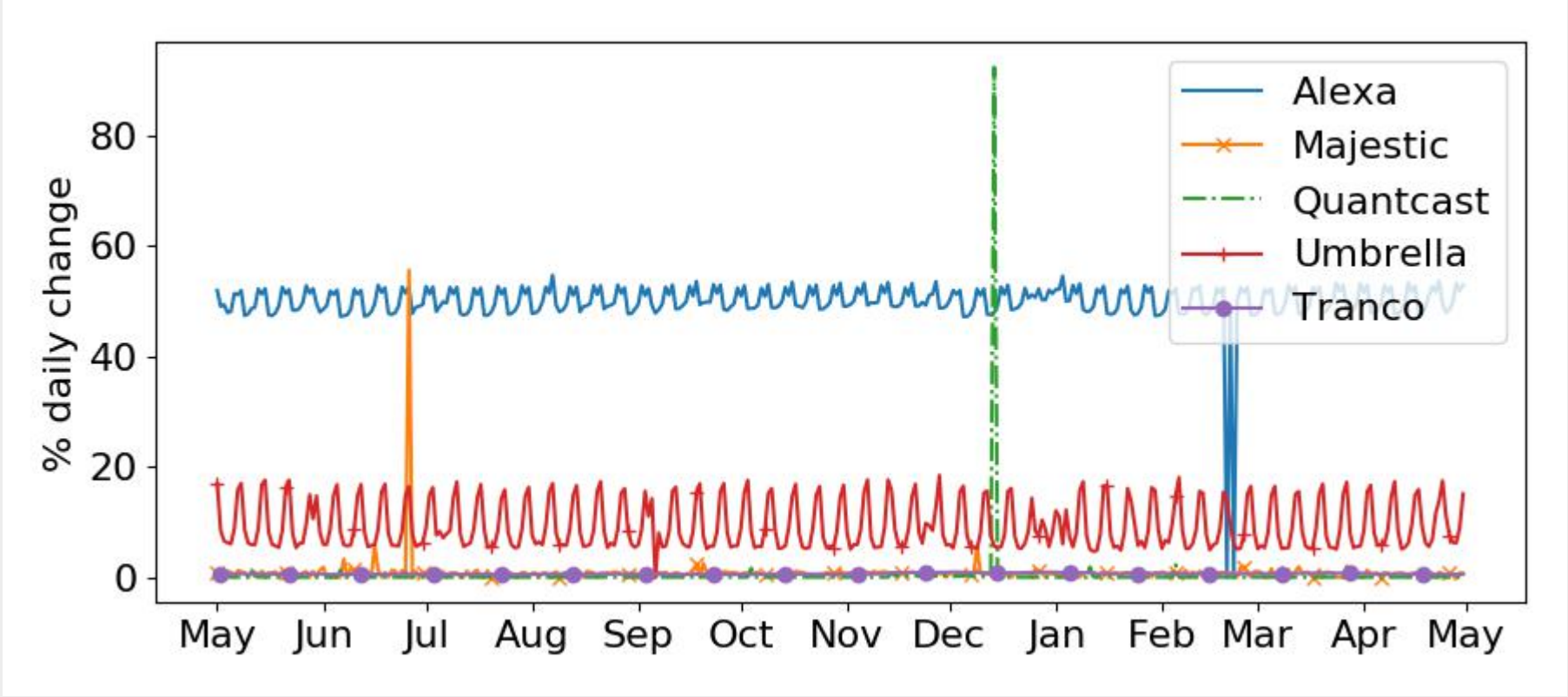
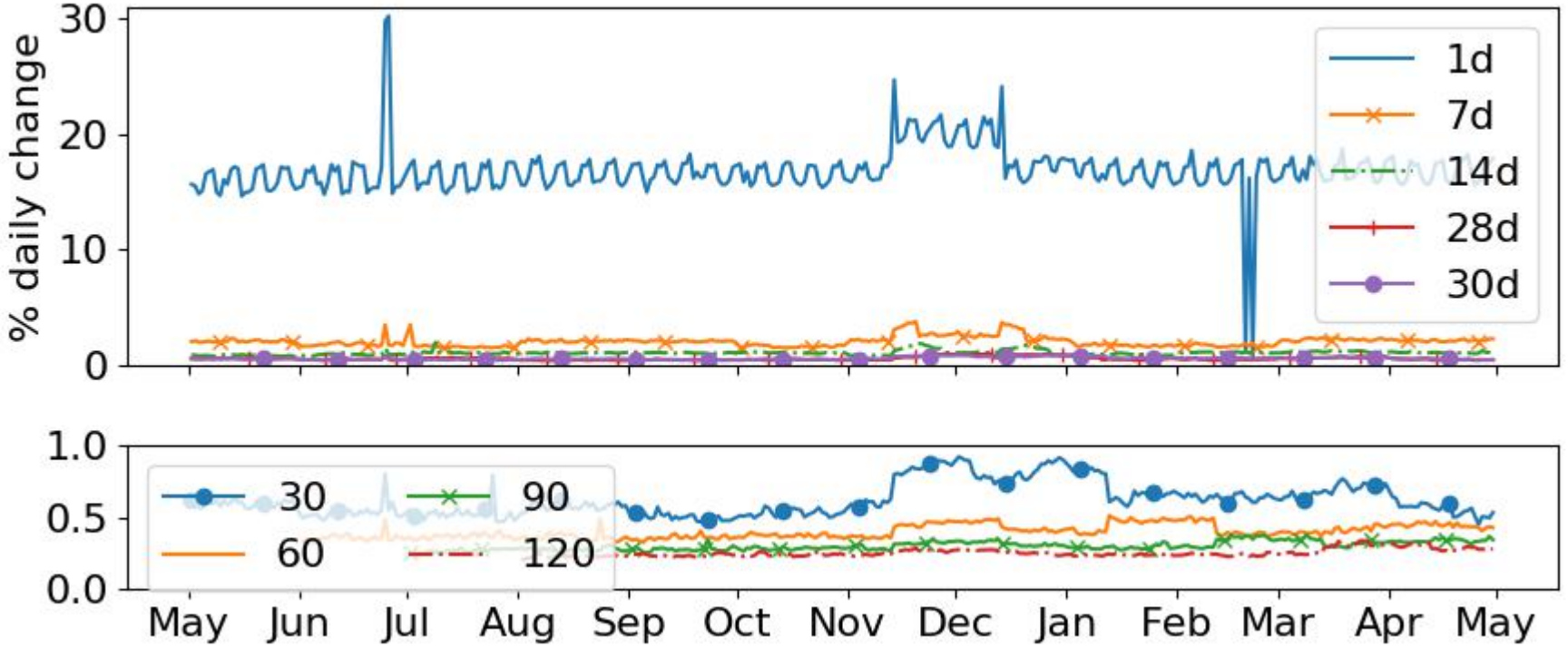
