Ex Ante Access Regulation for Foundation AI Models: An Access-Justice Approach

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Abstract.
Foundation AI models are a vital input for downstream AI applications. Yet their development exhibits natural-monopoly characteristics, with control concentrated in the hands of a small number of companies. This concentration threatens innovation in downstream AI applications and creates systemic risks. Competition law mechanisms have so far proven inadequate for addressing these issues. However, there is inspiration to be had for a regulatory approach from the ex-ante approach of the Digital Markets Act (DMA) and telecommunications regulation.

The paper first outlines the problem of market concentration in the foundation AI model market according to current literature. It then proposes an accessibility approach which lies in ex-ante model access regulation drawing on the DMA and telecommunications regulation, including the proposed Digital Networks Act (DNA) and the EU Electronic Communications Code (EECC) which preceeded the DNA. The proposed approach aims to better serve the access justice regulatory framework coined by H. W. Micklitz and specific to the EU regulatory technique. The paper also briefly discusses other regulatory approaches proposed so far, thereby providing a starting point for further research and debate.

Keywords: Ex-ante Regulation, Foundation AI Models, Access Justice, Market Concentration, FRAND, Competition Law, Digital Regulation, Big Tech, Digital Markets Act, Telecommunications Regulation.

1 Introduction

Foundation AI models are an essential resource for downstream use of AI and innovation. They can be characterized as general-purpose algorithms which can be further used in more specific use cases. An example of this distinction could be the model GPT 5.6 and its specific use, the chatbot ChatGPT. [1] Although the terminology for this part of the technology varies, this paper uses the terms 'foundation AI models' and 'foundation models' to refer to models with specific attributes. For the purposes of this paper, a foundation model is trained on large amounts of data, is versatile and adaptable, and contains a large number of parameters or weights. [2] These models can then be used to build specific services or applications, thereby acting as a sort of infrastructure to secondary markets, as well as a bottleneck for access to secondary markets. The bestknown type of foundation model currently is the large language model, or an LLM. [3] The strategic importance of foundation models becomes even clearer if one accepts the claims of AI optimists, who argue that AI may have universal utility and shape the global economy. Although I do not necessarily share this view, more cautious estimates of AI's impact on the global economy also underscore the bottleneck role of foundation models. For example, McKinsey estimates that AI could replace 40% of jobs in the US by the year 2030, [4] different reports suggest that AI adoption may boost the global GDP by up to 15 % by 2035. [5] Other reports also suggest that AI may account for 7-10 % of the global GDP by itself. [6] Given the rapid pace and turbulent nature of AI development, such predictions vary widely, and describing the current state of the global foundation model market is challenging. However, this paper presents several indicators of the market's current structure.

It is this bottleneck character of AI technology that has drawn attention to the concentration of the foundation AI model market. As of the date of submission, the foundation model market shows signs of a natural monopoly. [7] Some economic reports also suggest that the foundation model market is becoming concentrated globally. [8] This raises serious competition concerns. In particular, further concentration could stifle innovation, reduce competition in the market generally, and encourage exclusionary conduct against potential downstream competitors. These are all classic harms associated with monopolistic or oligopolistic markets with a large amount of vertical integration. [9]

This has led some authors to propose measures that would remedy the unfolding market concentration. The two main approaches can be summarized as training data access, usually from dominant companies [7] and public utility strategies. [10,11]

The main goal of this paper is to propose a more concrete version of the public-utility approach, drawing on ex ante access regulation in the DMA [12] and the telecommunications sector and adapting it to the access-justice framework coined by H. W. Micklitz.[13] This article focuses mainly on the access to secondary markets dimension of the concentrating foundation model market; it also suggests avenues for further research. This paper argues that a tailored ex ante access regime for foundation models is preferable to general competition law and purely data-access or public-utility approaches because it better fulfils the criteria of access justice.

