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Personal Touch

A €100 billion boost to EU competitiveness from personalised ads

An Implement Consulting Group study in collaboration with Dr. Antonin Bergeaud, HEC Paris
Commissioned by Google

MAY 2025

Preface

This report assesses the contribution of personalised advertising to Europe's competitiveness and consumer value.

- Digital advertising has grown around 10% per year since 2019 and is now the largest advertising channel in the EU.
- In 2023, digital advertising spending in the EU amounted to 57% of total advertising spend. Within digital advertising, this report focuses on digital display ads and the benefits of personalisation.
- The report relies on EU market data from several sources including IAB Europe, the European association for the digital marketing and advertising ecosystem.
- The report conducts a comprehensive review of peer-reviewed academic studies of the impacts of personalised ads in Europe. This includes recent work using European data from 2024 to estimate advertisers' willingness-to-pay for personalised ads. The estimates are based on data from millions of ads transactions from real-time auctions including recorded sales prices.

Contributors

The authors are especially thankful to Associate Professor, Dr. Antonin Bergeaud for great input and guidance in developing our perspective on digital advertising and its broader economic role in Europe. We also extend our thanks to Dr. Garrett A. Johnson, Associate Professor of Marketing, Assistant Professor Shunto Kobayashi and PhD student Zhengrong Gu, all from Questrom School of Business Boston University, for valuable discussions and input.

In developing the report, we have furthermore benefited greatly from discussions with Google experts.

Authors

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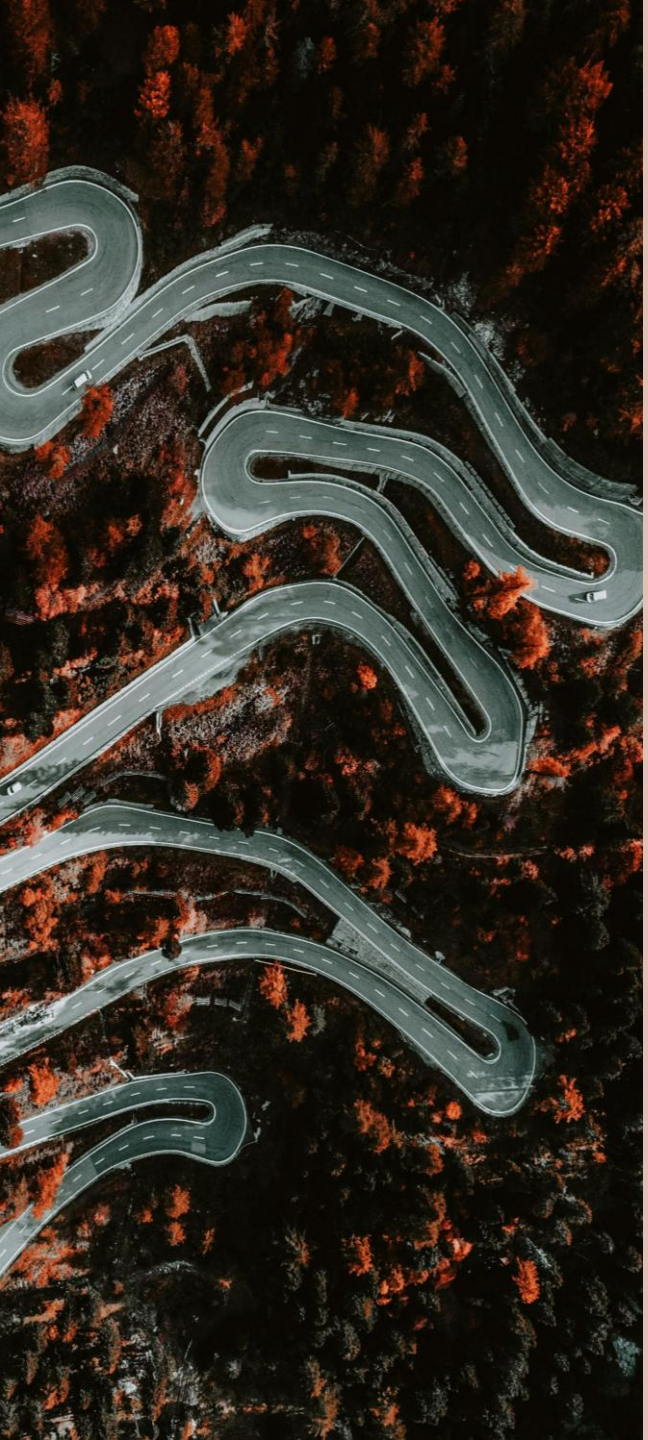

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A €100 billion boost to EU competitiveness from personalised ads

Personalised ads are an efficient form of advertising. They help European businesses grow and help fund accessible, affordable and diverse online services for consumers. Closing Europe's competitiveness gap requires that European businesses have access to the best and most innovative digital tools, including within digital advertising.

Boosting competitiveness and consumer value today

- **Helps EU business growth:** Personalised ads are already securing €100 billion in additional sales for EU businesses, contributing €25 billion to GDP and supporting 570,000 jobs.
- **Empowers SMEs:** Secures €80 billion extra revenue and helps with levelling the playing field. Nearly 75% of SMEs say they would struggle to find customers without personalised advertising.
- **Supports media diversity and plurality:** Enables publishers to earn more, fostering a vibrant ecosystem. Publishers earn twice as much selling personalised compared to contextual ads, generating an estimated €10 billion in revenue.
- **Informs consumers and supports accessible, affordable and diverse online services:** Personalised ads helps fund online content and ads provides valuable information, aiding purchasing decisions. 75% of European consumers prefer the current model of personalised advertising[1].

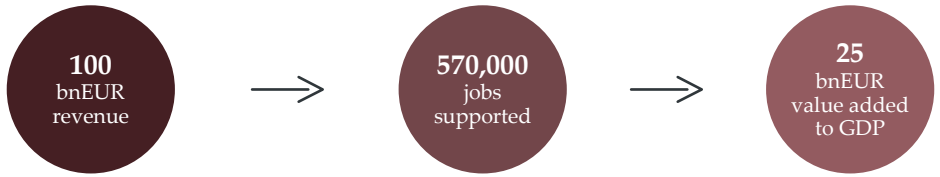
Enhancing future EU competitiveness in a digital world

Generative AI will power digital advertising. By 2030, generative AI-powered ads could create €250 billion in additional sales for EU businesses.

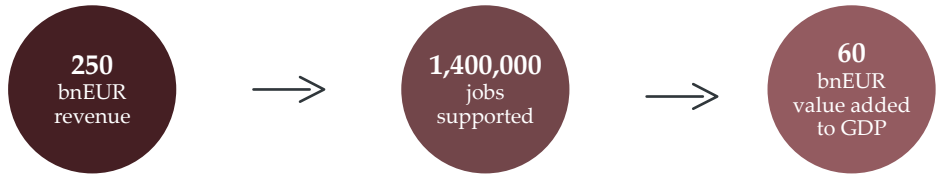
This requires a policy framework which is:

- **Puts innovation first:** Personalised ads are an efficient form of advertising and its contribution to Europe's competitiveness and economic growth will grow with the use of generative AI in advertising.
- **Balances innovation with consumer protection**: New forms of digital advertising with generative AI needs to balance user demand with privacy.
- **Avoids "contextual only" scenarios putting competitiveness at risk:** Relying solely on contextual ads would put the current €100 billion gain at risk.
- **Simplifies regulation:** Rather than introducing new rules prematurely, Europe should conduct competitiveness checks and streamline digital advertising rules to ensure that EU businesses can operate efficiently and continue to innovate.

In 2023



In 2030



Source: IAB Europe (2021).

Key Findings

Personalised ads underpin competitiveness

Advertising is key for the market economy and can support as much as 4% of GDP

- Advertising plays a key role in connecting consumers' needs with business offerings.
- When consumers are well-informed, they can make better purchasing decisions, which helps control prices and allows the most competitive businesses to thrive.
- Research shows that the matching facilitated by effective advertising leads to a more efficient use of resources. The optimising effect of advertising supports around 4% of GDP.
- Using a conservative and proportionate approach, we estimate that the absence of personalised ads would reduce economic efficiency in the EU by around EUR 70 billion.

Advertising is key for European businesses, especially startups and small businesses

- Effective advertising is one of many important elements in the competitiveness of EU businesses.
- Efficient advertising helps startups and businesses to grow, and access to the newest and most efficient advertising tools is especially important for new and small businesses.
- Research shows that 25% of business growth relies on introducing and selling new products.

An efficient digital advertising sector supports European competitiveness

- Digital advertising has grown around 10% per year since 2019 and is now the largest advertising channel in the EU.
- In 2023, digital advertising spending in the EU amounted to 57% of total advertising spend.
- Digital advertising has enabled many companies and in particular startups and SMEs to reach out to potential clients beyond their local market at a low cost.

Personalised advertising funds the media and online services from which consumers benefit

- Within digital advertising, this report focuses on digital display ads and the benefits of personalisation.
- The report provides detailed analyses of EU market data for the year 2023 and the spend on digital display ads.
- Digital advertising underpins the commercial model for making content widely available to EU citizens for little or no cost. Digital advertising helps fund a wide range of online content and services ranging from small specialised websites to large European media.
- This promotes media diversity and plurality. We estimate that 70-80% of the digital display advertising spend ends up with the publishers.

Personalised ads support up to EUR 100 billion in additional sales for EU businesses

Digital advertising has grown thanks to more efficient and accessible personalised ads

Digital advertising allows businesses to reach specific audiences, ensuring more efficient and effective outcomes/ use of resources. Rather than broadcasting the same ad to all TV viewers at a given time, digital ads can be tailored to reach groups of users browsing a site or using an app, if they fall into a defined audience or group of users that an advertiser wants to reach.

Using data to segment and reach relevant users is not a new innovation, nor is it limited to digital media. Advertisers have always used audience data to reach relevant users with their advertising, and media owners have provided that data (e.g. about TV viewers or newspaper readers). With digital media there is more data available, and the methods are more precise, which enable advertisers to reach users where they spend their time online.

Data helps advertisers understand what customers are interested in and via personalised ads they can more easily reach customers where they are. According to recent research using European digital ads data, personalised ads are 2-3 times more efficient than contextual ads when conducting like-for-like comparisons of the willingness to pay for access to a given group of potential customers

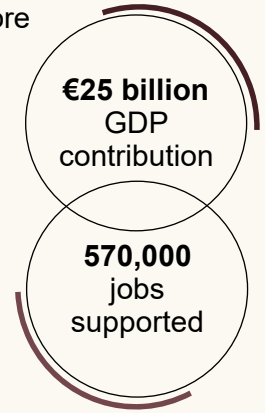
Personalised ads provide an efficiency gain to EU advertisers, supporting additional sales of up to EUR 100 billion

The ability to use personalised ads has given EU advertisers more value for their advertising spend. Building on detailed research results and European advertising data for 2023, we estimate that, thanks to the efficiencies of personalised ads, EU advertisers have secured additional advertising-driven sales per year of up to

€100 billion

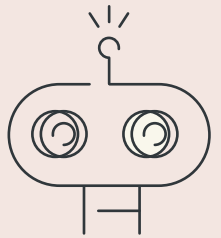
More revenue leads to more GDP and supports European jobs.

With more conservative assumptions the revenue gain is estimated at EUR 40 billion.



With continued growth and use of generative AI, the efficiency gain is projected to increase to EUR 250 billion by 2030

The digital ads market in the EU is expected to continue to grow at around 8% per year towards 2030. Over this period, generative AI is expected to provide further efficiency gains in the digital advertising value chain, as new tools can be used both to achieve better personalisation and to drive general efficiencies. We estimate that this will increase the current efficiency gain of EUR 100 billion to around EUR 250 billion by 2030. This will require the adoption of AI tools in digital advertising.



EU consumers benefit from personalised ads and want their data to be used responsibly

EU SMEs secured up to EUR 80 billion in additional turnover thanks to personal ads

- SMEs often have limited marketing budgets, and digital display ads are more cost-effective and budget-friendly for many purposes. This helps SMEs maximise their reach with their limited budgets – and compete with larger firms.
- Digital display ads provide adaptability in ad formats, placements, and budget adjustments. SMEs can start with a small budget and scale up based on performance, allowing for dynamic and efficient marketing management.
- SMEs spend more than 70% of their digital ad spend on digital display (double the share of larger firms). Nearly 3 out of 4 SMEs say it would be impossible or difficult to find the customers their business needs without personalised advertising. We estimate that personalised ads help generate up to EUR 80 billion in additional turnover for EU SMEs.

EU publishers are paid more than double for a personalised ad compared to contextual

- Traditional publishers such as newspapers, magazines and books have seen an overall decline in revenue, but a growing digital advertising revenue in the last decade. By 2025, digital advertising revenue is expected to make up over 13% of their revenue.
- Personalised ads generate more revenue for publishers than contextual ads for a given ad space. Ultimately, this is because advertisers are willing to pay more for an ad display when it is personalised. We estimate that EU publishers received EUR 10 billion from personalised ads in 2023. Had they sold the same number of ad display as contextual ads, their revenue would be 60% lower.

EU consumers benefit from personalised ads, but there are still privacy concerns

- A personalised ad provides more value for consumers as it informs their purchasing decisions. It also allows consumers to more easily discover new products or services. It can save time in terms of finding the appropriate goods or services and allow them to have better price information.
- While for some consumers personal ads create feelings of intrusion and spark privacy concerns, 75% of European consumers prefer the current model for the internet, with access to content funded by targeted ads, over a scenario where the majority of sites and apps fund themselves through subscriptions.

Privacy concerns must be addressed in a way that does not put the EUR 100 billion boost for European business at risk

The use of personalised ads is already regulated in the EU via multiple sets of rules

- Digital advertising in the EU is regulated by a combination of rules (Digital Markets Act, Digital Services Act, GDPR, ePrivacy Directive, Consumer Rights Directive 2024/825 and the AI Act). The combination of these rules is already providing a complex regulatory environment for European advertisers and numerous ads platforms providing services to advertisers and publishers.
- The use of data is key for today's digital media in order to personalise digital advertising and other services. Specifically, data enables advertising to reach particular audiences with high efficiency and effectiveness. Cross-border data flows and a practical, proportionate data protection regime are prerequisites for the effective functioning of digital advertising businesses and for the EU's attractiveness as a place to innovate and operate digital businesses.
- Leading digital businesses are increasingly developing alternative ways of customising and personalising services in general, and online advertising services in particular, where ads can be matched without personal data being shared with third parties. These new approaches are not yet providing the same level of efficiency as the current models.

Privacy concerns must be addressed in a way that does not hinder the efficiency gains

- A hypothetical ban, or shadow ban, of personalised ads would put EUR 100 billion ad-driven revenue at risk (or potentially as much as EUR 250 billion in 2030).
- Privacy concerns should be addressed in the existing legislation instead of adding additional layers of legislation that could add fragmentation to an already complicated European regulatory landscape. To foster growth and competitiveness, Europe needs more businesses finding their customers and growing online. As the report *The future of European competitiveness*[1] showed, the EU needs harmonised and coherent data rules to enable that.
- In a hypothetical scenario, where advertisers are forced to revert to only using contextual advertising, this would imply a significantly less efficient advertising industry in the EU and the additional cost would come in terms of lost sales for SMEs in particular, reduced revenue for publishers, and some inconveniences and impact on purchasing power for groups of consumers who value the current advertising formats and the free content these support. It could also lower their ability to access diverse services and sources of information.
- Losing access to cost-efficient personalised ads would put European SMEs and startups at a significant competitive disadvantage. They compete with both larger firms, with the means to fund bigger advertising campaigns, and SMEs as well as startups from other regions, who would still have access to personalised advertising.

Note: 1) Draghi (2024)

1

The economic role of advertising

Advertising reaches new customers and generates growth

- **Improved brand awareness**
  Ads help make new potential consumers aware of a brand's existence.
- **Sales growth of new products**
  Advertising facilitates the creation of new products – of innovative character or higher quality – to reach consumers and the market.
- **Broad audience**
  Ads enables advertisers to reach a wider audience, potentially attracting new customers.
- **Engagement**
  Advertising enables companies to engage with consumers – and more efficient advertising allows advertisers to only reach the most interested consumers.

Advertising and advertisers

An advertiser searches for consumers willing to buy their products and publishers with ad space relevant to them

Advertising helps them identify new customers

… and informs customers on prices and quality

In general ads provide *advertisers* with benefits…

- Increasing sales and acquiring new customers
- Improved brand awareness
- Keeping customers engaged with the brand

enhanced by more effective ads…

- Effective ad campaigns enable advertisers to reach the right audience, enhancing ads' relevance and boosting user engagement and conversion rates, associated with more sales. This leads to higher returns and economic performance.

but might also…

- Risk being perceived negatively, if the ads are irrelevant to consumers or they are shown repeatedly.

Advertising creates revenue for publishers

- **Revenue stream**
  Advertising has always been a central revenue stream to publishers and media. As society has become digitalised, so has most media content become digital, and the revenue stream from online ads has grown.
- **Modern advertising enables small publishers**
  Modern digital advertising connects a diverse set of both small and large publishers to potential advertisers. This lowers barriers to market participation for publishers and others looking to secure advertising revenue. Programmatic auctions enable small publishers to compete in the sales of ad space, without the sizeable sales force, as larger media companies might have.
- **Audience attraction and retention**
  Through content with no or little cost, publishers can attract a larger audience. This increase in audience size further increases potential revenue from advertising and helps retain users. Digital ads enable publishers to generate democratised editorial content.

Advertising and publishers

Publishers search for users interested in their editorial content – and develops and publishes editorial content to keep their users engaged

In many cases, advertising serves as the main revenue stream and increasing their user base or keeping them more engaged increases their potential revenue – and publishers search for the highest bidder on their advertising space

Needs to strike a balance between revenue from advertising and the risk of alienating users through too many ads

In general ads provide *publishers* with benefits…

- Vital revenue stream
- Enables enhanced user satisfaction
- Audience attraction and retention

enhanced by more effective ads…

- Reserving ad space for more effective ads, results in less intrusive and irrelevant ads, enhancing publishers' user satisfaction
- More effective ads increase the value of publishers' ads space, resulting in higher revenue

but might also…

- Have a negative impact on the user's experience, if publishers reserve to much space for ads, essentially driving users away.

Advertising helps to match consumer needs with business offerings

Ads inform consumers about goods and services offered for sale. This is fundamental to the market economy. More fully informed consumers are better equipped to make purchase decisions appropriate to their own needs. Data-driven digital ads allow advertisers to address consumers in a way that is more relevant to their circumstances and experience.

- **Access to content with little or no cost**
  Most consumers are unwilling to pay for published media, especially online.[1]
- **Easier to find products and prices**
  Ads connect consumers with relevant products, minimising their time spent identifying the best product. Economists call this *lower search costs.*
- **Lower prices and more choices**
  Ads foster increased competition among advertisers, leading to lower prices and more choices for consumers.
- **Informed purchase decisions**
  Ads inform consumers about products, services, and innovations. This helps consumers make informed purchases.

Advertising and consumers

Searches for products and services suiting their needs

Advertising helps them discover relevant - and new – products

… and informs them on prices and quality

In general ads provide *consumers* with benefits…

- Informed purchase decisions
- Easier to find products and prices
- Lower prices and more choices
- Access to content with little or no costs

enhanced by more effective ads…

- Effective ads minimise consumers' exposure to irrelevant ads, making it easier for consumers to find relevant and learn about new products.

but might also…

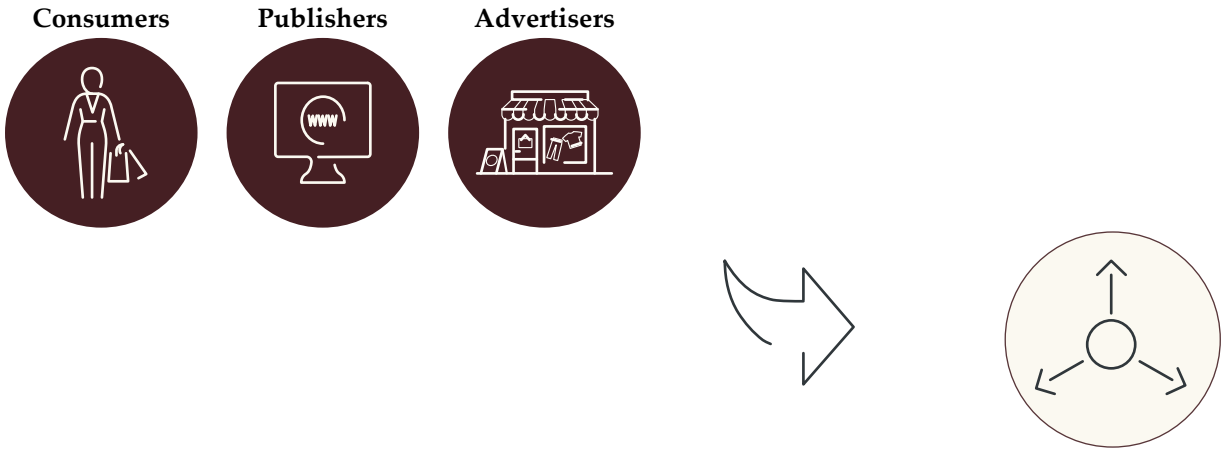
- Risk leaving the consumers with feelings of intrusion and privacy concerns, when they are effectively using available behavioural data to improve the effectiveness of ad campaigns.

Note: 1) See e.g. IAB Europe (2021).

Advertising serves a vital role in the market economy, contributing to a 4% increase in GDP

- Advertising plays a crucial role in a well-functioning market economy, by informing consumers, providing publishers with a vital revenue stream and by letting advertisers reach relevant consumers.
- When consumers exercise informed choices, it helps to keep prices in check and will ensure that the most efficient firms grow.
- This benefits not just the specific sectors of society but also society in general. By directing consumption towards the products that best match their needs, advertising allows the most productive companies to perform best.
- As such, advertising has macroeconomic benefits. Several academic papers find that advertising contributes to efficient allocation of resources increasing productivity, innovation and societal welfare. Research shows that the matching facilitated by advertising leads to a more efficient use of resources. The optimising effect of advertising supports around 4% of GDP.[1]

The wider macroeconomic benefits of efficient advertising



Increased overall productivity and innovation

Efficient advertising results in the most productive firms growing their sales. This happens, as the benefits of their products become more well known, when advertising works best. The result is increasing overall productivity, and subsequently GDP growth, to the benefit of society.

Note: 1) See e.g. Afrouzi, Drenik and Kim (2023), Baslandze et al. (2023) and Cavenaile et al. (2024).

In the research, we focus on the economic effects of personalisation within digital display advertising

The analysis focuses on personalised digital display ads since…

Personalised ads provide a highly efficient form of advertising

Rather than everyone visiting a website being shown the same ad, personalised ads enable advertisers to reach specific types of users based on their needs. This increases the benefits of advertising, as it ensures higher conversion rates and ultimately a higher return for the advertiser.

Personalised digital display ads enhance advertisers' competitiveness

In competitive markets, personalised digital display ads enable advertisers to effectively reach consumers likely to purchase their products. In this study, we investigate how the increased efficiency from personalisation creates benefits for advertisers and especially small enterprises, consumers and publishers.

2

The advertising market and its functionality in the EU

Advertising can be delivered through a range of formats - both digital and non-digital

Advertisers can use both digital and non-digital formats to reach potential customers. There are three main formats of digital ads: display, search and others (classified and directories).

	Format of advertisement Where the ads are shown		**Description**	**Examples**
DIGITAL	Display excl. social		Display ads, excl. social, includes video ads, digital audio and digital display banners appearing on websites and apps, such as news sites or shopping sites. These platforms often reserve and sell space for ads. The platforms sell ad space directly to advertisers or through ad technology providers.	• Banner ads shown on newspaper online-sites (or other sites). • Native ads embedded within articles on content sites, matching the look and feel of the surrounding content. • Ads before media content, i.e. ads shown, before watching a video on YouTube, etc.
	Social		Social ads are paid ads that appear on social media platforms, designed to integrate seamlessly into users' feeds and profiles, leveraging first hand behavioural data to reach specific audiences.	• Ads shown as 'posts' on social media sites, e.g. Instagram, Twitter, LinkedIn, etc. • Ads displayed in social media 'stories', Instagram stories, Facebook stories, etc.
	Search		Search engines, such as Google, Yahoo and Bing, can also deliver ads directly to users based on their search queries.	• Sponsored links on search results. • Sponsored content on map-based apps, e.g. Google maps or Apple maps.
	Other digital		Classified and directory ads are a type of digital advertisement served on websites dedicated to showcasing ads for specific product categories. These sites often cater to consumers selling products but may also be targeted at advertisers.	• Ads on eBay and similar auction sites, real-estate listings etc. • Job listings on employment websites.
NON-DIGITAL	Non-digital		Non-digital ads are all ads not shown and delivered digitally – they take many forms, from radio and TV advertising to newspapers, outdoor banners, bus/train ads and direct mail.	• Ads on TV and radio. • Outdoor banner ads, e.g. on buses, buildings etc.

Digital ads are generally targeted towards specific consumers, or groups of consumers, via two distinct methods

Regardless of format, advertisers can apply two different approaches to reaching the desired group of potential customers (targeting methods), namely either personalised or contextual. The two types of digital display ads are not perfect substitutes, and contextual ads are most effective on sites where users have already self-selected into the site to some extent (e.g. sites for specific customer groups – a website reviewing or selling cars), while personalised ads are the most valuable on websites targeting a broad user group.

