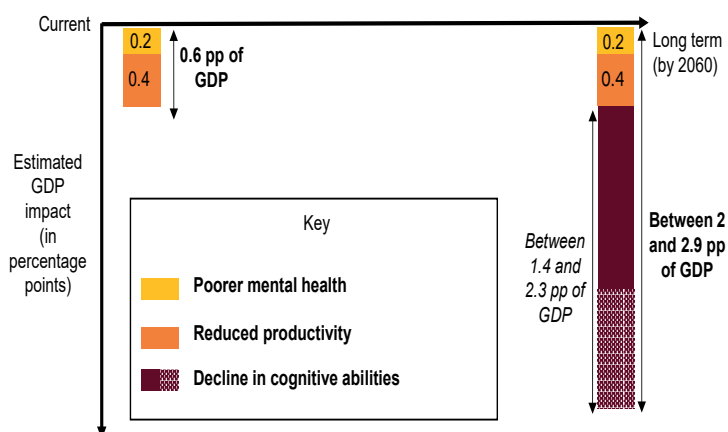


The Attention Economy in the Digital Age

*Solal Chardon-Boucaud**

- The attention economy refers to business models that seek to monetise consumer attention. Most of these business models rely on advertising, allowing them to provide certain services appreciated by consumers free of charge or at a special rate. Consumers then indirectly “pay” for these services by providing an audience for advertisers.
- While these business models have been used for a number of years by legacy media (e.g. print, television), certain digital platforms such as social media are taking them even further, due to technical and economic characteristics specific to their industry.
- Digital firms in the attention economy generate economic activity via their revenue, sales from online advertisements and productivity gains from the development of new tools and features.
- Nevertheless, the business models of the attention economy have significant negative externalities for users and society (e.g. reduced productivity, impact on cognitive abilities and mental health). According to a review of the existing literature, these negative externalities could reduce GDP in the long term by 2 to 3 percentage points for the quantifiable portion of these impacts. This order of magnitude – which should be interpreted with caution owing to its underlying assumptions – depends above all on a decline in children’s cognitive abilities, which is expected to lower their future productivity when they enter the labour market as adults (see Chart on cover page).
- Regulatory initiatives being taken at national and European Union level involve (i) regulating platform features, (ii) protecting vulnerable groups such as children, and (iii) fostering competition to aid the development of healthier alternatives.

Impact of the main negative externalities generated by the attention economy on French GDP



Source: DG Trésor estimates.

How to read this Chart: In the long term (by 2060), a decline in cognitive abilities due to the attention economy could reduce economic activity by between 1.4 and 2.3 percentage points of GDP, based on the methodology detailed later in this paper. In the short term the externalities generated by the digital attention economy are estimated to lower GDP by roughly 0.6 percentage points.

* This paper was produced jointly with the Directorate General for Enterprise, including the Digital Platform Regulation Unit, the staff of which the author wishes to warmly thank. However, this publication reflects the views of the French Treasury only.

1. Digital firms in the attention economy use business models that maximise capture of user attention

1.1 The attention economy is largely based on a two-sided market model where user attention is monetised through platforms

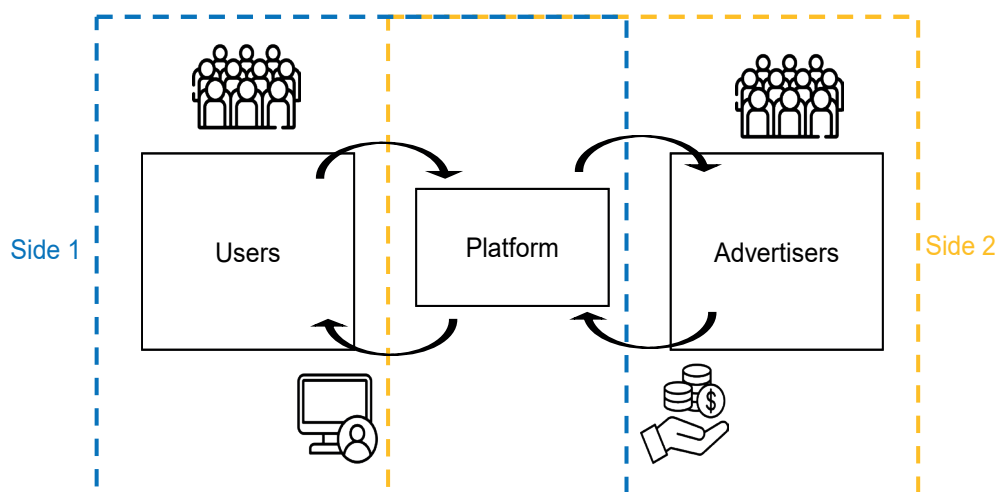
The attention economy generally refers to business models that are based on monetising user attention.¹ This monetisation is a product of the discrepancy between an information-rich environment (Falkinger, 2005)² and the fact that users have a limited amount of attentional resources (Pashler, 1997).³ Attention capacity is in particular limited by the number of hours a person is awake, cognitive abilities and the fact that a user's attention cannot be captured by two entities at once. Attention is thus a scarce economic resource involving attention rivalry and attention exchange (Newman, 2020),⁴ which can accordingly lead to economic transactions between various players.

In most business models (see Table 1), user attention is monetised indirectly through advertising. By providing an audience for advertisers, consumers indirectly

“pay” for the services that they are given access to free of charge or at a special rate. This strategy is used by companies in the media, television, radio and newspaper sectors, and more recently by digital firms.

The attention economy works based on a “two-sided” market model (Rochet and Tirole, 2006).⁵ In such a market, platforms serve as an intermediary between two types of players, exchanging access to consumer attention. The first side involves interactions with consumers, while the second is made up of interactions with advertisers (see Diagram 1). Platforms create economic value by facilitating interactions between both sides, and this value is monetised primarily on the “advertisers” side. Users show a marked preference for having access to a free service they use immediately, as provided to them by the platforms (side 1). Conversely, at times in contradiction with their stated intentions,⁶ users pay less heed to the use of their data or attention, allowing advertisers to monetise these less visibly on the “advertisers” side (side 2).

