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ACTIVE CHOICE INTERVENTIONS AT SCALE:  
BROWSER DEFAULTS UNDER THE DIGITAL MARKETS ACT

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Active Choice Interventions at Scale: Browser Defaults under the Digital Markets Act  
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### **ABSTRACT**

Can active choice mitigate preset-default effects? Using difference-in-differences around the EU Digital Markets Act's choice-screen mandate, we study Firefox on iOS and Android. From month 15 onward, Firefox usage was 91 percent higher on iOS and 13 percent higher on Android relative to a no-mandate counterfactual. The platform gap is consistent with rollout differences: iOS reached existing users, while Android primarily reached new devices. Market-share data corroborate movement away from defaults: Safari declined on iOS, with gains concentrated in Chrome; Firefox's smaller gains were meaningful relative to baseline. Chrome declined on Android, where it was default, and Firefox rose modestly.

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# 1 Introduction

Default settings are pervasive in digital markets. Mobile operating systems can preinstall an application and set it as the default, leading many consumers to use it without making an active choice. This has raised policy concerns that default settings may shape behavior even when switching is in principle feasible. In digital ecosystems, firms that control a key access point may use defaults to steer consumers toward their own related products and services.

For instance, consumers can choose among multiple web browsers that differ in performance, compatibility, privacy protections, integration with other services, and their providers’ business models. Yet mobile operating systems typically preset an affiliated browser—Safari on iOS and Chrome on many Android devices—whether or not it is the user’s preferred option. Choice screens have been proposed as a way to counter this form of steering by requiring users to make an active selection rather than passively rely on the preset default.

In March 2024, the European Union’s Digital Markets Act (DMA) required browser choice screens on iOS and Android. The requirement formed part of the DMA’s broader effort to facilitate “contestable and fair markets in the digital sector.” Article 6(3) requires designated gatekeepers—large digital platforms that control important access points between businesses and users—to enable users to “easily change default settings” that “direct or steer end users to products or services provided by the gatekeeper.” For web browsers, this includes prompting users to choose from “a list of the main available service providers” rather than relying on the browser selected by the operating-system provider ([European Union, 2022](#)).

We study whether this intervention shifted browser usage away from preset defaults. Using novel data from Mozilla, we construct a country-by-week panel of Firefox daily active users across 70 countries from 2022 to 2025. Our difference-in-differences design compares changes in the 27 EU member states around the March 2024 rollout with contemporaneous changes in 43 non-EU comparison countries. We estimate effects separately for iOS and Android, which implemented the mandate differently.

The browser setting provides a compelling opportunity to study active choice at scale. The DMA introduced a common policy across a large set of countries at a known date, while differences in implementation across iOS and Android allow us to examine how exposure and choice architecture shape the response. The analysis also introduces a new source of behavioral measurement: to our knowledge, this is the first academic study to use these Mozilla data. The panel allows us to trace the magnitude, timing, and persistence of observed usage changes at a scale that is difficult to capture using surveys or selected samples.

We find a persistent increase in Firefox usage after the mandate, with substantially larger

effects on iOS than on Android. The effects also grow over the initial months: from 15 months after the mandate onward, Firefox usage is about 91 percent higher on iOS and about 13 percent higher on Android relative to a no-mandate counterfactual.

The contrast across platforms is consistent with differences in rollout decisions. The iOS choice screen was displayed to all existing users with iOS 17.4 and again to users with iOS 18.2 and Safari set to default. In contrast, Android browser choice screens were displayed primarily to new devices, and only to those for which Chrome was the default browser. Thus, exposure to choice screens was considerably higher for users of iOS devices than for users of Android devices. A back-of-the-envelope exposure adjustment suggests that the smaller Android estimate partly reflects limited exposure rather than a negligible response among users who saw the choice screen.<sup>1</sup>

While the Firefox data allow for novel insight into consumer decisions, the main analysis also has limitations. The Mozilla data allow us to observe usage for Firefox but not for other browsers. We also observe aggregate daily active users rather than individual-level behavior. Accordingly, our main analysis speaks to how the DMA choice-screen mandate affected Firefox usage, rather than to complete market-wide substitution patterns or individual heterogeneity.

As a complementary analysis, we use third-party market-share data to examine whether the DAU results are reflected in browser market shares. Specifically, we analyze the market shares of Chrome, Safari, and Firefox on iOS and Android. The results are broadly consistent with our main findings. Market shares shift away from the browser that was preset as the platform default: Safari on iOS and Chrome on Android. At the same time, Chrome gains share on iOS, where Safari—not Chrome—was the default. On iOS, Safari’s market share declines by 6.93 percentage points, while Chrome’s market share increases by 6.65 percentage points. Firefox also increases its market share by 0.22 percentage points, which is sizable relative to its pre-treatment average market share of 0.49 percent. On Android, the results similarly point to movement away from the preset default, but are noisier. Our estimates suggest that Chrome’s market share declines by 1.93 percentage points, while Firefox’s market

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<sup>1</sup>A recent industry survey of 5,186 smartphone users across France, Germany, Spain, Sweden, and the UK found that 36% planned to buy their next smartphone within a year ([Vodafone Institute for Society and Communications, 2025](#)). To make this comparable with our estimator, we linearly adjust this figure to a 15-month window, which implies roughly 45%. Moreover, data from Statcounter suggest that Samsung devices account for about 51% of EU Android usage ([Statcounter Global Stats, 2026a,b](#)). While Google states that some Samsung devices do not have Chrome as the default browser, we do not observe the share. Under bounding assumptions about the share of Samsung devices shown a choice screen, these inputs imply a rough exposure-adjusted effect in the range of 28% to 58%. This calculation is intended to be illustrative rather than definitive. In particular, it abstracts from additional Android exposure through factory resets and eligible existing Pixel devices, for which we do not observe a comparable denominator.

share increases by 0.111 percentage points.<sup>2</sup> Overall, these market-share patterns provide corroborating evidence for the main DAU results, while also highlighting the greater noise and sensitivity of the Android market-share estimates.

More broadly, the results show that active choice can shift behavior in a major digital market, while also highlighting the importance of implementation. The markedly different responses across iOS and Android suggest that the reach and design of the intervention shape both the magnitude and timing of its effects. Although Firefox begins from a small base, especially on iOS, the results demonstrate that active-choice interventions can generate persistent changes in observed usage at scale.

## Related Literature

A large literature has found that default settings often affect behavior. An early canonical example pertained to retirement saving, where automatic enrollment substantially increased 401(k) participation, and many individuals remained at default contribution rates and asset allocations (Madrian and Shea, 2001; Choi et al., 2002; Beshears et al., 2009). More recent evidence suggests that the level of the default also matters: higher defaults may be less sticky than lower ones, but still influence a meaningful share of employees (Beshears et al., 2025). Defaults also shape choices in other domains, including organ donation and end-of-life care (Johnson et al., 2012; Abadie and Gay, 2006; Halpern et al., 2013). Consistent with this broader evidence, Jachimowicz et al. (2019) document large average default effects alongside substantial heterogeneity across contexts.

Another strand of this literature explores mechanisms behind default effects. In some cases, defaults may be interpreted as implicit recommendations. Default effects may also operate through inertia, cognitive costs, or inattention (Sunstein, 2013; Jachimowicz et al., 2019). For instance, evidence from health-plan choice is consistent with inattention playing an important role (Brot-Goldberg et al., 2023).

The prevalence of default effects, especially when preferences are unknown or incentives are misaligned, has motivated policies that require active choice rather than reliance on a preset option. Evidence on active-choice interventions is mixed. In the context of organ donation, Kessler and Roth (2014) find that a yes/no active-choice frame did not increase registrations relative to a conventional opt-in frame. At the same time, they show that other question wording can matter, and that asking individuals to reconsider their donor status

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<sup>2</sup>This excludes Russia from the control group, since Russia exhibits an abrupt decline of around 18 percentage points in Chrome’s market share between December 2023 and January 2024, due to shocks unrelated to the DMA.

increases registrations.

Related theoretical work highlights how control over digital access points can enable steering and cross-market leverage, with important implications for entry and competition (Heidhues et al., 2024). In this context, the design of user-choice mechanisms is itself economically relevant: Ostrovsky (2023) studies auctions used to allocate positions in search-engine choice screens and shows that seemingly small auction-design choices can materially affect market outcomes. More broadly, recent work on digital platforms emphasizes how data and information structures shape competition and market power in digital environments (Bergemann and Bonatti, 2024). The effects of user-choice interventions may depend on the presence of viable challengers and on how such policies interact with other regulatory changes (Decarolis and Li, 2023). Related work also highlights how economics can help clarify the effects of the DMA, including the role of implementation and enforcement in shaping competitive outcomes (Fletcher et al., 2024; Crémer et al., 2023). A small recent literature studies such interventions in digital markets. Existing work finds effects ranging from relatively modest to substantially larger across settings (Decarolis et al., 2025; Allcott et al., 2025). Related work has begun to look at the impact of the Digital Markets Act. For instance, Pape and Rossi (2026) study Google’s DMA-induced changes to map results and find little evidence of traffic gains for rival mapping services.