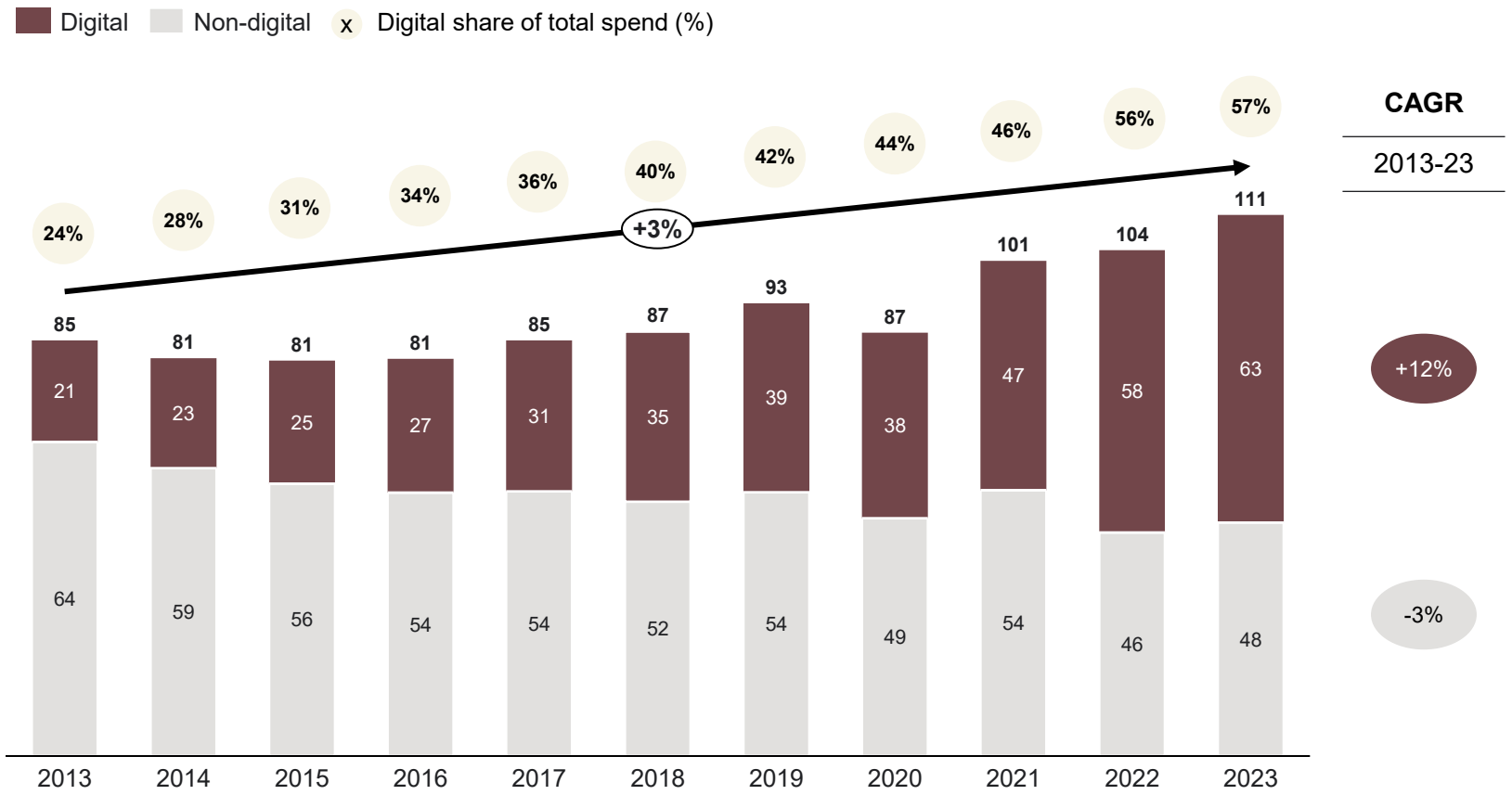
DIGITAL DISPLAY ADS

Targeting method How digital ads target specific consumer groups	**Description**	**Examples**
Contextual 	In contextual advertising, advertisers show content to users based on the users' presumed interest, based on the website they visit. Using specific keywords (individual words) and topics (central themes), advertisers can target their campaigns to specific ad groups. This ensures ads appear on relevant content sites, reaching visitors already interested in related subjects.	• A travel blog article about European beach destinations shows banner ads for swimwear and travel insurance. • A Swedish food blog displays a banner ad for a plant-based milk brand. • A search for "best hiking trails in Portugal" brings up ads for outdoor gear and hiking tours in Portugal.
Personalised 	In personalised advertising, advertisers show content to users based on characteristics such as their online behaviour, physical location, or demographics. This enables advertisers to reach users based on their interests and demographics, past online behaviour and other things. Advertisers are moving away from third-party cookies and relying on first-party data. This shift is driving increased ad spend toward social media as these effectively leverage first-party data for personalisation.	• An Irish fitness enthusiast sees banner ads for yoga apparel and equipment based on their interests as reflected in their social media activity. • A young professional in Berlin who frequently interacts with Facebook ads from tech websites receives a personalised ad on Instagram for a new smartphone model, with an offer specifically for customers in Germany. • A globetrotter based in France frequently searches for various travel destinations on Instagram and later sees ads on Instagram from a French travel agency promoting travel packages, based on their recent searches.

Advertising spend has increased slightly by 3% per year over the last decade, particularly driven by the spend on digital ads

- IAB Europe is the European association for the digital marketing and advertising industry, reporting the advertising spend across 29 European markets.
- Overall ad spend has increased by EUR 26 billion since 2013, corresponding to an average growth rate of 3%.
- The growth is driven by the digital ad spend, which has seen a significant increase in its share of total advertising spend from 24% to 57% in ten years.
- This primarily reflects changes in consumer behaviour but also showcases how digital ads are not just replacing old ads but growing the total market.

Ad spend in Europe (28 countries)[1]
billion EUR

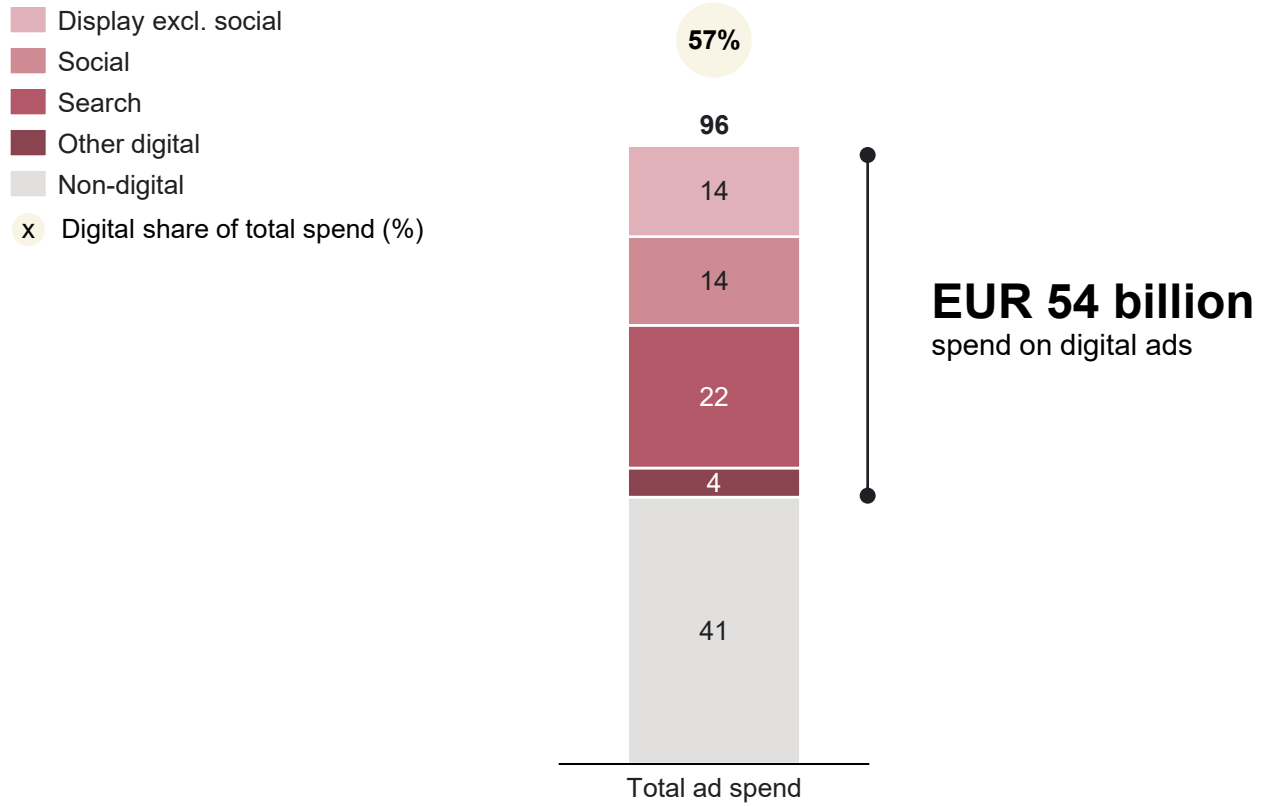


Note: 1) Countries are EU27 excluding Portugal, Malta, Luxembourg and Cyprus and including the non-EU member states Norway, Serbia, Switzerland, Turkey and Ukraine. UK is excluded from the original IAB dataset, as it is a large non-EU advertising market.
Source: Implement Economics analysis based on IAB Europe (2020), IAB Europe (2021), IAB Europe (2022), IAB Europe (2023), IAB Europe (2024) and AA/WARC Expenditure Reports.

Digital ad spending was EUR 54 billion in the EU, with display ads constituting more than half of the spend

- 57% of the total ad spend in the EU was digital in 2023. This is primarily search ads, social and other display ads.
- Display ads excl. social ads account for 26% of the digital ad spend, while social display ads accounts for 25% and search accounts for 41%.
- “Other digital” ads include classifieds and directories.
- The digital share of total spend has increased steadily in the last decade and is expected to continue increasing.
- Younger generations use social media as integral parts of their lives. Unlike older generations who may engage more with traditional media, younger individuals increasingly rely on social media as their primary source of content consumption, supporting a continued increase in the digital ads share of total spend.

Ad spend in EU27, 2023
billion EUR

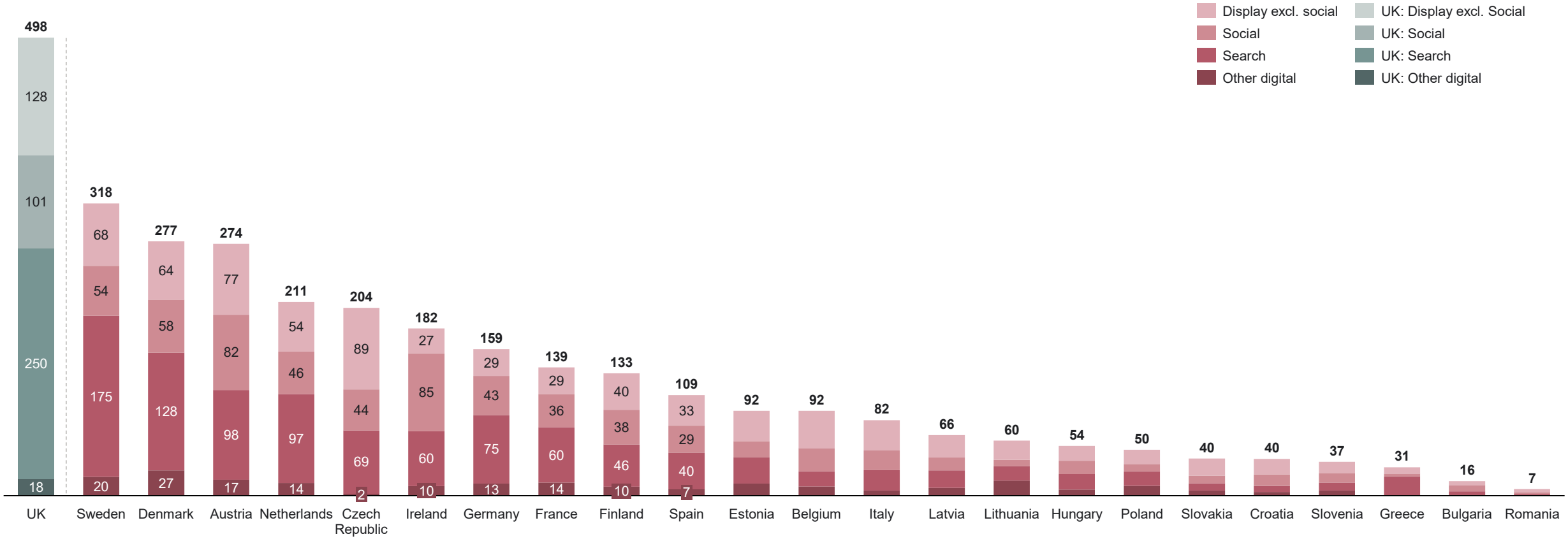


Note: IAB reports ads spend data for 23 of the 27 EU member countries. IAB does not report data for Portugal, Malta, Luxembourg and Cyprus. The 23 EU countries with IAB data are highly representative of the overall EU27 picture as they cover 98% of the EU economy in 2023. The ad spend in the 23 EU countries is scaled with GDP (scaling factor of 1.02 derived as 1/0.977). The scaling factor is the same when using consumption.
Source: Implement Economics analysis based on IAB Europe (2024).

Digital ad spend per capita varies widely across EU markets

Digital ad spend per capita varies significantly across EU countries, with Sweden leading at EUR 318 per capita and Romania lagging at EUR 7 per capita. This reflects different degrees of maturity in the use of digital ads. The UK in particular is known to be mature, as reflected in the high spend per capita, which outperforms the EU. In the EU, Sweden, Denmark, and Austria show advanced adoption of digital ads and high spend.

Digital ad spend per capita, 2023
EUR

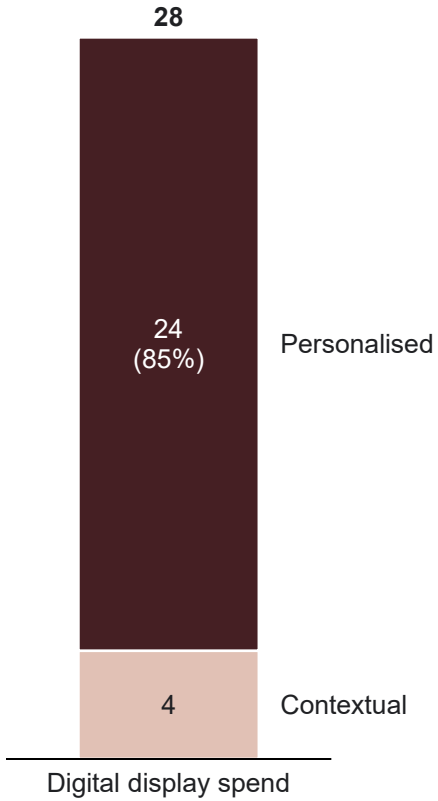


Note: IAB reports ad spend data for 23 of the 27 EU members. IAB does not report data for Portugal, Malta, Luxembourg and Cyprus. The 23 EU countries with IAB data constitute 98% of EU27 GDP in 2023.
Source: Implement Economics analysis based on IAB Europe (2024), Eurostat and World Bank Group.

Personalised ads are the vast majority of display ads

- Personalised ads are predominantly programmatic ads, sold through programmatic auctions, although not all such programmatic ads are personalised.
- It is estimated that 52% of all display ads in Europe are sold on digital auctions, while the same figure for the US is 86%. These auctions are known as *programmatic auctions*.
- According to IHS Markit, ~90% of all display ads were personalised in 2020, based on data from 2016.
- Based on current market insights, and available data, we estimate conservatively that **85%** of digital display ads are personalised today.

Ad spend in EU27, 2023
billion EUR



Personalised ads in display

- Digital ad spend is mainly split between display and search ads.
- Display ads account for about half of total digital ad spending.
- We focus on display ads, as they show significant impact from personalisation, supported by market data and empirical studies.
- Although search ads also benefit from personalisation, their efficiency gains are typically smaller compared to display ads.

Development in personalised ads

- Previously, third-party cookies were used to personalise ads by tracking user behaviour across different websites.
- Today, most personalised ads are used on social media, leveraging user behaviour on the platform (e.g., persons or pages the user follows or likes).
- The spend on social media ads is increasing, highlighting their efficiency.

Note: IAB reports ad spend data for 23 of the 27 EU member countries. IAB does not report data for Portugal, Malta, Luxembourg and Cyprus. The 23 EU countries with IAB data are highly representative of the overall EU27 picture as they cover 98% of the EU economy in 2023. The ad spend in the 23 EU countries is scaled with GDP (scaling factor of 1.02 derived as 1/0.977). The scaling factor is the same when using consumption.
Source: Implement Economics analysis based on IAB Europe (2024) , PWC/IAB (2024) and IHS Markit (2017).

Revenue-based publishers must balance showing ads to earn revenue and attracting users with relevant content

Publishers selling ad space must find a balance between showing ads to make money and showing relevant content to attract users. They cannot increase the ad space significantly in the short term without risk of jeopardising the user-experience which may result in loss of users. This means they must carefully manage the number, quality and relevance of the ads shown to maintain user attraction and optimise the user experience. Publishers will want to attract advertisers with the highest willingness to pay for access to their specific audience and users.

Key choices for revenue-based publishers

Develop content to attract users
Ad revenue-based publishers must develop relevant content to attract users. As publishers attract more users, they become more attractive for advertisers.

Show ads to make money
Publishers show ads to gain revenue. The more users, the more revenue. With more revenue, more funding is available for developing quality content.

Limited ad space available in the short run

Limited ad space on websites
It is not possible for publishers to create more ad space in the short run, limiting their possibility to adjust the amount of ad space sold.[1]

User tolerance
In the short run, revenue-based publishers face a natural cap on space for ads, as too many will jeopardise the user-experience, driving users away and threatening their business viability.

In the short term, the amount of ad space is fixed. This is determined by publishers' assessment of the balance between attracting ad revenue and attracting users.

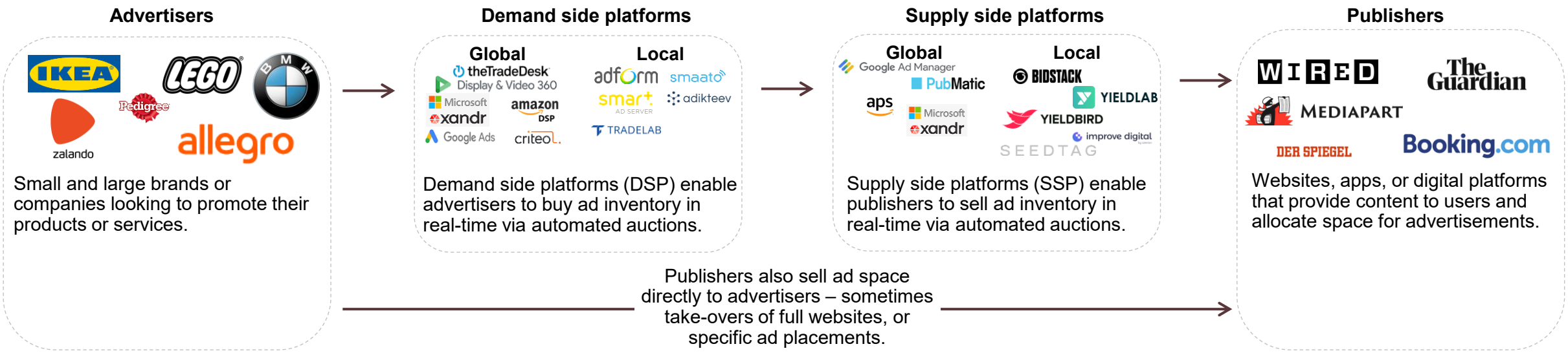
In the longer term, the supply of ad space and the amount of digital content is dependent on the willingness of advertisers to pay for ads, which in turn depends on the efficiency and expected return on advertising spend.

Note: 1) In the advertising market, ad space is known as "inventory".

The highly diverse digital ads market functions via data-driven personalisation and programmatic auctions to deliver ads instantly and aimed at relevant consumers

Most digital ads are programmatic, i.e. sold through real-time auctions via ad exchanges that connect advertisers to publishers. The share of programmatic ads varies across markets, with the share being 52% of display ads in Europe[1] and 83% in the US[2]. All remaining trade of ad space occurs directly between publishers and advertisers. Typically, advertisers use a mix of DSPs to manage their ad campaigns, while publishers use a mix of SSPs to manage their ad inventory.

Ads are sold through programmatic auction-based platforms and directly to advertisers. Examples of actors include…



Digital display ads

Of every **EUR 100** spent on ad campaigns → about **EUR 70-80** goes to publishers[3]

Note: 1) See IAB Europe (2024). 2) See IAB and PWC (2024). 3) Publisher selling ads through programmatic services secure 65% of advertisers' ad spend according to CMA investigation (see CMA (2020)). A PWC/ISBA study found 57% (see ISBA (2023) and ISBA (2020)). They secure up to 100% when they sell their ad space directly to advertisers. On average publishers secure between 70-80% of the ad spend on digital display advertising.

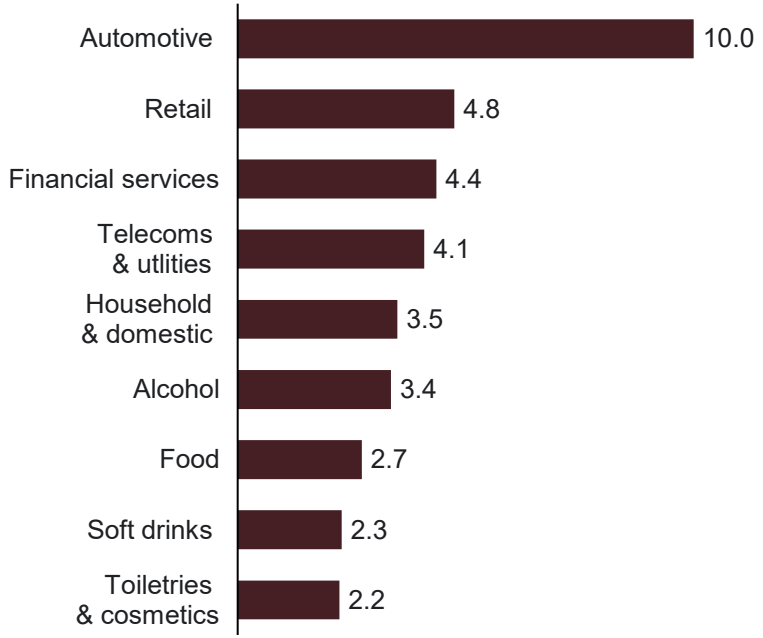
4

The efficiency gains from personalised advertising

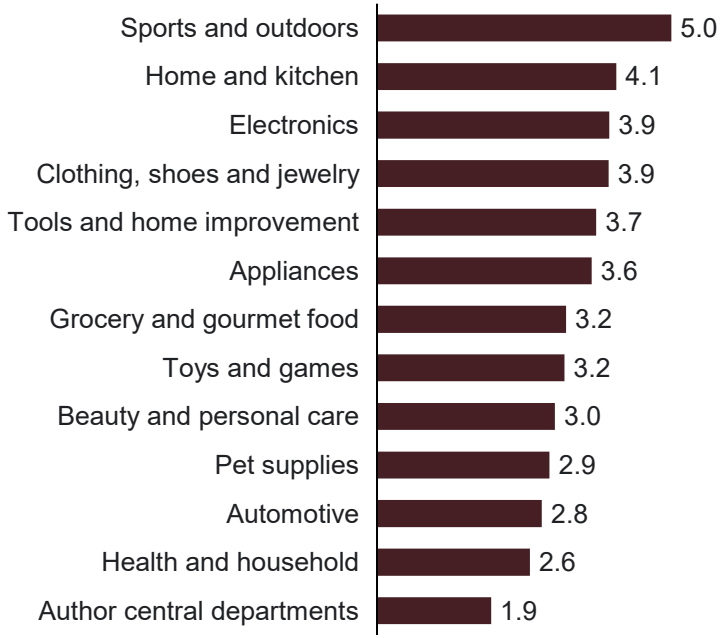
Digital advertising has a high return on spend

- Return on advertising spend (ROAS) measures the efficiency of a digital advertising campaign. ROAS measures the revenue generated from spending one euro on advertising.
- ROAS varies significantly across platforms, industries, product margin and available sources. Tadelis (2023), finds a ROAS of 3.3 for ad campaigns on Meta. Perpetua (2022), finds an average ROAS of 3.5 across all Amazon product categories, while Teikametrics (2024) reports a ROAS of 5.6 across all products sold and advertised through Amazon.
- WARC (2024), finds a median ROAS of 4.3 across a range of product categories and advertising campaigns.
- We base our calculations on these sources but assume, conservatively, an average ROAS of 3 to 5.

Return on advertising spend (ROAS) for digital advertising across product categories
Revenue per EUR spent on ads



WARC (2024)[1]



Perpetua (2022)[2]

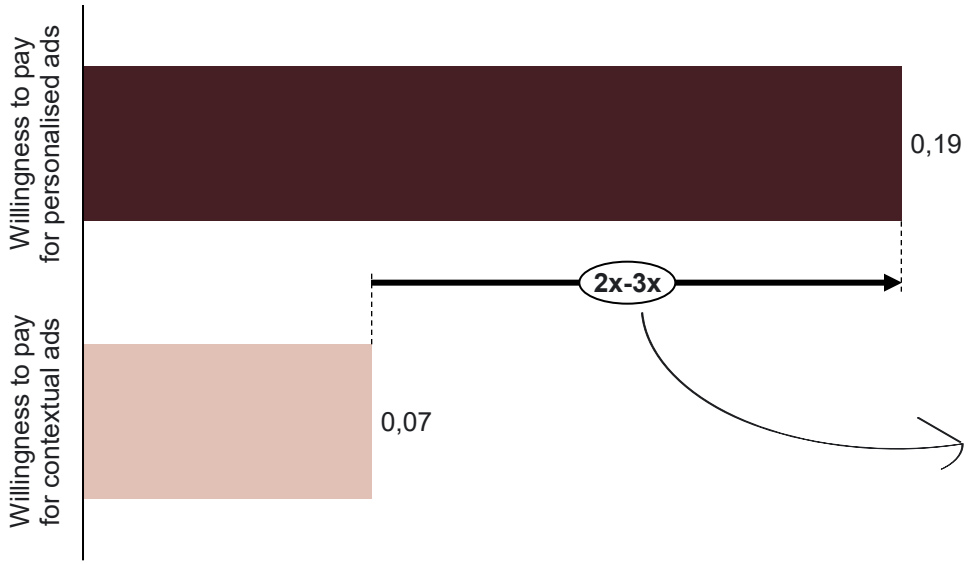
Note:1) WARC bases its estimates on 1394 cases of ad campaigns between 2000 and 2023. 2) Amazon data is based on all available product categories and data from Perpetua is based on EU-countries with Amazon websites (DE, ES, FR, GB, IT). Meta data, from Tadelis et. al. paper, is based on data across 25 industries in the US.
Source: Implement Economics analysis based on WARC (2024) Perpetua, Amazon Advertising (2022), Teikametrics, Amazon Benchmark report (2024), Google Economic Impact (2009) and Tadelis et al., Meta platform (2023).