2 Current state of the Foundation AI model markets

The structure of the foundation AI model market reveals pronounced concentration dynamics driven by fundamental economic forces. [14] The market for cutting-edge foundation models displays substantial economies of scale characterized by 1) a high fixed cost for pre-training the model, 2) fixed costs for fine-tuning the model and 3) low variable costs of operation. [3] These economies of scale create structural incentives for concentration typical of natural monopoly markets. [7] In addition, because foundation models can perform a wide range of tasks, significant economies of scope are also present. [3] Training costs have exploded exponentially, reaching nearly $200 million for a single frontier model in 2024, compared to just $1,000 in 2017. [15] These astronomical barriers to entry limit competition to a few well-capitalised technology corporations. This rise in training costs is the result of the cost of the main building blocks of developing a frontier foundation model themselves. These basic building blocks are training data, computational power and AI engineers, often referred to simply as talent. [3]

First, the cost of computational power or compute, is rising steadily due to the concentrated structure of the chip markets and other constraints on that market.[3] It is now often noted that Nvidia supplies most of the chips necessary for the processing done when developing new foundation models. [16] In fact, compute is so important that some authors have developed ‘scaling laws‘ which predict the performance of the model based on how much compute was used in its training. Over the last 15 years, developers have increased the needed compute by a factor of 4.2X per year, and the overall spending on training frontier foundation models grew by a factor of 3.09X per year in the same period. [17] Whether this trend will continue is uncertain; however, some claim that this trend leading to high entry costs may continue up to 2028. [18] This is due in part to the fact that manufacturing compute hardware requires skilled labor and remains highly specialized and expensive. [19] Another factor is that rising demand for memory and processing power in electronics is expected to keep this bottleneck in place for years to come. [19, 20]

The second hurdle of acquiring talent. It is well established that AI engineers are expensive, especially those capable of developing a frontier foundation model. As in many high-growth sectors, demand for skilled workers exceeds supply, allowing them to command very high salaries. This barrier to entry is a natural feature of a fast-growing industry, since it takes significant time to acquire the skills needed for such roles. [21] For that reason, this barrier is likely to persist until the supply of skilled workers increases significantly. This may sadly take several years.

It is also well established that frontier AI models are exceptionally data hungry. [22] Moreover the world is about to run out of high-quality text which is publicly available and needed to train bigger and better models. [23] Some solutions to this issue include the provision of high-quality open-access data sets which may ease concentration concerns somewhat, but do not mitigate the advantage of proprietary data sets. [3] Another option is using synthetic data for training purposes [24] or so-called “self-play” approaches, where the model improves by interacting with itself, effectively exchanging data requirements for compute requirements. [25] However, synthetic data is not always suitable and may produce results that do not transfer well to real-world use, [24] and the self-play approach only exchanges one barrier to entry for making a second one even harder to cross. [25] This gives an advantage to big technology companies that already collect extensive user data through services such as social networks, search engines, and email platforms.

It is therefore unsurprising that these essential inputs also strongly incentivize vertical integration with existing large technology firms. [26] This is because these companies already have access to most of the needed resources, such as large and exclusive proprietary data sets, large amounts of compute, as well as a base of skilled engineers. It is also important that large technology companies currently have the capital needed to finance frontier foundation-model development. This is why vertical integration between big tech companies and AI developers is already well on the way, raising competition concerns. [3]

For example, Microsoft has secured strategic stakes in both OpenAI and Anthropic as well as the European Mistral. The same is true for Amazon, which invested in Anthropic or Nvidia, which invested in OpenAI. Alphabet, while developing its Gemini model line, is also heavily invested in Anthropic, so even companies with their own model development plans may participate in the vertical integration tendencies. In China frontier models are also tied to big tech investments and threaten vertical integration. Moonshot AI, the developer of Kimi AI, one of the top ten foundation models currently, is largely funded by investments from Alibaba and Tencent, two of China's largest technology corporations. [3]