Our results highlight two margins that shape active-choice interventions at scale: exposure, or how many users encounter the choice, and conversion, or whether the prompt leads users to adopt and continue using an alternative. These margins help explain why the same broad policy generated larger and faster effects on iOS, where the screen reached existing users, than on Android, where exposure accumulated mainly through new devices. More broadly, the market-share results show that weakening a platform default need not imply deconcentration: on iOS, much of the movement away from Safari went to Chrome, while on Android Chrome lost share when it was the preset default. Thus, choice screens can reduce default advantage without eliminating broader incumbent advantages.

## 2 Choice Screens and the DMA

The EU Digital Markets Act (DMA) entered its implementation and enforcement phase on 7 March 2024. From that date, operating system providers with a designated browser are required to present EU users with a browser choice screen, prompting an active choice rather than reliance on a preset default.

In practice, Android and iOS implemented this requirement in materially different ways.

On Android, the choice screen appears on new or factory-reset devices during initial setup and on all Google Pixel handsets (Android, 2024). Users must select a browser, which is then installed (if needed) and set as the system default for opening links from other apps. However, except for new Pixel devices after March 2026, Chrome typically remains pinned to the home-screen dock (“hotseat”), preserving salience even after an alternative is selected (Alphabet, 2026). On iOS, the choice screen is shown when a user first launches Safari on any device running a compliant OS version, not only on new devices. Apple introduced the screen in iOS 17.4, where users could initially defer the choice via a “Not Now” option; later versions (iOS 18.2 and higher) increased commitment by removing deferral and requiring users to engage with the full list before setting a default. Also in iOS 18.2 and higher, Apple’s implementation pins newly downloaded browsers via the DMA choice screen to the hotseat in place of Safari (Apple, 2026). Screenshots of these implementations are provided in Appendix Figures A1–A3.

We treat the DMA mandate as a natural experiment to study how browser choice screens affect downstream usage. We first estimate average effects on overall usage, and then quantify platform-specific effects for iOS and Android.

### 3 Data

We measure mobile browser usage using client-based daily active users (DAU), defined as the number of Firefox clients that ran on a given calendar day. DAU is the main outcome of interest. Our sample spans January 1, 2022 to December 31, 2025 and includes 27 EU member states, which were subject to the DMA browser choice-screen mandate, and 43 non-EU comparison countries. For each country, we observe DAU separately for iOS, Android, and their combination (Total). The weekly series are constructed as Monday–Sunday averages of daily active users. Table 1 reports descriptive statistics for the main DAU measures<sup>3</sup>.

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<sup>3</sup>We exclude non-European countries that, on average, had fewer than 10,000 daily active users, due to the high level of noise in their data, with many of them even recording zero users on some days.

**Table 1:** Descriptive Statistics: Daily Active Users

|         | Total     |         | iOS     |         | Android   |         |
|---------|-----------|---------|---------|---------|-----------|---------|
|         | Mean      | SD      | Mean    | SD      | Mean      | SD      |
| EU      | 4,799,204 | 753,051 | 871,742 | 336,004 | 3,927,463 | 422,786 |
| US      | 2,211,595 | 126,880 | 760,485 | 46,440  | 1,451,110 | 83,263  |
| IN      | 708,073   | 93,878  | 40,299  | 5,706   | 667,775   | 88,663  |
| IR      | 471,663   | 70,930  | 24,606  | 4,398   | 447,057   | 67,278  |
| GB      | 427,187   | 24,619  | 102,436 | 5,762   | 324,751   | 19,004  |
| CN      | 370,336   | 53,695  | 132,460 | 13,932  | 237,876   | 43,169  |
| BR      | 344,105   | 22,651  | 40,294  | 5,042   | 303,812   | 18,239  |
| JP      | 315,744   | 12,560  | 81,336  | 1,874   | 234,409   | 11,943  |
| CA      | 301,470   | 32,166  | 83,665  | 8,152   | 217,805   | 24,061  |
| RU      | 216,580   | 6,232   | 20,702  | 1,187   | 195,878   | 6,443   |
| AU      | 190,991   | 16,012  | 50,644  | 3,547   | 140,347   | 12,613  |
| Overall | 175,517   | 16,177  | 35,954  | 5,991   | 139,563   | 10,302  |

Notes: Statistics computed using weekly averages of daily active users over the estimation sample. The table reports the European Union aggregate and the ten largest non-EU countries by average total usage. Overall reports the unweighted average across all 70 countries in the analysis sample.

### 3.1 Empirical Strategy

Our identification strategy exploits the fact that the March 2024 DMA rollout required browser choice screens in EU member states, but not in other countries. We analyze the effects of the mandate in two complementary ways. First, we present graphical evidence on the evolution of Firefox usage around the rollout, aggregating countries into broader regions for ease of visualization. Second, we estimate difference-in-differences specifications that compare changes in Firefox usage in countries where browser choice screens were required with contemporaneous changes in other countries.

Our main specification is

$$\log(DAU_{ct}) = \alpha + \beta \text{ChoiceScreen}_{ct} + \delta_c + \gamma_t + \varepsilon_{ct}, \quad (1)$$

where  $c$  indexes countries and  $t$  indexes weeks.  $\text{ChoiceScreen}_{ct}$  is an indicator equal to one for EU member states in the post-mandate period and zero otherwise,  $\delta_c$  are country fixed effects,  $\gamma_t$  are week fixed effects, and  $\varepsilon_{ct}$  is an error term. We estimate this specification separately for Total, iOS, and Android DAU and cluster standard errors at the country level. The coefficient  $\beta$  captures the average change in Firefox usage after the mandate in countries required to implement browser choice screens relative to the contemporaneous change in other countries.

To study dynamics, we replace the single treatment indicator with interactions between the treatment indicator and indicators for months since the mandate, grouping month 15 and



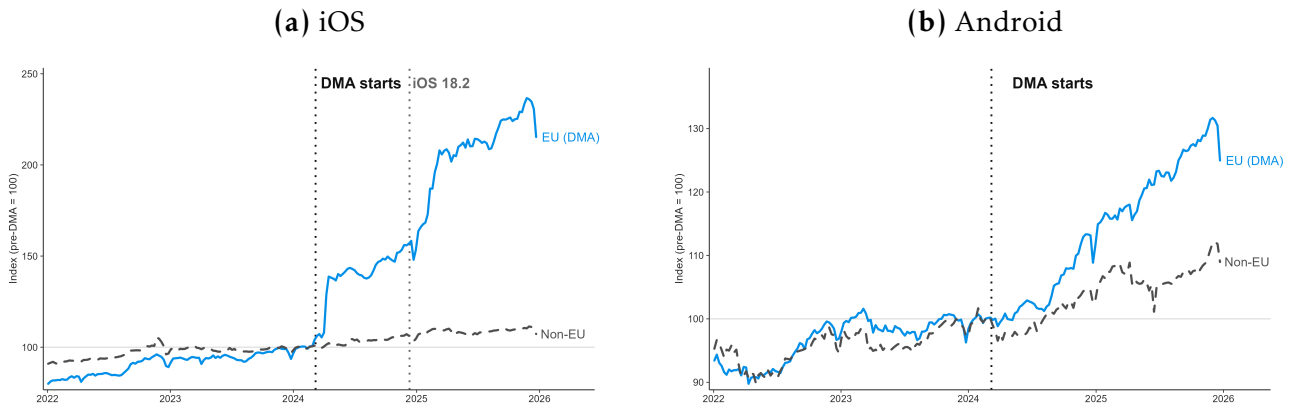
beyond into a single bin. This allows the estimated effect of the policy to evolve flexibly over time and makes it possible to compare the timing and magnitude of the response across platforms. Our interpretation of the difference-in-differences estimates rests on the assumption that, absent the DMA browser choice-screen mandate, Firefox usage in countries required to implement browser choice screens would have followed trends similar to those in other countries, conditional on country and week fixed effects.

## 4 Results

### 4.1 Graphical Evidence

The graphical evidence shows a clear post-mandate divergence in Firefox usage around the March 2024 DMA rollout. Figures 1a and 1b plot the evolution of weekly average DAU around the rollout for the treated region and comparison regions. In both cases, usage in the treated region rises relative to the comparison regions after the mandate. The divergence is especially sharp on iOS, where the treated series begins to pull away immediately after the rollout. On Android, the divergence emerges more gradually and remains substantially smaller throughout the post-mandate period.