Personalised ads are up to 3 times more efficient than contextual ads

- According to research, advertisers are willing to pay up to 3 times more for personalised ads than for contextual ads, with most advertisers paying between 2 and 3 times more when conducting like-for-like comparisons of a given group of potential customers.
- The research examines advertisers' willingness to pay for ads towards a given user group and the rationale is that their willingness to pay reflects the expected return on advertising spend and hence their relative effectiveness.
- The empirical studies cover a range of methods including randomised trials, observational studies and economic modelling.
- Our review of new research using data from Europe shows an efficiency difference of 50% to 75%. A detailed market study from the UK CMA finds an efficiency difference of 70%.
- Research from the US finds similar results.

Advertisers' willingness to pay
CPM/EUR

Method and data:
Researchers estimate advertisers' willingness-to-pay for personalised ads using data from millions of ads transactions from real-time auctions incl. recorded sales prices. Using advanced estimation techniques, the researchers conduct like-for-like comparisons to estimate what advertisers would have been willing to pay for personalised vs. contextual ads. See appendix A for more detail.



Higher willingness to pay reflects…

That advertisers must expect a higher **ROAS** when investing in personalised advertising compared to contextual advertising.

This corresponds to an efficiency difference of 50-75%

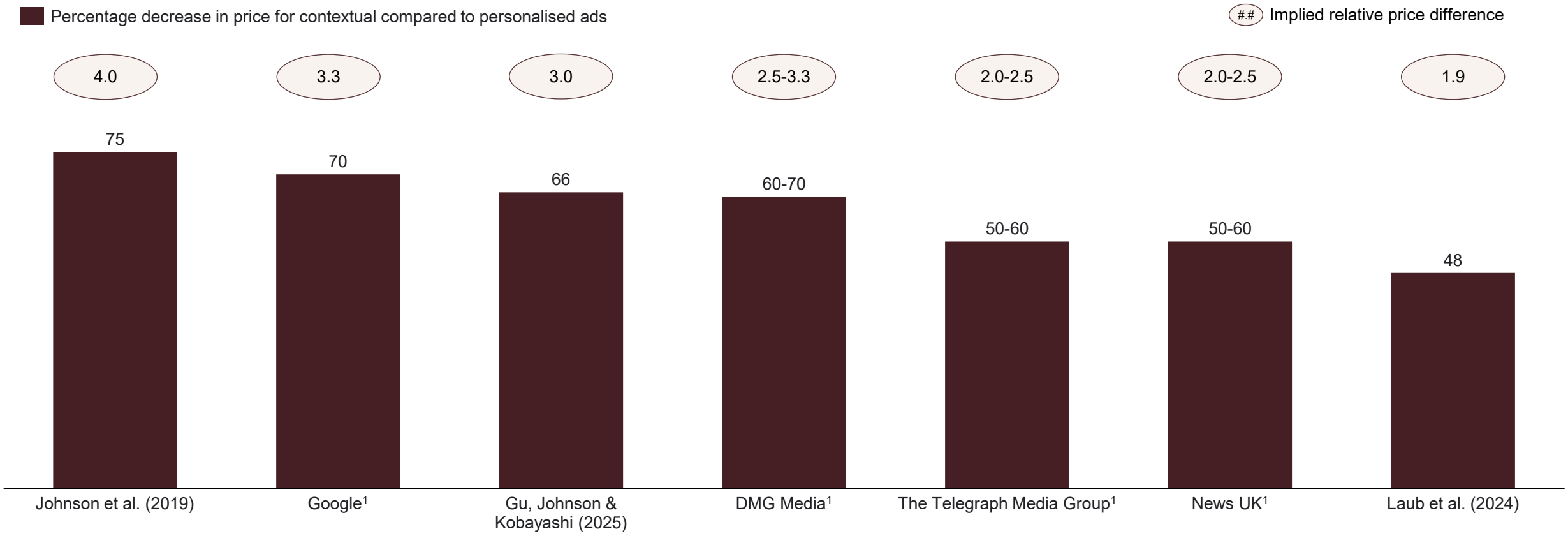
Note: CPM=cost per mille, price for 1,000 ad impressions. The efficiency difference implies a 50-75% lower willingness to pay for contextual advertising, when conducting like-for-like comparisons of access to specific user groups for a given set of advertisers. CPM-price shown is the average price in Johnson et. al.(2019). The following page gives an overview of relevant studies. See appendix A for full overview of the literature review.

This efficiency advantage of personalised ads is well documented in research

The estimates below are based on research no more than five years old, i.e. from 2019 and onwards, and based on European data. A number of estimates stems from a UK report from the Competition and Markets Authority who, in 2020, collected estimates from a range of sources – ranging from publishers to tech companies. Several papers find similar estimates, using data from the US, or older data. A few papers also find much lower estimates, but they generally stem from papers using much smaller datasets or unpublished literature. See appendix for the full body of literature on the subject. The newest paper, utilising data from 2024, from Gu, Johnson & Kobayashi finds similar estimates to previous papers.

Efficiency difference between personalised and contextual display ads

%



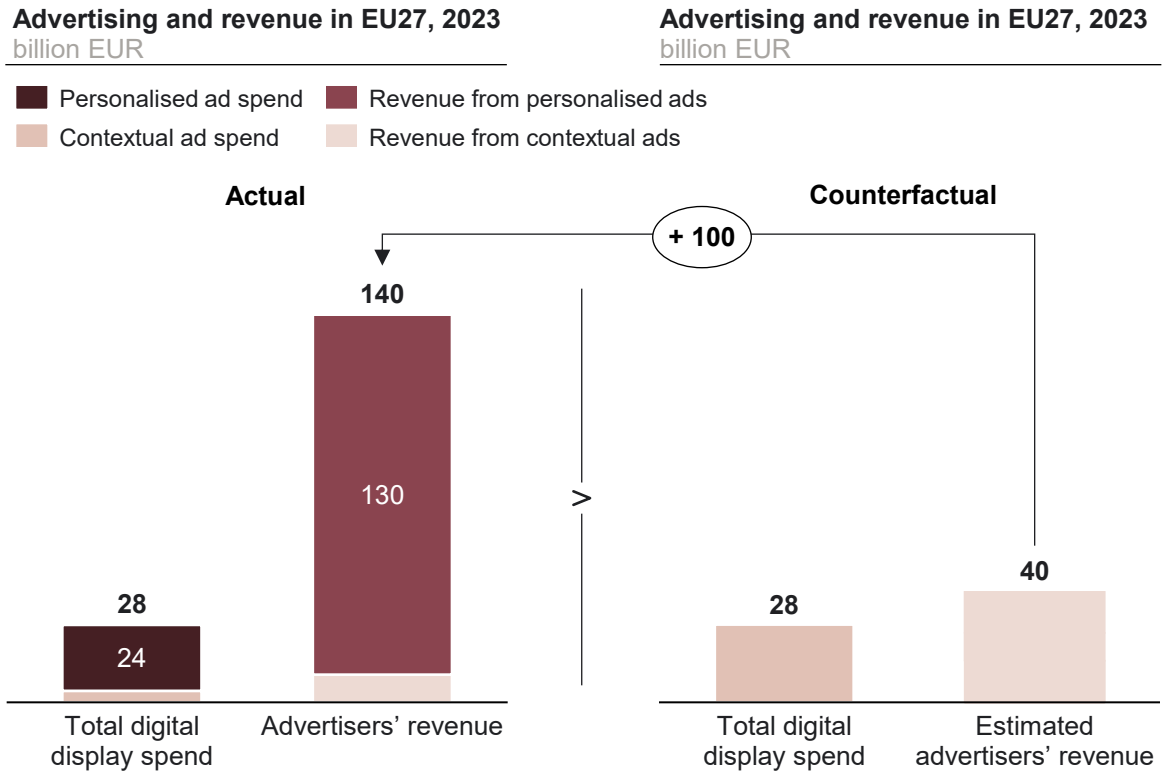
Note: 1) Results reported by Competition and Markets Authority UK (2020): *Online platforms and digital advertising market study – Appendix F: The role of data in digital advertising.*

Advertisers gain up to EUR 100 billion from using personalised ads instead of contextual ads

Previous studies have estimated the first order effects of personalised ads, ie. before possible behavioural responses.[1] To estimate the first order efficiency of personalised ads, we estimate **the revenue gain** enabled by personalised advertising (see appendix for details). We apply the efficiency difference of 50-75% between personalised and contextual ads and a ROAS ranging between 3 and 5. We find an estimated revenue gain from personalised ads of between EUR 40 billion (low end) and EUR 100 billion (high end).

Up to…

€100 billion **additional advertising sales due to the efficiencies of personalised ads**



While this calculation is helpful in gauging the first order effects, it does not consider behavioural responses from advertisers or publishers.

The *foregone revenue* calculation

Calculates…

The current ad generated revenue for advertisers given their current digital display ad spend of EUR 28 billion with a mix of personalised and contextualised ads. We then calculate a counterfactual ad generated revenue if advertisers spend the EUR 28 billion only on contextual ads.

… showing that…

European advertisers are estimated to gain between ***EUR 40 billion and EUR 100 billion more revenue*** for the same ad spend by using personalised ads compared to a situation where personalised ads were not available.

… but does not take into account

Advertisers may change their total ad spend in response to changed conditions for using ads. Since contextual ads are less efficient, economic theory suggests that advertisers would lower their total spend in response to a lower expected return.

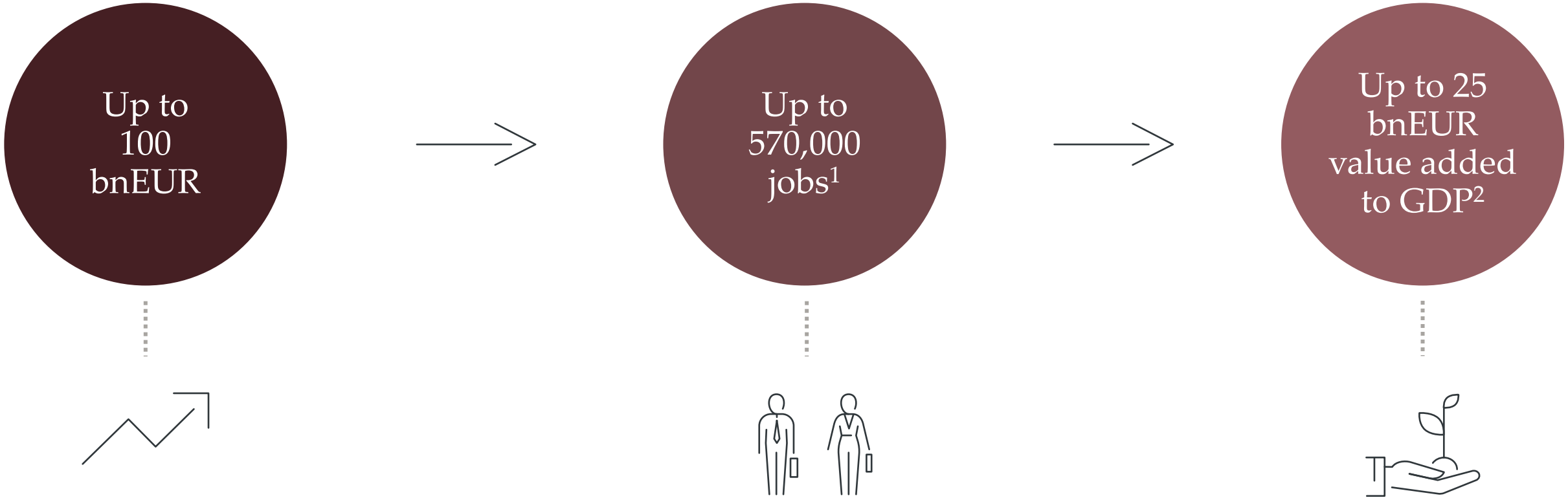
Furthermore, publishers may also react, and the amount of ad space may also change in response to changes in yield per ad space.

Considering such behavioural responses will most likely cause the estimated efficiency gain to increase.

Note: Current contextual ads are assumed a ROAS close to the return on personalised ads – reflecting that the price difference captures much of the difference. In the counterfactual situation however, we assume a smaller ROAS for the spend shifted to contextual ads, given that the alternative must be worse than paying the premium price for personalised advertising. 1) See for example Mueller & Castro (2021).
Source: Implement Economics analysis based on IAB Europe (2024).

The revenue gain of EUR 100 billion corresponds to EUR 25 billion in GDP and supports 570,000 jobs

The availability of personalised ads gives advertisers a revenue gain of EUR 40-100 billion reflecting a support of 200,000-570,000 jobs across all industries and directly contribute 10-EUR 25 billion to the EU GDP, as more revenue leads to more GDP and supports European jobs. This support of the economic activity in the EU enhances the overall market efficiency and fosters growth, strengthening the EU's position in the global market.



Note: 1) The average net turnover per person employed in EU27 was 206,000 EUR in 2023. 2) The gross value added ratio is 0.26 and calculated as gross value added divided by net turnover in the EU's highest aggregate (Industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations) in 2022
Source: Implement Economics analysis based on Eurostat.

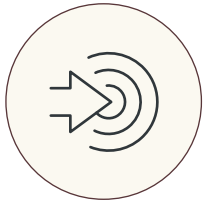
5

Value for small advertisers (SMEs)

SMEs choose to invest more in cost-effective, data-driven and adaptable ads

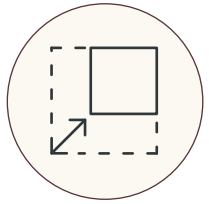
Cost-effective advertising

SMEs often have limited marketing budgets, and digital display ads offer cost-effective marketing, allowing businesses to reach relevant audiences, and readily optimise campaign budgets and performance. This helps SMEs maximise their reach without overspending.



Relevant advertising

Personalised ads are more efficient, because they can be targeted at specific consumers, that have already expressed or shown an interest in the product type. They maximise the chance of conversion and the return on the ad.



Adaptability and scalability

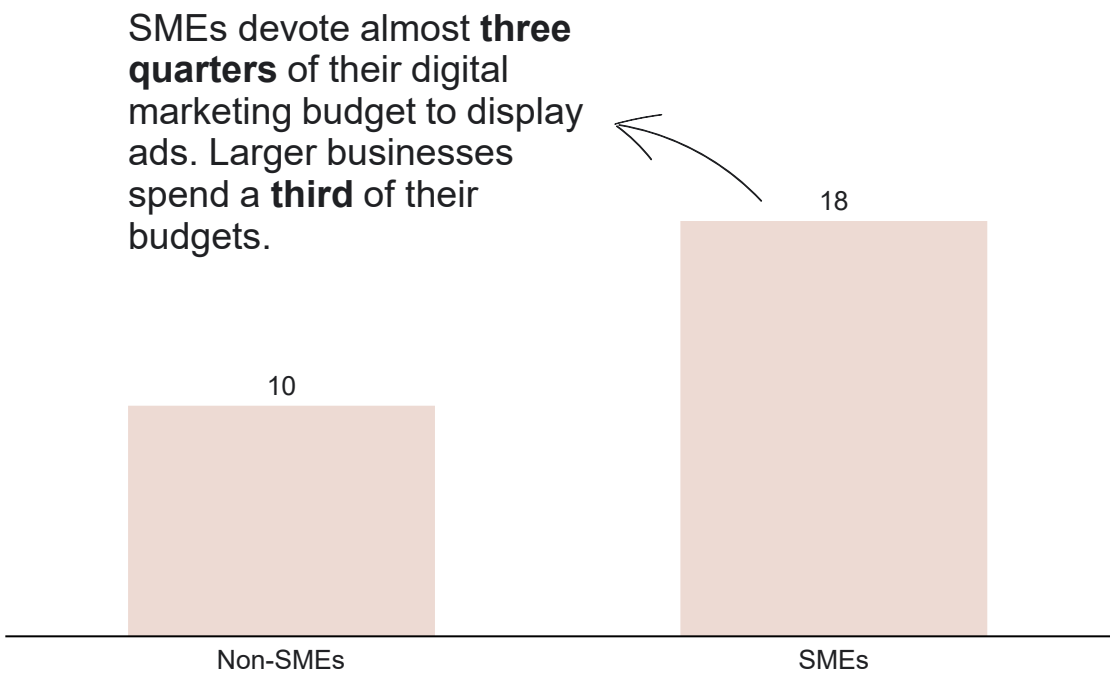
Digital display ads provide adaptability in ad formats, placements, and budget adjustments. SMEs can start with a small budget and scale up based on performance, allowing for dynamic and efficient marketing management.

SMEs rely on and invest heavily in digital display ads

To efficiently compete with larger firms, an essential task for SMEs is to find and reach new customers, leading SMEs to devote almost three quarters of their digital marketing budget to display ads. This is twice as much as larger businesses spend.

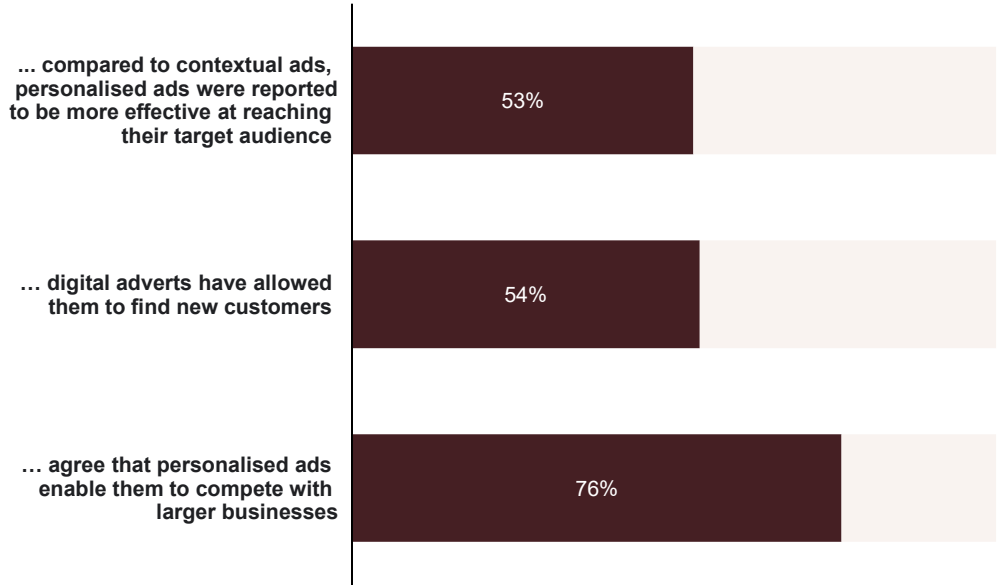
SMEs invest heavily in digital display ads...

Digital display ad spend in EU27, 2023[1]
billion EUR



… as they find them effective in finding and reaching customers

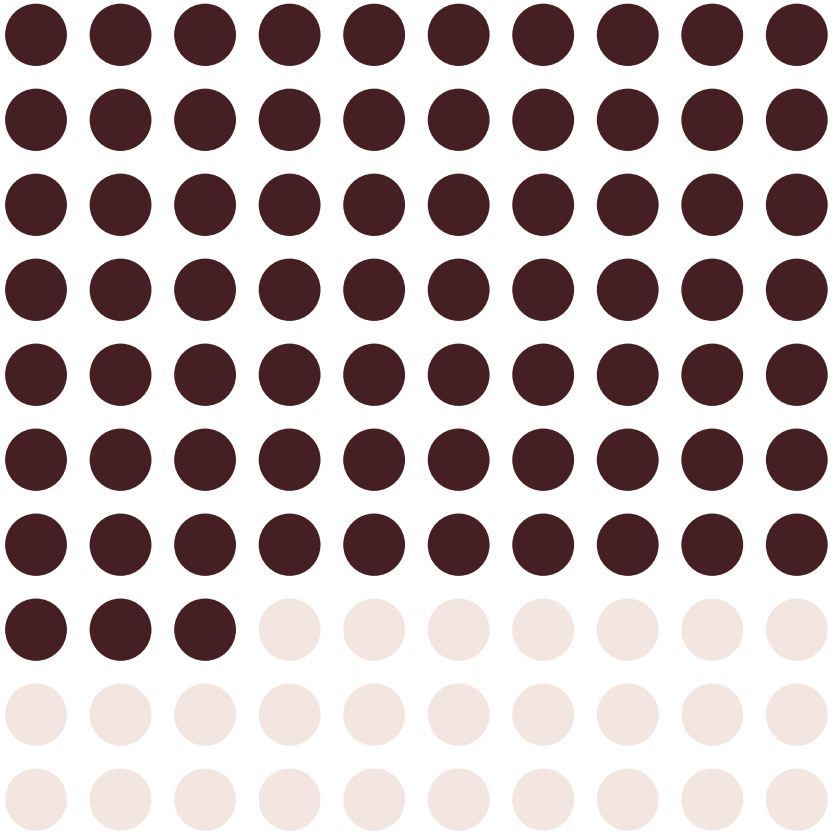
Share of SMEs saying that[2]...
%



Note: 1) SMEs spend on digital ads is calculated as follows: 45% of all digital ad spend is from SMEs. SMEs spend 54% of their total ad spend on digital display ads. This corresponds to directing 72% of their spend towards digital ads. 2) Right hand side is based on a survey of 4,287 SME advertisers using advertising in the EU.
Sources: Implement Economics analysis based on IAB Europe (2024), Mueller & Castro (2021), and Polling by Public First (2024).

Inability to use personalised ads can impact SMEs and especially startups

- Firms, and in particular SMEs, grow by adding new products to the market that are previously unknown by customers.[1]
- Personalised digital ads enable SMEs to precisely reach their audience. With limited resources, this allows them to reach the specific audience most likely to buy their product.
- Startups, as a specific subgroup of SMEs, are even further exposed – as evidenced in a recent report examining restrictions on personalised advertising on startups.[2]
- Startups often rely on personalised ad measurement tools to test market demand for their products and services. Effective advertising provides the information they need to quickly adapt, optimise strategies, and make informed decisions.
- Effective feedback loops from targeted ads are crucial for startups' survival and growth as they facilitate search and validation for product-market fit.
- If the use of personalised ads is limited just in the EU, it will likely turn into a significant competitive disadvantage for SMEs and startups in Europe.



73%

of SMEs say it would be impossible or difficult to find the customers their business needs without personalised advertising.

Policy Prototyping – real world examples from startups[3]

Targeted advertising performed better by

162%

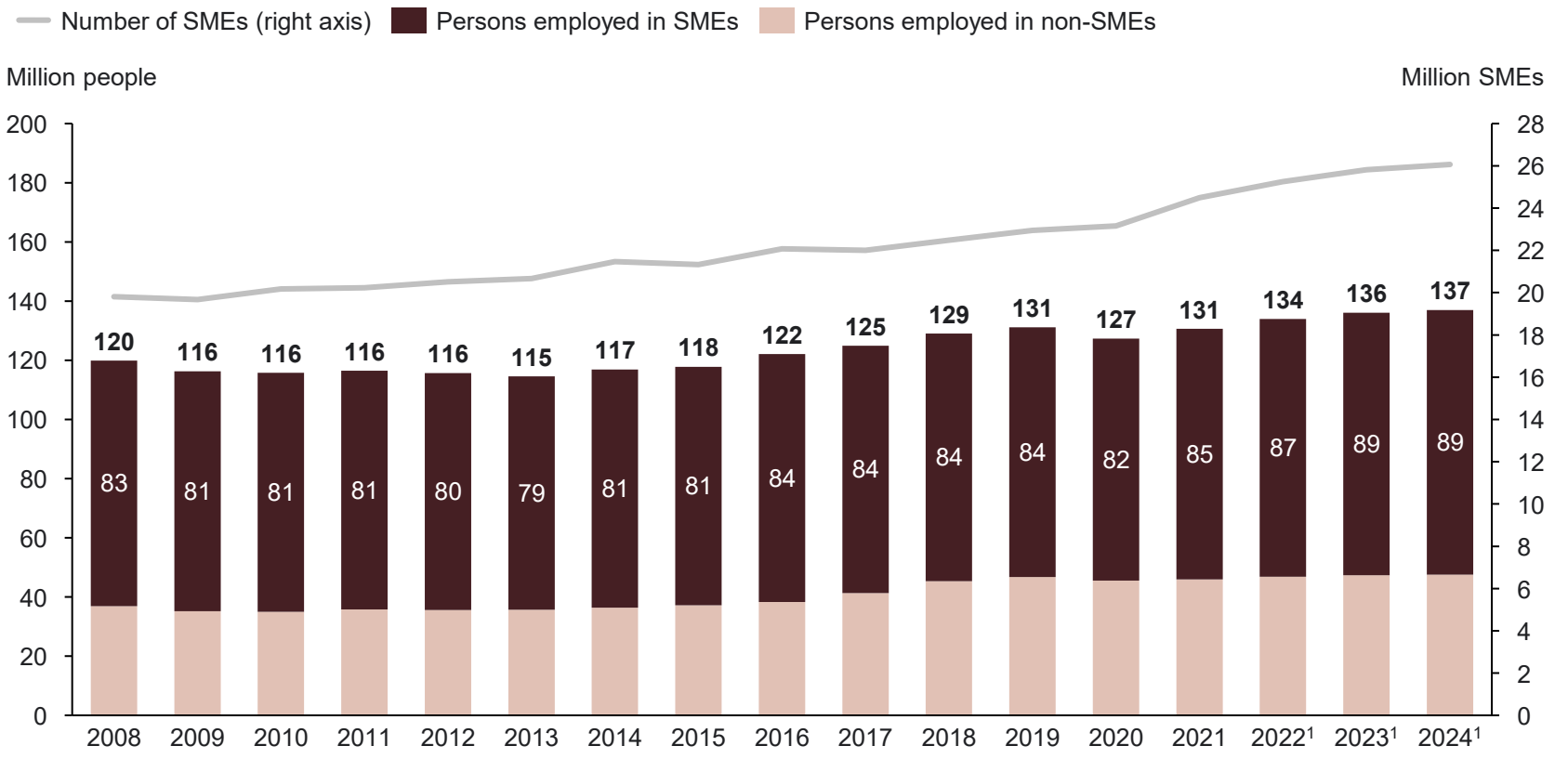
in delivering new and returning customers to websites.

