How Do Competition Policy and Data Brokers Shape Product Market Competition?

Heli Koski

The Research Institute of the Finnish Economy
heli.koski@etla.fi

Abstract

This paper empirically analyzes how a data broker affects competition in oligopolistic product markets. It examines a unique case concerning the two dominant Finnish food retail companies' voluntary withdrawal from information exchange via a data broker. Moreover, the companies jointly approached the Finnish antitrust authority, originating an investigation whether their prior horizontal information exchange was illegal. This resulted in the permanent termination of a data broker's business in the Finnish food retail sector. The empirical analysis employs quarterly data from the food retail sector of the old EU-15 countries for 2005–2017.

The difference-in-differences model is used to explore the competitive impacts of a termination of vertical and horizontal information exchange via a data broker in the Finnish food retail sector. Data suggest that competition was less fierce and product prices higher after the termination of information exchange via a data broker. Longer-term evidence on the price increase in the absence of a data broker is inconclusive. Furthermore, discontinuation of data exchange from the downstream to the upstream firms facilitated downstream bargaining power and generated a long-term increase in the gap between retail and producer prices.

Tiivistelmä

Lisäävätkö datanvälittäjät kilpailua?

Tämä aineistoanalyysiin perustuva tutkimus arvioi da-
tanvälittäjien kautta vaihdettavien tietojen vaikutusta
kilpailuun EU–15-maiden elintarvikemarkkinoilla. Tut-
kimuksessa hyödynnetään Suomessa tapahtuneita
muutoksia päivittäistavarakauppaa koskevien tietojen
vaihdossa. Datanvälittäjän, AC Nielsenin, poistuminen
Suomen elintarvikemarkkinoilta vuonna 2008 johti kor-
keampiin ruoan kuluttajahintoihin ja vähäisempään kil-
pailuun tuotemarkkinoilla. Tutkimus ei tarjoa selkeää
näyttöä hintojen pidempiaikaisesta noususta datanvälit-
täjän poistuttua markkinoilta. Aineiston valossa näyttää
siltä, että kilpailun käytyä kovaksi oligopolistilla mark-
kinoilla, yritykset koordinoivat toimintaansa ja pyrkivät
tilanteeseen, jossa kumpikaan ei hanki tietoja datanvä-
littäjän kautta. Tutkimus osoittaa myös, että ero elin-
tarvikkeiden tuottaja- ja kuluttajahintojen välillä kasvoi
sen jälkeen, kun tuotantoketjun alkupään markkina-
toimijoilla ei ollut enää mahdollisuutta hankkia tarkko-
ja myyntimäärä- ja hintatietoja AC Nielsenin ScanTrack
-palvelun kautta.

"This concerns the exchange of information between the Finnish grocery retailers Kesko, Suomen Osuuskauppojen Keskuskunta (SOK) and Tradeka Oy ('Tradeka'). The Finnish Competition Authority started to investigate SOK's and Kesko's inquiries about the FCCA's view of potential competition law problems related to the ScanTrack information exchange system maintained by AC Nielsen Oy."[2]

1. Introduction

Digitization and the emergence of markets for data has changed the nature of data collection and information exchange. Specialized third-parties, i.e., data brokers, collect, aggregate and cleanse consumer and market information and further license or sell data to companies.[3] Analysts predict that global data broker markets focusing on consumer data will grow at an annual rate exceeding 11% until the end of 2024.[4] The growing importance of data brokers and algorithm use for frequent and detailed monitoring of consumer behavior not only enhances market transparency but also enables intensified information exchange among companies competing in product markets.[5] The real-world competitive responses of firms when markets for data enable better detection of and adaptation to competitors' actions are poorly understood yet are of utmost importance to the regulators and antitrust authorities. Economic theory does not unambiguously predict whether the competing companies' information exchange via data brokers enhances competition or instead facilitates collusive behavior.

This paper empirically analyzes how a data broker that enables horizontal information exchange in oligopolistic markets affects product market competition. It further assesses how retail sales

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[2] Commencement of the proceeding as described in the FCCA's decision 19.6.2008 (registration number: 154/61/2007): Tietojenvaihto suomen päivittäistavarakaupan markkinoilla (Engl. Exchange of information on the Finnish grocery market). Source: https://www.kkv.fi/ratkaisut-ja-julkaisut/ratkaisut/arkisto/2008/muut-ratkaisut/154612007/ Accessed Sept 6, 2018.

[3] This paper defines a data broker as a company that collects and sells data concerning individuals and/or markets. A narrow definition employed in the media comprises third parties selling merely data comprising personal information.

[4] Source: http://www.digitaljournal.com/pr/3520846. Accessed Sept 19, 2018.

[5] Furthermore, algorithms accelerate the speed at which sellers may analyze markets and react to changes, e.g., by adjusting prices. Dynamic pricing models optimize prices based on demand and, in the case of non-digital goods, available in the store.

data sold by data broker to suppliers influence bargaining power between downstream and upstream companies. The empirical part of the paper examines a unique case concerning the two dominant Finnish food retail companies' voluntary withdrawal from information exchange via a data broker. Moreover, the companies jointly approached the Finnish antitrust authority, originating an investigation whether their prior horizontal information exchange was illegal. This resulted in the permanent termination of a data broker's business in the Finnish food retail sector.

The empirical analysis employs consumer and producer price data for food in the old EU-15 countries for 2005-2017. We use the difference-in-differences model to explore the competitive impacts of a termination of vertical and horizontal information exchange via a data broker in the Finnish food retail sector. The other countries where both the suppliers and retailers had access to retail food sales data via a data broker throughout the sample years are used as a control group. We find that competition was fiercer and product prices lower when one or both companies bought data from a data broker than it was after the termination of a data broker's business in the Finnish food retail sector. Our data further indicate that the discontinuation of data exchange from the downstream to the upstream firms facilitates downstream bargaining power and increases the gap between retail and producer prices.

Closest to this study is the emerging theoretical literature exploring how the markets for data with a profit-maximizing data broker influence competition in product markets (see Bounie et al., 2018). This work also has connections to another narrow stream of industrial organization literature concerning the competitive effects of downstream buyer power and upstream bargaining power (see Doyle and Han, 2012; Piccolo and Miklos-Thal, 2012). Our empirical investigation further contributes to a vast number of both theoretical and empirical industrial

organizational studies concerning information exchange and collusion (see, e.g., Albaek et al. 1997; Vega-Redondo, 1997; Athey and Bagwell, 2001; Bos and Harrington, 2010; Levenstein and Suslow, 2011; Ater and Rigbi, 2017; Luco, 2018). Furthermore, this study provides a new perspective on the discussion of competition and determination of food prices (see, e.g., Lira et al., 2012; Schnepf, 2015).