Diagram 1: Process of monetising user attention



Source: Directorate General for Enterprise, French Treasury.

- (1) This study on how attention economy markets work (section 1 and 2 of this paper) was conducted jointly with the French Treasury and the Directorate General for Enterprise. However, this publication reflects the views of the French Treasury only.
- (2) J. Falkinger (2008), “Limited Attention as a Scarce Resource in an Information-Rich Economies”, *The Economic Journal*.
- (3) H. Pashler (1997), *The Psychology of Attention*.
- (4) J. M. Newman (2020), “Antitrust in Attention Markets”, *University of Miami Legal Studies*.
- (5) J.C. Rochet and J. Tirole (2006), “Two-Sided Markets: A Progress Report”, *The RAND Journal of Economics*, vol. 37.
- (6) Known as the privacy paradox, this is the disconnect between individuals’ concerns about the protection of their data and their actual online behaviour.

Table 1: Primary business models of digital firms in the attention economy

Primary business model (not necessarily exclusive) ^a	Main examples in France	Type of platform or services
Ad-only, no paid services	Google, Bing	Search engines
	Facebook, Instagram ^b	Personal social media platforms
	YouTube, ^c Dailymotion	Video sharing platforms
Freemium (free access to standard services, paid for through advertising, while access to additional features requires a paid subscription)	Monopoly GO!, Brawl Stars	Online video game platforms (free access alongside optional in-game purchases)
	LinkedIn, Indeed	Professional social media platforms (free access but advanced features only available with paid version)
	Spotify, Deezer	Streaming music and video platforms (paid access enables users to listen/watch ad-free or with limited ads, and provides access to advanced features)
Paid subscription to access standard services (with the option to pay more for a premium, often ad-free version)	Netflix, Disney+	

a. YouTube, Facebook and Instagram offer paid versions with limited ads, but they have very few subscribers (see footnotes 7 and 8).

b. Facebook and Instagram offer paid, ad-free versions, but they accounted for no more than 10 million paid subscribers in early 2024 (Meta has not provided any recent figures), for 3.1 billion and 2 billion monthly active users respectively. While YouTube's launch of a paid subscription is part of the company's business strategy, Meta began offering such an option primarily to comply with the Digital Markets Act (DMA). In a decision reached in April 2025, the [European Commission](#) found Meta's offering of two different plans to users to be non-compliant with the DMA.

c. [YouTube](#) offers ad-free paid subscriptions (YouTube Premium and YouTube Music), with 100 million subscribers out of a total of 2.5 billion users in April 2024.

Source: This table has been reworked from: French Digital Council (2022), "[Votre attention s'il vous plaît](#)" (in French only).

Note: The companies mentioned as examples are the two with the largest market share in their respective sectors in France in 2024.

However, advertising is not necessarily the only component of the business models of digital firms in the attention economy (see Table 1), as they also offer paid subscriptions that provide access to certain additional content and features.⁷

1.2 Due to characteristics specific to their market, digital platforms have significantly ramped up the capture of user attention

Although attention capture techniques are not new, digital firms have taken the attention economy one step further than legacy media because of technical and economic characteristics specific to their business.

On the technical front, digital platforms design their interfaces in such a way as to maximise the time users spend on their services (Bhargava, 2021),⁸ for

instance through infinite scrolling, which shows content continually as the user scrolls down the page. Similarly, algorithmic content curation allows platforms to select content that is most likely to keep a user online. Such increased user engagement benefits platforms economically: each additional second a user spends on the platform, the more profit it earns, as the time spent viewing content also increases the number of advertisements shown.⁹

Likewise, the interconnection of data between the various services provided improves the effectiveness of targeted advertising, with the idea being to build a data ecosystem. The goal is to collect a wide range of user data, through services directly linked to the attention economy (e.g. content streamed on a video sharing platform) as well as through services with no direct link to the attention economy (e.g. routes plotted in a

(7) Although advertising accounts for only a small share of [Netflix's](#) revenue, the "Netflix with ads" plan has become increasingly popular, with almost 50% of new subscribers selecting the plan in 2024.

(8) V. Bhargava, M. Velasquez (2021), "Ethics of the Attention Economy: The Problem of Social Media Addiction", *Business Ethics Quarterly*.

(9) Although ad impressions increase the profit of platforms, advertisers may take care to not expose the same user to an excessive number of ads for the same brand or product (known as ad fatigue, this phenomenon can result in a user becoming irritated and even deter them from making certain purchases). For more on this topic, see R. Guo, Z. Jiang (2024), "Optimal dynamic advertising policy considering consumer ad fatigue", *Decision Support Systems*.

digital map application). This data is then aggregated to increase the effectiveness of targeted advertising, the purchases influenced by such targeted advertising and, thereby, advertisers' willingness to pay (Colin, 2015).¹⁰

Economically speaking, the attention economy is characterised by the existence of several network effects. For example, social media platforms enjoy "direct" network effects (Katz and Shapiro, 1985;¹¹ Rochet and Tirole, 2003),¹² meaning the value of the service increases for all users on one side when the number of users of that side goes up. This mechanism is inherently important for social media platforms, where the ability to interact with a larger number of users increases the value of the service, especially compared to other players in the attention economy, such as television networks, newspapers, etc.

Digital firms in the attention economy also enjoy network effects related to the nature of the market.

