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DCI Submission to the European Commission (EC) on Generative Artificial Intelligence

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DCI

SUBMISSION

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Dynamic Competition Initiative (DCI)

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The DCI welcomes the opportunity to submit comments on the EC's consultation on competition and generative artificial intelligence (hereafter, "GenAI").[1]

The two main messages of the DCI submission are the following:

- The technological and economic properties of GenAI do not support a case of tipping in which one firm takes the entire market;
- The financial and regulatory context of GenAI could fuel '*winner takes all or most*' dynamics in GenAI markets.

These points are set out in more detail in the paragraphs below.

I. Antitrust Policy Development towards GenAI: History and Assumptions

Several key information and communications technologies ("ICT") industries have historically displayed monopoly tendencies. In this context, antitrust decision-makers tasked with maintaining effective competition in the economy eye the development of

[1] This submission authored on behalf of DCI does not necessarily reflect the opinions of all affiliated members of DCI. All signatories are participating in their individual capacity. More information on DCI can be found at www.dynamiccompetition.com.

computer applications built on large language models ("LLMs") with concerns of monopoly formation on the back of their minds.

Antitrust agencies want to avoid a new wave of digital monopolization like in the 2000s. Painstaking law enforcement and regulatory initiatives have been needed to control the market power of search, social networks, and e-commerce monopolies. To date, the impacts of these interventions are still unclear.

Against that backdrop, several (non-exclusive) ambitions have been formulated for competition policy towards GenAI. First, competition policy may attempt to prevent the tipping of GenAI markets towards one or more dominant firms. Second, competition policy may attempt to maintain a degree of technological variety in GenAI, allowing consumers to benefit from alternatives should the market tip toward an inefficient technology.

Both policy goals assume that GenAI will display '*winner takes all or most*' dynamics. This assumption cannot be tested, but it can be examined considering the evidence available in computer science literature as well as observable industry facts. To date, several technological and economic properties of GenAI systems undermine a strong '*winner takes all or most*' scenario (I). By contrast, capital markets and regulatory costs may encourage biased GenAI technology selection, and *de facto*, a *"winner takes most or all*" scenario (II).

II. Technological and Economic properties of GenAI: Against Winner Takes All or Most Effects

GenAI systems have been historically deemed to benefit from scaling laws. In 2020, a paper established that an LLM performance is a function of (i) the size of the datasets on which it is trained, (ii) the amount of computational power used for training, and (iii) the number of parameters of its model (dimension).[2]

[2] Kaplan, Jared, Sam McCandlish, Tom Henighan, Tom B. Brown, Benjamin Chess, Rewon Child, Scott Gray, Alec Radford, Jeffrey Wu, and Dario Amodei. "Scaling laws for neural language models." *arXiv preprint arXiv:2001.08361* (2020).

Since then, however, several papers in the LLM literature have nuanced and challenged these findings. More recent works showed that for a fixed computational budget, more parameters did not mean higher performance[3] and that substantial improvements were possible with smaller datasets.[4] In addition, recent works demonstrated at least equal performance between LLMs trained with proprietary and publicly available data.[5]

If the findings are right that Small Language Models ("SMLs") are technologically competitive, there is no strong technological grounding for an assumption that a firm with a leading LLM will end up benefiting from a path-dependent '*winner takes all or most*' effect. By contrast, other economic properties of GenAI may still support '*winner takes all or most effects'*. Network effects are one of them, but GenAI systems do not appear to have the same very strong positive direct and indirect network effects seen in search engines, social networks, or e-commerce. The widespread reliance of commercially available LLMs on a subscription model (with a freemium version) at an early stage is a telling admission that network effects are, at best, limited. Similarly, economies of scale on the supply side do not appear to support '*winner takes all or most effect*'. As most data that is open and available on the Internet has been scraped, access to additional data is becoming increasingly costly for LLM developers.[6] The limits to the (publicly available) data that GenAI models can be trained on mean that competitive advantage will be shaped by the ability of rivals to gain access to scarce, non-public, data, not just voluminous data.[7] In addition, the incompressible need for human feedback in self-supervised techniques and the requirements of access to large and scarce computational resources make economies of scale, at best, a long-term perspective.

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[3] Hoffmann, Jordan, Sebastian Borgeaud, Arthur Mensch, Elena Buchatskaya, Trevor Cai, Eliza Rutherford, Diego de Las Casas et al. "Training compute-optimal large language models." *arXiv preprint arXiv:2203.15556* (2022).

[4] Touvron, Hugo, et al. "Llama: Open and efficient foundation language models." *arXiv preprint arXiv:2302.13971* (2023).

[5] Id.

[6] Possible concerns of monopolization of, or abuse of dominance on data markets, including through data lakes mergers, cannot be ruled out. Such dynamics could be harmful to the growth of GenAI suppliers.

[7] Models that can get access to other data might be able to stay ahead of the competition for at least a while, without this necessarily implicating size.

III. Financial and Regulatory Properties of GenAI: Towards Winner Takes All or Most Effects

The growth of startups like OpenAI, Anthropic, or Mistral today appears to have more to do with cash flow than scaling laws, economies of scale, or increasing returns. As already said, GenAI development is cash-intensive, requiring access to costly computational, human, and energy resources. At this stage of the lifecycle, monetization models are still unclear. The ability of GenAI firms to stay in the race and pull ahead appears, in turn, dependent on benefiting from continuous access to funding through capital markets, financial institutions, or even M&A transactions and strategic partnerships with firms enjoying deeper pockets.[8] In addition, money markets may be biased toward closed-source GenAI developments as they likely offer more obvious value capture opportunities. A bias towards closed source does not allow an inference of anticompetitive harm in itself unless it correlates with reductions in consumer welfare enhancing product differentiation or innovation.

In addition, regulatory costs might favor GenAI players that benefit from the backing of large firms. The combined effect of stringent privacy laws and rising copyright litigation risks biasing GenAI technology selection towards organizations that can shoulder the financial burden of lobbying, compliance, counseling, and litigation risks.

IV. Antitrust Policy Implications

To close, the DCI wants to stress the four following points. First, high and healthy levels of oligopoly competition currently characterize GenAI development. Second, strategic partnerships and M&A between large firms and GenAI firms may be needed to maintain a degree of competition for the market and avoid premature '*winner takes all or most*' dynamics. Third, the private funding of GenAI development may skew incentives of capital suppliers to adopt 'open-source early, closed-source later' strategies. Antitrust agencies must, therefore, keep a vigilant eye on the ability and incentives of GenAI

[8] In some cases, competitive concerns may arise when such partnerships entail the integration of some LLM systems into a large firm's consumer-facing applications. But as long as LLM competition is vibrant and a degree of basic interoperability is maintained, the risk of one LLM pulling ahead by product tying or bundling appears moderate.

developers and ecosystem partners to limit future open-source competition. Fourth, antitrust agencies must call the attention of other law and policymakers to the competitive risks associated with regulatory costs.