Note: Based on a survey of 4,287 SME advertisers using advertising in the EU. 1) See Argente et al. (2024). 2) See Danish Entrepreneurs (2024) 3) Danish Entrepreneurs (2024) conducted a prototyping experiment with six startups from Denmark, Sweden and Finland. The real-world examples supports the findings of the scientific literature, as described on p. 73.
Source: Implement Economics analysis based on Polling by Public First (2024).

SMEs account for two thirds of all jobs in Europe

- The number of SMEs has steadily increased since 2008 at an average annual growth rate of 2%. In 2024, the number of SMEs amounted to 26 million.
- In 2008, SMEs accounted for 69% of total employment in EU27. By 2024, this share had decreased to 65%.
- Meanwhile, the number of people employed by SMEs has increased by 6 million, amounting to almost 90 million in 2024

Employment and number of in SMEs in EU27
Million



Note: The figure includes all type of SMEs (<250 employees) in the total non-financial business economy. 1) Numbers for 2022-2024 are provisional.
Source: Implement Economics analysis based on Eurostat.

Personalised ads contribute up to EUR 80 billion to SME revenue, supporting growth among SMEs

SMEs are important to overall economic growth. Many SMEs introduce new goods and services to the market, which creates economic growth. Hence, the revenue from personalised ads in SMEs is important for the economic activity in the EU.

Personalised advertising increases SME revenue by…

35 bnEUR

When assuming an efficiency difference of 50% and a ROAS of 3.

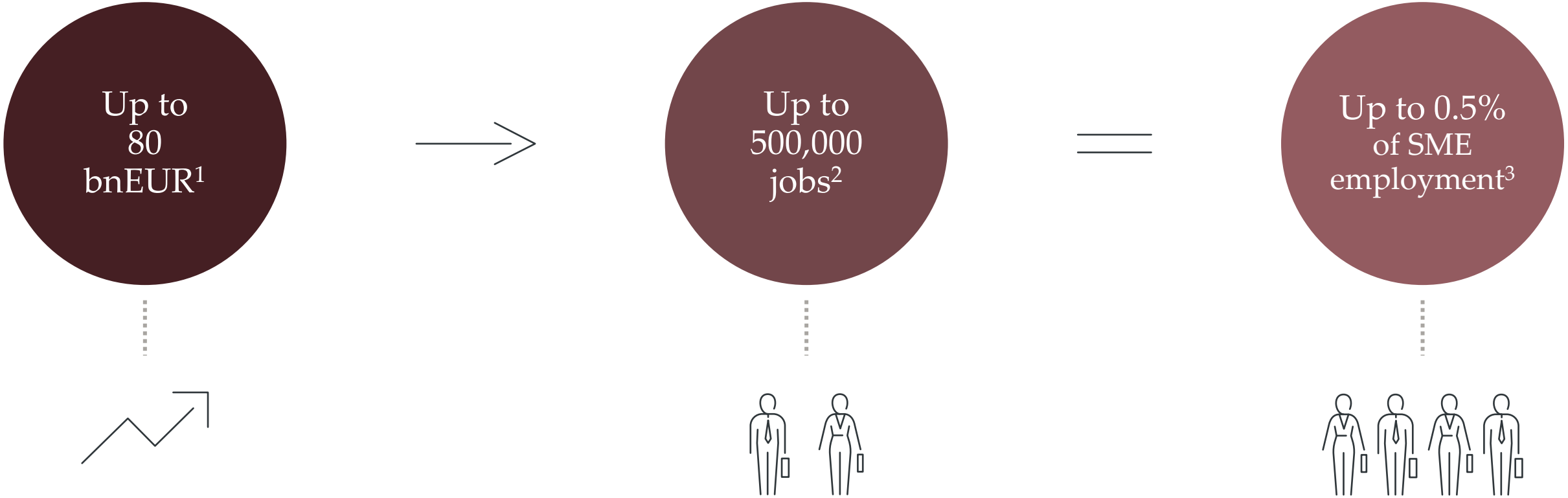
80 bnEUR

When assuming an efficiency difference of 75% and a ROAS of 5.

Note: 1) The literature finds that contextual ads are 50-75% less efficient than personalised ads. We assume that SMEs spend share on personalised advertising is similar to the overall market spend share on personalised advertising. The SME's revenue gain is calculated under the assumption that the total number of ads sold is constant.

Personalised ads support up to 500,000 persons employed in SMEs

Personalised ads are the most efficient way for advertisers to find and reach relevant consumers for their products, supporting SME revenue and consequently the ability to hire employees. Personalised ads bring SME's revenue gains of EUR 35-80 billion. This corresponds to between 200,000-500,000 jobs, accounting for between 0.2-0.5% of SME employment.



Note 1) The SME's revenue gain is calculated under the assumption that the total number of ads sold is constant. 2) The average net turnover per person employed in EU27 SMEs was 160,000 EUR in 2023. 3) Total employment in SMEs in EU27 within industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations) was 105 million in 2023.
Source: Implement Economics analysis based on Eurostat.

6

Value for publishers

In this context, publishers are both traditional media publishers and the large group of digitally native media publishers

Publishers stem from different origins and serve vastly different types of content, but they all maintain platforms that publish content intended to inform, engage, or entertain, sourced from a wide range of sources – from professional journalists to private individuals. Most online publishers show advertising on their websites - and especially for digitally native publishers, ad revenue is often an important source of revenue.

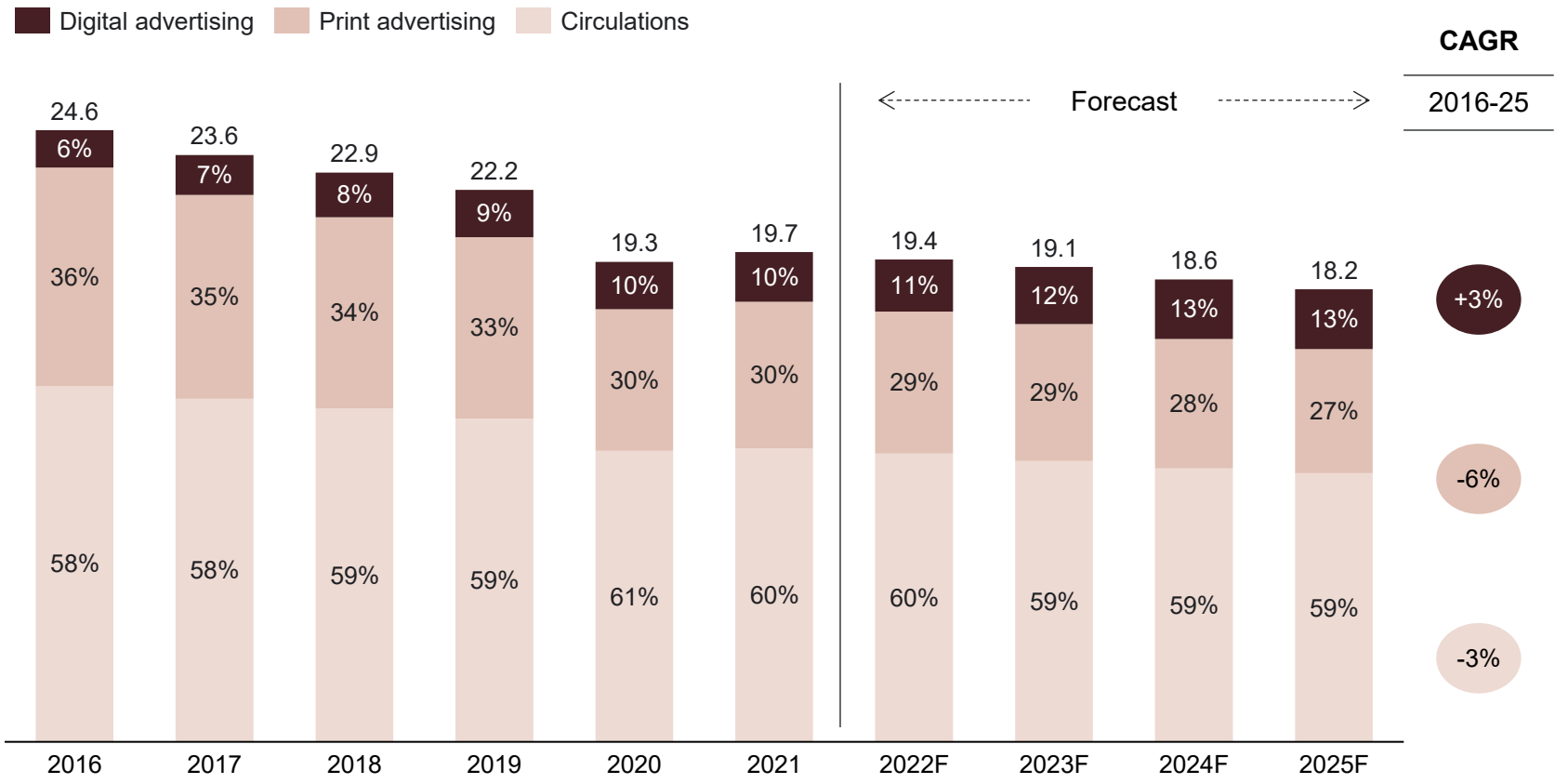
‘Publishers’ covers a truly vast range of media:

Content quality	Market origins: Legacy publishers	Market origins: Digitally native publishers
Premium Publishers	Established, trusted brands delivering premium journalism or specialised content to loyal audiences. • Originated from print media but have transitioned to digital platforms. • Focus on subscriptions, premium advertising, and sponsored/branded content.	High-quality digital-first publishers targeting niche or premium audiences. • Originated in the digital space. • Revenue streams include subscriptions, premium memberships, and sponsored content.
Non-premium publishers	Mass-market traditional publishers adapting to digital but relying heavily on ad revenue. • Originated from print media but partly transitioned to digital platforms. • Content may be broad, general-interest, and designed for high traffic volumes. • Heavy reliance on programmatic ads, direct-sold ads, and low-cost advertising models.	Digital-born publishers prioritising high traffic and ad-driven models with general-interest content. • Originated in the digital space. • Reliance on programmatic advertising, viral content strategies, and high-traffic models. • Lower editorial investment and emphasis on click-based revenue. • Often produce general-interest, entertainment, or user-generated content.

Legacy publishers have in recent years seen growing digital advertising revenue

- The main share of legacy publishers' revenue stems from print advertising and circulation. However, the business model has been changing, over the past decade, with digital advertising becoming an increasingly important revenue source for publishers.
- By 2025, digital advertising revenue is expected to make up over 13 % of their revenue – a 7 percentage point increase since 2016.
- In 2019, Reuters found that around 94% of digital native publishers provide consumers access to content mostly funded by ads, whereas only around 30-40% of legacy publishers provide content mostly financed by ads.

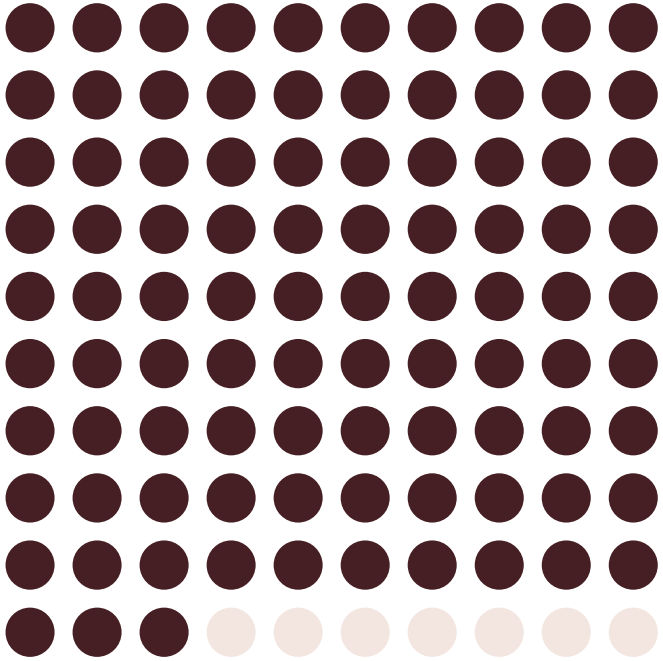
Revenues in newspapers, consumer magazines and books, EU
billion EUR



Source: Implement Economics analysis based on PwC (2021) and Reuters (2019)

Digitally native publishers are often small and rely heavily on ad-based revenue

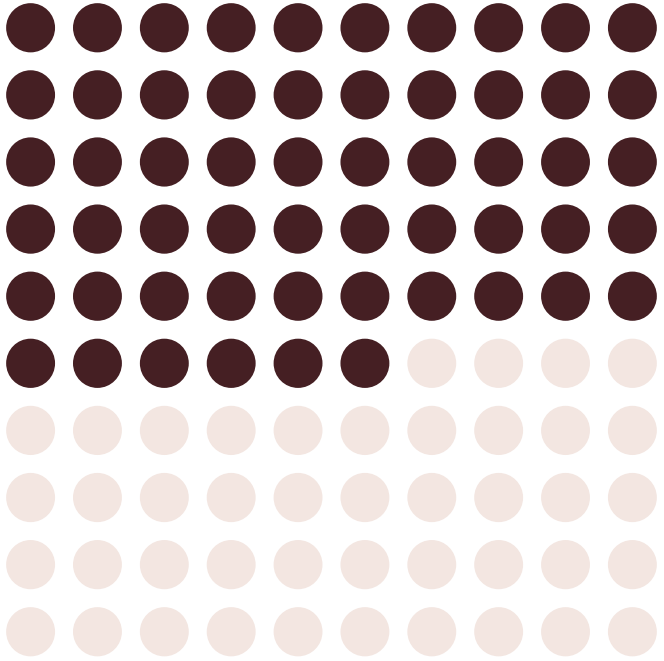
Digital native publishers often operate in small teams or even as private individuals leveraging online tools for content creation, editing and distribution. In the past decade, they have increased their presence in the news media market in the past decade. Digital native publishers rely heavily on an ad-based business model as over 90% of their revenue comes from digital ads.



93%

of enterprises in publishing in EU have less than 10 employees[1]

If personalised ads are banned publishers expect their revenue to **decrease by 30%** on average.



56%

of publishers say they will add a paywall or move to a subscription model, if personalised advertising becomes unavailable[2]

Note: 1) Based on Eurostat. We use the NACE J58.1 code as a proxy for publishing. This includes publishing of books, periodicals and other publishing activities as defined by NACE J58.1 and is likewise used by the European Commission when disclosing the news media market perspectives. 2) Based on a survey of 481 publishers in EU.
Source: Implement Economics analysis based on Eurostat and Polling by Public First (2024).

Personalised ads contribute EUR 10 billion to publishers' revenue

The contribution of personalised ads to publishers' revenue depends on what the next best alternative to personalised ads is. We investigate the scenario where contextual ads are advertisers' next best alternative to personalised ads and where publishers sell the same amount of ad space, but at a lower average price than with personalised ads. We assume that contextual ads are 50-75% less efficient than personalised ads[1] and that the average ROAS across ads is up to 3-5[2]. If publishers see a fall in ad income, they might need to raise income from paywalls or subscription models.

Publishers' revenue contribution from personalised advertising is…

5 bnEUR

When assuming an efficiency difference of 50% and a ROAS of 3.

10 bnEUR

When assuming an efficiency difference of 75% and a ROAS of 5.

EUR 10 billion corresponds to ***60%*** of publishers' current revenue from digital ads.

Note: 1) The literature finds that contextual ads are 50-75% less efficient than personalised ads. 2) See appendix for more detail.

Without personalised ads, the publishing industry will likely struggle to maintain a viable businesses model

Alternatives to the ad-based business model include paywalls and subscriptions models. These business models are not uncommon in the publishing market, as legacy publishers to a higher extent utilise this kind of models. Today most of the digital native publishers' content is financed by ads.

Without personalised ads, the publishing market might face the following scenario…

Publishers introduce paywalls

Without personalised ads, ad-revenue based business models may become unsustainable for publishers, potentially pushing them towards the introduction of paywalls to remain in business.

User demand decreases

Introducing paywalls may lead to a significant decline in user demand, as users generally exhibit a low willingness to pay for media content.[1]

Publishers adjust paywall prices

Consequently, if the number of users or website visitors decreases, publishers may either raise paywalls prices to increase revenue or lower them to grow demand, potentially increasing ad space or lowering ad quality. Both strategies could trigger a downward spiral of diminishing demand.

Publishers go out of business

Over time, this unsustainable business model could force many publishers out of business, leading to a reduction in the diversity and availability of media content.

The risk is likely higher among small publishers, whose income streams are highly dependent on advertising revenue.

Note: 1) See e.g. IAB Europe (2021).

7

Value for consumers

Personalised ads paradoxically provide consumers with perceived benefits, but also create feelings of intrusion and privacy concerns

Personalised ads provide consumers with perceived benefits…

Informed purchase decisions

Personalised ads are tailored to individuals' preferences and interest leading consumers to find better and more relevant products, informing their purchase decisions.

Easier to find products and prices

Personalised ads benefit consumers as they reduce the time needed to search for products matching their interests – known as *lower search costs*.

Access to content with little or no cost

Personalised advertising enables media platforms to deliver editorial content with little cost, securing consumers' access to information. Consumers in Europe have a low willingness to pay for online content and are more satisfied with their costless experiences vs. paid ones.

… but can also leave consumers with feelings of intrusion and privacy concerns

Feelings of intrusion

When ads are highly personalised consumers can experience feelings of intrusion if they are not aware of when or where they gave away the specific personal information used in the personalised ad.

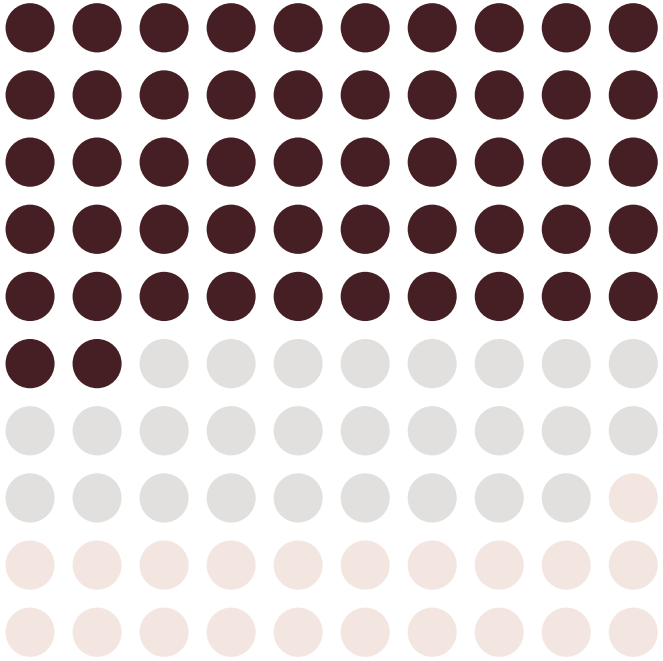
Privacy concerns

Privacy concerns can arise in consumers when they worry about the misuse of their personal data, impacting their trust and willingness to engage with personalised ads.

Note: Yan Lau (2020) shows how targeted ads using personal data reduce search costs for consumers. 1) See Cavenaile et al. (2024).
Source: Implement Economics analysis based on IAB (2017), Yan Lau (2020) and Cavenaile et al. (2024).

Consumers value ads that are relevant to their needs

When asking consumers across the EU, only a small minority do not prefer ads that are relevant to them over random or contextual ads (21% and 11%). The majority of consumers (52%) prefer ads which are relevant to them personally over ads that are based on the content off the website/app where the ads are placed. When instead comparing to random ads, the share of consumers who prefer ads relevant to them increases to 56%.

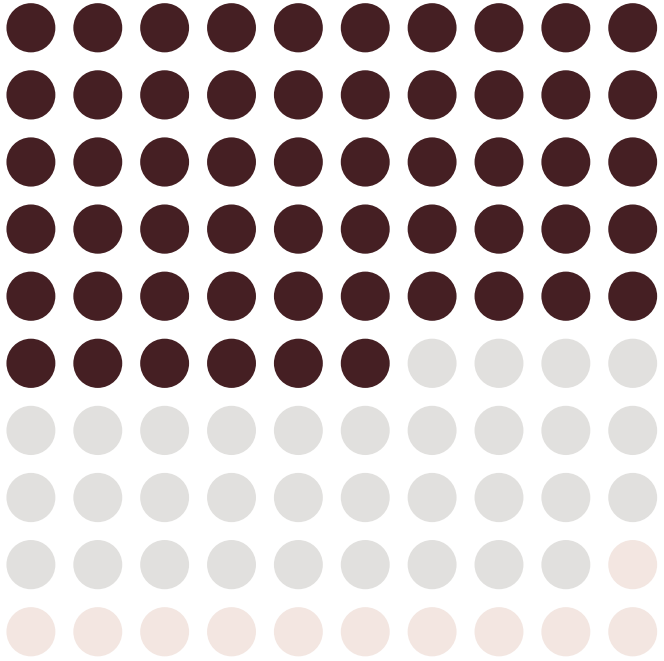


52%

of consumers in the EU agree with the statement "I prefer ads that are relevant to me over ads that are based on the content of the website/app."

21%

of consumers in the EU disagree with the statement "I prefer ads that are relevant to me over ads that are based on the content of the website/app."



56%

of consumers in the EU agree with the statement "I prefer ads which are relevant to me over random ads."

11%

of consumers in the EU disagree with the statement "I prefer ads which are relevant to me over random ads."

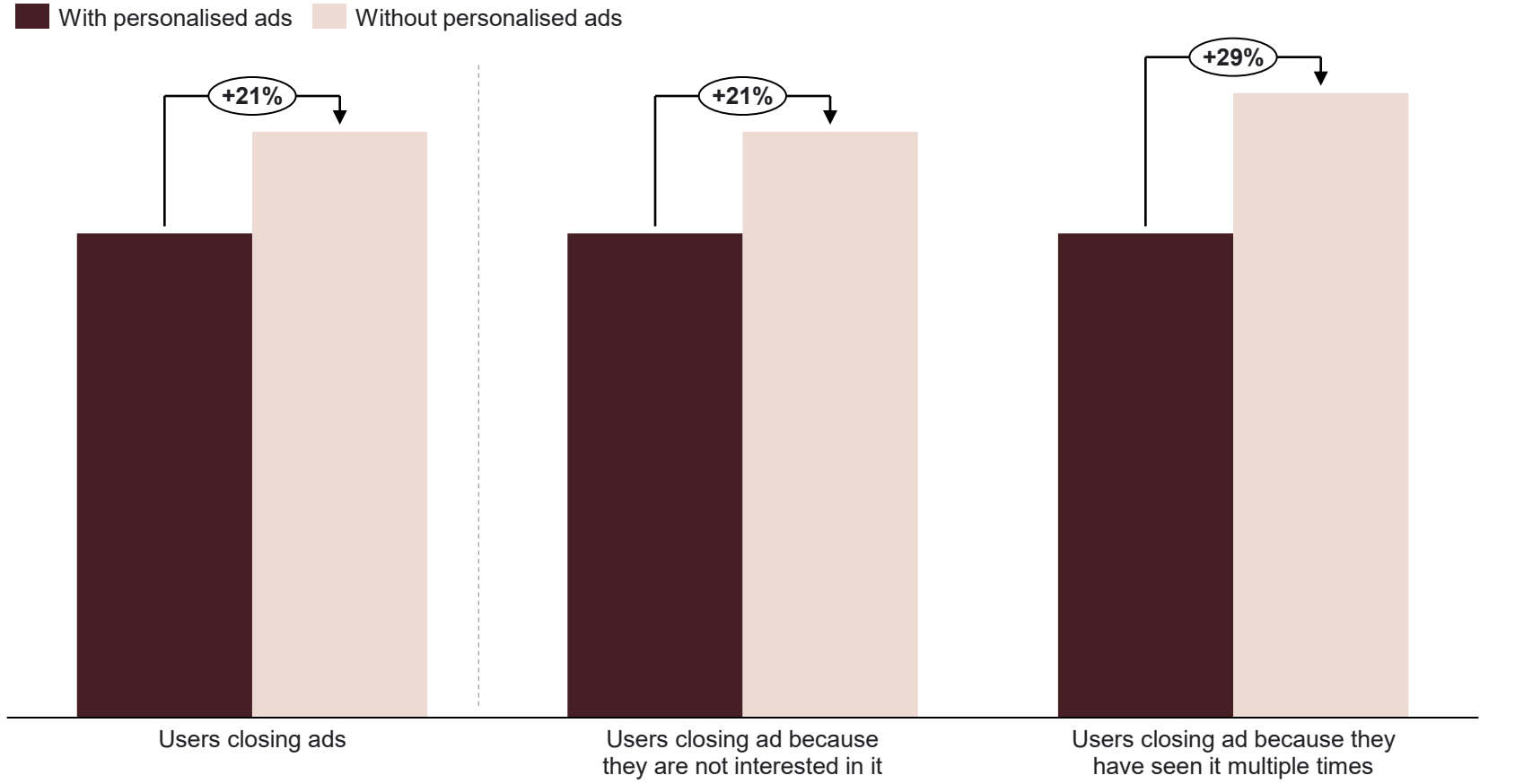
Source: Implement Economics analysis based on Kantar, IAB (2025)

Consumers value targeted ads more than the alternative

- According to a survey by Ravichandran & Korula from 2019, more users choose not to see ads that are not personalised.
- When investigating why consumers close ads, they cite “no interest” far more often (+21%), when personalised ads are disabled.
- In addition, consumers choose to close ads they have seen before far more often (+29%) when personalised ads are disabled.