Competition authorities have not overlooked the concerns arising from this degree of interconnection and vertical integration. A significant example of this is the joint statement of the FTC, the UK competition authority and European Commission on competition in generative AI foundation models and AI products, which highlights these issues. The joint statement also points out the threat of practices which are now described as "acquisition by proxy" where competition law safeguards and merger rules are being circumvented by exclusive licensing deals and heavy investments into key startups all under the guise of a strategic partnership, like the case of Inflection AI. [27]

The concentration within the foundation AI models can also be observed in performance benchmarks. One of the most widely used benchmarks for model performance is the LMSYS leaderboard. [28, 29] At the time of writing, the top 9 places in the overall leaderboards are dominated by Anthropic (Claude models), Meta (Muse models) and Alphabet (Gemini models). [1]The 10^{th} place is the exception with a Kimi model. In other words, most current frontier foundation models are produced either by large technology firms or by firms connected to them through investment or exclusive-deal arrangements, as is the case with Anthropic. But to be completely accurate, the Kimi model is developed by a Chinese company which is backed by Alibaba and Tencent, [3] so it also has meaningful ties to large technology companies. Accordingly, it is reasonable to conclude that the vertical-integration pattern noted above applies to all current top ten foundation models. If we were to look for a place in the overall leaderboards that are not vertically integrated in some way with big technological companies, we would currently have to look around the 30^{th} position. [29] This highlights the advantages that vertical integration brings for frontier foundation model development and serves as an indicator of the concentration in the foundation model market.

Other indicators of concentration in the market are also visible; another indicator may be the total amount of spending on AI training. Although comprehensive current estimates are unavailable, in 2023 the GPT-4 series of models was the clear winner with a total of 69 % spending distributed between OpenAI and Microsoft. [3] If this is taken as a proxy for market share at the time, it would mean that the GPT-4 models made up almost 70% of the market.

Although these indicators are not definitive and the foundation model market is far more volatile than it was in 2023 or 2024, [3] the evidence nonetheless supports concern

[1] This information was captured on 25th July 2026.

that natural-monopoly conditions may be emerging if AI capabilities continue to scale with training expenditure. [30]

A counterargument to concerns about oligopoly or concentration is the growing adoption of open-source foundation models, such as Meta's Llama model line. I would argue, however, that these do not mitigate the concerns because open-source models have, at least up to the time of writing this article, always lagged behind their frontier counterparts in performance. This is also connected to the fact that open-source models can raise safety concerns and may not be as stable or reliable as the proprietary models. [3]

To conclude this section, there is strong evidence that the foundation model market may be moving toward greater concentration. It exhibits strong economies of scale and scope, substantial barriers to entry, and significant vertical integration. The ongoing concentration is also visible in secondary markets such as the LMSYS benchmark leaderboard and the approximate spending on model development.

3 Ex ante access regulation and access justice

3.1 Access justice

This chapter introduces the regulatory framework doubling as a value system for the paper. It is the framework of 'access justice' developed by H. W. Micklitz. To provide context to the following discussion, it is necessary to at least briefly discuss the concept of "access justice" here.

Micklitz claims that there is a sort of leitmotif of solidarity in EU law since its inception. [31] He claims that this stems from the fact that the EU aims to become a social market economy. [31] By this he means that the EU is a project meant to open up markets and make them accessible but preserve a social protection framework as well. [31] This leads to some specifics typical for EU law according to Micklitz, mainly that the provisions and regulatory approaches do not aim to achieve social justice but a more specific access justice. [32] This is visible in several regulatory approaches used by the EU. For example, Micklitz cites the essential facilities doctrine, which aims to make markets accessible for new entrants.[13] Another example is the concept of services of general economic interest, [33] which are closely connected to infrastructure regulation and aims to liberalize the given markets, although the CJEU has also used it in social contexts. [33] According to Micklitz, universal service obligations, such as those found in the telecommunications sector, are examples of EU provisions that reflect access justice. [31]

