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New firms and regional economic activity in Turkey

Yasin Enes Aksu, Burhan Can Karahasan*

Abstract

New firms are important for local development as they create jobs and stimulate local demand. Meanwhile, firms' location decisions are also affected by local demand and supply conditions. These potential links between firms' location decisions and local economic conditions are theoretically discussed. However, strength of these channels over each other is less examined. We use monthly data (i.e., 2009-2021) to investigate the bi-directional relationships between new firms and regional economic activity in Turkey. Results from Panel VAR analyses confirm that new firms have strong effects on regional development which we measure by electricity consumption and employment. Moreover, our spatial extension shows that impact of new firms exceeds the administrative borders of regions. Contrariwise, the reverse case is less likely as economic activities' impact on new firms is relatively weak. Our results validate that agglomeration of new firms have permanent positive effect on the level of economic activity in a region.

JEL Codes: R11, R12

Keywords: electricity consumption, employment, new firms

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Türkiye’de yeni firmalar ve bölgesel iktisadi aktivite

Öz

Yeni firmaların oluşumu yerel kalkınmanın anahtarı olarak görülmektedir. Literatürdeki çoğu çalışma, yeni firmaların istihdam yaratarak işgücü piyasalarını doğrudan etkilediğini vurgulamaktadır. Diğer taraftan, firmaların yer seçim kararları da yerel talep ve arz koşullarından etkilenmektedir. Firmaların yer seçimi kararları ile yerel ekonomik koşullar arasındaki potansiyel çift yönlü bağlantılar teorik olarak tartışılsa da mevcut veri kısıtları dolayısıyla ampirik olarak literatürde fazla yer bulamamıştır. Bu çalışmada, Türkiye'de yeni firmaların bölgesel dağılımı ve bölgesel ekonomik faaliyetler arasındaki çift yönlü ilişkileri araştırmak için aylık verileri (2009-2021) kullanılmaktadır. Panel VAR analizlerinden elde ettiğimiz sonuçlar, yeni firmaların bölgesel elektrik tüketimi ve istihdam ile ölçtüğümüz bölgesel kalkınma üzerinde kalıcı etkileri olduğunu doğrulamaktadır. Ayrıca, mekânsal analiz çerçevesinde yeni firmaların etkisinin bölgelerin idari sınırlarını aşabileceğini gösterilmektedir. Diğer taraftan, bölgesel ekonomik aktivitenin firma oluşumu üzerindeki etkisi görece sınırlıdır. Sonuçlar bir bölgede yeni firmaların kümelenmesinin bölgesel iktisadi aktivite üzerinde kalıcı pozitif etkiler yarattığını göstermektedir.

JEL Kodları: R11, R12

Anahtar kelimeler: elektrik tüketimi, istihdam, yeni firmalar

1. Introduction

There has been considerable interest for the importance of new firms within the regional science community. An important strand of the literature explores the positive effects of new firms for regional economic development. For instance, Fritsch & Mueller (2004), Van Stel & Suddle (2008), Mueller, Van Stel & Storey, (2008) argue that formation of new firms stimulates job creation at the local level. From a different vein, impact of new firms on knowledge spillovers and economic development have also been central discussions (Acs, Braunerhjelm, Audretsch & Carlsson, 2009a; Acs, Lawrence & Ryan, 2009b; Braunerhjelm, Acs, & Carlsson, 2010). Meanwhile, factors which affect new firms' geographical distribution have also been densely discussed. Regional distribution of income, access to finance and various supply based incentives affect the firms' location decision (Fristsch, 1992; Reynolds, 1994, Kangasharju, 2000; Ghani, Kerr & O'Connell, 2014; Cála, Arauzo-Carod & Manjon-Antolin, 2015).