This is true of cross-network effects, also known as two-sided effects (the value of the service increases for one side of the market when the number of users goes up on the other side of the market),¹³ as well as of "indirect" network effects (the use of a service results in third parties creating additional services, increasing in return the service's initial value).¹⁴

These various network effects – some of which are characteristic of how the digital sector works – help platforms to accelerate the expansion of their user and advertiser base, while also making it easier to retain this base. Given that the value of the service increases as the number of users goes up on both sides of the market, the growth of users tends to be "self-perpetuating" and to mitigate the risk of attrition.¹⁵ It is thus worthwhile for platforms to seek out and deepen network effects to maximise their revenue while simultaneously reducing the risk of losing some of the players they bring together.

2. The digital attention economy generates value, but also has major adverse socio-economic impacts

2.1 The digital attention economy generates value added through revenue, advertising-related sales and resulting productivity gains

Digital firms in the attention economy primarily provide a service that proves useful to direct consumers, in addition to facilitating commercial transactions through advertising which forms large platforms' main source of revenue (see section 1.1.). One estimate suggests that revenue generated directly from online advertising in France amounts to approximately €9bn measured in 2023 euros (Wyman, 2024).¹⁶ Advertising also induces sales by bringing products to the attention of consumers and by encouraging consumerism (see Box 1). To gauge the impact of advertising, several expert studies have produced an estimated return on investment (ROI), meaning the additional sales generated for every euro spent on

advertising by an advertiser. For example, Ekimetrics and SNPTV (2021)¹⁷ estimated that the ROI for an online banner campaign in France is €3.40 per euro spent on advertising. Total sales from online advertising may amount to around €32bn annually in France, measured in 2023 euros. This revenue cannot be converted directly into percentage points of French GDP, however, because the value added of this output was only partly generated in France. Revenue from advertising campaigns may be recognised in the accounts of a foreign company if it is managed abroad, and the products sold may be imported. Moreover, the estimated total sales generated by online advertising may be lower in reality, as other types of sales can potentially be substituted for some of these online ad-based sales, such as those generated by other brands that do not use online advertising.

(10) Colin et al. (2015), "Économie numérique", *Note du Conseil d'analyse économique*, no. 26 (in French only).

(11) M. Katz, C. Shapiro (1985), "Network Externalities, Competition, and Compatibility", *American Economic Review*.

(12) J.C. Rochet, J. Tirole (2003), "Platform Competition in Two-Sided Markets", *Journal of the European Economic Association*.

(13) For example, the more users a social media platform has, the higher the value advertisers place on the platform's advertising service.

(14) For example, the more users a social media platform has, the more video game publishers (third parties) are encouraged to produce a diversified range of games adapted to the platform, which in turn raises its value.

(15) Conversely, below a certain threshold of users, network effects can be "limiting" for a platform: people are reluctant to use it because the total number of users is low. This can create barriers to market entry (see section 3).

(16) O. Wyman (2024), "32^{ème} Observatoire de l'e-pub" (in French only).

(17) Ekimetrics, SNPTV (2021), "#ROITV3" (in French only).

Box 1: Advantages and negative externalities of advertising (online and offline)

In a broad sense, advertising is an essential tool when the scale of an economy is too vast for consumers to be otherwise aware of all the market offers. By relaying economic information, advertising addresses information asymmetry between supply and demand and allows consumers to make informed choices.

Nevertheless, advertising (whether online or offline) also produces negative externalities. Since it often draws on strategies that are more persuasive than informative, it can distort consumers' choices relative to their needs (Kaldor, 1950),^a both qualitatively (related to the nature of the products purchased) and quantitatively (related to the volume of products purchased). Advertising can therefore encourage consumers to make sub-optimal choices. Furthermore, several economic papers (such as Grossman and Shapiro, 1984)^b note that excessive advertising can lead to imbalances characterised by firms overinvesting in marketing, resulting in consumers having to pay an unnecessary markup for advertising costs when buying a product.

a. N. Kaldor (1950), "The Economic Aspects of Advertising", *The Review of Economic Studies*.

b. G. Grossman, C. Shapiro (1984), "Informative advertising with differentiated products", *The Review of Economic Studies*.

Furthermore, certain tools developed by firms in the attention economy could bring about significant productivity gains, even though these benefits are harder to quantify. A McKinsey report (2012)¹⁸ thus suggested that when social technologies are used optimally, they have the potential to raise productivity by 20% to 25% across all sectors of the economy by improving communications within enterprises, the product development process and after-sales support, etc. The ex-post literature is not advanced enough to confirm this prediction but a few microeconomic examples show a positive effect. For example, Deprince and Mayrhofer (2022)¹⁹ found that social networking sites increase the productivity of Belgian SMEs, in part because they improve collaboration and interaction among employees, customers, distributors, etc.

2.2 The digital attention economy could prompt economic losses by reducing the quality of human capital

Existing reviews of the literature (Wilmer et al., 2017;²⁰ French Digital Council, 2022)²¹ also highlight the potential negative externalities of the attention economy from a socio-economic standpoint (see Chart on cover page).

The main impact is a decline in cognitive abilities that lowers worker productivity: this could reduce GDP by roughly 1.4 to 2.3 percentage points in certain scenarios (see Box 2). This impact is expected to manifest fully in the long term, as cognitive decline will be particularly present in children affected by the attention economy as they gradually enter the labour market as adults. In the short term, if not already, GDP losses caused by lower productivity or impacts on mental health are also thought to be non-negligible (around 0.6 percentage points of GDP).

Impact on attentional capacity

Inattention caused by frequent interruptions related to the attention economy could directly result in slower task performance and "resumption errors", arising after an interruption or change of task (Brumby et al., 2013).²² Some studies even suggest that the mere presence of a smartphone on a table, without using it, may be distracting (Thornton et al., 2014;²³ Skowronek, 2023).²⁴ In the longer term, these interruptions may also permanently reduce attention capacity (Ophir et al., 2009),²⁵ as does the intensive use of a smartphone (Lee et al., 2015).²⁶

(18) *Les Echos* (2012), "Les réseaux sociaux, un possible gain de productivité" (in French only).

