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Research Report

Final report for the project "Defining what the relevant market is: A new method for digital antitrust"

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Final report for the project “Defining what the relevant market is: A new method for digital antitrust”

1 General Information

- DFG reference number: DE 2964/2-1
- Project number: 490725816
- Project title: Defining what the relevant market is: A new method for (digital) antitrust
- Applicant: Prof Dr. Markus Dertwinkel-Kalt, Am Stadtgraben 9, 48143 Münster
- Cooperation partner: Prof. Dr. Christian Wey (DICE)
- Reporting period (entire funding period): August 1, 2022 - July 31, 2025

2 Summary

2.1 English

How can we determine whether two products belong to the same market? This question lies at the core of antitrust law and competition policy. Before authorities can assess mergers, they must define the “relevant market.” Traditionally, this is done using the SSNIP test, which measures whether a small but significant increase in price would cause consumers to switch to alternatives. However, this approach requires reliable price and demand data and fails in modern markets, particularly digital platforms, where services are often free and price-based comparisons are impossible.

This project offers a new approach to defining relevant markets. The method is intuitive, survey-based, and free of price data. It provides a simple way to detect how strongly consumers perceive two products as substitutable or complementary. Rather than asking about prices, it elicits consumers’ preferences using hypothetical choice scenarios. In these, respondents are asked whether they prefer receiving both products with a 50% probability or receiving one of them, randomly selected, for sure. Their decisions reveal how the two goods are perceived to be related—whether they are seen as complements (if the probabilistic bundle is preferred) or substitutes (if the guaranteed single item is preferred).

We implemented this method in a large online survey with real-world product examples, ranging from household goods to digital services. The results are intuitive and match expected patterns of product relationships. For example, different brands of cooking oil are perceived as substitutes, while items like pen and ink are seen as complements. Product pairs expected to be independent, like pens and potatoes, were indeed perceived as unrelated in the survey.

The method was also applied to antitrust-relevant markets. It revealed limited substitutability between major social media platforms (e.g., Instagram and TikTok), high substitutability

between gaming consoles and gaming PCs (supporting the FTC's market definition in the Microsoft–Activision case), and low substitutability between cigarettes and e-cigarettes (aligning with a narrow market definition by the FTC). These findings support the method's validity and demonstrate its potential for defining markets where price-based methods fall short.

While we initially aimed to expand the method across multiple standalone papers in the digital space, we combined our experimental findings in one paper and additionally developed a second research line. This is due to the following two developments. First, due to regulatory developments under the European Digital Services Act (DSA) and Digital Markets Act (DMA), competition authorities increasingly relied on real-world usage data, making market definition in digital markets less essential. Second, the geopolitical *Zeitenwende* following Russia's invasion of Ukraine and the ensuing energy crisis motivated us to investigate the economic effects of energy policy and green transition in energy markets.

2.2 German

Wie lässt sich bestimmen, ob zwei Produkte demselben Markt angehören? Diese Frage steht im Zentrum des Kartellrechts und der Wettbewerbspolitik. Bevor Wettbewerbsbehörden Fusionen bewerten können, müssen sie den „relevanten Markt“ definieren. Traditionell geschieht dies mithilfe des SSNIP-Tests, der prüft, ob eine kleine, aber signifikante Preiserhöhung dazu führen würde, dass Verbraucher auf Alternativen ausweichen. Dieses Verfahren setzt jedoch verlässliche Preis- und Nachfragedaten voraus und versagt in Märkten, insbesondere bei digitalen Plattformen, in denen Dienste kostenlos angeboten werden.

Dieses Projekt entwickelt einen neuen Ansatz zur Definition relevanter Märkte. Die Methode ist intuitiv, umfragebasiert und kommt ohne Preisdaten aus. Sie bietet eine einfache Möglichkeit, zu erfassen, wie stark Konsumentinnen und Konsumenten zwei Produkte als substitutiv oder komplementär wahrnehmen. Anstelle von Preisfragen werden hypothetische Entscheidungssituationen vorgelegt: Die Befragten wählen, ob sie lieber beide Produkte mit einer Wahrscheinlichkeit von 50% oder eines davon, zufällig ausgewählt, sicher erhalten möchten. Ihre Entscheidungen geben Aufschluss darüber, ob die Produkte als komplementär (wenn das Bündel bevorzugt wird) oder als substitutiv (wenn das sichere Einzelprodukt bevorzugt wird) wahrgenommen werden.

Wir haben diese Methode in einer groß angelegten Online-Umfrage mit realitätsnahen Produktbeispielen getestet. Die Ergebnisse sind plausibel und entsprechen den erwarteten Mustern von Produktbeziehungen. So werden verschiedene Marken von Speiseöl als Substitute wahrgenommen, während beispielsweise Stift und Tinte als komplementär gelten. Andere Produktpaare wie Stifte und Kartoffeln, die als unabhängig erwartet wurden, wurden im Survey auch so wahrgenommen.