Consumer behaviour on interactions with ads

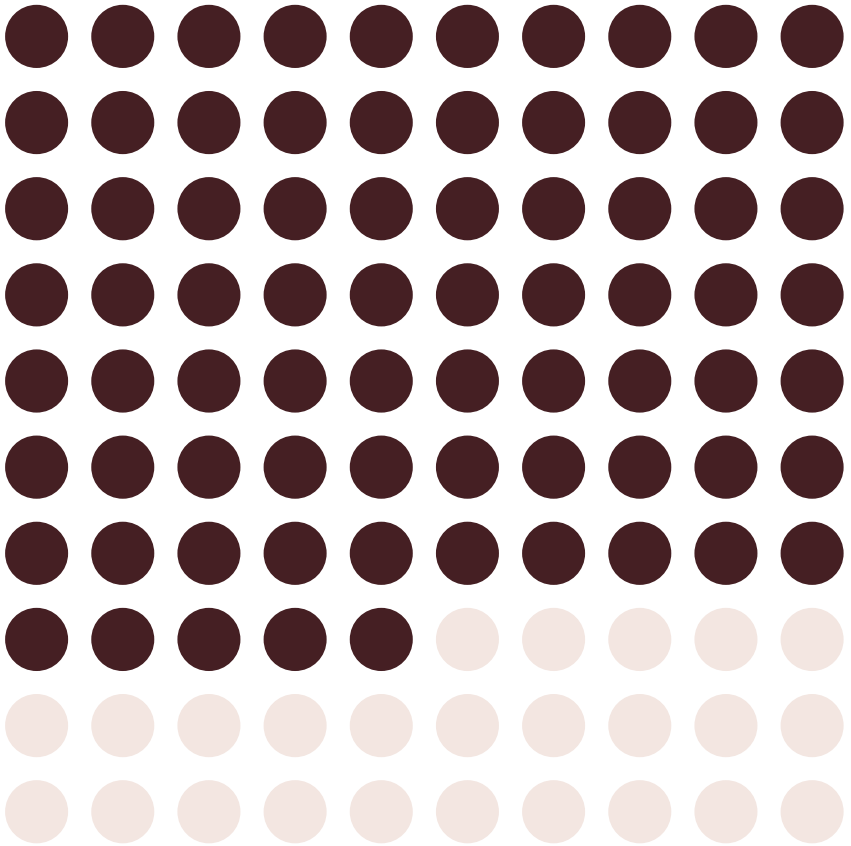
%



Source: Implement Economics analysis based on Ravichandran & Korula (2019)

Consumers value personalised ads, as they democratise access to content

- When investigating consumers' preference for different types of ads, consumers indicate that they prefer content financed by targeted ads over subscription models.
- Consumers preferring personalised ads to other types of ads is further supported by higher click-through-rates.
- Consequently, almost half of Europeans say that they would reduce their internet activity significantly to avoid paying for content.
- Without personalised ads, publishers relying on an ad-based business model might be forced to introduce paywalls to secure a viable business.



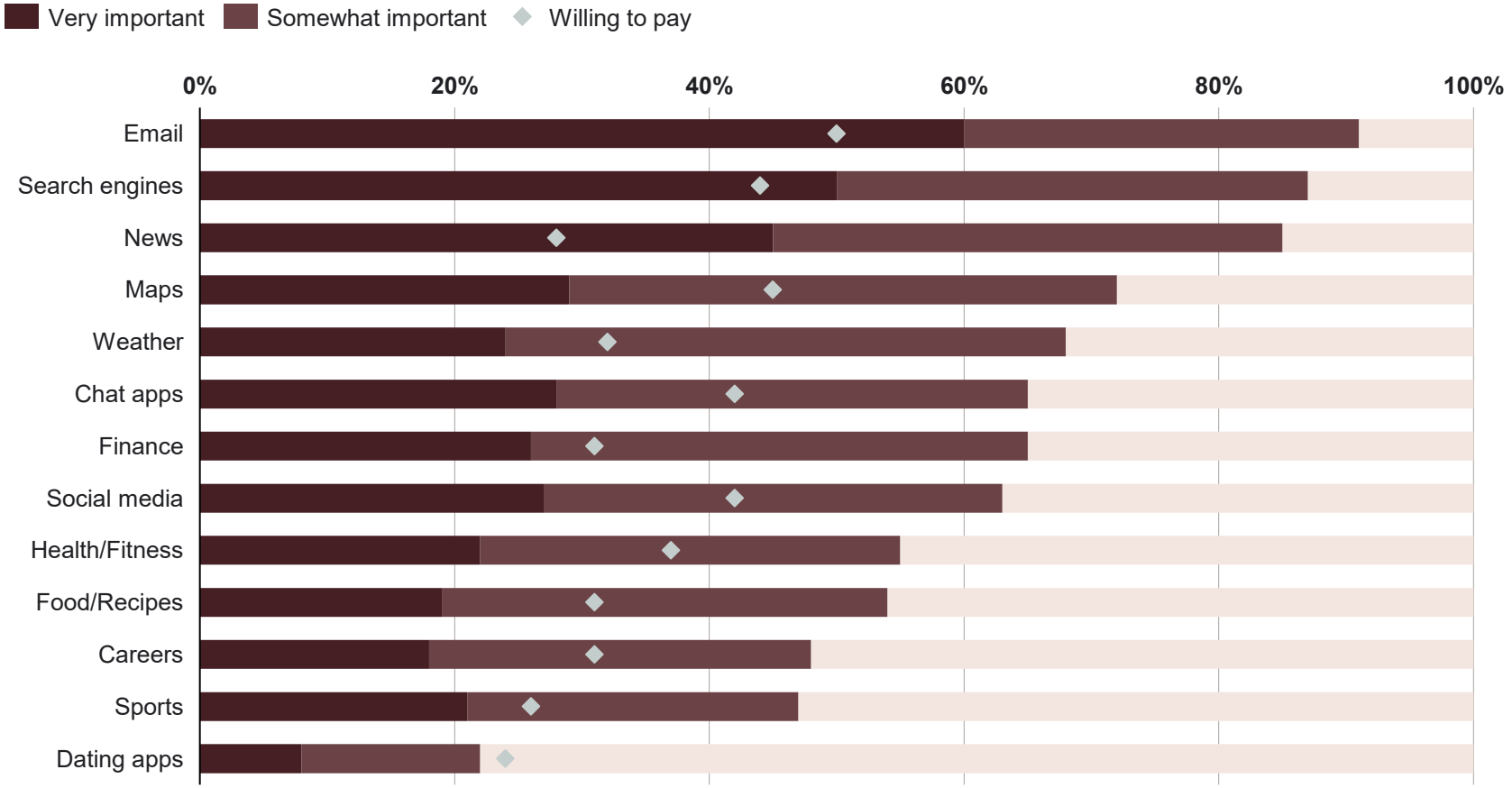
75%

of European consumers prefer the current model for the internet, with access to content funded by targeted ads over a scenario where the majority of sites and apps fund themselves through subscriptions.

Source: Implement Economics analysis based on IAB Europe (2021).

Consumers value news highly, but pay for it reluctantly

- There is a significant discrepancy between what service types consumers find important and their willingness to pay for it.
- For example, more than 80% of Europeans think that news is important content to access online, but less than 30% would be willing to pay for it.
- A big discrepancy between the importance of news and the willingness to pay for it makes news publishers very vulnerable to the use of paywall – or subscription-based business models – in the worst case driving them towards bankruptcy.
- A likely scenario would for instance be publishers placing content behind paywalls.



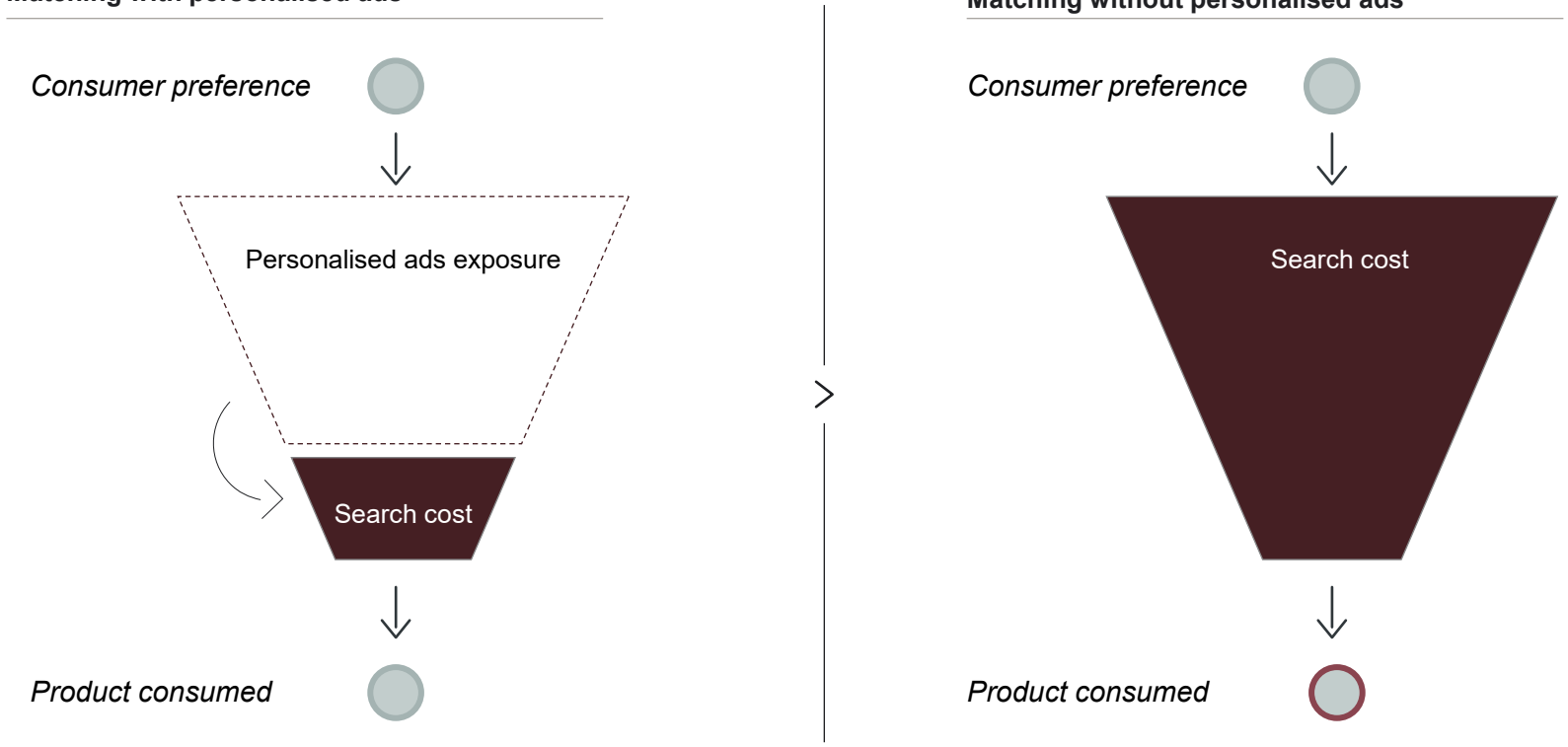
Source: Implement Economics analysis based on IAB Europe (2021).

Personalised ads significantly reduce the time consumers spend searching for products

- Personal ads reduce consumers' time and efforts spend searching for products.
- This allows consumers to find relevant products more efficiently, as shown by Yan Lau (2020).
- Reduced searching efforts from personalised ads drives greater sales of niche products. As Brynjolfsson et al. (2006) show, this enables demand to shift beyond mainstream hits to niche goods.
- Consequently, personal ads benefit consumers by reducing the time and effort needed to find niche products, often supplied by young firms, that better match their interests.

ILLUSTRATIVE

Consumer effort in searching for products matching their preferences in different ad environments



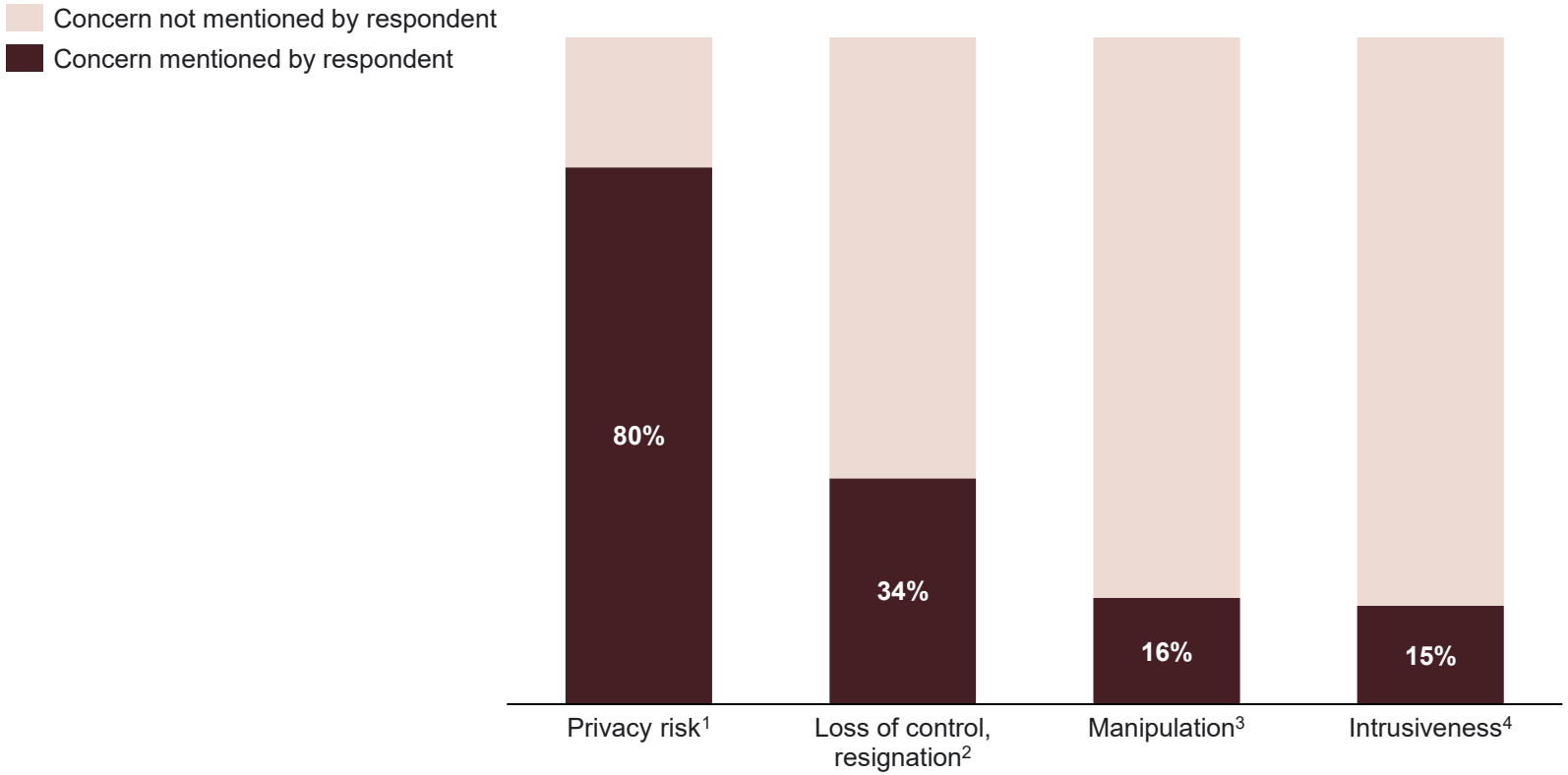
Source: Implement Economics based on Yan Lau (2020).

Consumers also have concerns regarding the presence of personalised ads

- Several academic papers have explored consumer perceptions of personalised ads, revealing a dual effect. While consumers may find personalised ads beneficial in some cases, they can also trigger negative reactions – such as privacy concerns.
- The most prevailing concerns regarding personalised ads include privacy risk, loss of control, manipulation while less prevalent concern include stereotyping and discrimination. The latter concerns are together mentioned by around 6% of consumers.

Consumers' concerns regarding personalised ads

%



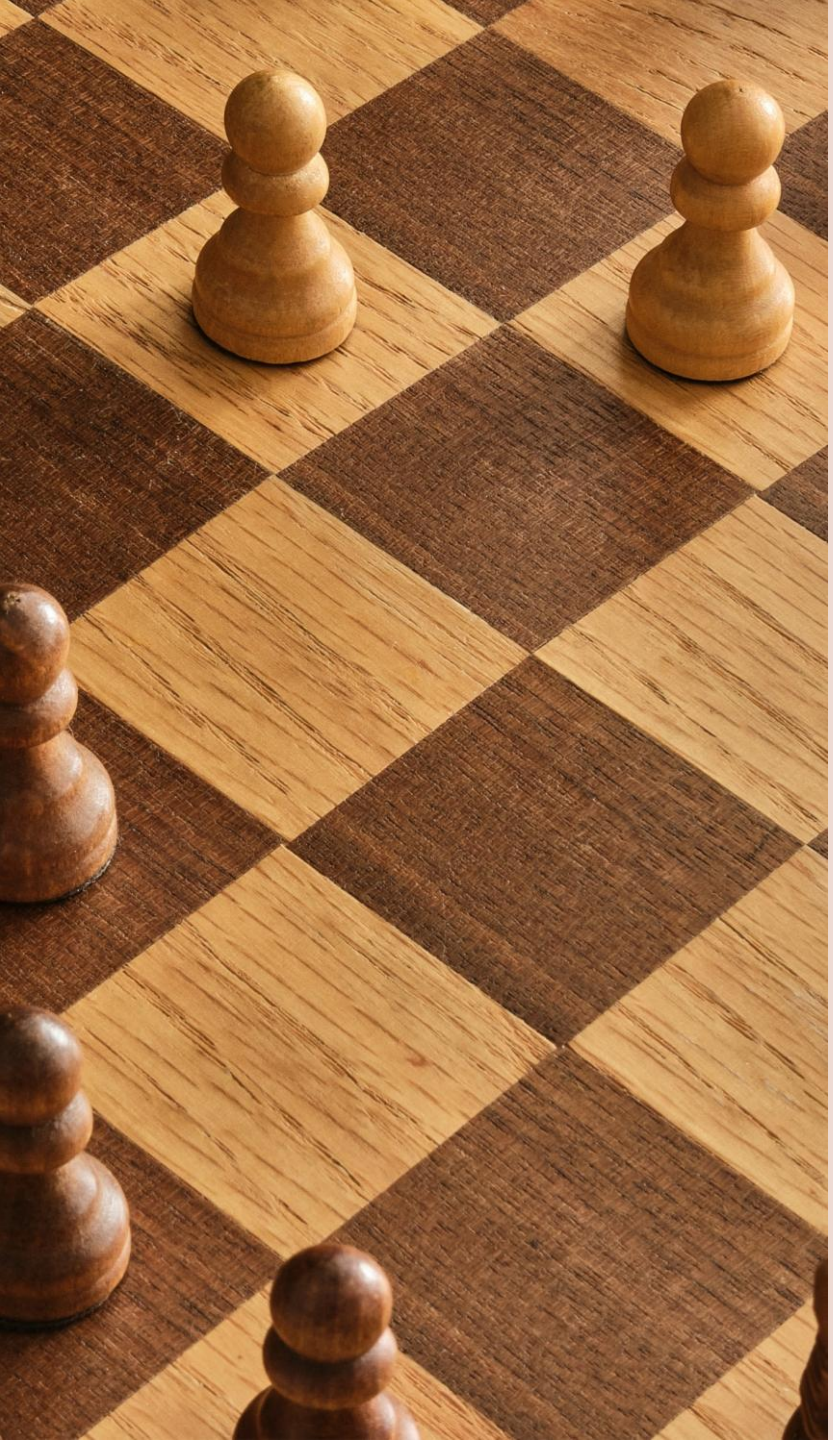
Note: Based on survey of 251 consumers. Four most mentioned concerns reported. 1) Privacy risk concerns include e.g.: "*Data is not safe once it is collected*" or "*My data can be sold to others without my knowledge*". 2) Loss of control or resignation concerns include e.g.: "*I do not want anyone to know everything about me, but that is what is happening now*". 3) Manipulation concerns include e.g.: "*They influence my purchase behaviour*". 4) Intrusiveness concerns include e.g.: "*It irritates me a lot*".
Source: Implement Economics analysis based on Strycharz et al. (2019)

Utilising an alternative methodology we find a potential welfare loss of up to EUR 70 billion

- By directing consumers towards the best products, advertising supports efficient allocation of resources by directing production towards the most efficient firms, thereby generating overall welfare gains. The ability to personalise ads is part of this positive welfare effect.
- Cavenaile et al. (2024) finds that "shutting down advertising results in a welfare loss of 3.64% in consumption-equivalent terms, mostly coming from losses in allocative efficiency".[1]
- In the absence of personalised advertising, the effectiveness of advertising will be reduced. This inefficiency results in suboptimal consumer choices and a misallocation of resources, reducing overall welfare.
- Using a conservative and proportionate approach, we estimate that the absence of personalised ads would reduce economic efficiency in the EU by around 70 bnEUR.[2]

Eliminating personalised ads risks reducing welfare in the EU by around …

Note: 1) Cavenaile et al. (2024) finds that advertising helps with optimising consumption. Advertising helps improve consumer choices which leads to more efficient consumption, increasing consumer welfare. 2) This is based on personalised ad spend as a share of total ad spend in the EU and taking the efficiency of personalised ads into account. This is a conservative estimate as personalised ads are also used in other ads formats.
Source: Implement Economics based on Cavenaile et. al. (2024) and Eurostat.



8

The impact of new AI-enhanced digital advertising

Generative AI will improve efficiency in the advertising market

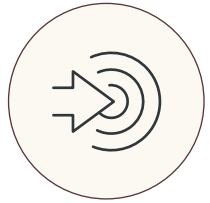
Efficient and easy to access

Generative AI makes the production of ads more efficient, easier to access and cost effective. It can, for instance, translate ad campaigns to multiple languages. This might allow even SMEs to run multinational advertising campaigns. Generative AI enables businesses to scale campaigns, innovate faster, and allocate resources to impactful activities, increasing productivity.

Speed and quality

Generative AI accelerates the speed of ad production while also improving its quality. Creating graphics and text can now be completed in a shorter time, enabling advertisers to swiftly respond to market trends. It ensures higher quality through data-driven insights, optimising ad content.

Customization at scale

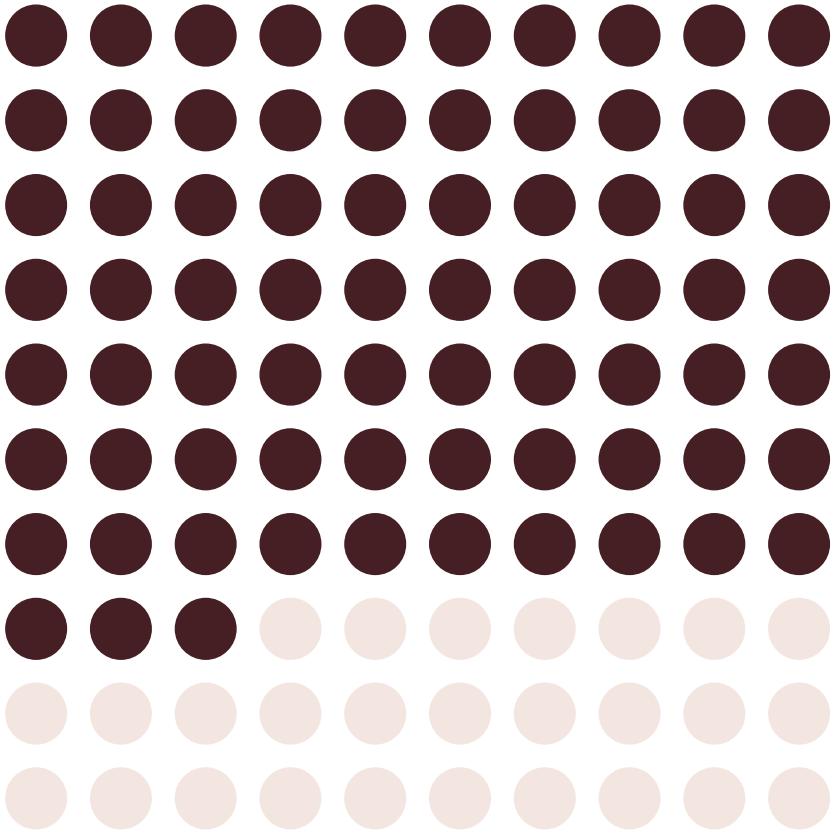


By leveraging real-time data, Generative AI can create dynamic ad content that is tailored to individual behaviour and preferences. It can create highly granular segments making one-to-one reaching easier.

A future scenario could be that contextual advertising might become as effective as personalised advertising is today, eliminating the need to collect as much data. The market will solve the problem on its own.

Generative AI is revolutionising advertising

- A survey of more than 500 marketers reveals that more than 70% agree that Generative AI (GenAI) adoption will fundamentally change personalisation and marketing strategies.
- GenAI is transforming how ads are created, delivered, and personalised.
- GenAI's ability to process massive amounts of data in real time will enable predictive insights and customised engagement, fundamentally shifting how advertisers interact with customers.



73%

of marketers agree that AI adoption will fundamentally change personalisation, bringing it to new heights

Note: Based on a survey of 521 B2B and B2C company directors. All respondents are from companies with more than 500 employees and are familiar with the company's customer experience, marketing tech, or customer data strategies.
Source: Implement Economics analysis based on Twilio Segment (2024)

With GenAI expected to lift ROAS by 10-25%, personalised ads will contribute up to EUR 250 billion to advertisers' revenue by 2030

We have used the approach of estimating revenue gain from using personalised ads instead of contextual ads but maintaining the same overall spend on display ads.

The method finds an efficiency contribution from personalised advertising of…

100 bnEUR

When assuming an efficiency difference of 50% and a ROAS of 3.5.