(19) E. Deprince, U. Mayrhofer (2022), "The impact of social networking sites on psychic distance perceived by SMEs", *International Management*.

(20) Wilmer et al. (2017), "Smartphones and cognition: a review of research exploring the links between mobile technology habits and cognitive functioning", *Frontiers in Psychology*.

(21) French Digital Council (2022), "*Votre attention s'il vous plaît*" (in French only).

(22) D. Brumby, A. Cox, J. Back (2013), "Recovering from an interruption: investigating speed-accuracy trade-offs in task resumption behavior", *Journal of Experimental Psychology*.

(23) Thornton et al. (2014), "The mere presence of a cell phone may be distracting", *Social Psychology*.

(24) Skowronek (2023), "The mere presence of a smartphone reduces basal attentional performance", *Sci Rep* 13.

(25) J. Lee et al. (2015), *Emerging Issues in Smart Learning*.

(26) E. Ophir, C. Nass, A.D. Wagner (2009), "Cognitive control in media multitaskers", *Proc. Natl. Acad. Sci. U.S.A.*

Although the literature has a general tendency to highlight the negative impact of the attention economy on attention span, some studies suggest that frequent interruptions and the practice of “media multitasking” (i.e. consuming multiple forms of media at the same time) does not affect individuals’ distractibility (Ralph et al., 2014).²⁷ Some researchers even argue that multitasking can be associated with better performance in other cognitive areas, such as multisensory integration (i.e. the ability to process information coming from multiple sources) (Lui et al., 2012).²⁸

Impact on memory

Researchers’ findings on memory are mixed and depend on the type of memory being considered (Sparrow et al., 2011).²⁹ Digital technologies allow us, on the one hand, to retrieve information faster, thereby serving as a form of “transactive”, or external, memory. Transactive memory increases memory stores in the broadest sense since it allows us to accurately recall where the information is to be found after having accessed it in the past. On the other hand, use of digital technologies causes us to remember information less well (“declarative” memory), especially as demands are constantly put on us. On this topic, a number of studies nevertheless show that by allowing us to off-load our memory, the internet may help us remember certain information in the long run (Storm and Stone, 2015).³⁰

This process of storing information onto a transactive memory system also puts us at risk of becoming

dependent on certain technologies. Knowledge is being stored in an increasingly concentrated way on the internet, rendering other sources of transactive memory (e.g. books, the community, etc.) obsolete (Ward, 2013),³¹ although this risk has yet to be quantified to date.

Specific impact on children

A large body of research shows that frequent exposure to screens in early childhood, and particularly the use of social media and smartphones, has an especially significant impact on children’s attention span and memorisation and language skills (McArthur et al., 2022).³² Certain features related to the attention economy, such as autocomplete³³ and automated content curation, which prevent people from conducting their own searches and reduce their ability to “learn by doing”, are therefore especially harmful to young children (Stiegler, 2015).³⁴ From an economic perspective, the impact on academic performance (Desmurget, 2019;³⁵ Bahroumi, 2025)³⁶ is the most detrimental long-term effect.

The use of digital media in school as part of an educational programme can, however, have varying effects on learning, such as improving research skills or facilitating modern language learning (French Centre for Research on Education Systems, 2020).³⁷

(27) B.C. Ralph, D.R. Thomson, J.A. Cheyne and D. Smilek (2014), “Media multitasking and failures of attention in everyday life”, *Psychological Research*.

(28) K.F.H. Lui and A.C.N. Wong (2012), “Does media multitasking always hurt? A positive correlation between multitasking and multisensory integration”, *Psychon Bull Rev.* 19.

(29) B. Sparrow, J. Liu and D. Wegner (2011), “Google Effects on Memory: Cognitive Consequences of Having Information at Our Fingertips”, *Science*.

(30) B. Storm, S. Stone (2015), “Saving-Enhanced Memory: The Benefits of Saving on the Learning and Remembering of New Information”, *Psychological Science*.

(31) A.F. Ward and D.M. Wegner (2013), “Mind-blanking: When the mind goes away”, *Front. Psychol.*

(32) B.A. McArthur et al. (2022), “Screen time and developmental and behavioral outcomes for preschool children”, *Pediatric Research*.

(33) Autocomplete is a feature that predicts an internet user’s query and provides suggestions as they type in a search engine.

(34) B. Stiegler (2015), “La société automatique” (in French only).

(35) M. Desmurget (2019), “La fabrique du crétin digital. Les dangers des écrans pour nos enfants” (in French only).

(36) M. Bahroumi (2025), “Usage des écrans par les enfants de 3 à 4 ans : pratiques et liens avec les apprentissages”, DEPP (in French only).

(37) French Centre for Research on Education Systems (2020), Dossier thématique “Numérique et apprentissages scolaires” (in French only).

Box 2: Detailed impact estimate – Impact of the attention economy on cognitive abilities

To estimate the impact of the attention economy on cognitive abilities (which cover both attention span and memory recall), we examine the impact on children alone, as they are the population group most affected by digital media (see above).

Our estimate combines (i) a measure of the impact of the attention economy on academic performance and (ii) a measure of the impact of lower academic performance on the future productivity of workers. Consequently, our estimate should be interpreted as the impact on GDP that the attention economy could have in the long term, due to a decline in cognitive abilities. This impact will manifest fully when all cohorts of the children concerned will have entered the labour market.