The rest of the paper is organized as follows. Section 2 describes information exchange practices via a data broker in the European food retail sector and the collapse of the market for data in the Finnish food retail sector. Section 3 uses the literature on the impacts of data brokers and information exchange on competition to formulate hypotheses for the empirical part of the paper. Section 4 introduces the data. Section 5 presents the econometric model and the estimation results. Section 6 concludes.

2. Data brokers and information exchange in food retail markets: the case of Finland

In retail markets, various international data brokers (e.g., AC Nielsen, Information Resources, Inc. (IRI), GfK) collect store-level point-of-sales (i.e., POS) data directly from food retailers and data on purchasing behavior via consumer panels. The leading consumer data collector and data broker in the food and drinks industry, AC Nielsen, operates in over 100 countries.[6] AC Nielsen's ScanTrack service collects bar code (EAN)-level information concerning customers' purchases from cash registers in retail stores. In various countries, the retailers can buy rather detailed, high-frequency data on their competitors' activities. For instance, in Denmark, the retailers "…*have, in some areas, extensive knowledge of their competitors' daily operations due*

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[6] Source: https://www.nielsen.com/eu/en/about-us.html. Accessed Sept 9, 2018.

to the fact that they buy sales data from the Nielsen Company" (ECN Brief, 2011) and "*…get access to information regarding their competitor's prices and sales volume*" (Danish Competition Authority, 2011).

The European food retailing sector is typically highly concentrated, raising concerns of the dominant retailers' buyer power and use of anti-competitive practices (OECD, 2014). Horizontal information exchange enabled by the data brokers may increase, in particular, the possibilities of large companies in oligopolistic food retail markets to tacitly collude to avoid price-cutting and other forms of competition. The antitrust authorities have addressed this question in some countries, such as Denmark. The Danish national competition authority concluded that the data sold by the data broker do not result in the use of anticompetitive practices in the food retail sector: "*Although the information entails a higher degree of transparency between the competing retailers, there is no sign that it leads to competition limiting behaviour in the grocery market*" (Danish Competition Authority, 2011).

In February 2007, the Finnish Competition and Consumer Authority, FCCA, began an investigation of the potential antitrust problems related to the use of Nielsen's ScanTrack system in the domestic food retail sector. Interestingly, the inspection was initiated by the two dominant retail groups, Ruokakesko (henceforth Kesko) and Suomen Osuuskauppojen Keskuskunta (henceforth SOK), which themselves used ScanTrack. Kesko and SOK formed a tight oligopoly, as they covered, respectively, about 34 and 40 percent of the Finnish grocery trade.[7]

In February 2007, Kesko announced in its stock exchange release that it had terminated their ScanTrack service agreement as of the end of 2006 and "expressed its concern about the

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[7] The FCCA's decision 19.6.2008 (registration number: 154/61/2007): Tietojenvaihto suomen päivittäistavarakaupan markkinoilla (Engl. Exchange of information on the Finnish grocery market). Source: https://www.kkv.fi/ratkaisut-ja-julkaisut/ratkaisut/arkisto/2008/muut-ratkaisut/154612007/ Accessed Sept 6, 2018.

centralization of grocery trade to the Finnish Competition Authority".[8] Kesko's withdrawal from ScanTrack use ended the horizontal information exchange via the data broker between the two dominant Finnish food retail companies. In early 2008, SOK also withdrew from providing cash-register data to ScanTrack, leading to the termination of the service in Finland (Leppänen, 2010).

ScanTrack retail sales data was available for both the retailers and suppliers classified geographically into different regions and into the four size categories of retails stores, i.e., 100 to 399 m^2, 400 to 999 m^2, 1000 to 2499 m^2 and over 2500 m^2 stores. Exchanged weekly price and sales data from the three largest retailers and from various discount chains was very detailed and timely. The concentrated market structure, and particularly the two dominant food retail companies' high (i.e., about 80-90 %) market share in the three largest grocery size categories, enabled the food retailers to monitor even small price changes of their major competitors. The fourth largest retail company, Lidl, with about a 4% market share, did not participate in Nielsen's POS data collection. The POS data that Nielsen collected covered approximately 90% of trade of Finnish retailing grocery stores.

In June 2008, the FCCA announced its decision in the case concerning horizontal food retail information exchange via Nielsen. The FCCA concluded that Kesko and SOK had been able to detect changes in each other's competitive behavior using grocery store, grocery size category and regional level information. It was established that the price information that the three largest grocery retailers (i.e., Kesko, SOK and Tradeka) bought in 2006 from the Nielsen company was potentially harmful to competition. The FCCA's judgement was that such

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[8] Kesko Stock Exchange release 20.2.2007. Source: https://www.kesko.fi/en/media/news-and-releases/stock-exchange-releases/2007/providing--ean-information-to-acnielsen-scantrack/, Accessed Sept 9, 2018.

horizontal information exchange violated the Finnish Competition Act and Article 81 EC. However, it imposed no sanctions on the parties involved in the illegal information exchange, as the investigation was instigated by Kesko and SOK and as the retailers had already given up using ScanTrack.

Before the downstream firms withdrew from exchanging information via a data broker, the upstream firms on the Finnish food markets also had access to detailed information about retail sales and prices. Especially for the upstream firms with bargaining power (i.e., the major suppliers in concentrated sectors), such information was likely to be useful in price negotiations – whose results were trade secrets – with the food retailers. The suppliers had no need to develop their own retail food market monitoring systems, as a specialized data collector in the market sold detailed retail market information. The termination of ScanTrack data collection and exchange in Finland put an end to a situation in which the upstream suppliers were able to closely observe price developments and demand among the different food groups. It seems credible that this shifted bargaining power from the suppliers to the major retailers.

Subsequently, after the collapse of the ScanTrack service, the suppliers in the Finnish food and drinks industry began to develop their own food retail market monitoring system. In February 2011, the Finnish food industry association published the following news: "*The food market monitoring began again in February: There has been a shortage of information on the Finnish food market ever since the AC Nielsen market monitoring system Scantrack was abolished a few years ago. The Finnish Food and Drinks Industries' Federation has now created a tool for monitoring the trends in the food market with its member companies. The tracking service that replaces Scantrack is based on delivery information from the suppliers. It gives information on*

the overall market for food, its development and direction."[9] The sales data obtained via the new monitoring tool, as well as the data that the suppliers were able to buy directly from the retailers, were less accurate and more limited in scope compared to the data that the suppliers had obtained from the ScanTrack service.