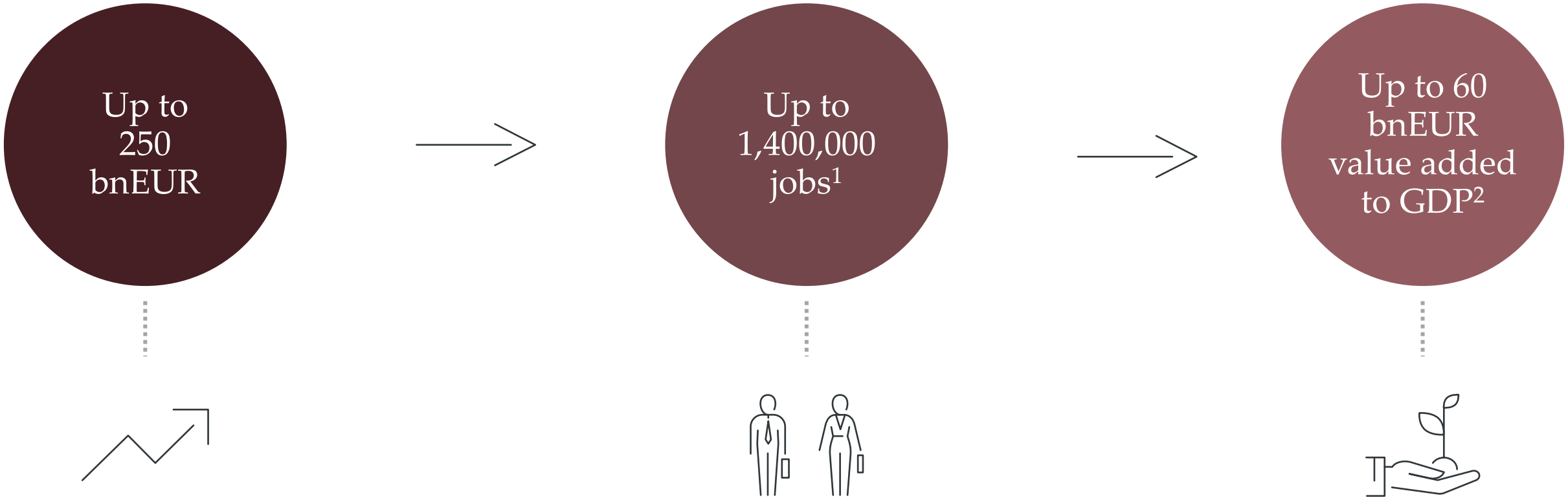
250 bnEUR

When assuming an efficiency difference of 75% and a ROAS of 5.8.

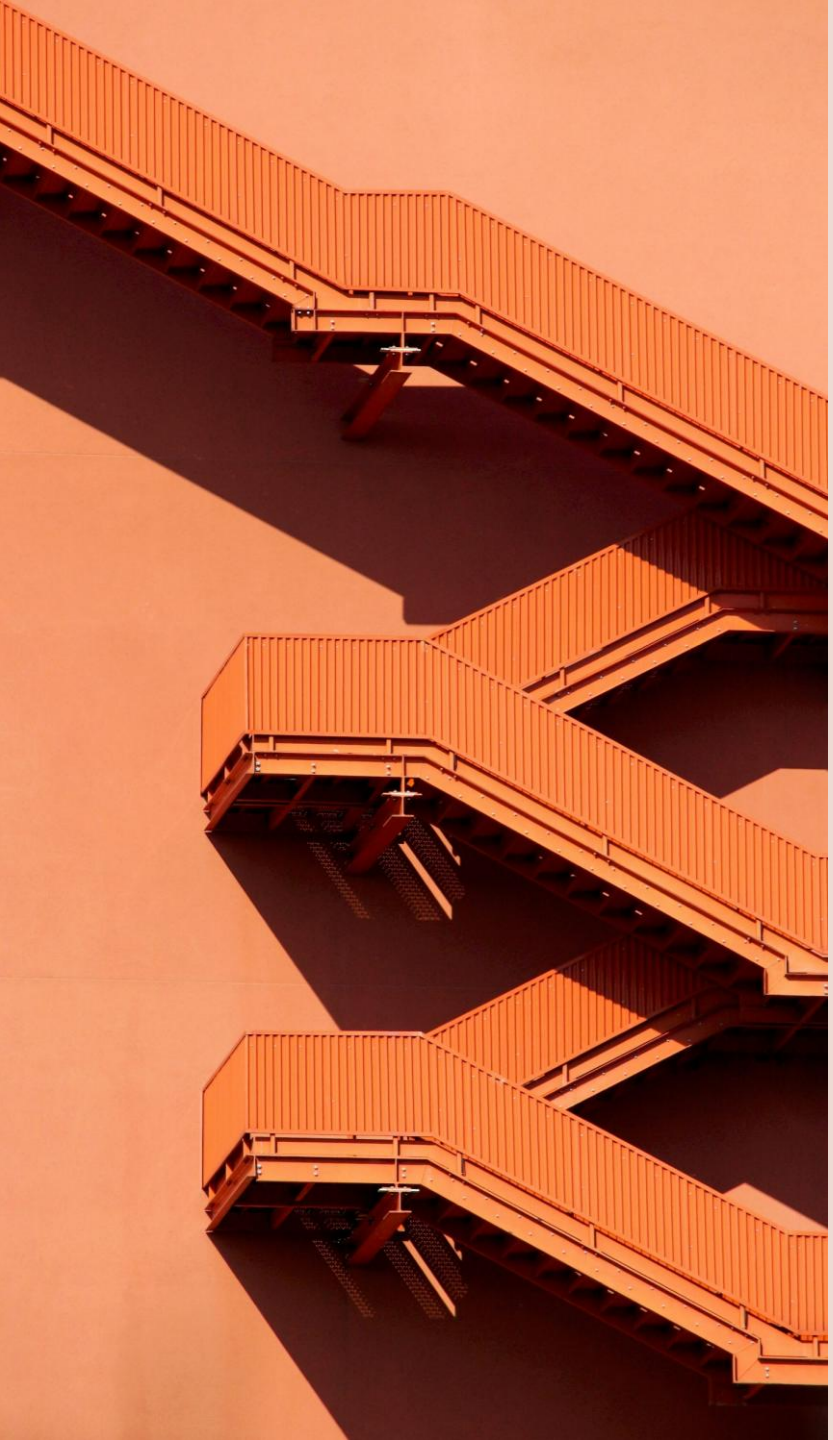
Note: For simplicity, we assume that Generative AI can create a ROAS uplift of 17.5% for personalised ads, corresponding to the average of 10-25%. 1) The literature finds that contextual ads are 50-75% less efficient than personalised ads. See appendix for full presentation of the different scenario outcomes assuming that contextual ads are between 50-75% less efficient than personalised ads.
Source: Implement Economics analysis based on IAB Europe (2024).

Personalised ads using generative AI support employment for up to 1,400,000 people

Personalised ads are the most efficient way for advertisers to find and reach relevant consumers for their products, supporting SME revenue and consequently the ability to hire employees, as more revenue leads to more GDP and supports European jobs. Advertisers enabling generative AI when using personalised ads, will potentially raise their revenue gains from EUR 40-100 billion to EUR 100-250 billion. This corresponds to up to 500,000-1,400,000 jobs, or up to EUR 60 billion value added to GDP.



Note 1) The average net turnover per person employed in EU27 was EUR 206,000 in 2023. 2) The gross value-added ratio is 0.26 and calculated as gross value added divided by net turnover in the EU's highest aggregate industry, construction and market services (except public administration and defence; compulsory social security; activities of membership organisations) in 2022
Source: Implement Economics analysis based on Eurostat.



9

Restricting the use of personalised advertising

Existing EU legal framework already heavily regulates online personalisation practices such as targeted ads

Seven different regulations make up the EU regulatory landscape for the online advertising sector

Regulatory frameworks	Key elements
The General Data Protection Regulation (GDPR)	• Processing personal data must have a valid legal basis, such as consent, contract, legal obligation, vital interests, public task or legitimate interests.
Consumer Rights Directive 2024/825	• Introduced to ensure consumers have access to necessary information before purchasing goods, services, or digital content (limiting e.g. greenwashing)
ePrivacy Directive	• Requires user consent for storing/accessing information with certain exceptions
Proposed of e-Privacy Regulation	• Simplifying the process for accepting/rejecting cookies
Digital Services Act (DSA)	• Bans on advertising based on profiling using minors' data or special categories of personal data • Transparency requirements for online ads, including a public ad repository
Artificial Intelligence Act	• Safeguards for general purpose artificial intelligence • Limits on the use of biometric identification systems by law enforcement • Bans on social scoring and AI used to manipulate or exploit user vulnerabilities
Digital Markets Act (DMA)	• Transparency obligations for gatekeepers to provide real-time access to information on ad portfolios • Opt-in consent mechanisms for data usage • Cross product data sharing for the purpose of advertising • Access to aggregated and non-aggregated data for business users • Data portability and transparency about consumer profiling techniques

Regulatory landscape for online advertising is under reviewed

The European Commission is currently lacking an overview and understanding of the current regulatory landscape relevant for the online advertising sector.

The Commission has requested a study of online advertising and the impact of different regulatory frameworks, including:

- The most relevant developments in the online advertising sector.
- Mapping of the main issues in the sector.
- Identification of relevant regulatory gaps, if any.

Past debates on online advertising suggested banning personalised ads - which would put revenue of EUR 100 billion at risk

A hypothetical ban, or shadow ban, of personalised ads would put EUR 100 billion ad-driven revenue at risk (or potentially as much as EUR 250 billion in 2030): In a hypothetical scenario, where advertisers are forced to revert to only using contextual advertising would imply a significantly less efficient advertising industry in the EU. The additional cost would come in terms of lost sales especially for SMEs, reduced revenue for publishers and with some inconveniences for the majority of consumers who value the current advertising formats and the free content it supports.

In past debates on digital regulation, various members of the European Parliament have suggested to ban or limit the use of personalised online ads. All of which were rejected during Parliament votes or Trialogue negotiations:

***The Digital Markets Act debated and rejected amendments on*:**

- A complete ban on personalised ads[1]
- A ban on combining personal data for advertising purposes[2]

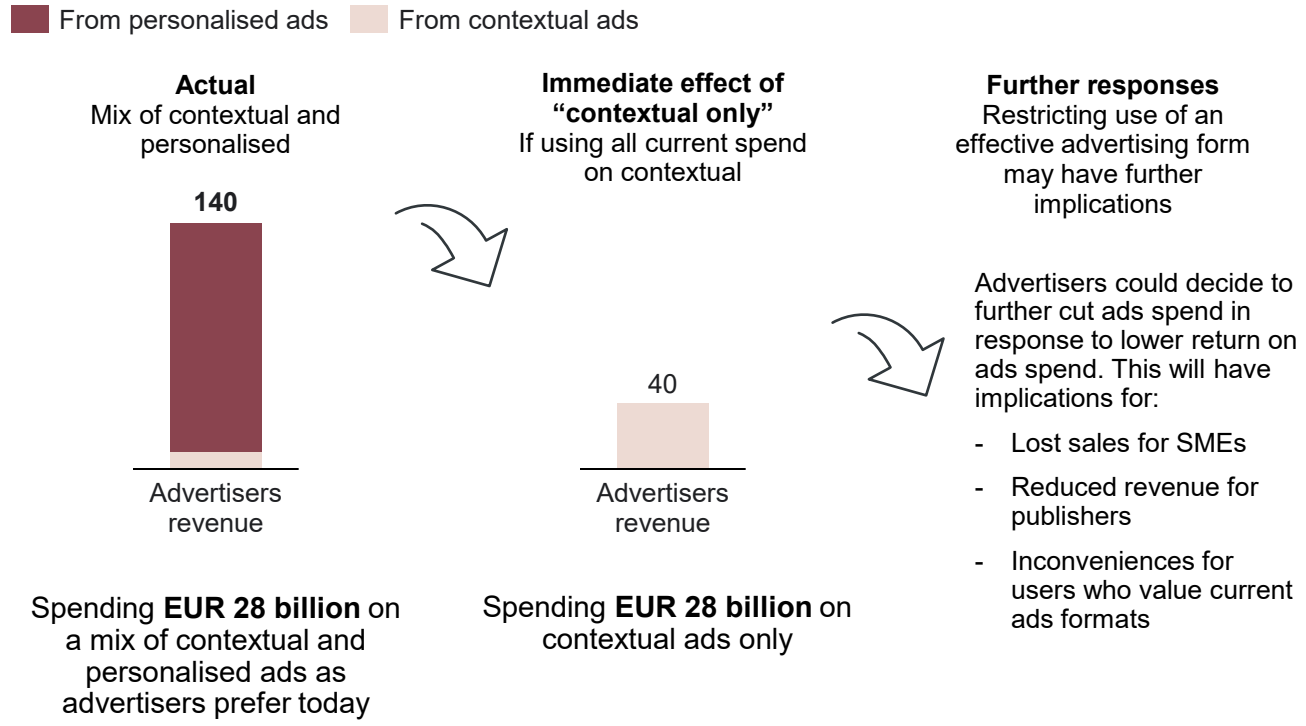
***The Digital Services Act debated and rejected* amendments on:**

- A full ban on personalised ads
- An opt-out by default or new consent requirements for personalised advertising[3]

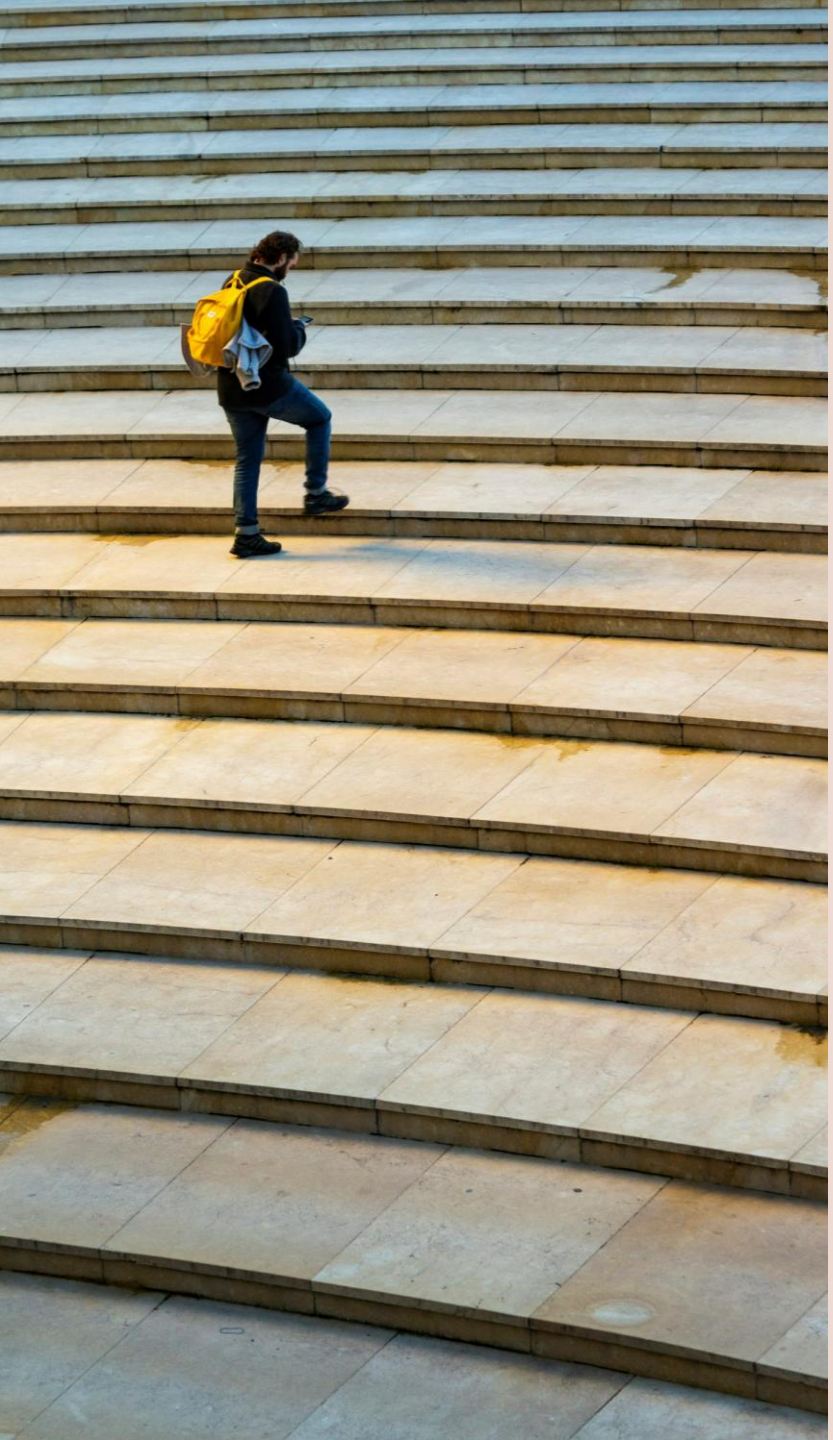
No new calls have been made to ban personalised ads

To accurately quantify specific losses from regulatory restrictions, the foregone revenue calculation must consider the specific regulatory proposal under consideration. Furthermore, when a proposal for regulatory restrictions on the ad market exists, it will be possible to take the most likely behavioural responses into account and provide a more accurate efficiency loss from restricting the use of personalised ads. However, the underlying literature review and general assumptions used in this report can be used in any future analyses

Advertiser revenue from ads in EU27, 2023
billion EUR



Note: 1) see: AM 209, AM 418 to the ITRE opinion. AM 474 to the ECON opinion suggested limiting advertising to "contextual" ads. 2) AM 211 or ban on targeted advertising (AM 210). 3) See **Amendment 92, Amendment 746 or Amendment 1019** suggesting either a full ban or a limit to only contextual ads.



10

Conclusion

Maintain EU competitiveness with the most efficient digital tools

Maintaining EU Competitiveness in a Digital World

Personalised ads provide efficiency gains to SMEs, increased revenue for publishers, and value to consumers.

The **Competitiveness Compass** is the major initiative of the new Commission to address the challenges presented in the Draghi report. Over the next years, the compass aims to ensure Europe's competitiveness and prosperity by making it easier and faster to do business in the EU.

The compass also aims to boost EU productivity with the diffusion of digital technology and aims to put innovation at the heart of the EU economy.

Advertising is one of the core business functions for any business and ensuring that European SMEs and innovative firms have access to the best and most efficient advertising tools, is part of the overall competitiveness picture.

This report emphasises the need to maintain the efficiency gains that personalised ads provide, as these are needed to maintain the competitiveness of EU businesses.

Personalised digital advertising is a powerful engine for EU competitiveness, generating EUR 100 billion in revenue and supporting businesses, publishers, and consumers.

With the expected growth of digital advertising and the diffusion of generative AI, personalised advertising could generate up to EUR 250 billion in additional sales for EU businesses by 2030.

"Competitiveness is the set of institutions, policies and factors that determine the level of productivity of a country."

The World Economic Forum definition

How the European Commission plans to boost competitiveness

- **Making business easier**
  to foster economic growth
- **A clean industrial deal**
  to support EU's competitive industries and create quality jobs
- **A more circular and resilient economy**
  to transition to more sustainable production and consumption practices
- **Boosting productivity with digital tech diffusion**
  to strengthen the EU's competitiveness and become a leader in AI innovation
- **Putting research and innovation**
  at the heart of our economy
- **Turbo charging investment**
  to accelerate green, digital and social transition
- **Tackling the skills and labour gaps**
  to improve people's careers and economic competitiveness

Source: Implement Economics based on World Economic Forum and European Commission.

Simpler, lighter, faster - Going much further than before in making the EU regulation fit for competitiveness

The *EU Competitiveness Compass* proposes to cut red tape as a key horizontal enabler of competitiveness.

Two actions can help restore EU competitiveness in digital advertising:

1 Simplifying the regulatory and administrative burdens on businesses

- Digital advertising in the EU is regulated by a combination of rules (Digital Markets Act, Digital Services Act, GDPR, ePrivacy Directive, Consumer Rights Directive 2024/825, and the AI Act).
- The combination of these rules already creates a complex regulatory environment for European advertisers and numerous ads platforms providing services to advertisers and publishers.
- The use of data is key to today's digital media and advertising. Data-driven services are crucial to providing and personalising digital advertising and other services. Specifically, data enables advertising to reach particular audiences with high efficiency and effectiveness.
- Cross-border data flows and a practical, proportionate data protection regime are prerequisites for the effective functioning of digital advertising businesses and for the EU's attractiveness as a place to innovate and operate digital businesses.

The Commission could consider including the digital advertising industry in the *Simplification Omnibus package*. Simplifying the regulatory burden on digital advertising businesses in the EU could include actions to eliminate overlaps and contradictions, while maintaining high standards.

2 Conducting competitiveness check

- As stated in the Competitiveness Compass, "regulatory burden has become a brake on Europe's competitiveness".
- The EIB finds that for two out of three companies the regulatory burden is the key obstacle to long-term investment. Many signal that the complexity and variety of administrative procedures make Europe a less attractive location for investment, compared to other regions.
- To restore Europe's competitiveness, the Competitiveness Compass proposes going much further than before in cutting red tape. Regulation must be proportionate, stable, coherent and technology neutral.
- The Compass proposes a new SME and competitiveness check in impact assessments that will become a stronger filter for new initiatives, also assessing the expected effects on cost differentials compared to international competitors.

The *Competitiveness Check* should be applied to any new regulatory proposals affecting digital advertising in the EU to help avoid new regulation hampering competitiveness or imposing unnecessary administrative burdens.

Note: EU Competitiveness Compass 2025 and European Investment Bank Investment Survey 2023.

Privacy concerns must be addressed in a way that does not hinder the efficiency gains

In conclusion, personalised digital advertising is a powerful engine for EU competitiveness, generating EUR 100 billion in revenue and supporting businesses, publishers, and consumers.

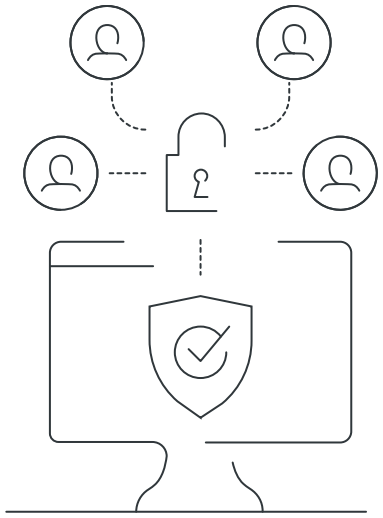
The European advertising industry is entering an era of significant additional productivity gains from the responsible use of generative AI.

EU policies should underpin these competitiveness gains and ensure that the digital innovation gap is not widening further as a result of regulatory brakes on innovation.

Preserving the productivity gains from digital advertising while addressing privacy concerns is essential for ensuring a thriving and competitive European economy in the digital age.

This report offers a framework based on the latest research findings and data to assess the productivity gains from personal advertising. These impacts should be considered in any new regulatory proposals affecting the digital advertising value chain in Europe.

- Privacy concerns must be addressed in a way that does not hinder the efficiency gains that personalised ads provide to SMEs, publishers and consumers. These efficiency gains are vital to maintaining European competitiveness.
- In a hypothetical scenario, where advertisers are forced to revert to only using contextual advertising, ad delivery will be based on the content the user is consuming at a given time rather than on their personal profile. This would imply a significantly less efficient advertising industry in the EU and the additional cost would come in terms of lost sales for SMEs in particular, reduced revenue for publishers and with some inconveniences for groups of consumers who are valuing the current advertising formats and the free content it supports.



Annex

Table of Contents

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A

Selected literature review

The literature exploits auction prices on ads utilising/not utilising cookies

The literature generally exploits auction data from ad exchanges, i.e. bids and prices.

Studies primarily focus on auction data of traded ads with and without third-party cookies to examine the counterfactual price difference.

One of them is **Johnson et al. (2019)**[1]. The study compares prices of display ads for users allowing third-party cookies, which enable personalised advertising, with users who are opted out of cookies. Consumers who opt out still see ads, just not ads that are targeted based on their previous browsing behaviour.

First- and third-party cookies

	 **First**-party cookies	 **Third**-party cookies
Purpose	**Improve browsing experience** and allow the website to **remember details about preferences**, login status, and shopping cart items.	Tracking user activity across multiple websites to **collect data for purposes such as personalised advertising, analytics, and retargeting**.
Functionality	1. Track activity on current website 2. Remember preferences and settings 3. Improve user experience	1. Track activity across websites 2. Build a profile about the user 3. Show relevant ads to the user 4. Retarget the user
Role in advertising	Ads using first-party cookies can target the customer by for example showing previously viewed goods within the same website.	Ads based on third-party cookies are personalised based on the user's previous browsing history across multiple sites, exploiting their behavioural profile.

Like-for-like comparisons of advertisers' willingness-to-pay for personalised ads can be derived from market data

ILLUSTRATIVE

Regression analysis

Using variation between opt-out and non-opt-out users (fingerprint method)

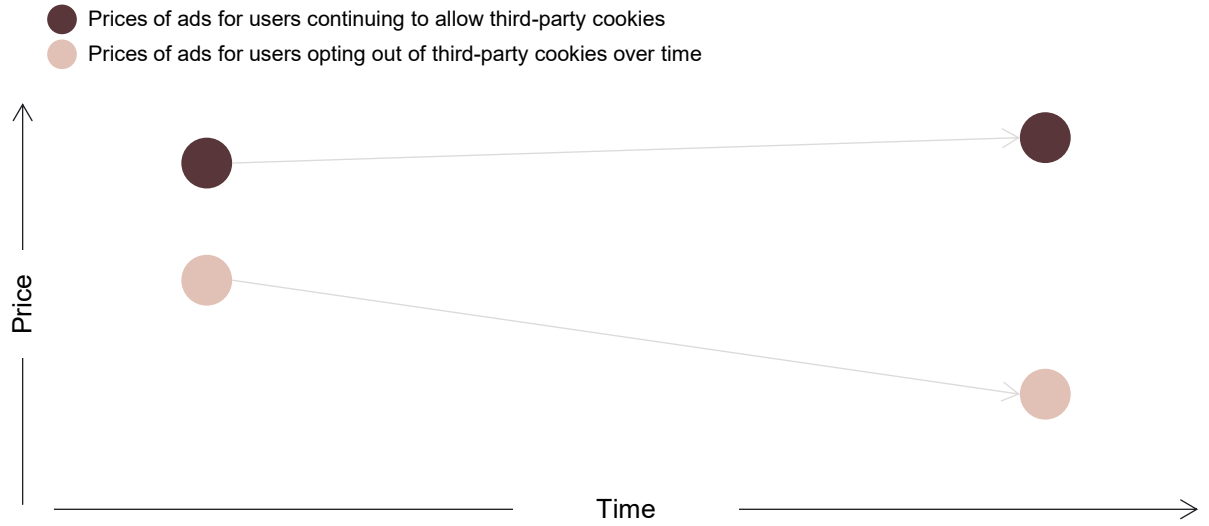
Johnson et al. (2019) compares millions of ad prices for opt-out users and non-opt-out users

- With a method called *fingerprint,* the researchers can gather characteristics of users who opted out of third-party cookies, by combining technical details like IP addresses, operating systems etc. By matching these details, researchers can reconstruct the users' browsing history despite not having direct access to the users' data.
- In this way, researchers can infer the potential value of ad impressions as if the users had cookies, despite the lack of direct tracking data, and compare the ad prices.