- Programme for International Student Assessment (PISA) scores are used to measure academic performance. According to PISA 2022 (OECD, 2023),^a students who spent a significant amount of time on their smartphone at school^b (more than three hours per day) had PISA scores in mathematics that were 30 to 50 points lower than those of students who spent a moderate amount of time on their smartphone (less than two hours per day) at school, after taking into account students' and schools' socio-economic profile (see Chart 1). By extrapolating this drop in scores of approximately 6% to 10% to the two other PISA domains (reading and science), the total drop in PISA scores would be between 90 and 150 points.^c These estimates, based on data collected prior to the arrival of large language models (LLMs) and generative AI, do not take into account the potential negative effect of LLMs on cognitive abilities. Kosmyna et al. (2025)^d suggest that LLMs could lead to a decline in cognitive abilities due to the accumulation of "cognitive debt": the use of LLMs requires less cognitive effort in the short term, with the long-term cost of diminished critical inquiry and creativity.
- Drawing on recent research from the OECD (Égert et al., 2022),^{e,f} a total decrease in the PISA score of 46 points^g (or around 3%) is estimated to result in, all else being equal, a maximum 2.5% fall in the productivity of the cohorts concerned, and to lower GDP by 2.3% in the long term (by around 2060), taking into account macroeconomic feedback effects.^h Overall, given that the students who used their smartphone the most at school saw their PISA scores fall by 90 to 150 points, their productivity is estimated to decrease by 5% to 8% in the long term. This could reduce GDP by 4.5 to 7.5 percentage points in the long run, assuming that all children are concerned by intensive smartphone use.
- We can, however, assume that the share of children concerned by this fall in productivity is 30% of a given age category, which corresponds to the share of 12- to 17-year-olds who use digital devices intensively, whether for leisure or learning, according to Crédoc, a French labour market research institute (2023).ⁱ This strong assumption (30% of a given age category are not likely to use their smartphones so intensively) is offset by the assumption that smartphone use has purportedly no impact on the other remaining 70%.

Overall, when combining this 30% share to a GDP loss of 4.5 to 7.5 percentage points, the impact of the attention economy on cognitive abilities is estimated to reach 1.4 to 2.3 percentage points of GDP annually by 2060.

a. OECD (2023), "PISA 2022 – Insights and Interpretations", pp. 33-34.

b. Used as a proxy for the use of a smartphone in absolute terms, for lack of better available data to calculate the extent of the impact smartphones can have on academic performance.

c. PISA scores cover three assessment domains (mathematics, reading and science), with the same weighting, for which France's average was close to the OECD average in 2022. In "PISA 2022 – Insights and Interpretations" (2023, op. cit.), the OECD studies the impact of smartphone use on mathematics scores only. However, the report gives no reason to believe that the estimated impact on reading and science would be different. To calculate the estimated impact we therefore use a decrease of 6% to 10% in the three PISA assessment domains.

d. N. Kosmyna et al. (2025), "Your Brain on ChatGPT: Accumulation of Cognitive Debt when Using an AI Assistant for Essay Writing Task", *MIT Working Paper*.

e. B. Égert et al. (2022), "A new macroeconomic measure of human capital exploiting PISA and PIAAC: Linking education policies to productivity", *OECD Working Paper*.

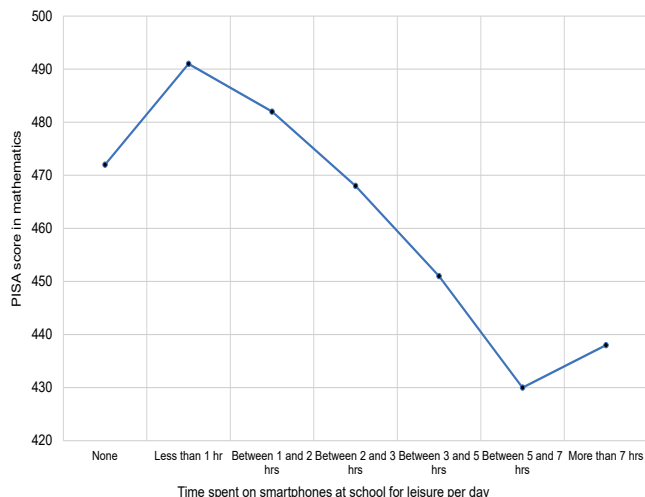
f. Showing that a 1% increase in the PISA score would result in a 0.8% increase in total factor productivity in the long term.

g. Overall decrease seen in France from 2018 to 2022 in the three PISA assessment domains (drop of 21 points in mathematics, 19 points in reading and 6 points in science).

h. Source: *DG Trésor* calculations.

i. Crédoc (2023), "Baromètre du numérique édition 2022". Excessive screen use in this study is defined as spending more than 35 hours per week using a screen (TV, computer, smartphone, etc.).

Chart 1: Time spent on smartphones at school for leisure and PISA score in mathematics



Source: OECD (2023), *PISA 2022 Database, Volume II Annex B1, Chapter 5 (Figure II.5.14)*.

How to read this Chart: In 2022, the average PISA score in mathematics for students who spent between five and seven hours on their smartphone at school for leisure per day was 430.

Note: Differences between categories related to time spent using smartphones are all statistically significant (see PISA Results Volume II Annex A3). The OECD did not provide any explanation or additional context regarding the fact that the scores of students who spent more than seven hours per day on their smartphone were slightly better than those of students who spent between five and seven hours per day on their smartphone.

2.3 The digital attention economy could also have major implications for public health

The literature cites that overexposure to screens and social media use are associated with poorer sleep quality and a higher prevalence of psychological problems such as depression, anxiety and chronic stress (Center for Addiction and Mental Health, 2018;³⁸ Khan et al., 2023),³⁹ the economic impact of which is already being felt in the short run. This stems from both

a direct effect linked to digital overload (generating stress hormones) and the features of certain applications (social comparison on social media, for instance). According to the French Institute of Statistics and Economic Studies (Insee) (Guillot et al., 2024,⁴⁰ see Chart 2), 34% of internet users – 57% of whom being under the age of 20 – have experienced at least one harmful effect of screen use (less sleep time, obsessive urges, etc.).