**Figure 1:** Firefox usage in the EU versus non-EU before and after DMA browser choice screens



*Notes.* The vertical dashed line marks the introduction of DMA browser choice screens on 7 March 2024. In panel (a), the second vertical line marks the compliance-related iOS 18.2 update in December 2024. The plotted series show weekly averages of daily active Firefox clients for the EU and the non-EU comparison series, indexed so that the pre-DMA average equals 100. Group-level series are constructed by aggregating country-level observations within each group. Daily active users are client-based: a client is counted on a day if Firefox runs on that device, so DAU should not be interpreted as the number of distinct people. The EU series aggregates AT, BE, BG, CY, CZ, DE, DK, EE, ES, FI, FR, GR, HR, HU, IE, IT, LT, LU, LV, MT, NL, PL, PT, RO, SE, SI, and SK.

These figures suggest four key results. First, browser choice screens increased Firefox usage in the countries where they were required: in the pre-mandate period, the treated and comparison series evolve broadly similarly, with the main divergence emerging only after the March 2024 rollout. Second, the effects were much larger on iOS than on Android. Third, the timing of the response differs across platforms: the iOS response appears quickly and reaches a much higher level, whereas the Android response builds more slowly and remains substantially smaller. Fourth, Firefox usage on iOS rises further after the compliance-related update accompanying iOS 18.2. Together, these patterns are consistent with the differences in rollout and implementation discussed above.

## 4.2 Average Effects

Table A1 reports our baseline difference-in-differences estimates. Across specifications, the estimated effects are positive and precisely estimated. These estimates summarize the average effect over the full post-mandate period. Converting the log-point estimates to percentage changes,<sup>4</sup> the estimates imply average increases of about 15 percent for total mobile usage, 60 percent for iOS, and 6 percent for Android relative to the no-mandate counterfactual.

The average effects confirm that browser choice screens increased Firefox usage and that the increase was much larger on iOS than on Android. At the same time, these estimates mask important dynamics. They combine the immediate response to the rollout with the subsequent evolution of usage, which is especially important in this setting because exposure to choice screens accumulated differently across platforms.

## 4.3 Dynamic Effects and Long-Run Impact

Table 2 allows the effect of the mandate to vary flexibly over time. The dynamic estimates reveal a striking contrast across platforms. On iOS, the response is immediate and grows steadily over time. The first-month effect is already positive and statistically significant, and the effect continues to rise over the following months. On Android, by contrast, the initial effect is close to zero and the response emerges only gradually. These dynamics are consistent with the institutional differences in implementation: iOS exposed a broad set of users quickly, whereas Android exposure accumulated more slowly<sup>5</sup>.

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<sup>4</sup>Percentage effects are computed as  $100 \times (\exp(\beta) - 1)$ .

<sup>5</sup>For the dynamic specification, “months since treatment” are calendar months relative to March 2024: each week is assigned to the calendar month of its Monday, so Month 1 is the post-treatment portion of March 2024, Month 2 is April 2024, and so on, while Month 15+ includes all weeks from May 2025 onward. Months are therefore calendar months, not 30-day windows or fixed blocks of weeks, and contain four or five weeks depending on the calendar.

Our preferred estimate of the longer-run effect comes from the 15+ month bucket. For iOS, the estimated longer-run effect is 0.6471 log points, obtained by summing the main effect and the Month 15+ interaction. This corresponds to an increase of about 91 percent relative to the no-mandate counterfactual. For Android, the corresponding estimate is 0.1198 log points, or about 13 percent. For total mobile usage, the corresponding longer-run effect is 0.2198 log points, or about 25 percent. These longer-run estimates are substantially larger than the average post-period effects, especially on iOS.

The dynamic results highlight that the effects of browser choice screens build over time. This matters for interpretation and for policy evaluation. In settings where exposure accumulates gradually, short-run evaluations may materially understate the effects of active-choice interventions. Our results suggest that implementation details determine not only the size of the response, but also how quickly that response emerges.

**Table 2:** Effects of choice screens on log daily active users over time

|                           | <i>Dependent variable: log(DAU)</i> |                       |                       |
|---------------------------|-------------------------------------|-----------------------|-----------------------|
|                           | Total<br>(1)                        | iOS<br>(2)            | Android<br>(3)        |
| Choice Screen             | 0.0144<br>(0.0160)                  | 0.1107***<br>(0.0145) | -0.0029<br>(0.0177)   |
| Choice Screen × Month 2   | 0.0340***<br>(0.0073)               | 0.1391***<br>(0.0103) | 0.0103<br>(0.0079)    |
| Choice Screen × Month 3   | 0.0577***<br>(0.0102)               | 0.2080***<br>(0.0163) | 0.0244**<br>(0.0110)  |
| Choice Screen × Month 4   | 0.0661***<br>(0.0117)               | 0.2267***<br>(0.0191) | 0.0300**<br>(0.0123)  |
| Choice Screen × Month 5   | 0.0494**<br>(0.0201)                | 0.2173***<br>(0.0267) | 0.0124<br>(0.0209)    |
| Choice Screen × Month 6   | 0.0492***<br>(0.0184)               | 0.2177***<br>(0.0264) | 0.0130<br>(0.0195)    |
| Choice Screen × Month 7   | 0.0696***<br>(0.0170)               | 0.2458***<br>(0.0202) | 0.0318<br>(0.0191)    |
| Choice Screen × Month 8   | 0.0709***<br>(0.0159)               | 0.2361***<br>(0.0154) | 0.0350*<br>(0.0184)   |
| Choice Screen × Month 9   | 0.0733***<br>(0.0177)               | 0.2292***<br>(0.0153) | 0.0391*<br>(0.0208)   |
| Choice Screen × Month 10  | 0.0883***<br>(0.0216)               | 0.2415***<br>(0.0178) | 0.0550**<br>(0.0255)  |
| Choice Screen × Month 11  | 0.0933***<br>(0.0218)               | 0.2715***<br>(0.0218) | 0.0533**<br>(0.0249)  |
| Choice Screen × Month 12  | 0.0944***<br>(0.0211)               | 0.3521***<br>(0.0220) | 0.0336<br>(0.0242)    |
| Choice Screen × Month 13  | 0.1230***<br>(0.0214)               | 0.4623***<br>(0.0227) | 0.0401<br>(0.0244)    |
| Choice Screen × Month 14  | 0.1416***<br>(0.0223)               | 0.4647***<br>(0.0236) | 0.0623**<br>(0.0255)  |
| Choice Screen × Month 15+ | 0.2054***<br>(0.0289)               | 0.5364***<br>(0.0288) | 0.1227***<br>(0.0338) |
| Country fixed effects     | Yes                                 | Yes                   | Yes                   |
| Week fixed effects        | Yes                                 | Yes                   | Yes                   |
| Clusters                  | Country                             | Country               | Country               |
| Observations              | 14,560                              | 14,560                | 14,560                |
| R <sup>2</sup>            | 0.99597                             | 0.99690               | 0.99493               |
| Total effect, Month 15+   | 0.2198<br>[24.58%]                  | 0.6471<br>[91.01%]    | 0.1198<br>[12.73%]    |

Clustered standard errors at the country level in parentheses. *Choice Screen* captures the immediate effect of choice screens in the first month after introduction (Month 1). *Choice Screen × Month X* captures the additional deviation in month X relative to this first-month effect; the total effect in month X is the sum of both coefficients. EU member states enter as separate treated units. *Total effect, Month 15+* is the sum of *Choice Screen* and its Month 15+ deviation; the implied percentage change,  $(e^{\beta} - 1) \times 100$ , is reported in brackets. Significance levels: \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

## 4.4 The iOS 18.2 Redesign

The iOS 18.2 update was followed by a second sharp rise in Firefox DAU, with the increase over the next several months comparable in magnitude to the initial post-DMA jump. The update bundled several changes to the choice-screen implementation. Early DMA screens allowed users to defer the choice by tapping “Not Now”; iOS 18.2 removed deferral, required users to engage with the full browser list before setting a default, provided more information within the choice flow, streamlined selection and installation, and allowed newly downloaded browsers to replace Safari in the hotseat under the conditions described by Apple. These changes made the choice screen more binding and easier to act on, and the timing of the redesign coincides with the second sharp rise in DAU (Figure 1a).<sup>6</sup>

Table A3 shows that the DMA choice screen substantially increased Firefox usage on iOS, with the effect becoming larger after iOS 18.2. Column (1) estimates that, before iOS 18.2, Firefox DAU increased by about 36 percent in treated EU countries relative to the control group. After iOS 18.2, the total effect rises to about 79 percent, suggesting a substantially larger response following the redesign. Columns (2) and (3) show that this increase was also dynamic. In column (2), the immediate choice-screen effect is about 23 percent, and Firefox usage in treated EU countries continues to grow by roughly 0.5 percent per week after the DMA; once this trend is included, the additional post-18.2 level effect is smaller, about 3 percent. Column (3) further shows that iOS 18.2 is associated with both an additional level increase of about 4 percent and a steeper post-18.2 trajectory: the weekly treatment trend rises from about 0.4 percent per week before iOS 18.2 to about 0.6 percent per week afterward.