At the beginning of 2014, a new provision was added to the Finnish Competition Act (948/2011) deeming that the companies with at least 30% market share in the Finnish groceries retail market (i.e., both Kesko and SOK) hold a dominant position in the market. This change in legislation brought to light the suppliers' concerns related to the inadequate information they obtained from food retail markets and the possible bargaining advantage that the dominant retailers had due to this information asymmetry. The FCCA began investigating the potential abuse of the dominant position of Kesko and SOK, followed by allegations that there were problems related to the two dominants retailers´ information exchange to the upstream firms. After the investigation, the FCCA concluded that the retailers' provision of sales information to the suppliers on terms different from the ones used at the time would not be considered to unambiguously promote competition in the grocery market. The FCCA found no evidence that Kesko or SOK had used data distribution practices that could be considered an abuse of their dominant position.[10]

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[9] Source: https://www.ruokatieto.fi/uutiset/ruokamarkkinoiden-seuranta-alkoi-taas-helmikuussa. Accessed Oct 4, 2018.
[10] The FCCA decisions 15.6.2016 (registration number: 205/KKV14.00.00/2013): Ruokakeskon menekkitiedonjako & Suomen Osuuskauppojen Keskuskunta menekkitiedonjako (Engl. Sales information distribution of Ruokakesko & Sales information distribution of Suomen Osuuskauppojen Keskuskunta). Sources https://www.kkv.fi/globalassets/kkv-suomi/ratkaisut-aloitteet-lausunnot/ratkaisut/kilpailuasiat/2016/muut-ratkaisut/ruokakesko-menekkitieto-paatos-lopullinen-15062016-julkinen.pdf & https://www.kkv.fi/globalassets/kkv-suomi/ratkaisut-aloitteet-lausunnot/ratkaisut/kilpailuasiat/2016/muut-ratkaisut/sok-menekkitieto-paatos-lopullinen-15062016-julkinen.pdf. Accessed Sept 30, 2018.

3. What does the literature say about data brokers and competition?

Some recent theoretical studies address the limited knowledge that contemporary research provides on the data brokers' impacts on markets, e.g., how competition affects the quantity and quality of supplied information and how this further influences product market competition (see, e.g., Kast et al., 2018). However, the theoretical literature exploring how third-party data providers affect competition is meager. The study by Bounie et al. (2018) is one of the first to explore the competitive impacts of a profit-maximizing data broker that chooses its optimal strategy to sell data to firms competing in the product markets. Their theoretical model suggests that when there is a data broker selling consumer information to two competing retailers in product markets, the retailers are in a prisoner's dilemma. In their model, the firms can use consumer information to price discriminate. When both retailers buy information from the data broker, more information induces them to compete more fiercely and reduces the firms' profits compared to the situation when neither of the firms bought market information (or, equivalently, when there was no data broker in the market). This is the Nash equilibrium, as being the only retailer not buying information would mean even lower profits for the uniformed company. When two firms have asymmetric information, as only one of the firms buys information from a data broker, competition is fiercer than it would be without the data broker, and the less informed firm always has lower profits than the more informed one.

We may also learn some lessons from the extensive industrial organization literature concerning the impacts of information exchange on product market competition and collusion, beginning with Stigler's (1964) pathbreaking article (see, e.g., Albaek et al., 1997; Harrington and Skrzypacz, 2007). The economic literature provides no unambiguous answer to the question whether more information softens or tightens competition. On the one hand, more

detailed consumer information allows a firm to price discriminate and extract more surplus from consumers, thus gaining higher profits. On the other hand, market transparency allowing consumers to compare prices and observe price changes may facilitate competition, as firms have an incentive to set lower prices. It is well known that in oligopolistic markets, price discrimination leads to an intensified competition, lower profits for the firms and increased consumer welfare due to lower prices (Schrerer, 1970). For instance, Vega-Redondo's (1997) theoretical framework with bounded rationality and imitation learning in Cournot markets with homogenous products suggests that a complete disclosure of individual data facilitates competition when firms imitate the most profitable firm.

Furthermore, as the broad literature concerning collusive behavior acknowledges, horizontal information exchange may facilitate collusion since it helps the competing firms to coordinate their prices to a level that provides both companies higher-than-competitive profits. Information exchange further allows a firm to monitor if its competitor(s) follow the collusive pricing practices and assists firms in maintaining a collusive level of competition that is softer than it would otherwise be. Mehra (2015) discusses how computer algorithms increase the transparency and accuracy with which firms can detect price changes and enable faster price responses. The use of similar algorithms further enables firms to predict their competitors' reactions and dominant strategies (Ezrachi and Stucke, 2017). All these factors potentially increase the power of oligopolistic competitors to charge supracompetitive prices and, moreover, to maintain collusion. Algorithms provide a more efficient means than available before to collude with tacit co-ordination (OECD, 2017).

The prior empirical work that relates to this study focuses primarily on the price impacts of i) the mandatory disclosure of information and ii) horizontal information exchange during

collusion.[11] The study of Albaek et al. (1997) indicates that after the Danish antitrust authority enforced firms to publish the transaction prices of ready-mixed concrete, the intensity of oligopoly competition diminished and prices increased. Luco's (2018) empirical investigation of the mandatory disclosure of price information in the Chilean retail-gasoline industry provides similar evidence of the impacts of information transparency on prices. On the other hand, the empirical study of Ater and Rigbi (2017) illustrates how a regulation in the food markets obliging Israeli supermarket chains to post all their prices online resulted in a decline in prices. Empirical studies on horizontal information exchange during collusion provide clear evidence of the higher mean prices during the (seller) cartels (see, e.g., Bolotova et al. 2008; Andreoli-Versbach and Franck, 2015).

In summary, the literature suggests that horizontal information exchange via a data broker may generate two contrary effects in oligopolistic product markets: more accurate and detailed market data available for firms i) leads into fiercer competition and lower prices or ii) facilitates collusion and leads into supracompetitive prices.

We thus propose the following opposing hypotheses:

H1: Competition tends to be softer and product prices higher when firms horizontally exchange information via a data broker than it would be without the presence of the data broker. (Traditional collusion hypothesis)

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[11] There are also empirical studies exploring price formation in the online markets where price disclosure is voluntary (see, e.g., Ellison and Fisher Ellison, 2009).

H2: Competition tends to be fiercer and product prices lower when firms buy market information from a data broker than it would be without the presence of the data broker. (Prisoner's dilemma with data broker hypothesis)

Furthermore, the theoretical model of Bounie et al. (2018) suggests that competition is fiercer when only one of the firms buys information from the data broker than when neither of the firms buy information. This leads to the following hypothesis:

H3: Competition tends to be fiercer and product prices lower when only one of the two competing firms buys market information from a data broker than it would be without the presence of the data broker. (Asymmetric information with data broker hypothesis)

Another stream of literature relevant here concerns the risk of downstream collusion when companies have buyer power. The contemporary theoretical literature concerning the input contracts and the collusive effects of buyer power is scarce, however. Doyle and Han (2012) develop a model of wholesale contracting with a buyer group that allows all retailers to coordinate jointly on wholesale contracts. Their study indicates that a buyer group facilitates collusion in the output market.[12] The theoretical model of Piccolo and Miklos-Thal (2012) suggests that when downstream firms have buyer power, they can "collude more easily in the output market if they also collude on their input supply contracts". They further indicate that when the upstream firms have bargaining power, it makes downstream collusion more difficult, as upstream and downstream firms must share industry profits to prevent each other from contract deviations. When bargaining power shifts from suppliers to retailers, the risk of collusion increases.