It is possible to estimate the economic impact of poorer mental health associated with the attention economy using research published by Khan et al. (2023, op. cit.) showing that the adults who reported moderate-high smartphone use (46% of the study sample) or high-severe use (24% of the sample) were at greater risk of having mental health problems (depression, anxiety, chronic stress) – roughly 30% and 60% higher respectively – than for the adults reporting low smartphone use (30% of the sample).⁴¹

Frequent smartphone use is therefore estimated to increase the prevalence of such mental health problems by 28% in the general population. This percentage comes in addition to the direct costs (healthcare costs, etc.) and indirect costs (absenteeism, early retirement, etc.) associated with these mental disorders, representing around €17bn annually in France in 2010 (measured in 2023 euros), prior to the widespread use of smartphones (Gustavsson et al., 2011).⁴² Ultimately, higher healthcare costs in connection with the development of the attention economy are thus estimated to account for 28% of this €17bn, or around €5bn (0.2 percentage points of GDP).

(38) Centre for Addiction and Mental Health (CAMH) (2018), "Social Media Use and Mental Health Among Students in Ontario".

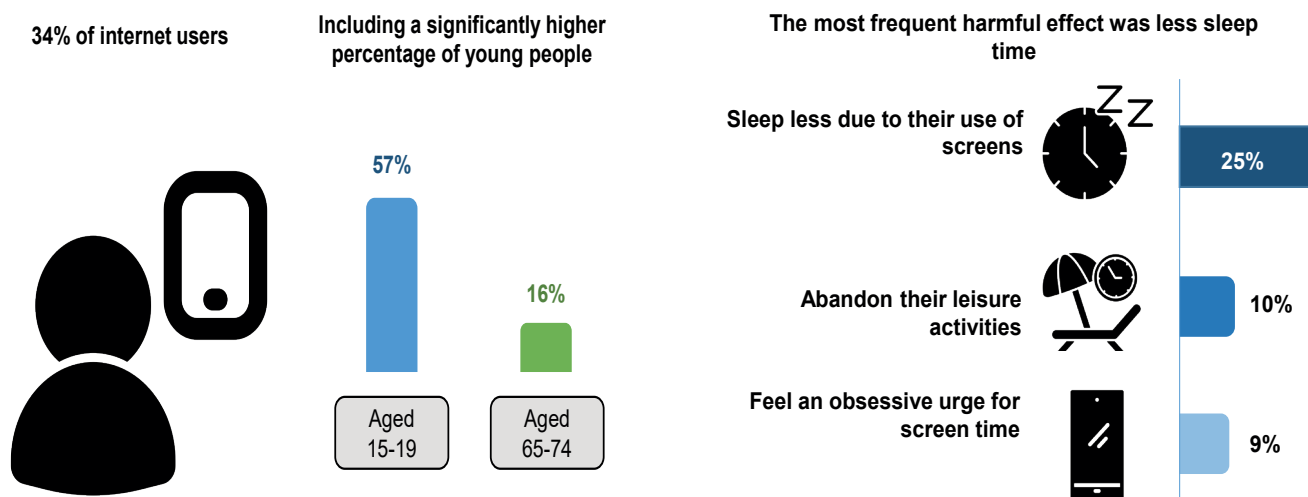
(39) A. Khan et al. (2023), "Excessive Smartphone Use is Associated with Depression, Anxiety, Stress, and Sleep Quality of Australian Adults", *Journal of Medical Systems*.

(40) V. Guillot et al. (2024), "En 2023, un tiers des internautes ressentent au moins un effet néfaste des écrans", *Insee Focus* no. 329 (in French only).

(41) These figures varied according to the selected pathology. The level of participants' smartphone use was determined with the help of the standardised Mobile Phone Problem Use Scale (MPPUS): by rating their agreement or disagreement with statements such as "There are times when I would rather use the smartphone than deal with other more pressing issues", this made it possible to categorise each participant into one of three groups: low-moderate use, moderate-high use and high-severe use.

(42) Gustavsson et al. (2011), "Cost of disorders of the brain in Europe 2010", *The Journal of the European College of Neuropsychopharmacology*. The estimated indirect costs do not factor in productivity losses associated with poorer sleep quality.

Chart 2: 2023 survey on the harmful effects associated with screen use experienced by internet users (excluding for work or study purposes)



Source: Insee (2024), "En 2023, un tiers des internautes ressentent au moins un effet néfaste des écrans", Insee Focus no. 329 (in French only).

Note: The survey measured six potentially harmful effects of screens (sleeping less, abandoning leisure activities, experiencing conflicts with family and/or friends, having academic or workplace problems, feeling an obsessive urge for screen time, feeling unwell or depressed).

2.4 The attention economy generates productivity losses

In the short term, the attention economy also generates productivity losses due to the use of certain platforms during work hours for non-work reasons (browsing social media, etc.). Some studies suggest that employees may be spending between 20 minutes and 2.5 hours of their workday looking at their smartphone for non-work reasons (OfficeTeam, 2017;⁴³ Duke and Montag, 2017;⁴⁴ Screen Education, 2020).⁴⁵

Furthermore, actual working time is reduced due to the time it takes to regain focus after an interruption situation related to the attention economy. The time required to regain focus to resume a primary task can be significant, although it varies based on the type and duration of the interruption (Monk et al., 2008).⁴⁶

The GDP loss associated with lost focus is estimated to be around 0.4%. This estimate draws on data from an Economist Impact survey (2023).⁴⁷ The report devised an impact model to estimate the economic costs of interruptions that prevent "knowledge workers"⁴⁸ across five major industries⁴⁹ from maintaining continuous focus in the workplace. The report concludes that optimising knowledge workers' time, including periods of focus, could increase such workers' gross value added by 43% in the industries studied. The interruptions included in the analysis are highly diverse: conversing with colleagues, browsing social media, etc. Given that only between 5% and 10% of the distractions seem to be related to browsing digital content for personal purposes,⁵⁰ the productivity losses generated by the attention economy are estimated to be approximately €10bn annually (measured in 2023 euros, 0.4% of GDP).