Die Methode wurde außerdem auf wettbewerbsrechtlich relevante Märkte angewendet. Dabei zeigte sich eine begrenzte Substituierbarkeit zwischen großen sozialen Medienplattformen (z.B. Instagram und TikTok), eine hohe Substituierbarkeit zwischen Spielekonsolen und Gaming-PCs (im Einklang mit der Marktdefinition der FTC im Fall Microsoft–Activision) sowie eine geringe Substituierbarkeit zwischen herkömmlichen Zigaretten und E-Zigaretten (was eine

enge Marktdefinition der FTC stützt). Diese Ergebnisse bestätigen die Validität der Methode und zeigen ihr Potenzial für Marktdefinitionen in Fällen, in denen preisbasierte Verfahren an ihre Grenzen stoßen.

Ursprünglich verfolgten wir das Ziel, die Methode in mehreren eigenständigen Arbeiten im digitalen Bereich weiterzuentwickeln. Letztlich haben wir jedoch unsere experimentellen Ergebnisse in einem gemeinsamen Paper zusammengeführt und zusätzlich eine zweite Forschungslinie entwickelt. Dies ist auf zwei Entwicklungen zurückzuführen: Erstens führten regulatorische Neuerungen im Rahmen des *Digital Services Act* (DSA) und des *Digital Markets Act* (DMA) dazu, dass Wettbewerbsbehörden verstärkt auf reale Nutzungsdaten zurückgriffen, wodurch die Marktdefinition in digitalen Märkten an Bedeutung verlor. Zweitens motivierte uns die geopolitische *Zeitenwende* infolge des russischen Angriffs auf die Ukraine und der daraus resultierenden Energiekrise dazu, die ökonomischen Auswirkungen der Energiepolitik und der grünen Transformation in Energiemärkten zu untersuchen.

3 Progress Report

Background and Objectives

The project “Defining what the relevant market is: A new method for (digital) antitrust” developed an alternative to traditional market definition methods used in competition law. Existing tools, especially the SSNIP test, often assume that goods are priced and that prices respond to marginal changes in consumer demand. These assumptions often fail in the digital economy, where services are frequently free, and consumer preferences are driven by non-price factors. The project aimed to develop a novel, survey-based method to identify substitutability relationships between products that does not rely on price data and is applicable to both traditional and digital markets.

Our research ambition was to bridge theoretical economic modeling with practical, policy-relevant tools for market delineation. Specifically, the project intended to:

1. Develop a robust theoretical foundation for preference-based substitution inference.
2. Translate the theory into an implementable survey methodology.
3. Apply and validate this methodology on real-world markets.
4. Assess its utility in antitrust enforcement and consumer research.

The original grant envisaged a series of publications addressing each of these steps.

Project Results and Scientific Contributions

The project resulted in three major research outputs.

1. Theoretical Foundation – Correlated Lotteries:

We introduced a new theoretical model that allows the analysis of preference structures over probabilistic combinations of binary outcomes. This framework, published in the *Journal of Economic Behavior & Organization* under the title *On Correlated Lotteries in Economic Applications* (Dertwinkel-Kalt *et al.*, 2023), characterizes correlation preferences over lotteries and serves as the theoretical foundation for linking these preferences to perceived substitutability and complementarity of goods in subsequent work, as laid out in the research agenda of our grant proposal.

2. Empirical Methodology for Market Definition:

Building on the theory, we developed and tested a new survey-based method to delineate markets. In the manuscript *Defining What the Relevant Market Is: A New Method for Consumer Research and Antitrust*, we describe the method and demonstrate its potential through an extensive online experiment. Participants are asked to make simple binary choices between bundled and isolated receipt of two goods. From this, we calculate a “substitution score,” capturing perceived substitutability between subjects. In addition to the substitution score, we also elicit an importance score, which captures how strongly participants prefer their chosen option over the alternative. Both scores are positively correlated across product pairs, which is reassuring for the validity of the method: product pairs perceived as more substitutable (high substitution score) also tend to be related to stronger preferences (high importance score). Our approach is well suited for zero-price goods such as social media platforms.

The survey results indicate that the method replicates intuitive relationships (e.g., high substitutability between oils, complementarity of pen and ink, independence of potatoes and pens).