Overall, the results suggest that the iOS 18.2 redesign was associated with both a discrete increase in Firefox usage and faster subsequent growth. This pattern is consistent with a stronger active-choice intervention, but the update changed several features at once. We therefore interpret the estimates as the response to the bundled redesign rather than as the effect of any single design feature.

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<sup>6</sup>Table A2 provides more detail about the design changes between iOS versions and the potential behavioral channels.

## 4.5 Market Share Analysis

Using Cloudflare Radar, we obtain browser-market-share data that provide a broad, though noisy, measure of observed web traffic across websites. Our data span October 2022 to December 2025, beginning with the first month for which Cloudflare published its Browser Market Share Report (Cloudflare Radar, 2026). Unlike the Mozilla data, which measure Firefox usage directly but only for Firefox, the Cloudflare data allow us to examine whether the DMA choice screens shifted market shares across browsers more broadly and to distinguish between iOS and Android devices.<sup>7</sup> We focus on Chrome, Safari, and Firefox: Chrome and Safari because they are the dominant mobile browsers, and Firefox because it allows us to assess whether the increase in Firefox usage documented above is also reflected in market-share data.<sup>8</sup>

These data should not be interpreted as a perfect measure of browser usage. Baseline shares may be measured with error, and Firefox usage may be undercounted if Firefox users are more likely to limit third-party measurement. We therefore interpret the Cloudflare estimates as evidence on relative market-share patterns within observed web traffic, rather than as a direct measure of total browser usage.

The market-share results in Table 3 reinforce the main interpretation. The clearest evidence comes from iOS, where Safari is the default browser. After the DMA rollout, Safari's iOS market share falls sharply in treated countries relative to comparison countries, while Chrome's share rises by a similar amount and Firefox's share also increases. By Month 15 onward, the estimates imply an increase of about 6.65 percentage points for Chrome and a decline of about 6.93 percentage points for Safari. Firefox's estimated gain is smaller in absolute terms, about 0.22 percentage points, but meaningful relative to its very low baseline share of less than 0.50 percent in the Cloudflare data. Thus, the iOS choice screen appears to have moved users away from Safari, mostly toward Chrome, but also toward Firefox.

On Android, where Chrome is the preset default, the market-share evidence is also con-

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<sup>7</sup>Cloudflare is our main data on market share, since it allows us to see market shares broken out by iOS and Android, which have different defaults and choice screens. Statcounter is another source of third-party data, but these data are not separated by iOS and Android so we are unable to use them for the main analysis. In appendix Tables A6 and A5, we look at shifts in market share across iOS and Android combined, using both Cloudflare and Statcounter data. Across both we find that Chrome share moves less, consistent with the fact that it has increased in iOS but decreased on Android. We also find that Firefox market share increases around 0.09-0.14 percentage points in Cloudflare and 0.25-0.30 percentage points in Statcounter depending on whether Russia is excluded.

<sup>8</sup>The EU group includes Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden. The non-EU comparison group includes Australia, Canada, India, Russian Federation, New Zealand, South Africa, Switzerland, Turkey, United Kingdom, and United States.

sistent with movement away from the default, although the estimates are more sensitive to sample composition. During data validation, we observed unusually large movements in Android browser shares for Russia during the sample period, including an abrupt decline in Chrome’s market share around the beginning of 2024. We do not attribute these movements to the DMA, and they may reflect Russia-specific market or measurement factors. Because Russia is part of the non-EU comparison group and this movement can affect the Android estimates, we report the Android results both including and excluding Russia. Excluding Russia, the estimates imply a decline of about 1.93 percentage points for Chrome and an increase of about 0.11 percentage points for Firefox. The Android results are therefore consistent with the choice screen weakening Chrome’s default advantage, although we interpret them more cautiously than the iOS estimates because the pre-treatment patterns are noisier.

Overall, the Cloudflare evidence suggests that the DMA choice screens did not only increase Firefox usage in Mozilla’s own data; they also shifted observed browser traffic away from the relevant platform default. The direction of movement differs across platforms because the default differs across platforms: Safari on iOS and Chrome on Android.

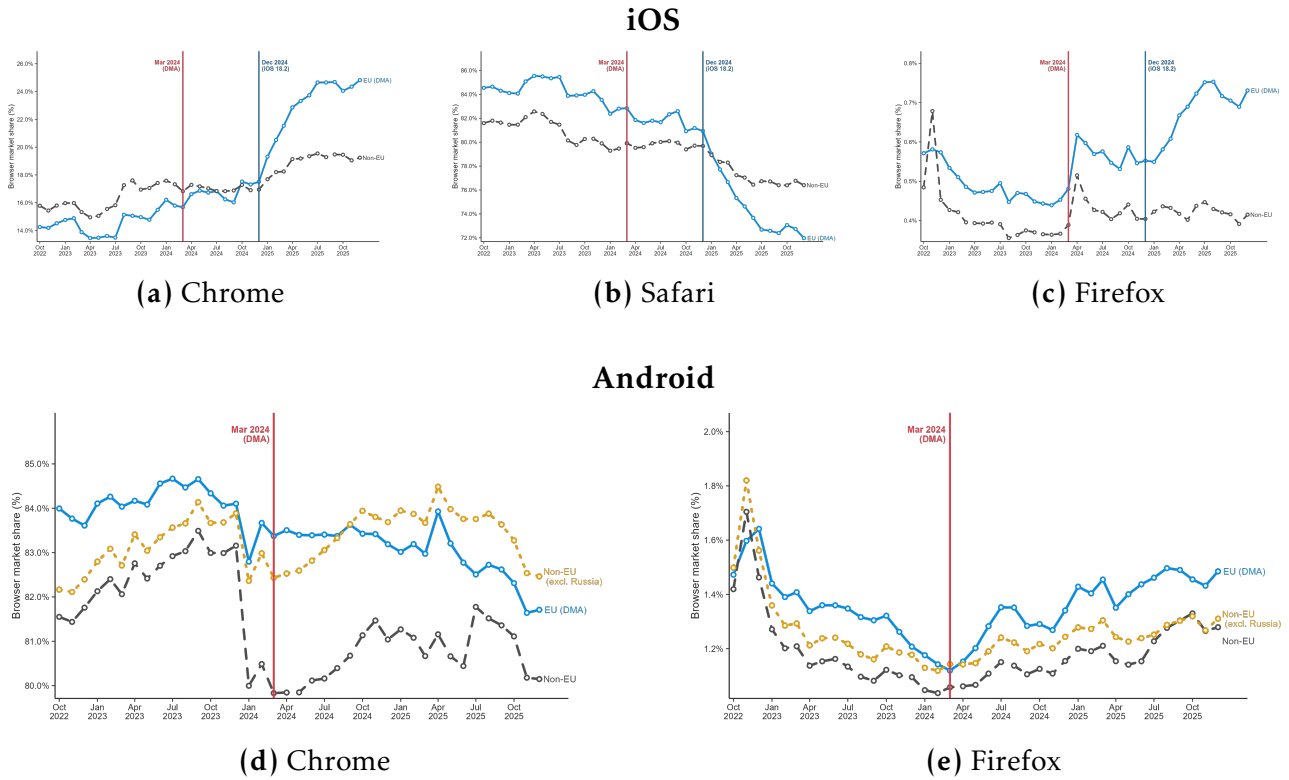
**Table 3: Effects of EU choice screens on browser market share over time (monthly)**