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[12] The meta study of Levenstein and Suslow (2006) relatedly found that joint-market institutions with a negotiation power facilitate collusion: trade associations were relatively commonly involved in the discovered U.S. cartels.

Given the suggestions of theoretical studies, it seems possible that the discontinuation of vertical market information exchange from the downstream firms to the upstream firms may increase the risk of collusion and supracompetitive pricing. After the data broker exited the markets, the upstream companies did not obtain as detailed information on retail prices and sales as they had earlier. Consequently, due to information asymmetry and increased bargaining power of retailers, it appears possible that the retailers had to share less profits with the suppliers and the margin between the retail and producer prices grow. It is likely that this effect would be strongest in the concentrated supplier sectors, since the firms in less concentrated (or competitive) ones had little or no bargaining power in the first place.

H4: The discontinuation of data exchange from the downstream to the upstream firms facilitates downstream bargaining power and increases the gap between the retail and producer prices

4. Data

The dependent variables of the estimated models for food prices are the country-level quarterly consumer price index (i.e., CPI) for food and CPI for seven food items. We further estimate a variant of the model in which the CPI for food is adjusted for general inflation. We subtract the CPI for other all items excluding food and energy from the CPI for food to remove the country- and time-specific variation in general inflation, i.e., to obtain a measure that captures merely the differences in food price developments across countries. The dependent variable measuring the gap between the consumer and producer prices is calculated as a quarterly difference in the CPI for food and producer price index (i.e., PPI) for food. The monthly and CPI and domestic PPI data are extracted from Eurostat's Food Price Monitoring Tool from January 2005 to December 2017. The price index data (2010 = 100) is classified by the individual use of purpose

to the aggregate "food" category (i.e., CPI_F) measuring the overall price development in the food products purchased for consumption at home. The data were also extracted from the following sub-categories: i) bread and cereal, ii) meat, iii) fish and seafood, iv) milk and cheese, v) oil and fat, vi) fruit and vii) vegetables.[13]

The overall country-specific price developments were captured by the monthly CPI for "all items less food less energy (COICOP 01-12 less COICOP 01, 04.5 & 07.2.2)" (i.e., CPI_{NF}) that was extracted from the OECD.Stat database. This "core" CPI measure for price inflation was chosen because it also excludes, in addition to the food price development, highly volatile energy prices. Monthly data were converted to quarterly observations. The dataset covers the "old" EU-15 countries, i.e., Finland, Sweden, Denmark, Germany, The Netherlands, Belgium, Ireland, Greece, Spain, France, Italy, Austria, Luxembourg, Portugal and the United Kingdom.

- FIGURE 1 HERE -

Figure 1 illustrates the price developments of food and non-food items from 2005 to 2017 in Finland and in the other EU-15 countries, on average. It shows that the CPI for non-food items excluding energy has followed a gently sloping, increasing trend both in Finland and in the other EU-15 countries from the beginning of 2005 until the end of 2017. Among the sample countries, the average CPI for food increased parallel to the international food price inflation from 2007 until mid-2008. Next, among the other EU-15 countries except Finland, food prices first

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[13] The subcategories beef and veal, pork, poultry, whole milk, cheese and curd and potatoes were excluded, as the data available in these categories were not adequate for empirical analysis (i.e., there were no data available for the "treated" country, Finland).

stagnated and then began to fall due to a global economic slowdown. Instead, in Finland, food prices rose sharply through 2008 until the second quarter of 2009. This period of price increases overlaps with the period following the termination of retail information exchange in the Finnish food markets.

The dotted line in Figure 1 measures the value added tax (VAT) percentage on food items in Finland. The VAT on food in Finland remained steady at 17% from 2005 until the last quarter of 2009. Thus, the change in the value added tax rate offers no explanation for the higher food price inflation in Finland after the mid-2008 than in other EU countries. Instead, it seems evident that a decrease in the VAT rates for food was passed on to the food prices in Finland. The 785/2008 law mandating a reduction from 17% to 12% in the VAT rate for food items in October 2009 was passed in December 2008. There was a clear decline in Finnish food prices following the passage of that law. There was a concurrent general slowdown in the global economy that hindered price inflation, but it is impossible to assess here its role in price decline.[14]

- TABLE 1 HERE -

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[14] Retail food price increases received plenty of media attention in Finland. Policymakers raised concerns about the dominant retailers' market power and pricing practices and further conducted investigations on food price formation. The study of Kotilainen et al. (2010), commissioned in 2009 by the Ministry of Economic Affairs and Employment, concluded that the Finnish food markets function well and that a lack of competition is not the underlying reason for the relatively high food prices in Finland. Moreover, in 2011, the FCCA assessed the role of buying power and competition in the Finnish food market (see Björkroth et al., 2012).

Our estimations control for the time- and country-varying factors that prior literature suggests potentially affect food prices. The major determinants of food prices include costs generated by labor, agricultural commodities and energy. The unit labor costs for the wholesale and retail trade, accommodation food services, transportation and storage sectors extracted from the OECD's Productivity and ULC by a main economic activity (ISIC Rev.4) dataset is used as a proxy for wage development in the food retail sector.[15] The monthly agricultural commodity price index is obtained from Eurostat's Food Price Monitoring Tool. We measure energy prices with the bi-annual electricity prices for non-household consumers in euros per kilowatt-hour extracted from the Eurostat database and converted to the energy price index. In the estimations in which the dependent CPI for food variable is adjusted for general consumer price inflation, the explanatory variables are correspondingly adjusted to general cost-push inflation (see Table 1).[16]

We use the value added tax for food (i.e., a VAT percentage) in a country at a given year as a control variable rather than adjust the dependent variable with it, as some previous studies find evidence that VAT is not fully passed through to consumer prices. For instance, Benedek et al. (2015) find that of the changes in reduced VAT rates, such as those for food, only around 30 percent pass through to prices. The pass-through percentage of VAT across countries is thus unknown and left to be determined empirically.

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[15] The unit labor costs are available at the quarterly level from 2005 to the first quarter of 2011, except for the UK and Portugal. We use annual unit labor costs for these two countries, and for all sample countries from 2011 to 2017.