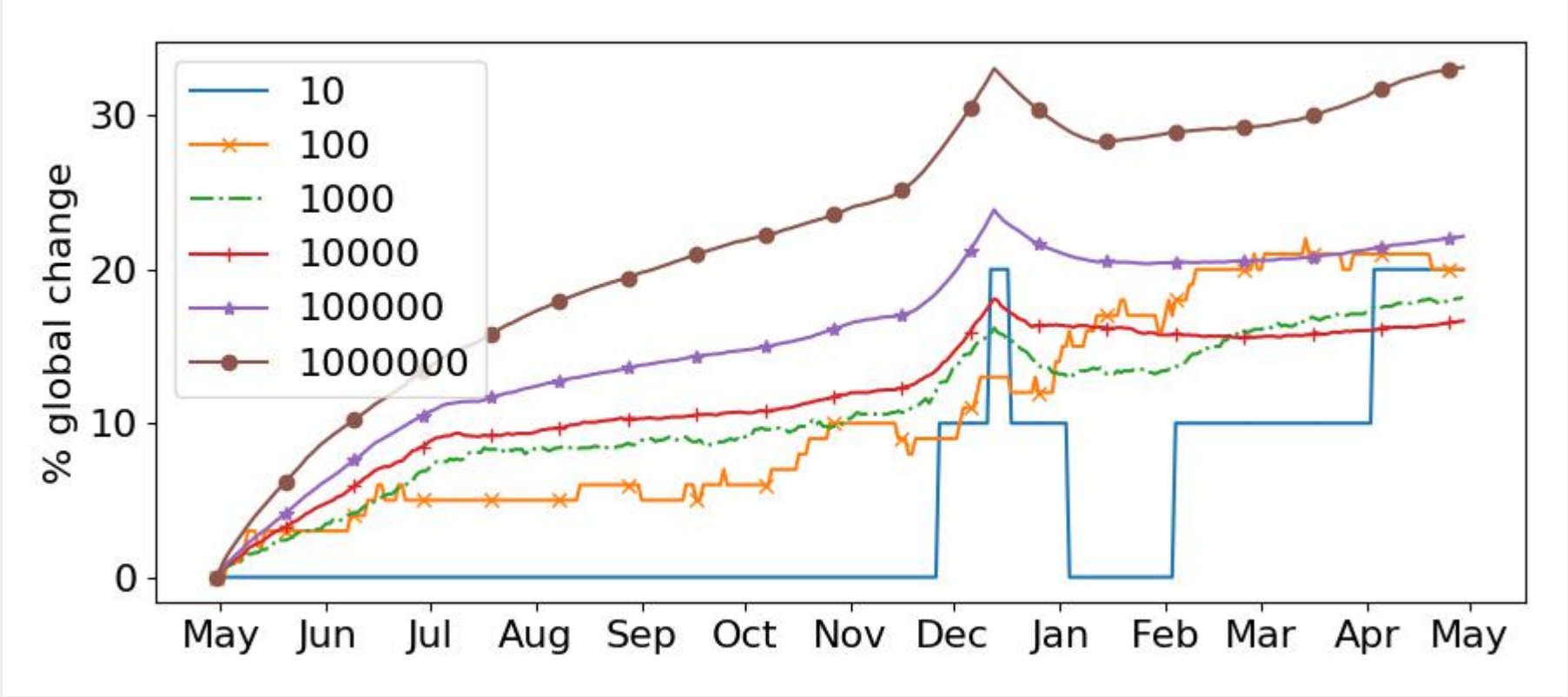
Tranco is very **stable** compared to its components