In summary, access justice rests on the idea that well-functioning markets do not always emerge spontaneously and may require regulation. This is because if left to themselves, markets may exclude participants (competitors but consumers as well) and bar the re-entry of those participants, which is detrimental to the markets themselves. [33] A policy grounded in access justice would therefore work against market exclusion and seek to create opportunities for market re-entry. In this respect, access justice has things in common with anti-discrimination law in cases where it deals with market entry, [33] and it also overlaps with competition law, whose goal is to prevent market distortion through power accumulation and barriers to entry. [33]

Micklitz further identifies characteristics typical of regulation aimed at access justice. These include mandated access to markets or inputs necessary to gain access to the market,[13] the removal of barriers to (re)entry, [32] coordination and collaborative regulation approaches, [32] and non-discrimination, which Micklitz views as another leitmotif of EU law. [31] He also suggested a sort of success condition for an access justice focused regulation, which is that all market participants have a fair and realistic chance to enter the market, reap its benefits as well as consume its products and services. [32]

This notion of access justice is relevant here as a value framework specific to EU law, and I use it to frame how the EU might address the concentrating foundation model market when competition law struggles to do so effectively.[3] Finally, Micklitz identifies issues similar to those arising from concentration in foundation AI models, whether social in nature or related to market entry. He even mentions the telecommunications regulatory regime as an example of access justice regulation dealing with a concentrated market. [33]

To summarize, the access-justice framework used here as a soft evaluative benchmark for selecting regulatory approaches is somewhat unique to the EU. It is particularly well suited to the EU's social market economy because it allows a regulatory approach that keeps downstream markets open, contestable, and non-discriminatory while also accounting for the social implications of the market structure and technology being regulated. This stands in contrast to pure competition law or data-access regimes, which address only part of this broader set of EU regulatory concerns.

3.2 DMA and Telecommunication

This chapter describes and analyzes ex-ante access regulatory tools and approaches utilized in the DMA and in the EU telecommunications sector, particularly within the European Electronic Communications Code [34] and the proposed Digital Networks Act. [35]

The utilization of the DMA ex-ante access approach mainly focuses on making previously inaccessible data available. There are several similarities between the concentrated digital markets that led to the DMA and the current foundation AI model market. In both cases, a handful of gatekeepers can utilize their dominant position as a bottleneck. Similarities also exist between the platform economy and the foundation model market in the pricing strategies used. There is currently evidence that foundation models, or systems built on them, are being offered at or near cost. This strategy has also been used, and in some cases still is used, when introducing a new digital platform to outcompete rivals that cannot sustain such losses or near-zero profitability until the market consolidates around a few players. Once this is achieved, the prices for the given platform or service can go up again, and the now dominant player can start extracting monopoly rent. This tactic is now sometimes called hyper-scaling and relies on the fact that low prices or providing the service for free develop a dependence of the consumer which can then be capitalized on. There are other similarities as well. The platform economy exhibits similar economies of scale and scope. A major difference, however, is that the network effect characteristic for the platform economy does not play such a significant role in foundation AI models. They matter mainly insofar as platform companies can leverage them to gain access to more proprietary training datasets.

In the case of the DMA, specific types of data were chosen to be made available by these gatekeepers under FRAND terms, sometimes free of charge, so the royalty is zero. [36] FRAND terms are a legal descriptor for terms of contract being fair, reasonable and non-discriminatory. [37] The concept is used in telecommunications, in standard-essential patent law, and now in the DMA in relation to gatekeepers and platform markets. They represent a specific regulatory tool used in the EU in situations where an essential resource is needed for market entry. In the telecommunications sector, this is physical infrastructure; [38] in patent law, it is used on patents where there is a strong motivation to make the patents available to satisfy some sort of public interest or to solve a far-reaching problem, like in the case of pharmaceuticals. [39] In the DMA, FRAND terms are used to make previously unavailable data accessible, for example to app developers seeking to distribute apps through an app store or access the app store itself, thereby making entry into the secondary app market easier. [37] This fulfills Micklitz's barrier-removal criterion by institutionalizing the dominant players' position in exchange for open secondary markets. [40] This is done in the pursuit of market access, which Micklitz claims is also pursuing access justice and all this under non-discriminatory conditions. FRAND obligations are implemented through licensing or other contractual agreements, often including a royalty for access. [37]