[16] As there are no data available on the unit labor costs at the level of other, non-food sectors, the unit labor costs in manufacturing is used as a proxy for the wage development in the other sectors and subtracted from the unit labor cost measure for the food retail sector. Total industry producer prices (excluding construction, sewerage, waste management and remediation activities, and food, beverages and tobacco) are used as proxy for the general producer price development in the economy and subtracted from the PPI for agricultural commodities.

5. Econometric model and empirical findings

We used the difference-in-differences (DID) methodology to capture the difference in food price developments in the "treated" country (i.e., Finland) during the time period before and after the "treatment times" as compared to the corresponding differences in food price developments in the other EU-15 countries. One advantage of the DID model is that it eliminates the potential bias arising from the unobserved time-invariant or permanent differences between the treated country and the other countries that would affect food prices even if there were no change in data policy or information exchange practices via the data broker. This is important to control for when we assess food price formation across countries. In many reports, the explanations provided for the relatively high food prices in Finland relate to time-invariant factors, such as its Northern location, with higher transportation costs and smaller farm sizes than in other EU countries (see, e.g., Kotilainen et al., 2010).

We used the random effects model with the clustered standard errors on the country-food category variables to allow for arbitrary correlation within the observation units to correct for autocorrelation. We estimated the following difference-in-differences model first for the years 2005-2010 and then for 2005-2017 to assess longer-term impacts[17]:

$$CPI_{Fijt} = \alpha_0 + \alpha_1\, PRE * treated_i + \alpha_2\, POST1 * treated_i + \alpha_3 POST2 * treated_i +$$

$$\alpha_4 \sum_{\tau=T1,T2} \alpha_4 1[t = \tau] + \sum_{q=1,\dots,4} \alpha_5 1[q = quarter] + \sum_{y=2005,\dots,2010} \alpha_6 1[y = year] +$$

$$\sum_j \beta_j\, C_{it} + \varepsilon_{it}$$

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[17] This a modified version of the DID model used by Aghion et al. (2018). In the alternative specification, the dependent variable is $CPI_{Fit} - CPI_{NFit}$.

where i refers to country, j to food group and t to time. PRE is a dummy variable that gets the value 1 when there is horizontal and vertical retail information exchange via a data broker (i.e., for 2005-2006). The dummy variable POST1 is assigned a value of 1 for the time period when there was no horizontal information exchange between the dominant Finnish food retailers via a data broker and prior to the FCCA's decision that deemed the retailers' information exchange via a data broker illegal (i.e., for 01/2007 to 06/2008). The dummy variable POST2 captures the time period after the Finnish competition authority's decision that ended food retail information exchange via a data broker in Finland (i.e., for 06/2008 onwards or after the data broker discontinued its operation). Treated$_i$ is a dummy variable that is assigned a value of 1 if for Finland, i.e., the country in which the two largest food retailers voluntarily ceased information exchange via a data broker and the competition authority further deemed such information exchange an illegal practice terminating the data broker's business in the Finnish food retail sector, and a value of 0 otherwise.

The estimated coefficient α_1 reveals the differences in the food prices between the country that experienced a change in the information exchange practices in its food retail sector and the other countries prior the policy change, i.e., when horizontal and vertical retail information exchange via a data broker was allowed in all sample countries. The coefficients α_2 and α_3 are of primary interest here: α_2 captures the change in food prices during the time when horizontal information exchange between the dominant retailers was terminated but there was still (partial) vertical information exchange from the retailers to the suppliers, and α_3 captures change in food prices after the competition authority deemed the use of a data broker for horizontal information exchange illegal. Coefficients α_{4T1} and α_{4T2} nail the treatment time effects for T1 and T2 that represent, respectively, the termination of horizontal retail

information exchange and the end of all retail information exchange via a data broker. Seasonal or quarterly variation in prices is captured by α_5. Changes in the time-related aggregated factors (such as changes in European competition law) that may affect food price developments in the sample countries irrespective of data policy are measured by α_6. Control variables C_{it} comprise the value added tax, unit labor costs, agricultural producer prices and energy prices, and the food category and country-specific dummy variables.

We first estimated the basic model in which the unadjusted overall food price development and the CPI for food compared to non-food inflation are the dependent variables. Table 2 reports the estimation results for 2005-2010. The estimated coefficients for the first interaction term suggest that there was no statistically significant difference in general food price development from 2005 until early 2007 between Finland and other EU-15 countries. The estimated coefficients of the term "No horizontal retail info exchange via data broker x treated" hint that the termination of horizontal information exchange between the two dominant Finnish food retailers competing in a tight oligopoly setting did not substantially affect food prices in Finland. Instead, when the FCCA's decision terminated information exchange leading to the collapse of both horizontal and vertical exchange of retail food sales data, food prices in Finland clearly increased from the third quarter of 2008 until the end of 2009, as compared to food price development in the other EU-15 countries. The estimated coefficients for the variable "No info exchange via data broker x treated" are 2.6 and 3.9, respectively, in the estimated models for the unadjusted and adjusted CPI. According to the Wald-test, the difference between these estimated coefficients is not statistically significant.

-    TABLE 2 HERE –

Table 3 captures longer-term price developments until the end of 2017. The estimation results show that the only interaction variable that gets statistically significant estimated coefficient is the variable "No info exchange via data broker x treated" in the model for the CPI for food adjusted to general inflation.

- TABLE 3 HERE –

These empirical findings reject the hypothesis of traditional collusion via horizontal information exchange (i.e., hypothesis 1). Data for 2005-2009 provide support for hypothesis 2 in the sense that after retail information exchange via a data broker was completely eliminated, competition among retailers softened. However, as the estimated coefficients for the variable "No horizontal retail info exchange via data broker x treated" are not statistically significant, the change did not immediately follow the termination of horizontal information exchange between the dominant retailers. In other words, when one of the two dominant retailers continued exchanging retail data via a data broker and had access to the data of the third largest retail company and various discount chains, competition seemed to be still fiercer and food prices lower than later on, without the presence of a data broker. This finding provides support for hypothesis 3. However, the results of the longer-term estimations do not unambiguously support hypothesis 2 or 3.

- TABLE 4 HERE –

Next, we estimated the model in which the dependent variable comprises j (j=1…7) subcategories of food, CPI_{Fijt}. The idea was to further assess whether the effect of the termination of information exchange among food retailers on food prices varied between different food items.[18] The estimation results show that there was a clear increase in the price of bread and cereal, milk and cheese, and oil and fat in Finland following the termination of both horizontal and vertical information exchange. Milk and cheese and oil and fat were the subcategories in which the increase after the end of retail information exchange was largest (i.e., about 7%) from the third quarter of 2008 until the end of 2009.