|                                                             | iOS                   |                        |                       | Android                |                       | Android (excl. Russia) |                       |
|-------------------------------------------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|
|                                                             | Chrome<br>(1)         | Safari<br>(2)          | Firefox<br>(3)        | Chrome<br>(4)          | Firefox<br>(5)        | Chrome<br>(6)          | Firefox<br>(7)        |
| <i>Dependent variable: market share (percentage points)</i> |                       |                        |                       |                        |                       |                        |                       |
| Choice Screen                                               | 0.5448***<br>(0.1932) | -0.3619<br>(0.2397)    | 0.0115<br>(0.0117)    | 1.7159<br>(1.7754)     | -0.0943*<br>(0.0514)  | -0.0201<br>(0.5614)    | -0.0941<br>(0.0558)   |
| Choice Screen × Month 2                                     | 0.4806**<br>(0.1955)  | -0.5971***<br>(0.1973) | 0.0106<br>(0.0580)    | 0.1183<br>(0.1617)     | 0.0294<br>(0.0210)    | 0.0377<br>(0.1534)     | 0.0337<br>(0.0226)    |
| Choice Screen × Month 3                                     | 0.8389***<br>(0.1571) | -0.9014***<br>(0.2543) | 0.0492<br>(0.0331)    | 0.0084<br>(0.2385)     | 0.0738**<br>(0.0335)  | -0.1368<br>(0.2098)    | 0.0789**<br>(0.0361)  |
| Choice Screen × Month 4                                     | 0.8455***<br>(0.2410) | -1.0319***<br>(0.2939) | 0.0499**<br>(0.0223)  | -0.2669<br>(0.2172)    | 0.1130**<br>(0.0460)  | -0.3672*<br>(0.2088)   | 0.1160**<br>(0.0495)  |
| Choice Screen × Month 5                                     | 1.1316***<br>(0.3038) | -1.2688***<br>(0.3645) | 0.0613***<br>(0.0221) | -0.2967<br>(0.3785)    | 0.1404**<br>(0.0618)  | -0.5903**<br>(0.2618)  | 0.1353**<br>(0.0653)  |
| Choice Screen × Month 6                                     | 0.5583*<br>(0.3189)   | -0.6762*<br>(0.4004)   | 0.0507***<br>(0.0166) | -0.5646<br>(0.4002)    | 0.1526**<br>(0.0572)  | -0.8946***<br>(0.2506) | 0.1523**<br>(0.0602)  |
| Choice Screen × Month 7                                     | 0.2926<br>(0.3649)    | -0.2917<br>(0.4305)    | 0.0202<br>(0.0205)    | -0.5906<br>(0.4283)    | 0.1167**<br>(0.0455)  | -0.9519***<br>(0.2573) | 0.1167**<br>(0.0491)  |
| Choice Screen × Month 8                                     | 1.3830***<br>(0.2751) | -1.4020***<br>(0.3398) | 0.0531**<br>(0.0214)  | -1.2535**<br>(0.4647)  | 0.1037*<br>(0.0518)   | -1.4569***<br>(0.4261) | 0.0971*<br>(0.0554)   |
| Choice Screen × Month 9                                     | 1.5589***<br>(0.3486) | -1.4525***<br>(0.3951) | 0.0489***<br>(0.0137) | -1.5937***<br>(0.5072) | 0.0985**<br>(0.0418)  | -1.3265***<br>(0.4464) | 0.0903**<br>(0.0436)  |
| Choice Screen × Month 10                                    | 1.7108***<br>(0.3471) | -1.6717***<br>(0.3935) | 0.0560***<br>(0.0165) | -1.3951***<br>(0.4500) | 0.1246**<br>(0.0505)  | -1.4402***<br>(0.4592) | 0.1208**<br>(0.0536)  |
| Choice Screen × Month 11                                    | 2.7662***<br>(0.4685) | -2.8036***<br>(0.4922) | 0.0342<br>(0.0216)    | -1.7968***<br>(0.5315) | 0.1673***<br>(0.0589) | -1.8724***<br>(0.5442) | 0.1737***<br>(0.0613) |
| Choice Screen × Month 12                                    | 3.4649***<br>(0.5390) | -3.5460***<br>(0.5424) | 0.0524*<br>(0.0310)   | -1.4316**<br>(0.5602)  | 0.1512**<br>(0.0599)  | -1.6220***<br>(0.5456) | 0.1543**<br>(0.0626)  |
| Choice Screen × Month 13                                    | 4.4328***<br>(0.5494) | -4.5516***<br>(0.5455) | 0.0834***<br>(0.0295) | -1.2372*<br>(0.7096)   | 0.1826***<br>(0.0667) | -1.6401**<br>(0.6100)  | 0.1737**<br>(0.0685)  |
| Choice Screen × Month 14                                    | 4.8626***<br>(0.7081) | -4.8368***<br>(0.6523) | 0.1579***<br>(0.0259) | -0.7723<br>(0.9264)    | 0.1354***<br>(0.0455) | -1.4980**<br>(0.6185)  | 0.1314***<br>(0.0471) |
| Choice Screen × Month 15+                                   | 6.1079***<br>(0.6221) | -6.5679***<br>(0.7089) | 0.2076***<br>(0.0350) | -2.0048***<br>(0.4918) | 0.1486<br>(0.0938)    | -1.9138***<br>(0.4938) | 0.2052**<br>(0.0795)  |
| Pre-treatment mean (EU)                                     | 14.5800               | 84.3176                | 0.4910                | 84.0789                | 1.3580                | 84.0789                | 1.3580                |
| Russia included                                             | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | No                     | No                    |
| Country FE                                                  | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   |
| Month FE                                                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   |
| Clusters                                                    | Country               | Country                | Country               | Country                | Country               | Country                | Country               |
| Observations                                                | 1,437                 | 1,437                  | 1,437                 | 1,443                  | 1,443                 | 1,404                  | 1,404                 |
| R <sup>2</sup>                                              | 0.9641                | 0.9657                 | 0.9098                | 0.9110                 | 0.9683                | 0.9548                 | 0.9705                |

Clustered standard errors at the country level in parentheses. EU member states enter as separate treated units. The dependent variable is browser market share in percentage points. Choice Screen equals EU × Post, where Post is 2024-03 onward; its coefficient captures the immediate effect of the choice screen in the policy month (March 2024). Month-specific interaction terms report deviations relative to this first-month effect; the total effect in Month  $k$  is the sum of the Choice Screen coefficient and the corresponding Choice Screen × Month  $k$  coefficient. Columns (6) and (7) replicate the Android Chrome and Firefox specifications excluding the Russian Federation from the Non-EU control group. All specifications include country and month fixed effects. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .



**Figure 2: Browser market share by operating system**



*Notes:* The figure shows monthly browser market shares for DMA and non-DMA countries. The vertical red line indicates the introduction of the DMA choice screen in March 2024. The vertical blue line indicates the additional iOS 18.2 browser choice screen for existing EU iPhone users in December 2024. Safari is not included in the Android panels because it is not available on Android. Groups are built using a simple average of market shares across EU and non-EU countries. Source: Cloudflare data.

## 5 Discussion

Using the EU DMA browser choice-screen mandate as a natural experiment, we show that requiring active choice can materially shift usage away from preset defaults in a large digital market. Firefox usage rises persistently in countries required to implement choice screens, with much larger and faster effects on iOS than on Android.

This contrast suggests that active-choice policies are not a uniform intervention. In our setting, the same broad policy was implemented differently across platforms, and those differences are associated with sharply different usage responses. More broadly, the results suggest that design and implementation can shape not only whether active-choice policies matter, but how much they matter and how quickly their effects emerge.

Our results highlight that observed browser shares under preset defaults should not be

interpreted as pure revealed preference: they partly reflect inertia, inattention, and the choice architecture through which users encounter browsers. At the same time, Firefox starts from a small base, especially on iOS, so even large proportional gains imply relatively modest shifts in shares. Nonetheless, the market-share evidence shows substantial movement away from the relevant platform default, especially from Safari to Chrome on iOS. This suggests that choice screens are a meaningful but limited intervention; more intensive policies, such as directly changing defaults or subsidizing experimentation with alternative browsers, might produce larger shifts in market shares, consistent with related evidence in [Allcott et al. \(2025\)](#).

Our analysis also opens several directions for future research. Because the data are aggregated, we do not observe individual-level behavior. The effects may also vary across user bases, as iOS and Android have different user bases, including higher baseline Firefox usage on Android. More broadly, because implementation differs along several dimensions at once, we cannot fully disentangle the contribution of individual design features.

Overall, the paper contributes to the literature on defaults and active choice by providing evidence from a major digital market in which policy directly targeted reliance on preset options. A large literature shows that defaults can shape behavior. Our results show that policies designed to mitigate the influence of preset defaults can materially affect market outcomes, and that implementation is central to shaping both the size and timing of those effects.