A key drawback of FRAND terms is their vagueness and the difficulty of defining them, since they are highly context-specific. [37] The hardest part to determine is usually the remuneration that is to be awarded for access. [37] Although the EU regulator has in some DMA cases required free access, that remains the exception rather than the rule under FRAND. Defining fair, reasonable and non-discriminatory royalty fees is no small feat. There are two main ways the royalty is usually determined with FRAND conditions, and that is a top-down approach [41] and a "closest license" approach. [41] In simple terms, a top-down approach calculates the total royalties already earned by the rights holder and divides them by the number of licensed resources, thereby producing an average price. This then becomes the FRAND royalty. [41] This would not, in my view, work well for foundation models. This is mainly because the models may be made available on a token or other actual use basis; in this case, determining the price would be quite difficult. Some models may need to be licensed under special safety-enhancing conditions, and others may simply be less capable than the rest of the portfolio. This approach does not provide for a more nuanced way of determining royalties.

The second approach, based on the closest or most similar license, could be more suitable, but it is also not a perfect fit. In this approach, the starting point for negotiating access is the most similar existing license, which is then modified. [37] This approach may be useful in markets where licensing is already common and standard forms are supplied by intermediaries or associations representing licensors and licensees. Without a structure like the BEREC to set some sort of standard, [41] dominant players controlling the essential resource may skew license terms in their favor.

There is also one other notable approach when determining FRAND terms which was delineated in the Huawei case. [42] This approach focuses on the negotiation process itself, and if the proper procedure is followed, the resulting terms should satisfy FRAND. This approach allows for the most flexibility, which could be useful with a fast-developing technology. This approach also leaves room for collaborative regulation if the process standards are set by an association of stakeholders or if such an association is recognized as an out-of-court dispute-resolution body. [43]

There is also other inspiration to be had from the DMA in regard to lessening the effect of vertical integration through the ban on service bundling [44] or merging some data sets and the need to keep them in data silos; [45] however, these fall outside the immediate scope of this article, but they could be an interesting topic to analyze in the future.

A similar case can be made in the telecommunications sector. In the EU, telecommunications infrastructure is expensive, and duplicating physical infrastructure is generally not economically feasible. As a result, competition in downstream connected markets suffered because of the bottleneck created by the essential resource. The EU solved this problem by mandating access to essential infrastructure in the field within the Electronic Communications Code. [46] All this was done in the interest of accessible markets, the removal of barriers to entry and fairer pricing. The stated goals of telecommunications regulation are to ensure a healthy competitive market and prevent abuse of dominant positions. [47] Like the concentrating foundation model market described above, these positions arose from the basic economic forces characteristic of natural monopolies. The largest difference between the EECC (and the DNA) and the DMA, and potentially the situation in the foundation model market, is the fact that telecommunications regulation focuses mainly on physical infrastructure rather than digital services. Although provisions like the universal service obligations can be found in the EECC, [48] these are not necessarily the main focus of it. Rather, they serve to address some of the symptoms of market concentration. It is also worth noting that, according to the European Commission's evaluation, the regulation was relatively successful in achieving these goals. [49] It is therefore reasonable to draw inspiration from it when regulating a similarly structured market.

The proposed DNA is a follow-up to the EECC and adopts a similar, though more moderate, approach. When the DNA was first proposed, there was talk about a more radical approach; [50] however, during the lawmaking process this sharp change in regulatory techniques failed to materialize, probably due to the relative success of the EECC.