(43) OfficeTeam (2017), "Employees waste more than one day a week on non-work activities".

(44) Duke and Montag (2017), "Smartphone addiction, daily interruptions and self-reported productivity", *Addictive Behaviors Reports*.

(45) Screen Education (2020), "Digital Distraction & Workplace Safety".

(46) C. Monk et al. (2008), "The effect of interruption duration and demand on resuming suspended goals", *Journal of Experimental Psychology*.

(47) *Economist Impact* (2023), "In search of lost focus: Productivity in the post-pandemic world".

(48) Employees whose work consists primarily of non-repetitive, intellectual labour (e.g. analysts, managers and researchers).

(49) Manufacturing, retail, information (e.g. media and technology), education and professional services.

(50) Estimate based on answers to questions 8 and 10 of the *Economist Impact* survey ("What are the main activities you do during the workday to take breaks from work?", "Which of the following most distracts you from engaging in productive work?"). While browsing digital content is interchangeable in the survey with other personal activities being carried out during work hours, we do not measure such activities in our paper.

3. Various public policy measures can mitigate the harmful effects of the attention economy

3.1 The EU Digital Services Act is creating avenues for regulating the most detrimental attention-capture techniques

Adopted in 2022, the Digital Services Act (DSA) seeks in part to limit the most addictive features of the largest platforms in the attention economy. To date, it applies to 17 “very large online platforms”, including the most well-known social media platforms, and to two “very large online search engines” (Google Search and Bing).⁵¹

The DSA requires very large online platforms to assess whether their services pose systemic risks with regard to addiction and their impact on users’ mental well-being.⁵² This assessment should ensure, for example, the safety and security of minors (Art. 28). In practice, providers of platforms must conduct risk assessments and submit them to the European Commission “prior to deploying functionalities that are likely to have a critical impact on” systemic risks (Art. 34). Platform providers are also required to “put in place [...] effective mitigation measures, tailored to the specific systemic risks identified” (Art. 35).

In July 2025, the Commission published its guidelines on the protection of minors under Article 28 of the DSA. In addition to establishing age-verification requirements (see section 3.3), the guidelines prohibit platforms from using certain especially addictive techniques such as infinite scrolling. Although these obligations are currently only applicable to minors, they could be extended to all users in the future. Additional measures regarding the regulation of highly addictive online features (such as prohibiting the use of “loot boxes”⁵³ by mobile gaming applications) could also be taken under the upcoming Digital Fairness Act, which the Commission is working on at this time.⁵⁴

The Commission has supervisory powers to enforce the DSA and has already opened several formal proceedings. Two separate proceedings against

TikTok (February 2024) and Meta (May 2024) were opened to assess whether, among other violations, the companies concerned had breached the DSA regarding their obligations to protect minors and to manage risks related to behavioural addiction and harmful content.

3.2 By stimulating competition, public authorities can also encourage platform business models that are more respectful of users’ attention

To limit the harmful effects of the attention economy, public authorities can create the conditions for the emergence of a wider variety of platforms. To this end, measures to stimulate competition can bring about a new wave of players deploying solutions that are more respectful of users’ attention and influence existing platforms to opt for alternative product design solutions.

Choi and Jeon (2023)⁵⁵ demonstrate that when competition is weak, platforms make design choices that are biased towards advertisers and against users, by monetising their attention to a maximum without taking into account their preferences. Beyond lowering overall the quality of service (process of “enshittification”)⁵⁶ and stifling innovation, feeble competition encourages platforms to use the most addictive product designs, collect an excessive amount of personal data and amplify the reach of certain content creators (to the detriment of others).

To increase competition in light of these risks, regulators in the EU can draw on the Digital Markets Act (DMA), which entered into force in 2024. The DMA, which covers most services associated with the attention economy (social media, video sharing platforms, online messaging services, advertising services), seeks to remedy the structural competitive advantages enjoyed by “gatekeeper” firms such as Alphabet, Amazon, Apple, Meta, Microsoft and Bytedance.

(51) Very large online platforms (VLOPs) and very large online search engines (VLOSEs) fall under the scope of the DSA when they have more than 45 million monthly users in the EU.

(52) In addition to recitals 81 and 83, the DSA refers to two other categories of systemic risks that can prompt the regulation of certain practices of the largest firms in the attention economy: disseminating disinformation (recital 80) and violating democratic processes (recital 82).

(53) In gaming, a loot box is a virtual item, typically depicted as a treasure chest, which contains one or more virtual items allowing players to enhance their gaming experience. Often purchasable, these loot boxes can be highly addictive and lead to problematic gambling behaviour (excessive spending, gaming addiction).

(54) For more on this topic, see [the mission letter for the commissioner Michael McGrath](#) responsible for the Digital Fairness Act.

(55) J. Choi, D. Jeon (2023), “Platform design biases in ad-funded two-sided markets”, *The RAND Journal of Economics*, vol. 54.

(56) *Financial Times* (2024), “‘Enshittification’ is coming for absolutely everything”.

The DMA prohibits, for example, a number of unfair practices, including those that stifle innovation or impede market access. Several legal proceedings have been opened in this respect in the EU against firms in the attention economy, such as Meta.⁵⁷ Similarly, in the United States, the Federal Trade Commission (FTC) and the Department of Justice (DoJ) are pursuing antitrust cases against Meta and Google.