Table 4 indicates that there was no statistically significant longer-term increase in any of the food categories.[19] The longer-term estimations for the food sub-categories do not thus support hypothesis 2 and 3. It seems credible that a temporary increase in the Finnish food prices after the mid-2008 rather related to decreased competition that allowed the retailers charge prices higher than competitive levels. The estimated average overcharges of close to 7% for milk and cheese and oil and fat would be in line with the previous studies concerning collusion in retail markets. Laitenberger and Smuda (2015) found overcharge between 6.7 % and 6.9% for detergents in Germany during collusion that took place from July 2004 until March 2005. Cuibiano's (2017) study concerning the Brazilian fuel retail cartel suggests an overcharge of 4.6% to 6.6% for gasoline and up to 12% for ethanol.

We next estimated the equation capturing the difference between consumer and producer prices. Here, the dependent variable is $CPI_{Fit} - PPI_{Fit}$, where PPI is the domestic producer

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[18] There were no data concerning agricultural commodity prices for fish and seafood. Thus, this food category was excluded from the analysis. In addition, various food categories had missing data points in agricultural commodity prices.

[19] We also estimated a model in which food prices were adjusted to general inflation. The estimation results of this model didn't deviate significantly from those reported in Table 4.

price index for food extracted from Eurostat's Food Price Monitoring Tool database. There were no PPI data for food concerning Finland available at the level of food subcategories. We were thus able to merely estimate the model using the overall consumer and producer price differences. Table 5 reports the estimation results.

-   TABLE 5 HERE –

A positive and statistically significant coefficient for the variable "No horizontal retail info exchange via data broker x treated" suggest that the difference between consumer and producer prices compared to the corresponding price differences in the other EU-15 countries increased following the gradual collapse of the ScanTrack service in Finland that delivered suppliers detailed information on food retail sales. The gap between consumer and producer prices for food in Finland further widened from the third quarter of 2008 until the end of 2009 (i.e., following the complete termination of food retail information exchange) compared to the other sample countries. The estimated coefficient for the variable "No info exchange via data broker x treated" appeared statistically significant also in the longer-run estimations. Its magnitude was also statistically significantly larger than that of the variable "No horizontal retail info exchange via data broke x treated", unlike in the estimations for 2005-2009. In other words, the long-run difference between consumer and producer prices in Finland without a data broker appeared to be larger than the short-run one following the termination of information exchange. Overall, these estimations provide support for hypothesis 4.

6. Conclusions

This empirical study explores how the markets for data shape competition in oligopolistic markets. Specifically, it analyses how companies compete in the presence of a data broker as opposed to the situation where information exchange via the data broker is terminated. To the best of my knowledge, there are neither prior empirical studies addressing the competitive impacts of data brokers nor analyzing the relationship between downstream collusion, buyer power and upstream bargaining power. The empirical analysis examines the Finnish case in which the two dominant food retail companies voluntarily withdrew from information exchange via a data broker. The companies further jointly initiated the FCCA's investigation concerning the legitimacy of horizontal information exchange via the data broker resulting in a termination of data broker business in the Finnish food retail sector.

The data from the food retail sector of the EU-15 countries for 2005-2017 finds some support for an emerging strand of theoretical literature studying the competitive impacts of a profit-maximizing data broker in the market. Data suggest that competition was less fierce and product prices higher after the termination of information exchange via a data broker. However, longer-term evidence on the price increase in the absence of a data broker is inconclusive. It seems that the underlying explanation for the higher food prices in Finland after the termination of a data broker business rather relates to the firms' strategic behavior. It seems credible that, to avoid fierce competition, retail companies coordinated their behavior under the guise of competition policy to terminate information exchange via a data broker.

In addition, the empirical findings hint that the collapse of vertical information delivery via a data broker from the downstream to the upstream companies shifts bargaining power to the downstream firms, and the gap between supplier and retailer prices increases. Thus, the

downstream companies' incentives to terminate a detailed sales information delivery via a data broker may not only relate to their avoidance of a fierce price competition. Possibly and more importantly, the downstream companies that voluntarily cease to use a data broker that delivers retail sales information to the upstream companies benefit from the achieved information asymmetry in their trade negotiations with the suppliers. For antitrust authorities, this empirical finding stresses that it is important not only to focus on horizontal information exchange and product market competition but also to assess the impacts of policy decisions on the upstream firms. Also, to pursue effective data policy, more insights into how the markets for data affect competition in product markets in different contexts are needed.

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Figure 1. The consumer price index for food and non-food items in Finland vs. other EU-15 countries (average): 2005-2017
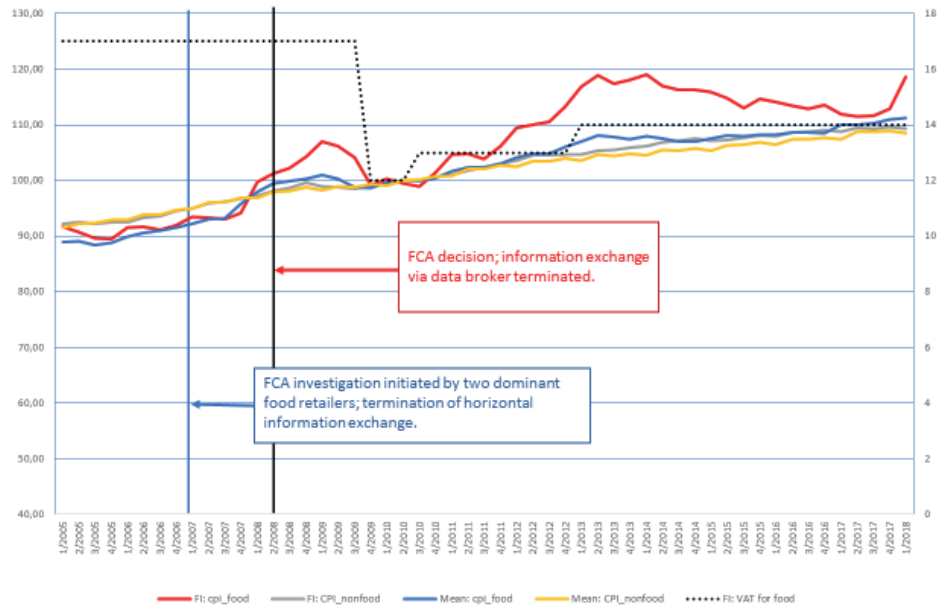
Table 1. Descriptive statistics of the variables for 2005-2018