In both of these regulations, the concept of significant market power stands as the benchmark for assessing which companies hold a dominant or significant enough position in the given market that needs to be regulated. [51] FRAND terms are also used to mitigate the punishing effect that free access would have on the dominant market player. Furthermore, the regulation also utilizes a collaborative approach to regulation. This takes the form of BEREC, an advisory body that issues guidance on FRAND terms in telecommunications and assists with market monitoring. [37] BEREC is made up mostly of member state regulatory bodies, so a better representation of the Micklitz collaborative regulation approach would be including other stakeholders in the structure as well, but still, it is a possible inspiration for regulatory tools useable in tackling the concentrating AI foundation model markets. Another potentially useful tool is telecommunications price regulation. After designating an undertaking as having significant market power, the regulator may, following consultation with stakeholders, impose remedial measures such as price ceilings. [52] In the most severe cases of market distortion, and again after stakeholder consultation, regulatory bodies can even require the separation of a market player to prevent monopoly power or excessive vertical integration. [53] This option was, however, removed in the DNA proposal.

These approaches could also be simplified as a way to enshrine the essential facilities doctrine in law. The essential facilities doctrine is a legal concept from competition law formulated by the decision-making of the CJEU. [13, 54, 55] In simple terms, it is a mechanism for making essential infrastructure or services accessible so that secondary markets can function and dominant undertakings cannot misuse their economic power. If three conditions are satisfied, the dominant player must contract with the other party under FRAND terms. These three conditions are 1) the facility is necessary, 2) access refusal is able to eliminate competition on the secondary market, and 3) the refusal must lack an objective reason. [55] This, however, works only on a case-by-case basis since a court decision is needed for it to take effect. I would argue that, through the regulations discussed above, the EU has effectively preselected certain essential facilities, thereby reducing the need for a necessity test in every case. This amounts to applying an essential facilities filter to the relevant market.

The telecom and DMA analogies are useful design templates for access governance, but they cannot provide a complete regulatory blueprint because foundation-model power is multi-layered, rapidly evolving, and more closely tied to technical, safety, and ecosystem constraints than telecommunications infrastructure. This must be taken into account when designing an effective regulatory approach.

3.3 Application to foundation AI models

Ex-ante access regulation to foundation AI models could play a crucial role in addressing the high market concentration seen in the foundation model market. Drawing on EU telecommunications regulation and the DMA, such regulation would mandate fair, reasonable, and non-discriminatory access to foundation AI models, much like the ex-ante access obligations that apply to telecommunications infrastructure. This access could apply to companies which can be designated as having significant market power, either stemming from their vertical integration or by market share approximation. In this way, mandatory access obligations would apply only where market concentration creates significant risks.

A suitable way to define significant market power in AI foundation models could hinge on the building blocks of frontier foundation model development as well as vertical integration and distribution options. A company could be considered to have significant market power if it fulfils half of the following criteria: the models of said company have been at the frontier for a two-year period, the company has a stable share of the foundation model usage and revenue overall of a certain percent, it has control over critical compute infrastructure and high-value proprietary data sets. Lastly, if the company is vertically integrated with distribution platforms or infrastructure needed for foundation model operation. The definition could be condensed into the following: "An undertaking has significant market power in foundation AI models where it can, independently and persistently, act to a material extent without being constrained by effective competitive pressure, due to its large share of overall foundation model usage or revenue, their models are consistently the top performers 2 years in a row according to independent benchmarks, their control over essential compute, data, distribution or due to large scale vertical integration or exclusionary deals."

The EECC and the DNA address bottlenecks in essential physical infrastructure by imposing symmetric or asymmetric access duties on operators with significant market power. This promotes competition by lowering entry barriers for downstream service providers who rely on these essential networks. Similarly, foundation AI models represent critical digital infrastructure. Ex-ante mandated access to these models on FRAND terms would facilitate broader ecosystem participation, reducing the concentration risk posed by dominant AI providers. Such an approach would satisfy Micklitz's barrier-removal criterion for access justice. It should, however, be noted that such a regulatory approach may solidify the position of dominant firms in the primary foundation model market while opening secondary markets and reducing the risk of exclusionary conduct. This includes preferential treatment of the kind reportedly employed by OpenAI, which provided early access to one of its frontier models to selected companies. [3]