We also applied our method to real-world antitrust contexts. For social media platforms, our results suggest that substitutability is limited: substitution scores for pairs such as Instagram and TikTok, WhatsApp and Facebook, and Instagram and WhatsApp fall short of the levels typically observed for close substitutes. This implies that even widely used social networking services are not perceived as readily interchangeable. In the video gaming sector, the U.S. Federal Trade Commission (FTC) initially sought to block Microsoft’s proposed acquisition of Activision Blizzard in 2022, suggesting that PC and console gaming belong to the same relevant market and that the merger could reduce competition within it. Our survey results show a high substitution score between Gaming PCs and Gaming Consoles, aligning with this assessment and indicating that consumers perceive both as close substitutes. In the tobacco sector, the FTC filed a complaint against Altria’s acquisition of a 35% stake in Juul Labs, treating both firms as competitors in the market for closed-system e-cigarettes. Had the market been defined more broadly to include conventional cigarettes, the evaluation of the acquisition might have been significantly different. Our findings support this narrow market perspective: Our elicited substitution score between conventional and e-cigarettes is low, suggesting that consumers do not view the two products as close substitutes.

The study builds on the research agenda set out in our original grant proposal *Defining What the Relevant Market Is: A New Method for Consumer Research and Antitrust* and provides a practical instrument for competition authorities to delineate markets, especially in settings where price-based methods are not applicable (Dertwinkel-Kalt *et al.*, 2024). The grant originally envisaged three subprojects. In subproject (I), we aimed to theoretically develop and empirically test a novel, survey-based method to assess product substitutability based on correlation preferences. Rather than running two surveys with 500 participants each in Germany and the UK as originally planned, we conducted a large-scale online survey with 1,000 participants recruited internationally. In subproject (II), we aimed to refine this method and initially considered two within-subject approaches to measure substitutability at the individual level. While these approaches were not implemented in full, we employed an "importance score" as a proxy of a within-subject measure of the relation between two goods. In subproject (III), we planned to apply the method to a specific relevant market. Instead of focusing on one market in isolation, we tested the method across multiple goods—including zero-priced digital services like WhatsApp and Facebook—to illustrate its applicability in both conventional and digital antitrust contexts. We are in ongoing exchange with practitioners—including legal scholars at the universities of Münster and Bonn as well as competition economists from consulting—who are interested in applying the method in real-world cases.

3. Reallocation of Resources and Research on Energy Markets:

While we initially aimed to expand the method across multiple standalone papers in the digital space, two developments led us to concentrate our output:

- **First, regulatory developments** under the European Digital Services Act (DSA) and Digital Markets Act (DMA) shifted enforcement away from traditional market-definition exercises. Competition authorities increasingly relied on real-world usage data, making market delineation in digital markets less essential.
- **Second, the geopolitical *Zeitenwende* following Russia's invasion of Ukraine** and the ensuing energy crisis—during which Germany faced a natural gas shortage and implemented new policies to relieve consumers, save energy, and foster the green transition—motivated us to investigate the economic effects of energy and green transition in energy markets.

These shifts inspired a separate research line that resulted in four papers. The first, *Why "Energy Price Brakes" Encourage Moral Hazard, Raise Energy Prices, and Reinforce Energy Savings* (Dertwinkel-Kalt and Wey, 2025), published in the RAND Journal of Economics in 2025, formally analyzes how energy price brakes alter incentives in energy markets. We show that under such schemes, consumers may actively seek contracts with higher prices to benefit from transfer payments, creating a moral hazard problem. The second paper, *Public Support for Environmental Regulation: When Ideology Trumps Knowledge* (Dertwinkel-Kalt and Grossmann, 2025), uses a survey experiment to study public support for climate policies introduced during the *Zeitenwende*. The results show

that support for Germany's Heating Law is primarily driven by ideological priors rather than informational effects. The third paper, *Why avoiding deindustrialization via subsidies may trigger a subsidy trap and slow down green investments* (Dertwinkel-Kalt *et al.*, 2025b), analyzes Germany's proposed electricity subsidy for energy-intensive firms. We develop a game-theoretic model showing that while the subsidy may prevent firm exit, it can weaken green investment incentives, attract non-targeted firms, and lead to higher-than-expected fiscal costs. The fourth paper, *Erroneous beliefs impede the implementation of cooperation-inducing mechanisms* (Dertwinkel-Kalt *et al.*, 2025a), shows that individuals often reject cooperation-enhancing mechanisms due to overly optimistic beliefs about cooperation without them and overly pessimistic beliefs with them. Providing accurate information about actual cooperation dynamics corrects these wrong beliefs and leads individuals to support the implementation of cooperation-inducing mechanisms.

Cooperation, Dissemination, and Scientific Events The project involved active cooperation between, in particular, Markus Dertwinkel-Kalt (University of Münster) and cooperation partner Christian Wey (DICE, Düsseldorf). Collaborative efforts included regular coordination, joint model development, and survey design.

As planned, Markus Dertwinkel-Kalt and Christian Wey organization of a **workshop on digital antitrust** in December 2024 at DICE, featuring keynotes by Florian Ederer, Massimo Motta, and others.