Variable	Mean	Description
Dependent variables	**(std)**	
CPI_{Fit}	101.89 (7.94)	CPI_{Fit} (CPI_{Fijt}) = CPI (2010 = 100) for overall food (food in subcategory j) in country i at time t. Source: Eurostat's Food Price Monitoring Tool.
$CPI_{Fit} - CPI_{NFit}$	0.48 (3.95)	CPI_{NFit} = CPI (2010 = 100) for all items less food less energy (COICOP 01-12 less COICOP 01, 04.5 & 07.2.2)". Source: OECD.Stat database.
$CPI_{Fit} - PPI_{Fit}$	-2.05 (4.43)	PPI_{Fit} = PPI (2010=100) for overall food in country i at time t. Source: Eurostat's Food Price Monitoring Tool.
Explanatory variables		
PPI_{Ait}	104.68 (11.49)	PPI_{Ait} (PPI_{Aijt})= Agricultural commodity price index (2010=100) for overall food (food in subcategory j) in country i at time t-1. Source: Eurostat's Food Price Monitoring Tool.
$PPI_{Ait} - PPI_{NFit}$	4.16 (9.04)	PPI_{NFit} = PPI (2010=100) industry (except construction, sewerage, waste management and remediation activities), except food, beverages and tobacco. Source: Eurostat.
$LAB_{COST\,Fit}$	99.11 (7.37)	
LAB_COST_{Fit}-LAB_COST_{NFit}	1.28 (12.84)	LAB_COST_{Fit} ($LAB_{COST\,NFit}$) = Unit labor costs for wholesale and retail trade, accommodation food services, transportation and storage sectors (manufacturing). Source: OECD's Productivity and ULC by main economic activity (ISIC Rev.4) dataset.
CPI_{Eit}	100.17 (2.49)	
CPI_{Eit} - CPI_{NFit}	-1.28 (4.82)	CPI_{Eit} = bi-annual electricity price index (2010 = 100) for non-household consumers; data in euros per kilowatt-hour incl. all taxes and levies converted to energy price index. Source: Eurostat database
VAT_{it}	8.89 (5.88)	VAT_{it} = Annual value added tax for food. Source: Various sources.*

*VAT variable is generated by using various information sources, of which the primary ones are: DICE Database (2017), "Value added tax rates (reduced tax rates), 1975–2016", ifo Institute, Munich, online available at http://www.cesifo-group.de/DICE/fb/3xZwX456h and https://www.vatlive.com/country-guides/. VAT rates for food in September 2004 were further listed in Zeiger et al. (2005).

Table 2. The estimation results of the random effects model for overall food price development: 2005-2009

	(1)	(2)
	CPI_{Fit}	$CPI_{Fit} - CPI_{NFit}$
Horizontal & vertical retail info exchange via data broker x treated	-0.410 (-1.20)	-0.642 (-1.08)
No horizontal retail info exchange via data broker x treated	-0.433 (-1.57)	-0.487 (-1.48)
No info exchange via data broker x treated	2.602*** (2.79)	3.896*** (4.49)
Observations	300	280
R-squared	0.941	0.873
Quarterly dummies	Yes	Yes
Year dummies	Yes	Yes
Country dummies	Yes	Yes
Treatment time FE	Yes	Yes
Pre-treatment effects	Yes	Yes

z statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Control variables of model 1 further include VAT, agricultural commodity prices, unit labor costs and CPI for energy.
Control variables of model 2 further include VAT, $PPI_{Ait} - PPI_{NFit}$, LAB_COST_{Fit}-LAB_COST_{NFit} and CPI_{Eit} - CPI_{NFit}.

Table 3. The estimation results of the random effects model for overall food price development: 2005-2017

	(3)	(4)
	CPI_{Fit}	$CPI_{Fit} - CPI_{NFit}$
Horizontal & vertical retail info exchange via data broker x treated	-0.406 (-1.30)	-0.700 (-0.94)
No horizontal retail info exchange via data broker x treated	-0.323 (-0.91)	-0.416 (-1.07)
No info exchange via data broker x treated	-0.423 (-0.32)	2.386** (2.15)
Observations	776	756
R-squared	0.878	0.648
Quarterly dummies	Yes	Yes
Year dummies	Yes	Yes
Country dummies	Yes	Yes
Treatment time FE	Yes	Yes
Pre-treatment effects	Yes	Yes

z statistics in parentheses
$^{*} p < 0.10$, $^{**} p < 0.05$, $^{***} p < 0.01$

Control variables of model 3 further include VAT, agricultural commodity prices, unit labor costs and CPI for energy.

Control variables of model 4 further include VAT, $PPI_{Ait} - PPI_{NFit}$, LAB_COST_{Fit}-LAB_COST_{NFit} and CPI_{Eit} - CPI_{NFit}.

Table 4. The estimation results of the random effects model for price development by food groups

	Dependent variable: CPI$_{Fijt}$					
	Bread & cereal	Meat	Milk & cheese	Oil & fat	Fruit	Vegetables
2005-2009:						
Horizontal & vertical retail info exchange via data broker x treated	1.073 (0.70)	-1.781 (-1.18)	-2.488 (-1.62)	-1.221 (-0.67)	0.834 (0.56)	-5.272*** (-3.08)
No horizontal retail info exchange via data broker x treated	-2.090 (-1.33)	-2.258 (-1.48)	-2.272 (-1.47)	-0.142 (-0.08)	2.817* (1.85)	-2.315 (-1.36)
No info exchange via data broker x treated	3.518** (2.15)	1.321 (0.80)	6.940*** (4.22)	6.929*** (3.99)	2.069 (1.26)	-2.973* (-1.68)
2005-2017:						
Horizontal & vertical retail info exchange via data broker x treated	0.885 (0.41)	-1.063 (-0.50)	-3.088 (-1.43)	-3.108 (-1.34)	0.445 (0.21)	-1.285 (-0.57)
No horizontal retail info exchange via data broker x treated	-3.120 (-1.41)	-1.530 (-0.71)	-2.757 (-1.27)	-2.594 (-1.14)	2.260 (1.04)	1.655 (0.74)
No info exchange via data broker x treated	-3.312 (-1.39)	-0.852 (0.36)	-2.064 (-0.87)	-3.746 (-1.56)	-5.391* (-2.24)	-1.875 (-0.76)
Observations	2005-2009: 1662				2005-2017: 4307	
R-squared	0.62				0.68	

Estimations include quarterly, year, country and food category specific dummies, treatment time FE and pre-treatment effects.

$*\ p < 0.10,\ ** \ p < 0.05,\ *** \ p < 0.01$

Control variables further include VAT, agricultural commodity prices, unit labor costs and CPI for energy.