While these studies explore the roots of the relationship between new firms and local economic conditions they disregard the bi-directional networks among each other. For instance, rising local demand through creation of new jobs or from increasing economic activity of new firms can also stimulate formation of the new firms. In other words, the link between local conditions and new firms' formation process can follow a bi-directional pattern which is shaped by the endogenous networks between characteristics of regions and the economic dynamisms of the newcomers. More importantly both channels are theoretically discussed. However, which one is more dominant is mostly under-investigated. Motivated from this gap in the literature, we aim to explore the bi-directional links between regional distribution of new firms and level of local economic activity in Turkey. Using monthly data on the formation of new firms and local economic activity we implement a set of panel vector autoregressive (P-VAR) analyses which are also augmented by a spatial framework.

An important dimension of our paper is the difficulty to obtain economic activity data at the monthly basis. We are able to collect monthly data for the agglomeration of new firms at the local level. However, macroeconomic indicators are mostly reported on annual basis and we lack in high frequency macroeconomic data at the regional level. In our analyses we refer to the social security records which contains information at the provincial employment figures on monthly basis. While this enables us to consider the changing local labor market conditions it still fails to describe the local demand characteristics. Not surprisingly, local demand and income is not reported at the monthly basis. In order to deal with this shortfall, we use the regional electricity consumption which can be gathered at the monthly basis at the provincial level. We believe constructing a provincial database with high frequency (monthly in our case) is another important dimension of the paper.

In addition to the data issues, we believe our paper contributes to the literature from a number of additional pillars. First, studies that deal with the geographical distribution

of new firms mostly deal with the unidirectional links either for the direct impact of new firms or the potential impact of local conditions. However, the possible bi-directional links are mostly neglected. Second, vast majority of the literature examine the new firms' impact by examining the economic activity within the administrative borders of a region. Yet, spatial externalities which can be an outcome of local networks are most of the time neglected. In our augmented spatial P-VAR setup we incorporate the spatial externalities. Finally, prior discussion show that Turkey has been suffering from persistent policy neutral regional imbalances for decades (Filiztekin, 2018[1999]; Doğruel & Doğruel, 2003; Rey & Janikas, 2005; Karahasan, 2020). Therefore, investigating Turkey is crucial for constructing territorial policies to sustain cohesion in developing countries.

The paper will review the related literature in section 2. In section 3 we introduce the data and the research methodology. Section 4 will introduce the empirical results and the paper will end with a conclusion (Section 5).

2. Prior literature

New firm formation plays a vital role for local economic activity and therefore is perceived as an important element for local development. Formation of new firms brings several benefits to the local economic activity. Firstly, these firms can introduce new products and services to the market, which can increase competition (Fritsch, 1997; Mata & Portugal, 1994). Secondly, new firms create and foster employment opportunities for the local community, thereby reducing unemployment and increasing income in the area (Fritsch, 1997). Lastly, new firms contribute to the overall diversity of an economy by introducing new ideas and ways to stimulate innovation and drive economic growth (Wong, Ho & Autio, 2005; Koster & Karlsson, 2009).

Inevitably, new firms may have an impact on regional development through different channels (Fritsch & Mueller, 2004; Van Stel & Suddle, 2008; Mueller et al., 2008). At this point, the most prominent impact has been through the employment created by new firms. For different country samples, Davidson, Lindmark & Olofsso (1994), Fristch (1997), Van Stel & Storey (2004), Koster & Van Stel (2014) point out that new firm formation processes positively affect employment. Therefore, national and regional policies that support new firm formation processes will contribute to regional development through employment growth.

In addition to the employment effect new firm formation will also have indirect effects to the local economy. One of the most important of these effects is the innovation and technological breakthrough contribution of new firms. Therefore, new firms can also be evaluated in terms of regional development within the framework of modern growth models (Acs et al., 2009a, 2009b; Braunerhjelm et al., 2010). Prusa & Schmitz (1991) examined the computer software industry and emphasized that new firm formation processes have an important role in innovation. More recently, empirical

analyses for Italy (Pellegrino, Piva & Vivarelli, 2012) and Spain (Segarra & Teruel, 2014) show that new firms significantly contribute to the innovation performance of the regions. These discussions guide us to understand that the benefits of new firm formation processes are beyond their ability to create employment and that new firms actually have an impact on technology, innovation and productivity (Acs & Varga, 2005; Audretsch, 2007).