Aggregating over 30 days leads to **balanced stability**



Smaller subsets see **higher stability** over one year



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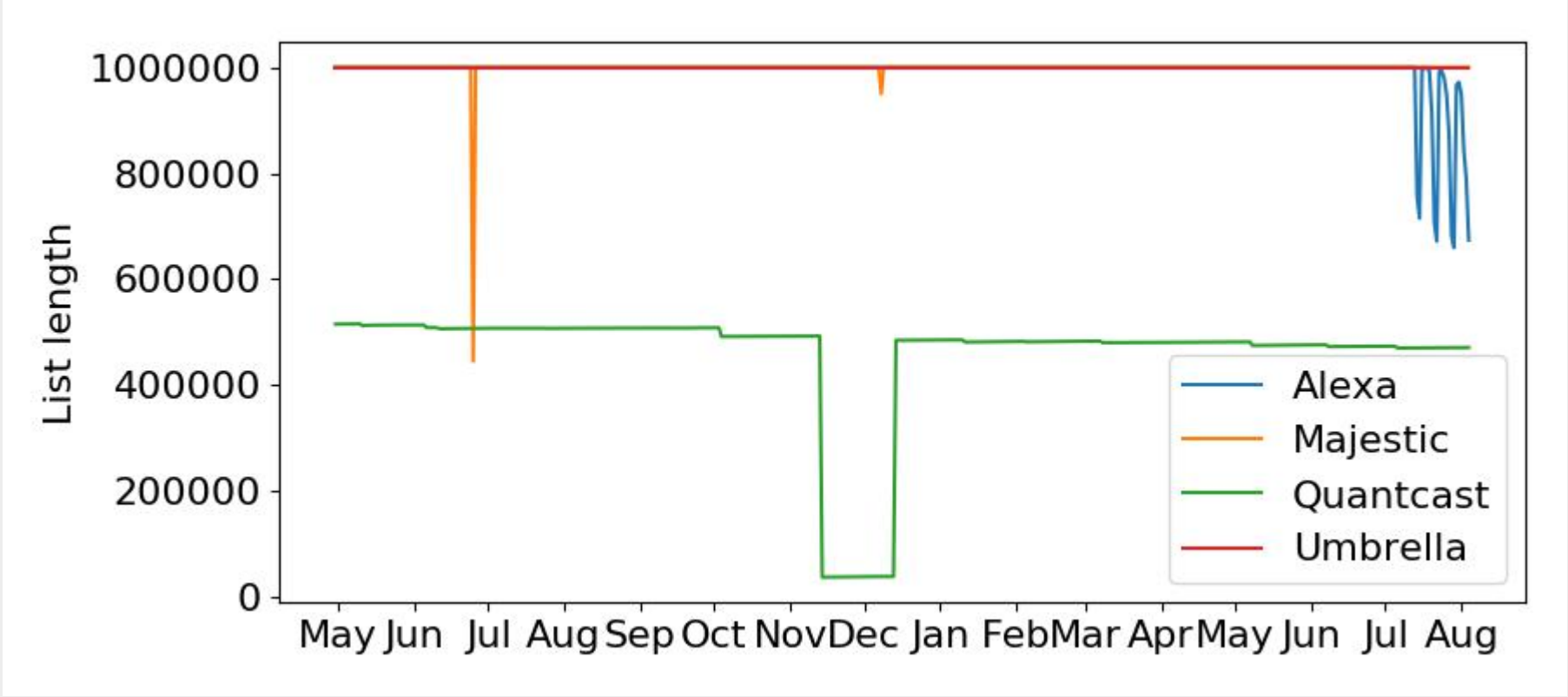
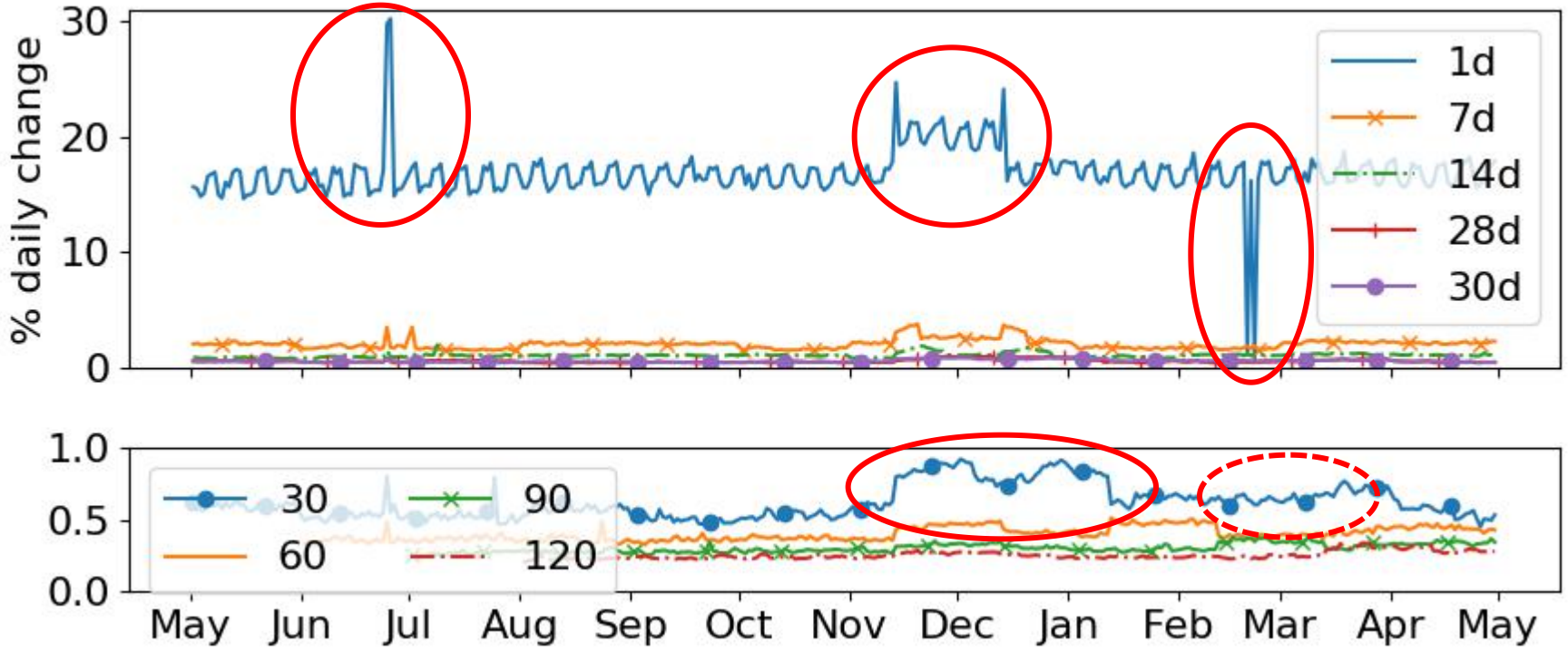
Component rankings experience **anomalies**



Tranco is somewhat affected, but **impact is reduced**



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We evaluate Tranco's properties and parameters

Similar to component and external lists

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Mostly **responsive** and **benign**

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Aggregation improves **stability**

Anomalies

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Similar to component and external lists

Mostly **responsive** and **benign**

Aggregation improves **stability**

Impact of anomalies is **reduced**

We make researchers aware of Tranco's properties

- **30-day aggregation** yields good stability trade-off
- **Apply filters** where appropriate
- Use **full list** to retain at least 1M domains
- Properties improve slightly for **smaller subsets**
- Properly **reference** the specific list used

Default parameters → **representative** set of domains

Download the Tranco ranking:

https://tranco-list.eu/

Thank you!

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References

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