Dissemination activities are listed in the following:

- Dissemination of **Dertwinkel-Kalt, Eulenberg and Wey (2025)** at:
 - Presentation at **EARIE 2024** (Amsterdam)
 - Presentation at the **Verein für Socialpolitik 2024** (Berlin)
- Dissemination of **Dertwinkel-Kalt, Ressi, and Wey (2025)** at:
 - **EARIE 2024** (Amsterdam)
 - **BECCLE Conference 2024** (Bergen)
 - **VfS Wirtschaftspolitischer Ausschuss 2024** (Cologne)
- Dissemination of **Dertwinkel-Kalt, Eulenberg, ... (2025)** at:
 - **VfS Sozialwissenschaftlicher Ausschuss 2024** (Berlin)
 - **THEEM 2025** (Kreuzlingen)
 - **ESA Africa 2025** (Nairobi)
 - **Max Planck Institute for Research on Collective Goods** (Bonn)
 - **RWI** (Essen)
- Dissemination of **Dertwinkel-Kalt and Wey (2025)** at:

- VfS Industrieökonomischer Ausschuss 2023 (Berlin)
 - EARIE 2023 (Rome)
 - Journées LAGV 2023 (Marseille)
- Dissemination of **Dertwinkel-Kalt and Grossmann (2025)** for instance through a policy article in the *Wirtschaftsdienst* (Dertwinkel-Kalt and Grossmann 2025b).

4 Published Project Results

The research conducted in this project resulted in the following publications:

4.1 Category A – Articles in peer-reviewed journals, contributions to peer-reviewed conferences or to anthology volumes, and book publications

- DERTWINKEL-KALT, M., EBERT, S. and KÖSTER, M. (2023). On correlated lotteries in economic applications. *Journal of Economic Behavior & Organization*, **215**, 292–306.
DOI: 10.1016/j.jebo.2023.08.025
- DERTWINKEL-KALT, M. and WEY, C. (2025). Why “energy price brakes” encourage moral hazard, raise energy prices, and reinforce energy savings. *The RAND Journal of Economics*, **56**, 129–144.
DOI: 10.1111/1756-2171.12489

4.2 Any other form of published results

- DERTWINKEL-KALT, M., EULENBERG, V. and WEY, C. (2024). Defining what the relevant market is: A new method for consumer research and antitrust, SSRN Working Paper No. 4710988.
DOI: 10.2139/ssrn.4710988
- DERTWINKEL-KALT, M., EULENBERG, V., FELDHAUS, C., FREY, J., BREUER, K., BRUSKE, B., FEHRE, F., HOFFMANN, P., HÖFS, C., KLOCKE, N., SCHNACK, L., STRUNK, F., THIELE, M., WALTER, A., WEINBERG, J. and ZÖRNER, K. (2025). Erroneous beliefs impede the implementation of cooperation-inducing mechanisms, *SSRN Working Paper No. 5391817*.
URL: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5391817
- DERTWINKEL-KALT, M. and GROSSMANN, M. R. P. (2025). Public support for environmental regulation: When ideology trumps knowledge, *arXiv preprint arXiv:2503.10821*.
DOI: 10.48550/arXiv.2503.10821
- DERTWINKEL-KALT, M. and GROSSMANN, M. R. P. (2025b). Ideologie schlägt Information: Über die Grenzen von Kommunikation in der Klimapolitik, *Wirtschaftsdienst*, 105(7), 495–498.

- DERTWINKEL-KALT, R., RESSI, A. and WEY, C. (2025b). Why avoiding deindustrialization via subsidies may trigger a subsidy trap and slow down green investments, SSRN Working Paper No. 5391807.
URL: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5391807

References

- DERTWINKEL-KALT, M., EBERT, S. and KÖSTER, M. (2023). On correlated lotteries in economic applications. *Journal of Economic Behavior & Organization*, **215**, 292–306.
- , EULENBERG, V., FELDHAUS, C., FREY, J., BREUER, K., BRUSKE, B., FEHRE, F., HOFFMANN, P., HÖFS, C., KLOCKE, N., SCHNACK, L., STRUNK, F., THIELE, M., WALTER, A., WEINBERG, J. and ZÖRNER, K. (2025a). *Erroneous Beliefs Impede the Implementation of Cooperation-Inducing Mechanisms*. SSRN Working Paper No. 5391817.
- , — and WEY, C. (2024). Defining what the relevant market is: A new method for consumer research and antitrust, SSRN Working Paper No. 4710988.
- and GROSSMANN, M. R. P. (2025). Public support for environmental regulation: When ideology trumps knowledge, arXiv preprint arXiv:2503.10821.
- , RESSI, A. and WEY, C. (2025b). Why avoiding deindustrialization via subsidies may trigger a subsidy trap and slow down green investments, SSRN Working Paper No. 5391807.
- and WEY, C. (2025). Why “energy price brakes” encourage moral hazard, raise energy prices, and reinforce energy savings. *The RAND Journal of Economics*, **56**, 129–144.