The DMA approach complements this by creating a regulatory framework that ensures fairness and contestability in digital markets with gatekeeper platforms, providing tools to address unfair practices before harm materializes. Applied to AI, ex ante regulation could help prevent dominant providers from using foundation models to reinforce market power, while also encouraging innovation and enabling interoperability through regulated model access or API requirements. More broadly, the DMA can serve as a model for limiting the negative effects of vertical integration in secondary markets. This could again be done by ensuring FRAND contracting terms are followed as well as by limiting or prohibiting foundation model providers from entering certain secondary markets. An important lesson that can be gained from the DMA is the prevention of service bundling strategies as well. This is an anticompetitive tactic in which access to one resource is conditional on using another resource provided by the access-granting firm, thereby locking the user into its ecosystem. [56] This helps keep the primary market contestable and reduces the entrenchment of dominant firms by allowing customers to switch providers without high transaction costs.

However, experience from telecommunications regulation suggests a balanced approach: overly broad mandatory access risks regulatory overreach and may stifle innovation. Access obligations should be carefully tailored, justified by market analysis, and include dispute resolution mechanisms, as seen in the DNA. [57] The inclusion of a standard-setting advisory body representing stakeholders could also be important to ensure that FRAND terms are sound and reflect market reality rather than the regulator's own assessment. This would also further the access justice criteria of non-discriminatory regulation as well as collaborative regulation.

To summarize, a workable regulatory framework following the principles of access justice dealing with the concentration in the foundation model market would ideally include the following regulatory tools. It would be based on ex-ante access to foundation AI models for secondary-market entrants. This access obligation would apply only to firms holding significant market power in the foundation AI model market. Access would be granted contractually through the foundation model's API to guard against possible safety or trade-secret concerns and would be subject to FRAND terms. These terms would ideally be set by a procedure akin to that described in Huawei or on the basis of standards provided by an advisory body composed of key stakeholders. These stakeholders should include representatives of national regulatory authorities, foundation model providers, foundation model access seekers across different sectors and, in the best case, also representatives of end users. This ideal framework would also prohibit foundation model developers with significant market power from entering into exclusionary licensing agreements with immediate downstream companies. Another prohibition should concern service bundling when making foundation models accessible.

To conclude this section of the paper, the existing telecommunications regulation as well as the DMA offer quite a lot of inspiration for regulating the foundation model market. With some adjustments, this inspiration can be synthesized into a regulatory regime that fits Micklitz's access-justice criteria and helps ensure open secondary markets while preserving incentives for innovation.

4 Other proposed regulatory approaches

Two notable approaches have been getting traction in the literature on the topic in recent years. These are public utilities approaches and data access approaches.

Broadly speaking, the public-utility approach proposes treating AI models as a public utility that startups, and indeed anyone, can use to innovate and develop new products and services. [10,11] Public utility is a broad term. The telecommunications regulation discussed above can also be understood as public-utility regulation, as can regulation of sectors such as water or electricity. What is common is that the regulatory approaches choose a specific resource and deliberately try to make it as accessible as possible. This applies not only in the sense of market access but also in relation to consumers. These resources are essential in today's world, and therefore regulation stipulates a reasonable level of accessibility to them. The term 'essential' does not need to imply a life-or-death situation; rather, it may refer to a resource that is commonplace in modern society or to a general-purpose technology that the legislature seeks to diffuse widely. [10] The aspect of public utility regulation that has not yet been discussed in this paper mainly concerns accessibility to consumers or everyone rather than the removal of barriers to market entry. A good example of this is universal service obligations, which mandate a sort of safety net for people who may not be able to afford for profit provided telephone service or internet connection. [58] Such obligations then establish maximum prices or conditions under which low-income persons can access these services. While this is an important part to play and was even recognized as an important and successful part of the telecommunication legislation during the evaluation of the EECC, [49] I feel it is not as usable for foundation models due to their lack of usability by end users.