The DMA also requires the largest firms in the attention economy to comply with interoperability obligations, the goal of which is to make the services of large platforms work or communicate seamlessly with third parties. Interoperability is an effective solution which has been deployed in sectors with similar issues (such as in telecommunications,⁵⁸ banking and railways) to improve consumer surplus and prevent companies from abusing their dominant position.⁵⁹ Along the same lines, the DMA has already introduced several interoperability obligations that could have a direct impact on the attention economy. Such is the case of the data portability obligation applicable to social media platforms: these platforms must allow users to export the data associated with their social media accounts, in a sufficiently standardised format that can be used on another platform. This would enable a user to more easily switch, if desired, to a social media platform that is better aligned with their interests, for example because it uses more limited attention-capture techniques (e.g. by using less addictive features). Not yet fully in force as of the time of this writing, this portability obligation could take effect in the next few years once the identified technical issues have been resolved.⁶⁰

Some stakeholders have put forward even bolder solutions regarding interoperability between social media platforms. Fukuyama (2021),⁶¹ Stasi (2023)⁶² and other digital industry figures (including the chairs of the French Data Protection Authority (CNIL) and

the Electronic Communications, Postal and Print Media Distribution Regulatory Authority (ARCEP))⁶³ suggest, for example, making content curation systems interoperable. This would allow users to be able to freely choose the entity providing the content curation system: the social media platform itself or another operator. Users would thus be able to more easily choose the order and type of content appearing on their newsfeed, such as by selecting a chronological mode (an option already present on certain micro-blogging platforms), which could boost the diversity of platforms' service offerings. As with data portability, the implementation of this advanced form of interoperability could, however, pose a number of technical issues related to the required standardisation of data formats.

3.3 France's Screen Time Committee has put forward measures to protect the most vulnerable group – children – with several measures currently being implemented

To better protect the most vulnerable group – children – France's Screen Time Committee put forward several recommendations in a report submitted to President Emmanuel Macron.⁶⁴ The committee notably recommended that children be exposed to screens through gradual milestones, based on their age (no exposure prior to age 3, followed by step-by-step exposure, with access to social media given no earlier than age 15). In practice, despite large-scale communication initiatives on the dangers screens pose to young children, the latter remain highly exposed to digital devices.⁶⁵ Likewise, the ban on children's access to social media platforms – which is applicable in theory – is no closer to taking effect at this time. Children aged 11 to 14 spend, moreover, an average of 1 hour and 42 minutes per day on such platforms (see Chart 3).

(57) Between 2023 and 2024, Meta temporarily introduced a binary “consent or pay” advertising model, under which “EU users of Facebook and Instagram had a choice between consenting to personal data combination for personalised advertising or paying a monthly subscription for an ad-free service”. A decision reached in April 2025 in respect of the DMA requires a third option: a free service with limited targeted advertising, available since November 2024 and currently under review by the European Commission.

(58) L. Zingales (2022), “Regulating big tech”, *BIS Working Papers* No. 1063. Regarding competition issues in telecommunications, see A. Dozias (2023), “Competition in the French Electronic Communications Market”, *Trésor-Economics*, No. 321.

(59) R. Bailey and P. Misra (2022), “Interoperability of Social Media: An appraisal of the regulatory and technical ecosystem”, John Hopkins University Press.

(60) To comply with the DMA, major platforms are already offering forms of data portability to users. But they highlight the technical issues involved in creating a standard data format: at this time, the format of transferred data makes it difficult to use on another platform, with the export process being especially onerous for users. With this in mind, the DMA will set out the technical conditions enabling the full entry into force of the portability obligation.

(61) F. Fukuyama (2021), “Making the Internet Safe for Democracy”, Johns Hopkins University Press.

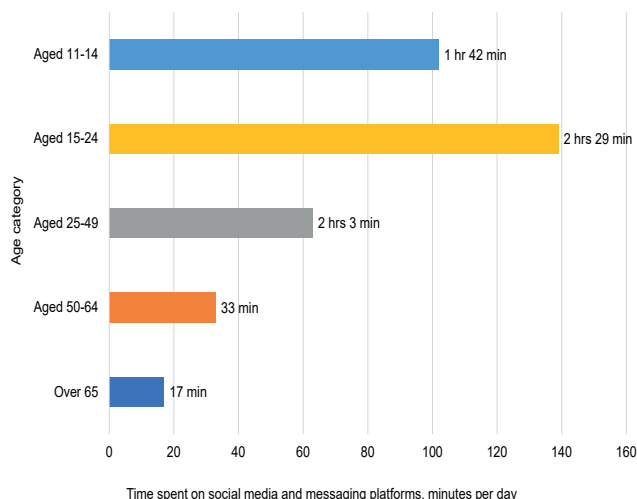
(62) M. L. Stasi (2023), “Unbundling Hosting and Content Curation on Social Media Platforms: Between Opportunities and Challenges”, *Journal of Law and Technology*.

(63) *Le Monde* (2024), “Pour le pluralisme algorithmique !”, editorial (in French only).

(64) Screen Time Committee (2024), “Children and Screens: In Search of Lost Time”.

(65) A survey from the French Public Health Agency (2023) found that children aged two used screens for an average of 56 minutes per day.

Chart 3: Breakdown of time spent on social media and messaging platforms, in minutes per day



Source: *Médiamétrie (2023) – L'année Internet 2022 (in French only)*.

How to read this Chart: In 2022, young people aged 11 to 14 spent an average of 1 hour and 42 minutes per day on social media and messaging platforms.

Note: Grouping together social media and messaging platforms is logical as the line is blurred between the two for many platforms: Snapchat is, for instance, both a messaging app and a social media platform, as Instagram messages are directly integrated in the application.

To address this situation, the guidelines covering Article 28 of the DSA have recently paved the way for a total ban on social media for children under 15 under French law. EU Member States will be able to set, under their respective national law, a minimum age to access social media platforms and to require platforms to implement robust age verification systems for users.

The Screen Time Committee has also recommended measures to better control the environment and limit exposure to screens, such as through placing a sweeping ban on screens in nursery schools and other facilities for children, including early childhood centres. It has also suggested introducing support measures for parents on children's access to digital devices, for instance by raising awareness among future parents about the risk of screen use (e.g. dedicated conversations on the topic during various prenatal and postnatal healthcare appointments).

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