Table 5. The estimation results of the random effects model for the difference between CPI and PPI for food

	2005-2009	2005-2017
	$(CPI_{Flt} - PPI_{Flt})$	$(CPI_{Flt} - PPI_{Flt})$
Horizontal & vertical retail info exchange via data broker x treated	-0.352 (-0.56)	1.286 (-1.51)
No horizontal retail info exchange via data broker x treated	1.823*** (2.61)	2.770*** (3.17)
No info exchange via data broker x treated	2.512** (2.56)	5.346*** (3.35)
Observations	280	723
R-squared	0.82	0.50
Quarterly dummies	Yes	Yes
Year dummies	Yes	Yes
Country dummies	Yes	Yes
Treatment time FE	Yes	Yes
Pre-treatment effects	Yes	Yes

z statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Control variables further include VAT, agricultural commodity prices, LAB_COST_{Fit}-LAB_COST_{NFit} and CPI for energy. Eurostat did not include PPI for food data in the case of Luxembourg, and it is thus excluded from the estimations.

Lisäävätkö datanvälittäjät kilpailua?

Kuluttaja- ja markkinadatan keräämiseen, yhdistelyyn, muokkaamiseen ja myymiseen erikoistuneet datanvälittäjät ovat nousseet merkittävään rooliin yritysten tietolähteinä. Yritykset käyttävät myös kasvavissa määrin algoritmeja kuluttajien käyttäytymistä koskevien tietojen keräämiseen ja analysointiin. Algoritmien hyödyntäminen ja datamarkkinoiden kehitys tekee markkinoista aiempaa läpinäkyvämmät. Yritykset saavat myös tuotemarkkinoilla kilpailevista kumppaneistaan enemmän ja tarkempaa tietoa. Taloustieteellinen kirjallisuus ei tarjoa yksiselitteistä vastausta kysymykseen yritysten käytössä olevan tiedon määrän vaikutuksesta kilpailuun. Tutkimus datanvälittäjien merkityksestä ja tähän liittyvästä yritysten strategisesta käyttäytymisestä tuotemarkkinoilla on vasta aluillaan.

Tämä aineistoanalyysiin perustuva tutkimus arvioi datanvälittäjien kautta vaihdettavien tietojen vaikutusta kilpailuun EU-15 maiden elintarvikemarkkinoilla. Tutkimuksessa hyödynnetään Suomessa tapahtuneita muutoksia päivittäistavarakauppaa koskevien tietojenvaihdossa. Vuoden 2007 alussa Kilpailuvirasto alkoi selvittää päivittäistavarakaupan vähittäismarkkinoilla toimivien suurimpien kaupanryhmittymien (ts. Ruokakeskon, SOK:n ja Tradekan) tietojenvaihtoon AC Nielsen Oy:n ScanTrack -palvelun kautta mahdollisesti liittyviä kilpailuoikeudellisia ongelmia. Selvitys aloitettiin SOK:n ja Kesko:n tiedustelujen perusteella. ScanTrack -palvelu keräsi tiedot tuotteiden myyntihinnoista ja -määristä myymälöiden kassapäätteiltä. Vuonna 2006 ScanTrack -palvelun data kattoi noin 90 % päivittäistavarakauppojen myynnistä. Dataa hyödynsivät sekä kaupparyhmittymät että elintarviketeollisuuden yritykset. Kesäkuussa 2008 Kilpailuvirasto julkisti ratkaisunsa, jossa se katsoi osapuolten ScanTrack -järjestelmän kautta harjoittaman tietojenvaihdon olleen kilpailunrajoituslain ja EY:n perustamissopimuksen perusteella kiellettyä. ScanTrack -palvelu lakkautettiin Suomessa. SOK ja Kesko olivat jo tätä ennen luopuneet ScanTrack -palvelun käytöstä.

Datanvälittäjän markkinoilta poistumisen vaikutusta kilpailuun Suomen elintarvikemarkkinoilla analysoidaan erotukset-erotuksissa -menetelmällä. Muut EU -15 maat, joissa päivittäistavarakaupan tietojen keruu myymälöiden kassapäätteiden kautta sallittiin, toimivat kontrolliryhmänä. Erotukset erotuksissa -menetelmä eliminoi tuloksista mahdollisen vääristymän, joka voisi syntyä ruoan hintaan vaikuttavista havaitsemattomista pysyvistä eroista (esim. pohjoiseen sijaintiin liittyvät korkeammat kuljetuskustannukset) Suomen ja kontrolliryhmänä toimivien maiden välillä. Lisäksi estimoinneissa kontrolloidaan ruoan arvonlisäveroa sekä keskeisiä ruoan kuluttajahintaan

vaikuttavia tekijöitä: työvoimakustannuksia, maataloustuotteiden tuottajahintoja ja energian hintaa.

Aineisto tukee verrattain lyhyellä aikavälillä hypoteeseja, jotka on johdettu orastavasta teoreettisesta kirjallisuudesta koskien tiedonvälittäjien kilpailullisia vaikutuksia. Datanvälittäjän markkinoilta poistuminen johti korkeampiin hintoihin ja vähäisempään kilpailuun tuotemarkkinoilla. Kilpailu oli myös kovempaa, kun vain yksi isoista kilpailijayrityksistä oli lopettanut tietojenvaihdon datavälittäjän kautta. Tutkimus ei tarjoa selkeää näyttöä hintojen pidempiaikaisesta noususta datanvälittäjän poistuttua markkinoilta. Aineiston valossa näyttää siltä, että kilpailun käytyä kovaksi oligopolistilla markkinoilla, yritykset koordinoivat toimintaansa ja pyrkivät tilanteeseen, jossa kumpikaan ei hanki tietoja datanvälittäjän kautta.

Tutkimus osoittaa myös, että ero elintarvikkeiden tuottaja- ja kuluttajahintojen välillä kasvoi sen jälkeen, kun tuotantoketjun alkupään markkinatoimijoilla ei ollut enää mahdollisuutta hankkia tarkkoja myyntimäärä- ja hintatietoja ScanTrack -palvelun kautta. Päivittäiskaupan yritysten kannusteet ScanTrack – järjestelmän käytön lopettamiseen eivät täten mahdollisesti liittyneet pelkästään kovan hintakilpailun välttämiseen. ScanTrack -palvelun alasajo Suomen elintarvikemarkkinoilla todennäköisesti lisäsi päivittäistavarakaupan suurten yritysten neuvotteluvoimaa suhteessa tavaratoimittajiin. Kilpailuviranomaisten näkökulmasta tutkimustulosten valossa korostuu, että arvioitaessa horisontaaliseen tietojenvaihtoon liittyviä kilpailullisia vaikutuksia tuotemarkkinoilla, on tärkeää arvioida myös datapolitiikkapäätösten vaikutuksia -tuotantoketjun alkupään yrityksiin. Tehokkaan datapolitiikan harjoittaminen edellyttää syvempää ymmärrystä siitä, miten datamarkkinoiden toiminta vaikuttaa tuotemarkkinakilpailuun erilaisissa markkinatilanteissa.