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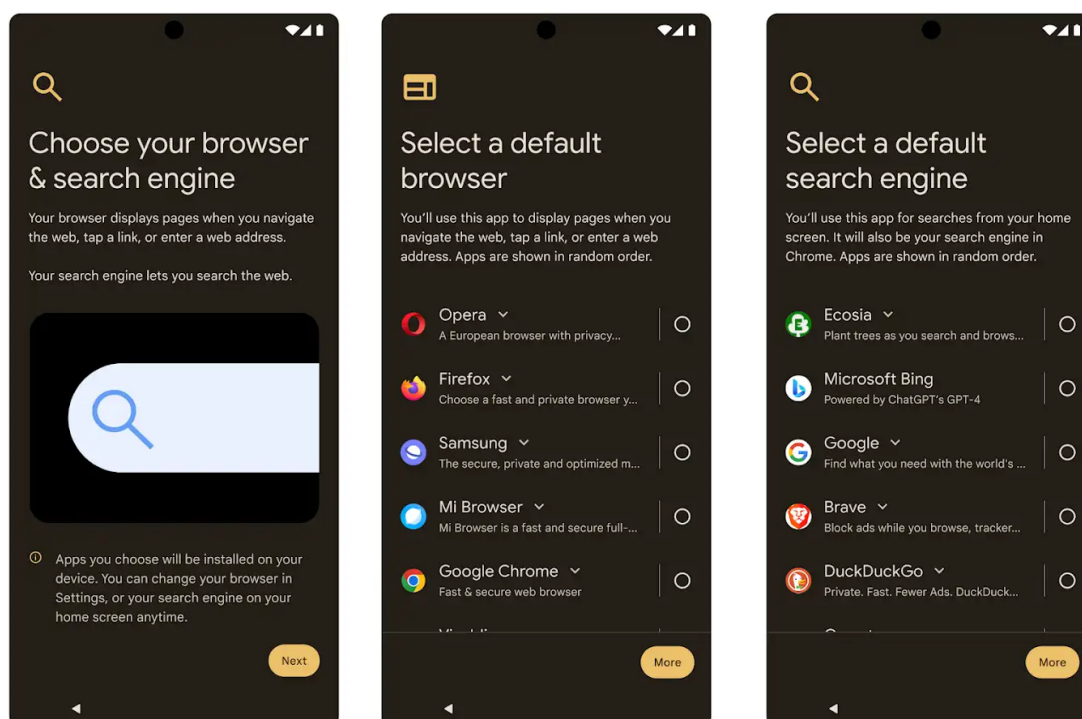
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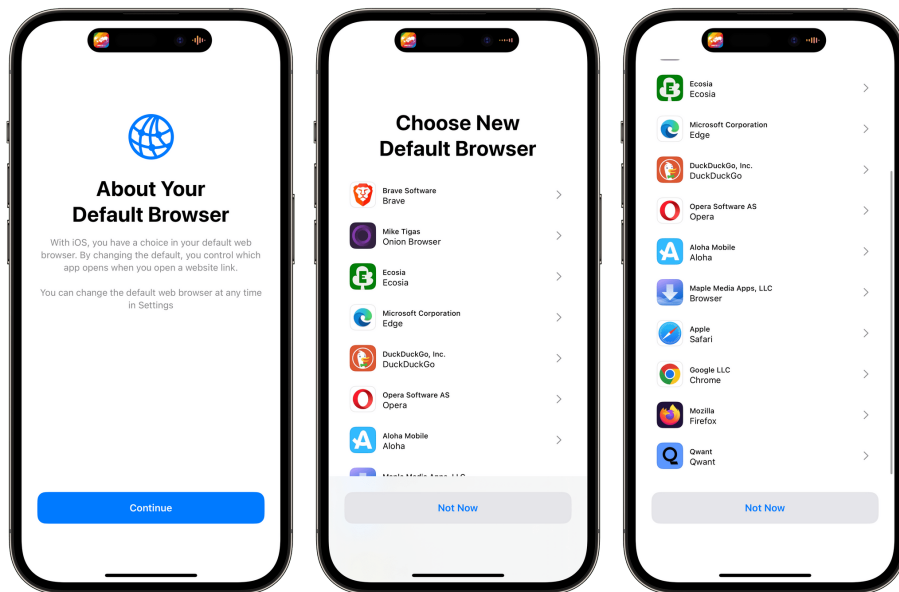
Vodafone Institute for Society and Communications. Refurbished over new: A second chance for smartphones—a comparative study regarding consumer behaviour in five european countries. Technical report, Vodafone Institute for Society and Communications, Berlin, Sept. 2025. URL <https://www.vodafone.com/~media/Files/V/vodafone/corp/news/protecting-the-planet/refurbished-over-new.pdf>. Produced by Kantar, with scientific support from the Wuppertal Institute for Climate, Environment and Energy.

**Appendix Figure A1: Android browser and search engine choice screens**



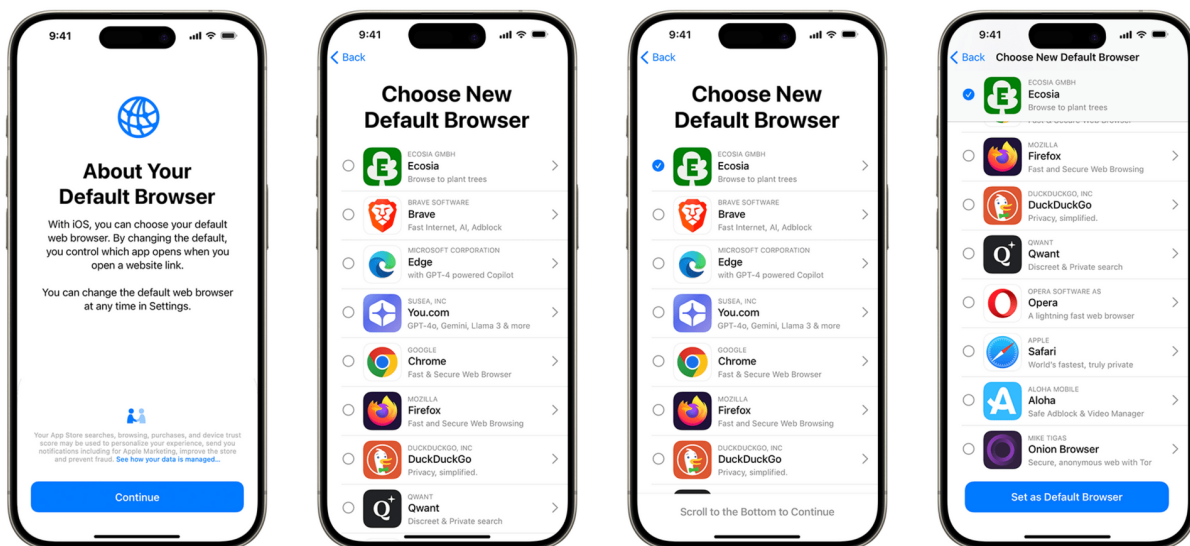
*Notes.* Choice screens presented during initial setup on new or factory-reset Android devices distributed in the EEA on or after March 6, 2024, on which Chrome is set as the default. First, an explainer page appears describing the concepts of browsers and search engines, and explaining that a default can be changed in Settings. When the user clicks "Next", they are presented with 12 browser options. On devices distributed in the EEA between March 6, 2024 and August 6, 2024 the five most popular eligible browsers in each country are at the top of the page (in random order), and the remaining seven are below, also ordered randomly. For devices distributed since August 7, 2024, all 12 browsers are ordered randomly. Users select a default search engine separately in the following step.

**Appendix Figure A2: iOS browser choice screen (v17.4 - v18.1)**



*Notes.* Choice screens displayed the first time a user opens Safari on a compliant device. First, a small explainer lets the user know about the ability to choose a different default browser at any time. After the user taps “Continue,” a list of up to 12 browsers appears (in random order). These are up to 11 of the most popular browsers based on the given country’s App Store, plus Safari. If the user taps a browser from the list, they are presented with its App Store listing, and are able to install it with a single tap. The browser selection can be skipped via the “Not Now” button, in which case the user continues to use Safari as the default browser. The selected browser can be changed later in Settings.

**Appendix Figure A3: iOS browser choice screen (v18.2 and higher)**



*Notes.* Choice screens displayed on first launch of Safari. The first page explainer now features larger black text. After the user taps “Continue,” a list of up to 12 browsers appears (including Safari). Each browser’s name is now listed together with its subtitle from the browser’s App Store product page (in grey text). Also, users can review each browser’s App Store product page by tapping on the chevron to the right. There are now radio buttons on the left of the screen to indicate selection and the chosen browser is pinned to the top of the screen. Users are required to scroll through the full list of browser options before setting a browser as default and the previous “Not Now” option is replaced by a forced selection and a “Set as Default Browser” button. Apps appear in random order and users can revise their browser choice in Settings.



**Appendix Table A1:** EU choice screens and log average daily active users of Firefox

|                                 | <b>Total</b>          | <b>iOS</b>            | <b>Android</b>       |
|---------------------------------|-----------------------|-----------------------|----------------------|
| Choice Screen                   | 0.1356***<br>(0.0232) | 0.4681***<br>(0.0235) | 0.0618**<br>(0.0258) |
| Observations                    | 14,560                | 14,560                | 14,560               |
| Countries                       | 70                    | 70                    | 70                   |
| Clusters (country)              | Yes                   | Yes                   | Yes                  |
| Fixed effects: Country and Week | Yes                   | Yes                   | Yes                  |
| $R^2$                           | 0.9956                | 0.9955                | 0.9948               |