I would argue that foundation models do not necessarily constitute an essential tool in today's world that measures be accessible to end users. Rather, the demonstrated concentration threatens with the closing of secondary markets. The public-utility approach discussed here offers an alternative in which the regulator gives up, to some extent, on correcting market asymmetries in favor of making secondary market products and services available to consumers. In a sense, this approach could be described as not trying to regulate publishers but rather focusing on building public libraries. While this approach may have its merits, I would say that it is not suitable for dealing with the issues outlined in this paper and does not fulfil the market entry and removal of barriers to entry or the collaborative regulatory approach derived from Micklitz.

The second approach discussed here could be described as making training data more accessible so that the foundation model market becomes more open by easing access for competitors.[7] While I agree that this approach may reduce the impact of high training costs, at least in the area of data acquisition, it has significant drawbacks.

Even setting aside questions about which data must be made available and who must provide it, there are several reasons to doubt that data access alone solves the concentration problem. First, there is the issue of speed of change in the market; even with this policy in place, dominant players may be in the position to conjure artificial barriers to entry, for example by lobbying for new regulation that burdens new market entrants in a more significant way than the dominant player due to high fixed costs of compliance.[3] While this is clearly problematic, and may indicate regulatory capture, other artificial barriers to entry could also emerge, such as predatory pricing.[3] It is also important to note that access to training data does not guarantee successful foundation model development; providing ingredients without a recipe is not enough. While it is possible and easier to develop a model while knowing what data should be used, the end result is also dependent on other factors like the aforementioned compute and talent. This suggests that although data access is an important lever against concentration in the foundation model market, it is not sufficient on its own if the goal is to ensure a healthy market.

It is also worth noting that, although the AI Act [59] is widely described as the world's first comprehensive AI regulation, [60] it does not do much to solve the problem addressed in this paper. This is largely given by the fact that the regulation is mostly built as a product safety type of regulation, [61] and this paper deals with a market structure problem. However, there is a part of the AI Act worth mentioning. Given the fact that what is called foundation models in this paper overlaps heavily with the concept of general-purpose AI models or general-purpose AI models with systemic risk regulated by the AI Act, [62] there is a provision which may be able to influence the market structure of foundation models.

The AI Act requires providers of such general-purpose AI models to make publicly available a sufficiently detailed summary of the content used to train the model, using a template provided by the AI Office. [63] The template is already available [64] and will most likely amount only to a generalized training data set description. While this obligation is similar to the discussed data access obligation, it is weaker in effect. It does not remove barriers to entry; it merely reveals the scope and type of data that frontier model developers may use in training their models. While this may provide some guidance to new entrants, it does not satisfy the access-justice requirements laid out in this paper. It does not help new entrants to access any of the necessary building blocks for successfully developing a frontier AI model. This leads to the conclusion that this provision is only a supporting one.

To conclude this section, existing telecommunications regulation and the DMA offer substantial inspiration for regulating the foundation model market. With some adjustments, this inspiration can be synthesized into a comprehensive regulatory regime that fits Micklitz's access-justice criteria and helps ensure open secondary markets while preserving incentives for innovation.

5 Conclusion

This paper has argued that the global foundation AI model market increasingly exhibits structural concentration and bottleneck characteristics that competition law alone is unlikely to address effectively. Drawing on the European Union's experience with ex-ante access regulation in telecommunications and the Digital Markets Act, it has proposed a tailored access-based framework for foundation models. Such a framework could improve downstream contestability, reduce dependence on a small number of dominant providers, and better reflect the access-justice logic that underpins this paper's normative approach. At the same time, the proposal must remain carefully limited: access duties should be justified by market analysis, calibrated to avoid overregulation, and accompanied by safeguards such as FRAND-type terms and dispute-resolution mechanisms. Compared with public-utility and data-access models, the access-regulation approach offers a more targeted response to bottlenecks while preserving incentives for innovation and investment.

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