Difference-in-Difference approach

Using variation over time *and* differences between opt-out and non-opt-out

… and analyse before and after prices for users who decide to opt-out



- The *Difference-in-Difference* approach looks at users who switch from allowing third-party cookies to opting out (or vice versa) over time.
- By comparing the changes in ad prices for these users before and after they switch, while also comparing to users who didn't switch, researchers can isolate the impact of opting out on ad prices.

Note: See more detailed description of the identification strategies in Johnson et al. (2019).

Johnson et al. (2019) estimate the counterfactual price, if third-party cookies were not available, using regression models

By using regression models, the estimation of price differences accounts for various factors, enabling the attribution of price differences solely to the presence or absence of third-party cookies. This allows for a counterfactual analysis where the estimated price difference reflects the impact of cookie availability on ad prices

The estimation models account for different factors such as…

Inventory characteristics: Various attributes related to the advertisement's placement and context, which can significantly impact its value. It includes the specific websites (site domain), the type of content on the website (content category), the size and type of the ad (ad format), and the placement of the ad on the webpage (ad tag).

Time: Temporal variations in ad prices based on the specific time when the ad impression occurs. It includes controls for the specific day of the week and the specific hour during which the ad impression occurs, as user activity and ad performance can vary throughout the week and day.

User attributes: Characteristics related to the user viewing the ad, which can influence the effectiveness and value of the ad impression. It includes the type of browser the user is using (browser type) and the geographical location of the user (country), as these can affect ad prices due to varying levels of support for ad technologies and different market values.

Unobservable factors: Specifically for the Difference-in-Difference approach, it accounts for unobservable factors that can influence the prices. This might for example be user responsiveness to ads, engagement levels, targeting strategies, market conditions, and technological proficiency etc.

When isolating the impact, Johnson et al. (2019) find that prices of contextual ads in the EU are 75%-88% lower than personalised ads

Johnson et al. (2019) find that the price of opt-out impressions is 75% lower than impressions based on third-party cookies in the EU. This corresponds to prices of personalised ads being **4 times** higher than the counterfactual price of contextual ads.

Different estimation results in Johnson et al. (2019)

	Model	Price gap[1] How much less advertisers pay for contextual ads compared to personalised ads	Implied factor between prices[2]	No. of observations Impressions	No. of users
Regression analysis Fingerprint method	Comparison *without* controlling for differences in the two groups	-37%	1.6	31,828,871	3,711,987
	Like-for-like comparison when controlling for differences in the two groups	**-52%**	2.1	31,828,871	3,711,987
	Like-for-like comparison when controlling for differences in the two groups	**-75%**	4.0	23,795,924	1,314,768
Difference-in-Difference approach	Comparison *without* controlling for differences in the two groups	-35%	1.5	23,795,924	1,314,768
	Like-for-like comparison when controlling for differences in the two groups	**-88%**	8.3	23,795,924	1,314,768

To ensure a like-for-like comparison of prices, the researchers accounted for features that influence the price:

- The ad placement (tag)
- The website it was posted on (site)
- The ad dimensions (size)
- The ad content category
- The time of the ad impression (time and day the week).
- The user's country
- The user's browser type
- User browsing history
- User privacy settings

Note: 1) Marginal effect computes the (weighted) average proportional change in opt-out impression prices compared to a baseline counterfactual with cookies. 2) E.g., if the factor is 2, the price on personalised ads is 2 times higher than for contextual ads.
Source: Johnson et. al. (2019)

Overview of estimates in literature

How much do ad prices fall when using contextual ads vs. personalised ads? Articles are described further in the following slides.

Article	Data	Year of data	Outcome	Method used	Implied efficiency-loss[1]
Johnson et al. (2019)	Ad exchange (10k+ advertisers, publishers)	2015	Exchange price	Regression adjustment	**75%[2]**
Beales & Eisenach (2014)	2 ad exchanges	2013	Publisher price	Regression adjustment	**38-67%**
Gu, Johnson & Kobayashi (2025)	Large ad management company	2024	Publisher revenue	Randomised Control Trial	**66%**
Goldfarb & Tucker (2011)	9,596 ad campaigns	2001-2008	User purchase intent (surveyed)	Natural experiment (ePrivacy Directive).	**65%**
Competition and Markets Authority UK (2020)	News UK	2019	Publisher revenue	Difference in revenue through Firefox after removing third-party cookies.	**50-60%**
	Telegraph Media Group	2017	Publisher revenue	Difference in revenue through Safari after removing third-party cookies.	**50-60%**
	DMG Media	-	Publisher revenue	Difference in revenue from non-personalised inventory and personalised inventory.	**60-70%**
	Google	2019	Publisher revenue	Randomised Control Trial of disabling third-party cookies	**70%**
Google (2019)	Google's top 500 publishers	2019	Publisher revenue	Randomised Control Trial of disabling third-party cookies	**52%**
Marotta et al. (2019)	One large multi-site publisher	2017	Publisher revenue	Augmented inverse probability weighting (AIPW)	**4%**
Wang et al. (2023)	One US-based publisher	2018	Publisher revenue	Regression adjustment	**5.7%**
Rafieian & Yoganarasimhan (2020)	Mobile in-app ad network in Asia	2015	Publisher revenue	Regression adjustment	**1.1%**
Alcobendas et al. (2023)	Auction data from Yahoo!	2022	Publisher revenue	Structural auction model	**54%**
Laub et al. (2024)	European ad exchange	2016	Publisher revenue	Regression adjustment, AIPW, Heckman selection	**48%[3]**
Sousa (2024)	Brazilian ad intermediary (196 advertisers, 2,572 publishers)	2022	Publisher revenue	Structural auction model	**57%**

Note: 1) Value estimates measure *loss* in e.g. prices. For articles that report estimates as increases, they are calculated and transformed to losses for ease of comparison. 2) EU-level. 3) Main reported estimate of 18% is based on impression-level estimation that allows for self-selection. Publisher-level estimates result in a 48% price difference, showing the average impact on ad prices across different publishers. The estimate of 48% mitigates some of the selection bias inherent in impression-level data.

Several papers estimate the effectiveness of personalised ads compared to contextualised ads (1/2)

A significant body of literature estimates the impact on publishers' revenue (or advertisers' spend) from personalised ads. The results from these studies indicate a reduction in ad prices of approximately 50-75%. They are all based on European data.

Article	Year of data	Peer reviewed?	Area	Point estimate	Measure	Implied efficiency-loss[1]	Comparison	Method used
Johnson et al. (2019): *Consumer Privacy choice in online advertising: Who opts out and at what cost to industry?*	2015	Yes	EU	**75%**	Lower ad price, in CPM (clicks per mille)	**75 %**	Using only contextual ads vs. behavioural *and* contextual ads	Natural experiment of AdChoices–program that allows users to opt out of behaviourally targeted advertising. The program was implemented in the US, EU and Canada (2014). Estimates based on thousands of advertisers and publishers.
Gu, Johnson & Kobayashi (2025): *The Impact of Privacy-Enhanced Ad Technologies on Publisher Revenue: Evidence from an Industry-Wide Field Experiment.* Work in progress.	2024	No	EU	**66%**	Lower publisher revenue in CPM	**66%**	Ads sold to users with (1) third-party cookies and limited Privacy Sandbox functionality, (2) Privacy Sandbox only, and (3) neither.	Experimental design randomising 2% of all Chrome users at browser level and computing the average treatment effect on treated on publisher revenue.
Beales & Eisenach (2014): *An empirical analysis of the value of information sharing in the market for online content*	2013	Yes	EU	**+60-200%**	Increase in ad prices, in CPM (clicks per mille)	**38-67%**	Ads utilizing cookies vs. not utilizing cookies	Econometric analysis of the availability of cookies allowing for personalised advertising based on a large database of advertising placements provided by two anonymous companies that operate advertising exchanges.

Note: 1) Value estimates measure *loss* in e.g. prices. For articles that report estimates as increases, they are calculated and transformed to losses for ease of comparison.

Several papers estimate the effectiveness of personalised ads compared to contextualised ads (2/2)

A significant body of literature estimates the impact on publishers' revenue (or advertisers' spend) from personalised ads. The results from these studies indicate a reduction in ad prices of approximately 50-75%. They are all based on European data.

Article	Year of data	Peer reviewed?	Area	Point estimate	Measure	Implied efficiency-loss[1]	Comparison	Method used
Goldfarb & Tucker (2011): *Privacy regulation and online advertising*	2001-2008	Yes	EU	**65%**	Lower purchase intention	**65 %**	Ads utilising a smaller amount of personalised data due to stricter regulation	Measure of self-reported purchase intent because of privacy regulation that restricted advertisers' ability to collect data on web users to target ad campaigns.
News UK[3]	2019	No	UK	**50-60%**	Lower publisher revenue	**50-60%**	Ads utilizing third-party cookies vs. not utilizing third-party cookies	Change in revenue generated through Firefox that removed third-party cookies in 2019.
Telegraph Media Group[3]	2017	No	UK	**50-60%**	Lower publisher revenue in CPM	**50-60%**	Ads utilizing third-party cookies vs. not utilizing third-party cookies	Difference in revenue from between Safari and Chrome after Safari removed third-party cookies.
DMG Media[3]	-	No	UK	**60-70%**	Lower publisher revenue per page	**60-70%**	Ads utilizing third-party cookies vs. not utilizing third-party cookies	Change in revenue across Safari and Firefox compared to browsers where third-party cookies are still enabled.
Google[3]	2019	No	UK	**70%**	Lower publisher revenue per query	**70%**	Ads utilizing third-party cookies vs. not utilizing third-party cookies	Randomised Control Trial measuring the change in revenue for Google's top 500 global publishers, but only for UK players.
Laub et al. (2024): *The Economic Value of User-Tracking for Publishers*	2016	Yes	EU	**48%**	Publisher revenue	**48%[2]**	Ads using tracking of users vs. no tracking	Estimation of effect on ad prices when user tracking is not available for desktop browsing. The extent varies across publishers.

Note: 1) Value estimates measure *loss* in e.g. prices. For articles that report estimates as increases, they are calculated and transformed to losses for ease of comparison. 2) Main reported estimate of 18% is based on impression-level estimation that allows for self-selection. Publisher-level estimates result in a 48% price difference, showing the average impact on ad prices across different publishers. 3) Reported by Competition and Markets Authority UK (2020): *Online platforms and digital advertising market study – Appendix F: The role of data in digital advertising*.

A range of studies we do not believe are applicable to our study, mainly because of their scope or method used

We find that some of the literature is not applicable to our approach. It is based on data for a different region or studies the efficiency from a narrow perspective – for instance by looking at one specific publisher. For specific publishers, the effects can be much lower if they are already targeted publishers (e.g. a used-car website will already have an audience that is self-selected into people interested in buying a car – and the value of a personalised ad will thus be much lower).

Article	Year of data	Peer reviewed ?	Country / region	Point estimate	Measure	Comparison	Method used	Main reason for excluding in this study
Marotta et al. (2019): *Online Tracking and Publishers revenues: An empirical analysis*. Working paper	2017	No	-	**4% decrease in publishers' revenues**	In CPM (clicks per mille)	Ads utilizing cookies vs. not utilizing cookies	When cookies are not available, audience-based targeting is not implemented, but other types of targeting can still be possible, e.g., contextual. Estimation based on one publisher's data with 60 different websites.	Data sample is unusually small and based on a sample of highly specialised publications. This means that the marginal value of targeted advertising is limited and is difficult to apply broadly.
Wang et al. (2023): *The early Impact of GDPR Compliance on Display advertising: The case of an Ad Publisher*	2018	Yes	EU	**5.7% decrease in publishers' revenues**	Revenue per click	Contextual targeted vs. only contextual.	Estimation model of the average treatment effect of treated, i.e. on ads to EU consumers from GDPR regulation in the EU. Estimation based on one publisher in the US.	Data sample is unusually small, and based on data from one single publisher, limiting variation. The identification method is quite different compared to the main body of literature.
Rafieian & Yoganarasimhan (2020): *Targeting and Privacy in Mobile Advertising*	2015	Yes	Asian country	**1,1% increase in platform revenues**	Average monetary unit per impression	Behavioural vs. contextual ads.	Modelled predictions using in-app advertising network data from one ad-network in one large Asian country	Asia-based study. Not applicable to the EU economy. Only based on one ad-network – which means the variation of the auction pricing is not sufficiently represented.
Google (2019): *Effect of disabling third-party cookies on publisher revenue*	2019	No	Global	**52% lower publisher revenue**	Revenue per query	Ads utilizing third-party cookies vs. not utilizing third-party cookies	Randomised Control Trial measuring the change in revenue for top 500 global publishers.	Data based on non-EU data and not applicable to the EU economy. Same study with data only for UK publishers is included (see previous page).
Alcobendas et al. (2023): *The Impact of Privacy Protection on Online Advertising Markets*	2022	Yes	US	**54% lower publisher revenue**	Winning bid prices	Ads utilizing third-party cookies vs. not utilizing third-party cookies	Structural model estimating the effect of banning third-party cookies based on Yahoo websites.	Based on one website - which means the variance of the auction pricing is not sufficiently represented. Not based on EU-data. Not applicable to the EU economy.
Sousa (2024): *Competition and Targeting in Auctions for Online Ads.* Working paper	2022	No	Brazil	**60% publisher revenue**	Advertiser spend	Ads utilizing third-party cookies vs. not utilizing third-party cookies	Structural model estimating effect of removing third-party cookies and detangling two opposing effects influencing the winning bid: matching effect and competition effect.	Brazil-based – not applicable to the EU economy.

Other studies look at the same question using alternative efficiency measures

A subset of the literature measures efficiency using click-through rates, resulting in a wide range of estimates. Due to varying baseline comparisons, these estimation methods are difficult to compare and apply directly when assessing the efficiency difference between personalised and contextualised ads. Nonetheless, the studies indicate that increased personalisation enhances the click-through rate.

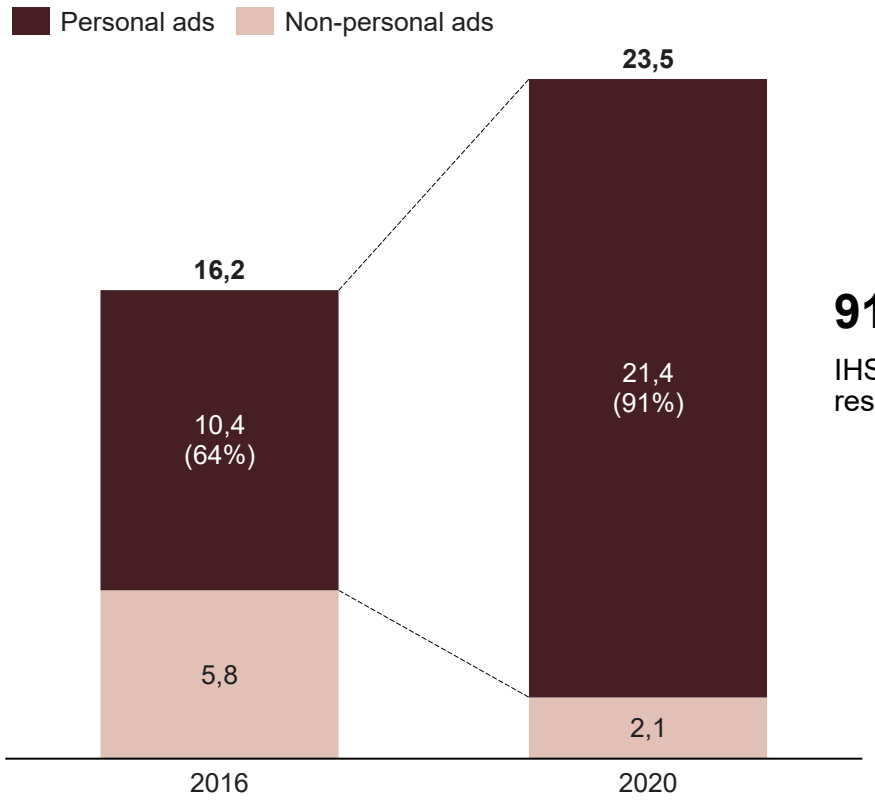
Article	Year of data	Peer reviewed?	Country/ region	Point estimate	Measure	Comparison	Method used
IHS Markit (2017): *The Economic Value of Behavioural Targeting in Digital Advertising*	2016	Yes	EU-28	**5.3x higher click-through rate**	Click-through rate for behaviourally targeted ads vs. standard run-of-network (advertising that is untargeted and delivered to all users of a publisher website or sites within an advertising network).	Conversion rate for run-of network	Industry survey; data on the conversion rates of display banner ads
Bleier & Eisenbeiss (2015): *The importance of trust for personalized online advertising*	2015	Yes	Germany	**27% higher click-through rate**	Click-through rate for high personalisation vs. low personalisation	Low degree of personalisation	Field data collection of click-through responses to agency-generated personalised display banner ads

Out of the EUR 28 billion display ads market, ~90% is estimated to be personalised advertising

A much-used estimate of the European spend on personalised ads in display ads is from IHS Markit (2017) *The economic value of behavioural targeting in digital advertising:*

- IHS Markit estimated that the total display ad spend in 2016 amounted to EUR 16 billion, of which personalised ads constituted 64%.
- They estimate that the total spend on display ads will grow 10% annually on average (CAGR) from 2016-2020, and that the spend on personalised ads will more than double.
- This result is widely used in literature on the size of the personal ad spend in Europe.
- The 2020 number of EUR 21 billion is also cited in several publications from the European Commission.[1]
- Mueller & Castro (2021) estimated a 2020 annual spend of EUR 16 billion, likely referring to IAB Europe's reported spend on social display ads[2]. These ads are *often* personal ads, but personal ads are present on other formats as well.

IHS Markit estimate of digital display ad spend in Europe (29 countries)
billion EUR



91%

IHS forecasted share for 2020, based on research conducted in 2017.

Note: 1) See for example *Online advertising: The impact of targeted advertising on advertisers, market access and consumer choice* (2021) and *Digital Services Act: European Added Value Assessment* (2020).
2) IAB Europe (2021).
Source: Implement Economics analysis based on IHS Markit (2017).

B

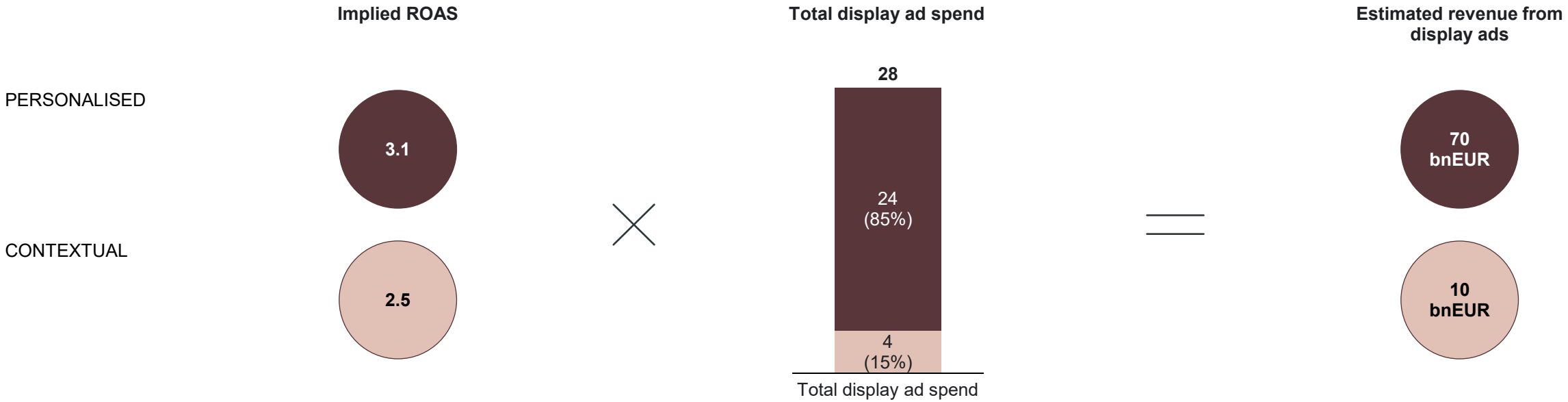
Method

We estimate the efficiency from using personalisation in display ads by firstly estimating the status quo

When the price captures the efficiency loss via the willingness to pay for the ads, we can estimate the corresponding drop in return on ad spend. We assume that the industry-wide Return On Ad Spend (ROAS) is between 3 and 6. Using low-end estimates of the efficiency of personalised ads as well as of ROAS, we estimate that the current return on display ad spend amounts to EUR 80 billion in the EU.

Calculating the return on ad spend in the status quo

LOW END ESTIMATE
USING 50% EFFICIENCY DIFFERENCE AND ROAS 3



These ROAS are based on an assumed weighted average ROAS in the industry of **3**

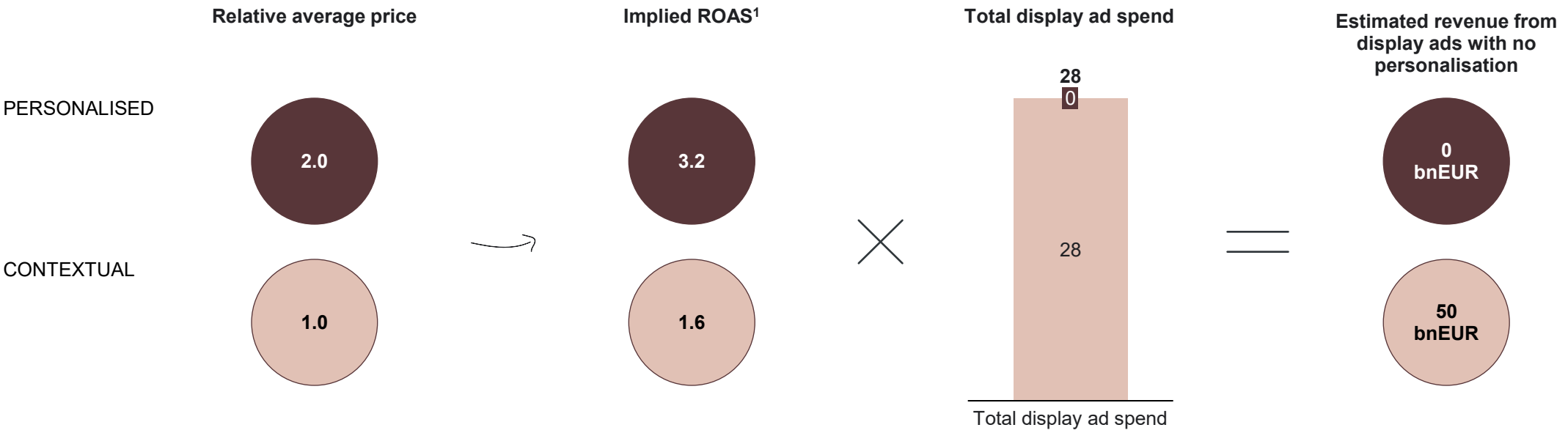
Using both personalised and contextual ads, advertisers' revenues amount to **EUR 80 billion**

If advertisers did not use personalisation, we estimate that advertisers' total revenue from display ads would decrease by ~40% to EUR 50 billion

If advertisers do not use personalisation and spent the total EUR 28 billion on contextual display ads, we estimate that advertisers' return from display ads would decrease by EUR 30 billion annually, corresponding to a ~40% decrease using low end estimates of efficiency and industry-average ROAS.