*Notes:* Dependent variable is the log of daily active users (DAU). Choice Screen indicator equals EU  $\times$  Post. All specifications include country and week fixed effects. Standard errors are clustered at the country level. Stars denote: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Appendix Table A2: Choice Screen Design and Relevant Mechanisms on iOS**

| <b>Dimension</b>          | <b>iOS 17.4–18.1</b>                                                                                                                                | <b>iOS 18.2 and later</b>                                                                                                                             | <b>Potential behavioral channel</b>                                             |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| Display rule              | Shown when an EU user first opened Safari on an eligible compliant device.                                                                          | Shown to EU users with Safari set as the default browser; users with another browser already set as default are not shown the choice screen.          | Exposure; targeting of default users                                            |
| Frequency                 | Shown once per user.                                                                                                                                | Shown once per device.                                                                                                                                | Repeated decision opportunities; learning/reminder effects at important moments |
| Deferral                  | Users could skip the choice screen by tapping “Not Now,” leaving Safari as the default.                                                             | The “Not Now” option was removed; users must choose a browser before proceeding.                                                                      | Active choice; default persistence                                              |
| Engagement with options   | Users could choose or defer without viewing the full browser list.                                                                                  | Users must scroll through the full list before setting a default browser.                                                                             | Attention to alternatives                                                       |
| Information before choice | The list displayed browser names and icons; detailed app information was available only after tapping a browser and viewing its App Store page.     | The list includes each browser’s App Store subtitle, and users can open the browser’s App Store page from the list.                                   | Information and product differentiation                                         |
| Choice flow               | Tapping a browser routed the user to that browser’s App Store page before completion.                                                               | Users select a browser directly on the choice screen using radio buttons and confirm with “Set as Default Browser.”                                   | Choice friction and transaction costs                                           |
| Installation flow         | If the selected browser was not already installed on the device, choice screen installation occurred through the App Store flow.                    | If the selected browser is not installed, download progress appears within the choice-screen flow and the browser opens automatically once installed. | Installation friction                                                           |
| Post-choice placement     | Selecting a new default browser did not automatically move that browser into Safari’s position in the Dock or on the first page of the Home Screen. | The selected browser can replace Safari in the Dock or on the first page of the Home Screen under the conditions described by Apple.                  | Salience; access friction and habit formation                                   |

*Notes:* Both versions displayed up to 12 browsers, including Safari, with browser order randomized. Unlike Android’s rollout, the iOS choice screen was not limited to new or factory-reset devices; this table focuses on design differences within iOS. The final column is descriptive. Because several features changed at the same time, the empirical analysis cannot separately identify the effect of any individual channel.

**Appendix Table A3: EU choice screens and iOS Firefox usage after iOS 18.2**

|                                                      | iOS                   |                       |                       |
|------------------------------------------------------|-----------------------|-----------------------|-----------------------|
|                                                      | (1)                   | (2)                   | (3)                   |
| Choice Screen                                        | 0.3086***<br>(0.0183) | 0.2046***<br>(0.0161) | 0.2236***<br>(0.0162) |
| Choice Screen × Post iOS 18.2                        | 0.2727***<br>(0.0152) | 0.0283**<br>(0.0131)  | 0.0382***<br>(0.0119) |
| Choice Screen × Time                                 |                       | 0.0052***<br>(0.0003) | 0.0042***<br>(0.0004) |
| Choice Screen × Post iOS 18.2 × Weeks since iOS 18.2 |                       |                       | 0.0013***<br>(0.0004) |
| Observations                                         | 14,560                | 14,560                | 14,560                |
| Countries                                            | 70                    | 70                    | 70                    |
| Country fixed effects                                | Yes                   | Yes                   | Yes                   |
| Week fixed effects                                   | Yes                   | Yes                   | Yes                   |
| Clusters                                             | Country               | Country               | Country               |
| $R^2$                                                | 0.996475              | 0.996773              | 0.996776              |

*Notes:* Dependent variable is the log of iOS daily active users. Choice Screen equals EU × Post DMA. Post iOS 18.2 equals one beginning in the week containing December 11, 2024. Column (2) adds Choice Screen × Time, where Time is the number of weeks since the DMA date and equals zero before treatment. Column (3) additionally includes Choice Screen × Post iOS 18.2 × Weeks since iOS 18.2, which estimates whether the treated-country trend changes after iOS 18.2. All specifications include country and week fixed effects. Standard errors are clustered at the country level. Stars denote: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

# A Statcounter Data

We use data from Statcounter, which do not provide a breakdown by iOS and Android. For this reason, the data are considerably noisier, and there are reasons to prefer the Cloudflare based results. Nevertheless, when conducting the analysis using these data, Tables A5 (Without Russia) and A6 (With Russia) show an increase in Firefox market share for the Month 15+ period. In addition, the descriptive statistics in Table A4 show a substantial increase in Firefox market share in the EU relative to non-EU countries.

The Statcounter data cover the period from January 2022 to December 2025 and include the following countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Australia, Canada, India, New Zealand, Russia, South Africa, Switzerland, Turkey, the United Kingdom, and the United States. The EU group consists of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden, while the remaining countries are classified as non-EU.

**Appendix Table A4:** Descriptive statistics — StatCounter sample (mobile browsers)

| Browser | EU (treated)     |                  |          | Non-EU (control) |                  |          |
|---------|------------------|------------------|----------|------------------|------------------|----------|
|         | Pre              | Post             | $\Delta$ | Pre              | Post             | $\Delta$ |
| Chrome  | 60.22<br>(12.52) | 62.20<br>(11.26) | +1.98    | 53.85<br>(18.81) | 58.19<br>(16.88) | +4.34    |
| Safari  | 29.02<br>(11.65) | 27.64<br>(10.32) | −1.38    | 35.23<br>(19.58) | 31.14<br>(17.43) | −4.10    |
| Firefox | 0.85<br>(0.42)   | 1.04<br>(0.59)   | +0.18    | 0.78<br>(0.45)   | 0.80<br>(0.48)   | +0.02    |

*Notes:* Cell entries report the mean mobile browser market share in percentage points, with between-country standard deviations in parentheses — computed as the cross-sectional standard deviation of country-level means within each group and period. The sample covers 27 EU countries (treated) and 10 Non-EU countries (control) over 48 months (2022-01 to 2025-12), for a total of 5,328 country-month-browser observations (2,886 pre-DMA and 2,442 post-DMA). Pre denotes months before 2024-03; Post denotes 2024-03 onward (DMA enforcement date).  $\Delta$  is the within-group change in mean market share between the two periods. Source: StatCounter Global Stats, mobile.

**Appendix Table A5:** Effects of EU choice screens on mobile browser market share: Cloudflare vs. StatCounter (excluding Russia)

|                                                             | Cloudflare Radar       |                       |                       | StatCounter            |                       |                       |
|-------------------------------------------------------------|------------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|
|                                                             | Chrome<br>(1)          | Safari<br>(2)         | Firefox<br>(3)        | Chrome<br>(4)          | Safari<br>(5)         | Firefox<br>(6)        |
| <i>Dependent variable: market share (percentage points)</i> |                        |                       |                       |                        |                       |                       |
| Choice Screen                                               | 0.4224<br>(0.6119)     | -0.3668<br>(0.3382)   | -0.0574*<br>(0.0297)  | -0.6195<br>(1.8676)    | 1.1612<br>(2.0471)    | 0.0469<br>(0.0707)    |
| Choice Screen × Month 2                                     | 0.3210**<br>(0.1540)   | -0.3668**<br>(0.1336) | 0.0494**<br>(0.0149)  | -0.9596**<br>(0.3675)  | 0.8552**<br>(0.3734)  | 0.0100<br>(0.0300)    |
| Choice Screen × Month 3                                     | 0.0386<br>(0.2398)     | -0.1576<br>(0.2161)   | 0.0826**<br>(0.0196)  | -1.8378*<br>(1.0661)   | 1.0689<br>(0.9437)    | 0.0678*<br>(0.0355)   |
| Choice Screen × Month 4                                     | -0.3683<br>(0.2920)    | 0.2404<br>(0.2372)    | 0.1107**<br>(0.0293)  | -2.4963*<br>(1.4717)   | 1.6574<br>(1.3796)    | 0.0870**<br>(0.0395)  |
| Choice Screen × Month 5                                     | -0.4827<br>(0.4432)    | 0.2969<br>(0.4223)    | 0.1296**<br>(0.0389)  | -3.1007*<br>(1.6275)   | 2.0974<br>(1.4658)    | 0.1307**<br>(0.0477)  |
| Choice Screen × Month 6                                     | -1.5117***<br>(0.4120) | 1.2342***<br>(0.4243) | 0.1314***<br>(0.0387) | -2.7467**<br>(1.3288)  | 2.4459**<br>(1.1730)  | 0.1422***<br>(0.0479) |
| Choice Screen × Month 7                                     | -2.1116***<br>(0.5430) | 1.8358***<br>(0.5506) | 0.1009***<br>(0.0300) | -3.7363***<br>(1.1375) | 3.3344***<br>(1.0351) | 0.1215***<br>(0.0413) |
| Choice Screen × Month 8                                     | -1.1482**<br>(0.4622)  | 0.3173<br>(0.4245)    | 0.1147***<br>(0.0375) | -6.0819***<br>(1.8548) | 5.8685***<br>(1.6767) | 0.0948*<br>(0.0537)   |
| Choice Screen × Month 9                                     | -0.6243<br>(0.6240)    | -0.1769<br>(0.5670)   | 0.1055***<br>(0.0286) | -4.4711***<br>(1.5513) | 4.1578***<br>(1.3253) | 0.0533<br>(0.0573)    |
| Choice Screen × Month 10                                    | -1.1834*<br>(0.6304)   | 0.3821<br>(0.5451)    | 0.1261***<br>(0.0314) | -4.0622**<br>(1.7244)  | 3.7659**<br>(1.6532)  | 0.0359<br>(0.0550)    |
| Choice Screen × Month 11                                    | -1.0951*<br>(0.5738)   | 0.1746<br>(0.5905)    | 0.1459***<br>(0.0335) | -1.9748<br>(1.8411)    | 1.6559<br>(1.8018)    | 0.0548<br>(0.0672)    |
| Choice Screen × Month 12                                    | -0.8443<br>(0.6040)    | 0.0187<br>(0.6384)    | 0.1454**<br>(0.0334)  | -1.0615<br>(2.3192)    | 0.3930<br>(2.4328)    | 0.1193<br>(0.0752)    |
| Choice Screen × Month 13                                    | -0.9765<br>(0.7016)    | 0.3423<br>(0.7290)    | 0.1598**<br>(0.0343)  | -1.4878<br>(1.9886)    | 0.9037<br>(2.1582)    | 0.0452<br>(0.0749)    |
| Choice Screen × Month 14                                    | -1.0331<br>(0.7767)    | 0.6768<br>(0.8367)    | 0.1436***<br>(0.0368) | -1.7104<br>(2.1078)    | 0.7748<br>(2.2961)    | 0.1193<br>(0.0767)    |
| Choice Screen × Month 15+                                   | -1.2353<br>(0.7821)    | 0.3987<br>(0.8730)    | 0.1985***<br>(0.0513) | -2.4399<br>(1.9251)    | 1.1176<br>(2.1747)    | 0.2611**<br>(0.1005)  |
| Pre-treatment mean (EU)                                     | 64.7587                | 23.8751               | 1.0616                | 60.2245                | 29.0178               | 0.8548                |
| Country FE                                                  | Yes                    | Yes                   | Yes                   | Yes                    | Yes                   | Yes                   |
| Month FE                                                    | Yes                    | Yes                   | Yes                   | Yes                    | Yes                   | Yes                   |
| Clusters                                                    | Country                | Country               | Country               | Country                | Country               | Country               |
| Observations                                                | 1,404                  | 1,404                 | 1,401                 | 1,728                  | 1,728                 | 1,728                 |
| R <sup>2</sup>                                              | 0.9851                 | 0.9841                | 0.9723                | 0.9007                 | 0.8858                | 0.7832                |

Clustered standard errors at the country level in parentheses. Columns (1)–(3) use Cloudflare Radar; columns (4)–(6) use StatCounter Global Stats. Russia is excluded from the Non-EU control group as a robustness check. Choice Screen equals EU × Post, where Post is 2024-03 onward; its coefficient captures the immediate effect of the choice screen in the policy month (March 2024). Month-specific interaction terms report deviations relative to this first-month effect. Month 15+ pools all months from the 15th post-treatment month onward. All specifications include country and month fixed effects. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .

**Appendix Table A6: Effects of EU choice screens on mobile browser market share: Cloudflare vs. StatCounter**

|                                                             | Cloudflare Radar      |                        |                       | StatCounter            |                       |                       |
|-------------------------------------------------------------|-----------------------|------------------------|-----------------------|------------------------|-----------------------|-----------------------|
|                                                             | Chrome<br>(1)         | Safari<br>(2)          | Firefox<br>(3)        | Chrome<br>(4)          | Safari<br>(5)         | Firefox<br>(6)        |
| <i>Dependent variable: market share (percentage points)</i> |                       |                        |                       |                        |                       |                       |
| Choice Screen                                               | 1.6632<br>(1.3378)    | -0.1419<br>(0.3832)    | -0.0530*<br>(0.0282)  | -0.2062<br>(1.8415)    | 1.0556<br>(1.9943)    | 0.0425<br>(0.0658)    |
| Choice Screen × Month 2                                     | 0.4455**<br>(0.1904)  | -0.4832***<br>(0.1717) | 0.0359*<br>(0.0192)   | -0.8103**<br>(0.3786)  | 0.7156*<br>(0.3811)   | 0.0084<br>(0.0291)    |
| Choice Screen × Month 3                                     | 0.2678<br>(0.3180)    | -0.3198<br>(0.2593)    | 0.0736***<br>(0.0205) | -1.6437<br>(1.0121)    | 0.9006<br>(0.9045)    | 0.0651*<br>(0.0341)   |
| Choice Screen × Month 4                                     | -0.1644<br>(0.3448)   | 0.0144<br>(0.3218)     | 0.1031***<br>(0.0285) | -2.3954*<br>(1.3754)   | 1.5796<br>(1.3056)    | 0.0787*<br>(0.0395)   |
| Choice Screen × Month 5                                     | -0.1599<br>(0.5284)   | 0.1136<br>(0.4409)     | 0.1273***<br>(0.0367) | -2.9454*<br>(1.5046)   | 1.9821<br>(1.3602)    | 0.1212**<br>(0.0465)  |
| Choice Screen × Month 6                                     | -1.1077*<br>(0.5629)  | 0.9747*<br>(0.4845)    | 0.1281***<br>(0.0366) | -2.7324**<br>(1.2456)  | 2.2528*<br>(1.1303)   | 0.1441***<br>(0.0467) |
| Choice Screen × Month 7                                     | -1.7236**<br>(0.6498) | 1.6660***<br>(0.5685)  | 0.0960***<br>(0.0281) | -3.5315***<br>(1.0847) | 3.1561***<br>(0.9966) | 0.1251***<br>(0.0405) |
| Choice Screen × Month 8                                     | -1.0097**<br>(0.4620) | 0.3499<br>(0.4114)     | 0.1135***<br>(0.0346) | -5.8633***<br>(1.7099) | 5.8863***<br>(1.5397) | 0.0863<br>(0.0531)    |
| Choice Screen × Month 9                                     | -1.0075<br>(0.6897)   | 0.0517<br>(0.5753)     | 0.1068***<br>(0.0266) | -3.8856**<br>(1.5533)  | 3.9348***<br>(1.2562) | 0.0431<br>(0.0565)    |
| Choice Screen × Month 10                                    | -1.1192*<br>(0.5889)  | 0.3462<br>(0.5117)     | 0.1242***<br>(0.0295) | -3.7482**<br>(1.6185)  | 3.6898**<br>(1.5248)  | 0.0286<br>(0.0543)    |
| Choice Screen × Month 11                                    | -0.9037<br>(0.5862)   | -0.0799<br>(0.6195)    | 0.1375***<br>(0.0328) | -1.4175<br>(1.7980)    | 1.5299<br>(1.6928)    | 0.0471<br>(0.0655)    |
| Choice Screen × Month 12                                    | -0.5635<br>(0.6458)   | -0.2150<br>(0.6544)    | 0.1393***<br>(0.0323) | -0.5888<br>(2.2565)    | 0.3757<br>(2.3428)    | 0.1234<br>(0.0731)    |
| Choice Screen × Month 13                                    | -0.5795<br>(0.7883)   | 0.1715<br>(0.7302)     | 0.1609***<br>(0.0334) | -0.9466<br>(2.0167)    | 0.8678<br>(2.1264)    | 0.0591<br>(0.0743)    |
| Choice Screen × Month 14                                    | -0.2610<br>(1.0561)   | 0.3904<br>(0.8401)     | 0.1446***<br>(0.0350) | -1.3915<br>(2.0918)    | 0.8015<br>(2.2660)    | 0.1270<br>(0.0760)    |
| Choice Screen × Month 15+                                   | -1.0641<br>(0.7622)   | -0.0490<br>(0.9376)    | 0.1523**<br>(0.0667)  | -1.9465<br>(1.9526)    | 1.1072<br>(2.1448)    | 0.2099*<br>(0.1118)   |
| Pre-treatment mean (EU)                                     | 64.7587               | 23.8751                | 1.0616                | 60.2245                | 29.0178               | 0.8548                |
| Country FE                                                  | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                   |
| Month FE                                                    | Yes                   | Yes                    | Yes                   | Yes                    | Yes                   | Yes                   |
| Clusters                                                    | Country               | Country                | Country               | Country                | Country               | Country               |
| Observations                                                | 1,443                 | 1,443                  | 1,434                 | 1,776                  | 1,776                 | 1,776                 |
| R <sup>2</sup>                                              | 0.9762                | 0.9839                 | 0.9692                | 0.8981                 | 0.8861                | 0.7820                |

Clustered standard errors at the country level in parentheses. Columns (1)–(3) use Cloudflare Radar; columns (4)–(6) use StatCounter Global Stats. All Non-EU economies are included in the control group, including Russia. Choice Screen equals EU × Post, where Post is 2024-03 onward; its coefficient captures the immediate effect of the choice screen in the policy month (March 2024). Month-specific interaction terms report deviations relative to this first-month effect. Month 15+ pools all months from the 15th post-treatment month onward. All specifications include country and month fixed effects. \*\*\* $p < 0.01$ , \*\* $p < 0.05$ , \* $p < 0.1$ .