Calculating the return on ad spend in the scenario with no personalised ads

LOW-END ESTIMATE
USING 50% EFFICIENCY DIFFERENCE AND ROAS 3



These prices reflect that contextual ad prices are **50% lower**

These ROAS are based on an assumed average ROAS in the industry of **3**

Advertisers spend the total of EUR 28 billion on contextual display ads

Using only contextual ads, advertisers' revenue would amount to **EUR 50 billion**

40%
drop in relative revenue due to efficiency loss

Note: 1) The implied ROAS of 1.9 for contextual ads is applicable for the spend on contextual display ads shifted from personalised display ads. The 4 bnEUR also spent on contextual display ads *with* personalised display ads (shown on previous slide) have a ROAS of 2.5

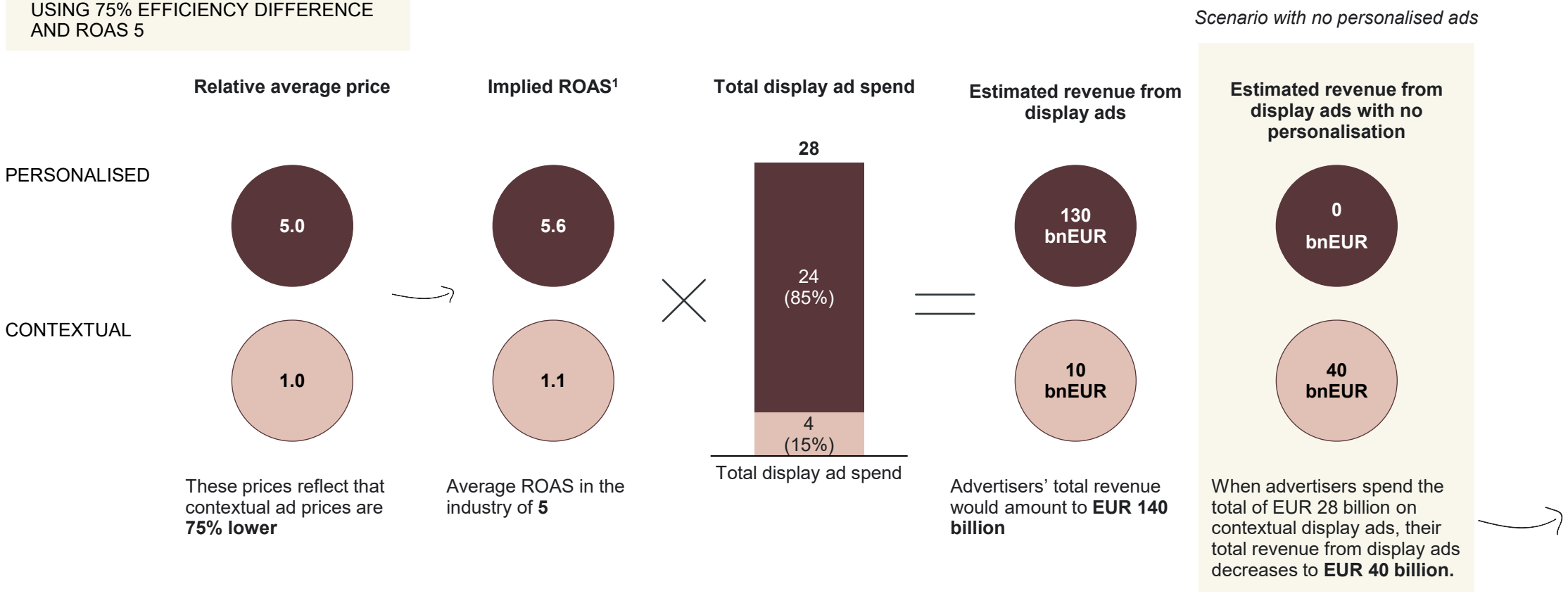
Using high-end estimates, not utilising personalised ads in display advertising would lead to a 70% drop in advertiser revenue

If advertisers spent the total of EUR 28 billion on contextual display ads, and no personalised ads, we estimate that advertisers' return from display ads could decrease by up to EUR 100 billion annually corresponding to a 70% decrease.

Calculating the relative drop in return on ad spend

HIGH-END ESTIMATE
USING 75% EFFICIENCY DIFFERENCE AND ROAS 5

Scenario with no personalised ads



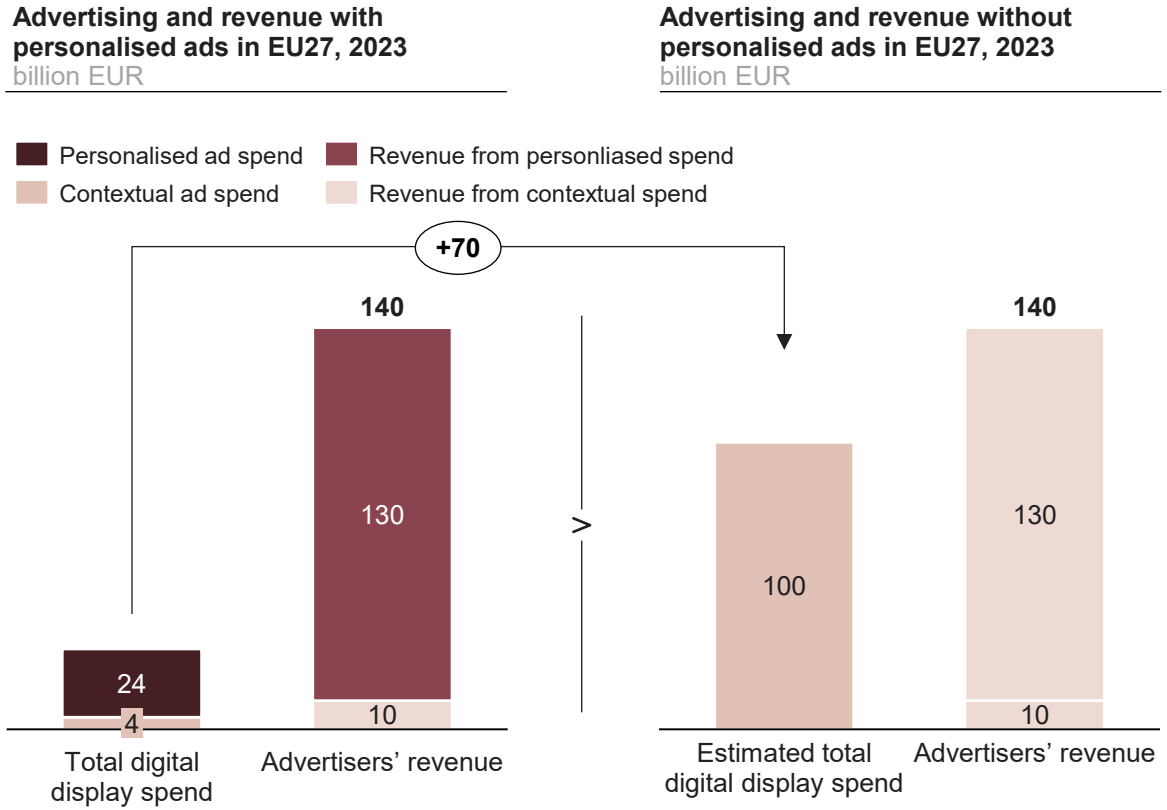
Note: 1) The implied ROAS of 1.2 for contextual ads is applicable for the spend on contextual display ads shifted from personalised display ads. The 4 bnEUR also spent on contextual display ads in the case *with* personalised ads have a ROAS of 2.5

Alternative approach to estimating the efficiency gains from personalised advertising – the *cost increase* calculation

The second approach considers the additional spending required on contextual ads to achieve the same revenue as was generated when also using personalised ads. The second approach thus estimates **the *cost increase.*** We assume an efficiency loss of up to 75% and a ROAS of up to 5. With a lower estimate, of 50% efficiency loss and a ROAS of 3, the corresponding increase in spend would be EUR 20 billion.

Up to…

€70 billion **additional spend to reach current revenue levels without personalised ads**



While this calculation is likewise helpful in gauging the first order effects, it also does not neither does it consider behavioural responses from advertisers or publishers.

The *cost increase* calculation

Assumes that…	Advertisers increase their spending on display ads (contextual ads) to secure an unchanged level of sales.
… implying that…	European advertisers would need to spend between ***EUR 20 billion and EUR 70 billion on non-personalised ads to get the same return*** as they currently do with personalised ads.
… but does not take into account	It is unrealistic to assume that advertisers will increase spending on ads when the alternative is less efficient (in fact, economic theory suggests the opposite). The estimate is *not* additional money that will actually be spent on advertising.

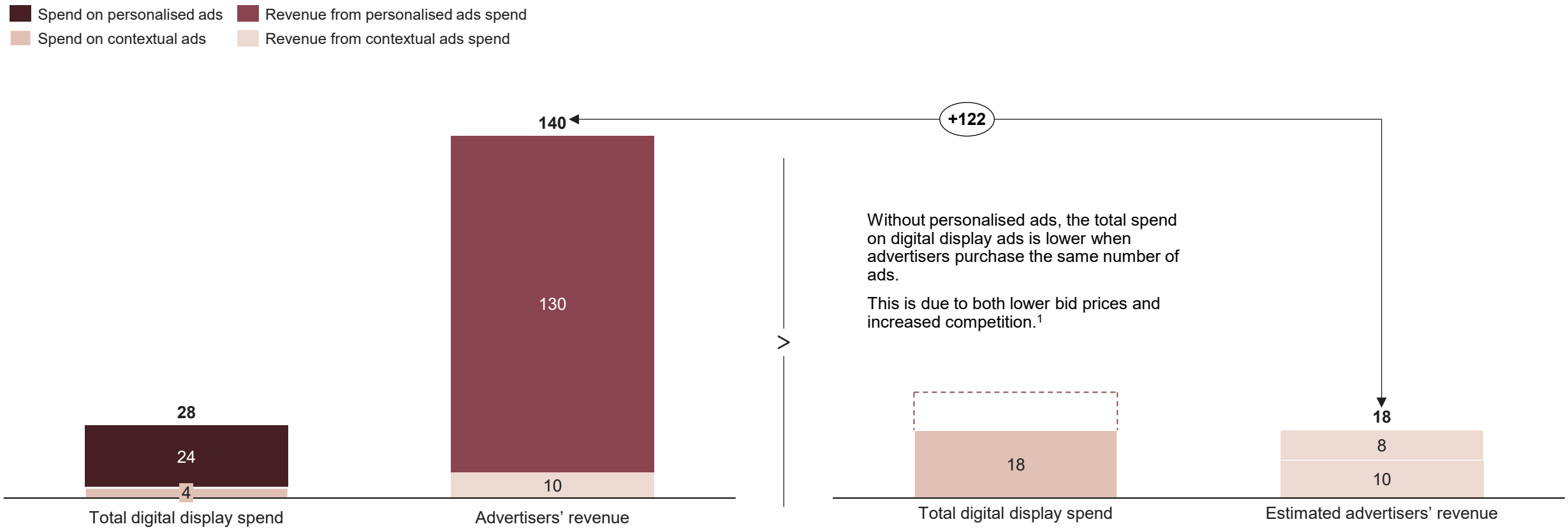
Note: Current contextual ads are assumed a ROAS close to the ROAS of personalised ads – reflecting that the price difference captures much of the difference. In the counterfactual situation however, we assume a smaller ROAS for spend shifted to contextual ad spend, given that the alternative must be worse than paying the premium price for personalised advertising. 1) See for example first order effects in Mueller & Castro (2021).
Source: Implement Economics analysis based on IAB Europe (2024).

Considering behavioural responses, personalised ads generate EUR 14 billion in advertising spend, resulting in up to EUR 122 billion revenue increase

When personalised ads are not available, advertisers buy the same number of ads[1] but as contextual ads. They are less efficient, which lowers overall spend. Assuming that contextual ads are 50-75% less efficient than personalised ads, and that the average ROAS across ads is 3-5, we estimate that spend on ads will decrease by EUR 10 billion, resulting in a reduction of up to EUR 122 billion in advertiser revenue. Our estimates suggest that personalised ads provide advertisers with a revenue gain of EUR 122 billion.

Advertising and revenue with personalised ads in EU27, 2023
billion EUR

Advertising and revenue without personalised ads in EU27, 2023
billion EUR

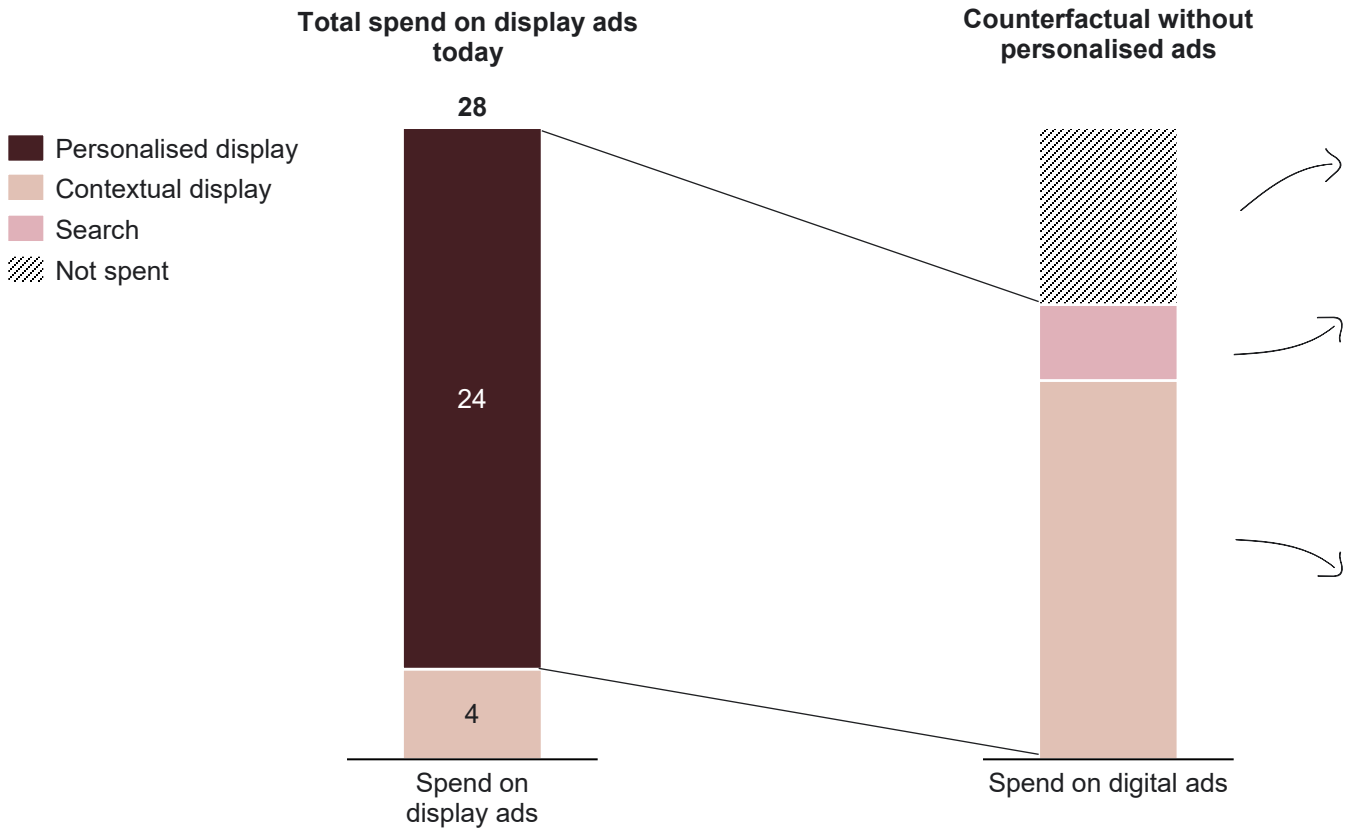


Note: 1) If publishers in fact can sell more ads with or without personalised ads, advertisers can buy more ads and potentially increase their revenue.
Source: Implement Economics analysis based on IAB Europe (2024).

Assessing the efficiency contribution of personalised ads will require establishing a true counterfactual situation without personalised ads

Within digital display, personalised ads are generally much more efficient than contextual ads. In the absence of personalised ads, advertisers could switch to the best alternative ways of advertising such as search, or contextual display ads, and they may decide to reduce their overall spending on ads. The actual resulting drop in spending, and thereby revenue, would likely be lower than the calculated EUR 10 billion in spending drop (and the EUR 122 billion in revenue loss estimated on the prior slide), as some of the spending would shift to search advertising instead.

Total ad spend in EU27 on digital ads in a counterfactual scenario without personalisation
billion EUR



Not spent on advertising

In many cases, other advertising means will not be a viable alternative to personalised display ads, especially not for SMEs. Furthermore, the supply of ads will not rise – so a share of spend would not be able to be deployed in contextual ads. The total advertising spend will likely decrease, resulting in decreasing revenues for businesses. Therefore, the lower spend will not be invested in other means.

Search

Search ads only appear when customers are already searching for the relevant product. Thus, they are particularly useful when the product or service being sold has a short sales cycle. This will mean search ads are a relevant alternative to personalised display ads in only a small share of cases.

Contextual display

While being less effective, contextual display advertising shares many of the characteristics of personalised display ads. Such ads are cheap and easy to deploy, and fulfil the same purpose – driving sales, awareness or advocacy. These might be the best alternative to personalised display ads.

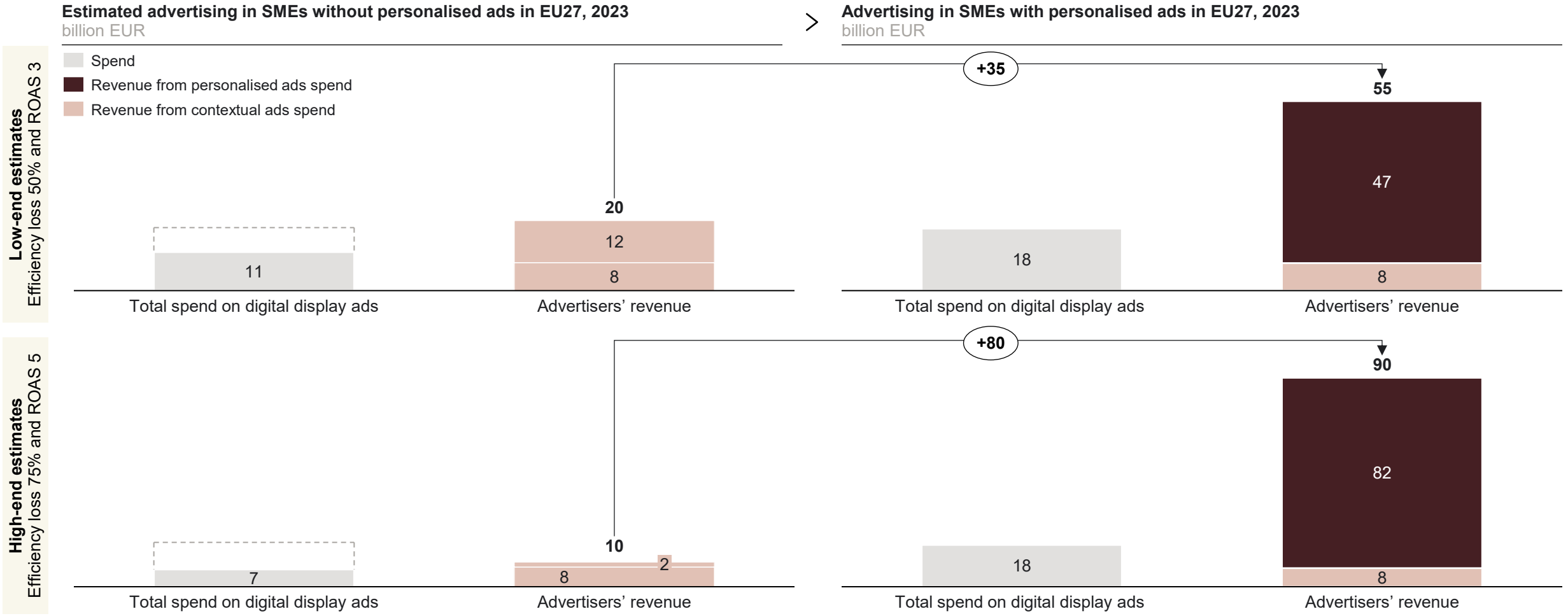
Source: Implement Economics analysis based on IAB Europe (2024).

C

Detailed results

Personalised ads contribute up to EUR 80 billion to SMEs' revenue, compared to a scenario with the current amount of ads space sold

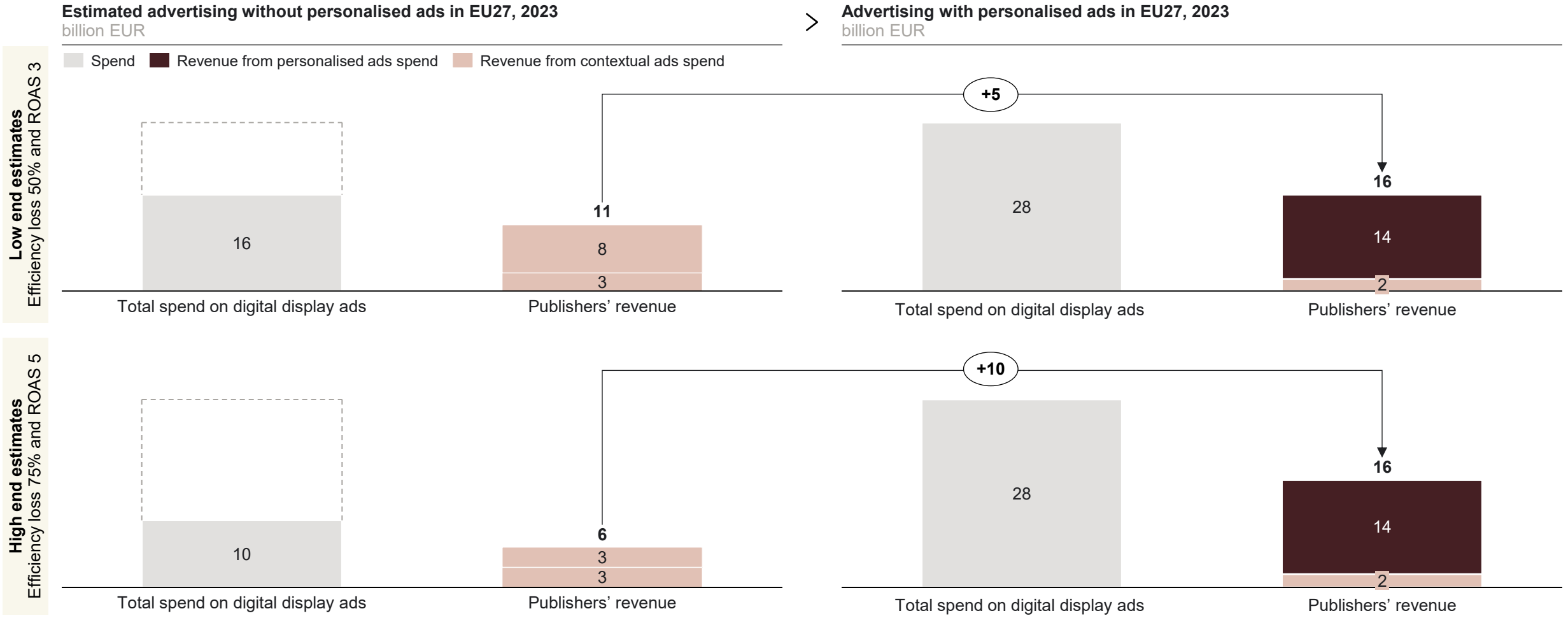
Scenario 1: SMEs buy the same total number of ads with and without personalised ads. SMEs' revenue would be EUR 35-80 billion higher compared to the counterfactual scenario.



Source: Implement Economics analysis based on IAB Europe (2024).

Personalised ads contribute up to EUR 10 billion to publishers' revenue compared to a scenario with the current amount of ads space sold

Scenario 1: Contextual ads are advertisers' next best alternative to personalised ads and publishers sell the same amount of ad space, but at a lower average price than with personalised ads.

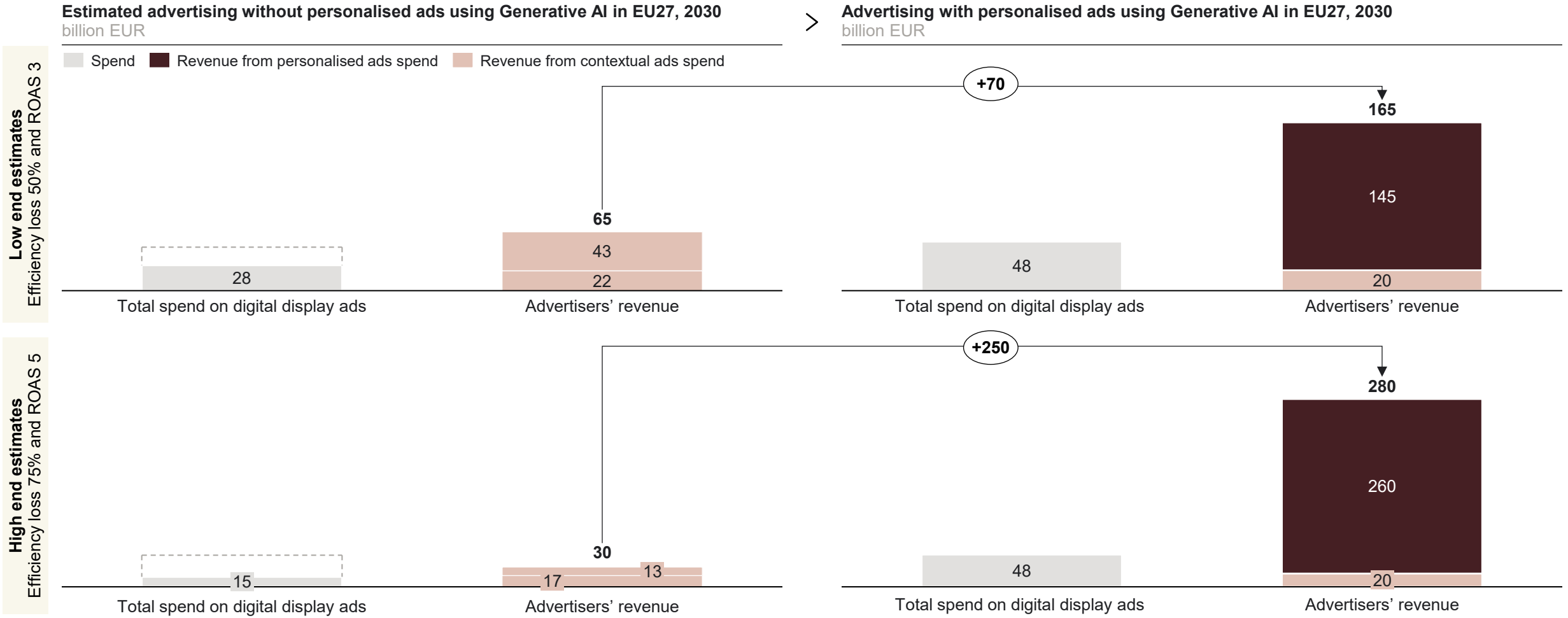


Note: We assume that 57% of advertiser spend ends at publishers.
Source: Implement Economics analysis based on IAB Europe (2024).

Personalised ads using Generative AI contribute up to EUR 20 billion in advertising spend, resulting in up to EUR 250 billion revenue increase

Research indicates that advertisers who employ **Generative AI** for personalised advertising are seeing a **ROAS uplift of 10-25%**.[1]

Scenario 1: Advertisers buy the same total number of ads with and without personalised targeting. Their revenue will be EUR 100-250 billion lower in 2030 without personalised ads.



Note: 1) For simplicity, we assume an average ROAS uplift of 17.5% for personalised ads, corresponding to the average of 10% and 25%. The advertising industry will see a general ROAS uplift from AI (3-5% for contextual).
Source: Implement Economics analysis based on Bain & Company (2024), McKinsey & Company (2024) and IAB Europe (2024).

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