From a different vein, recent literature emphasizes the endogenous nature of firms' location choice processes. Krugman (1991) pointed out that the balance between the centripetal and centrifugal forces of regions as the main driver determining the concentration of economic activity in a region. At this point, the debate on increasing returns especially contributes to the findings of modern growth theories on the rigidity of regional inequalities (Romer, 1990). In fact, Krugman (1991) defines the concentration of production in a region as a form of agglomeration economies which stimulates increasing returns and externalities. This pattern is useful to explain why economic activity tends to cluster in certain locations. Similarly, Fujita, Krugman & Venables (1999) and Fujita & Thisse (2002) emphasize the concept of agglomeration economy and point out that regional externalities directly affect the location decisions of economic activity. These ongoing debates necessitate a comprehensive analysis of firms' location choice behavior in terms of regional economy and inequalities.

Scholarly literature discusses why economic activity chooses certain locations and examines the relationship between location decision and economic growth (Hoover, 1948; Isard, 1954). In the 1990s, recent advances in the New Economic Geography (NEG) literature expand our knowledge on the interaction between location decisions and economic conditions. In particular, importance of certain regional factors is examined in order to understand the location decision of firms. Among potential candidates; local demand, public policies, education, labor market structure, access to finance, financial development and sectoral effects are discussed to influence the new firm formation (see Fritsch, 1992; Davidson et al, 1994; Reynolds 1994; Guesnier 1994; Reynolds, 1994; Lee, Florida & Acs, 2004; Sutaria & Hicks 2004; Cheng & Li,2011 among many others).

While early studies focus mainly on developed country groups, there is a growing interest for understanding the firm formation process in developing countries (Ghani et al., 2014; Cála et al., 2015; Cála, Manjon-Antolin & Arauzo-Carod, 2016). Similarly, the discussions in Turkey also draw attention to the fact that new firm formation processes may be related to sectoral and regional factors (Kaya & Üçdoğruk, 2002; Gaygısız & Köksal, 2003; Günalp & Cilesun, 2006). Karahasan (2015; 2018), on the other hand, is one of the most recent studies that discuss what kind of factors at the regional and spatial level will affect the location preferences of new firms. Moreover, Karahasan (2022) examines the spillovers between new firms and local innovation

providing information on the importance of new firms' agglomeration for local economy.

The idea of a possible endogenous relation between a firm's location decision and the local economic activity has been widely discussed in theoretical literature. However, due to the data limitations empirical studies are very limited. That is to say that, empirical studies prefer to rely on one side of the causal channels by keeping one of the dimensions (new firms and local development) as exogenous. Exceptions are Baptista & Preto (2011), Konstantinos & Karkalakos (2015) and Skopelitis (2017). For instance, Baptista & Preto (2011) on Portugal suggest that there is strong impact running from the firm start-up rate to regional employment growth. The study of Konstantinos & Karkalakos (2015) examined the bi-directional links between entrepreneurship and unemployment in 30 countries with Panel VAR setup and their findings indicates that past new firm formation rates reduces unemployment over the OECD countries. In a similar manner, the study of Skopelitis (2017) implies that entrepreneurship has a significant influence on employment growth in EU-15 countries. While these studies provide some insight on the importance of examining the two sides of the relation they do not control for the potential regional networks. However, we argue that spatiality can be a central dimension of the interconnection between distribution of firms and the extent of local economic activity.

Based on these developments in the literature we form a two-stage setup in our analyses. First, we will examine the bi-directional links between new firms and regional economic activity. Our main aim is to see whether a demand side (impact of economic activity on new firms) or a supply side (impact of new firms on economic activity) view dominates the other. Next, we will add a spatial dimension and observe whether our main results are robust to the inclusion of spatial externalities. Our objective is to test if agglomeration is bounded by the administrative borders of regions.

3. Data and Methodology

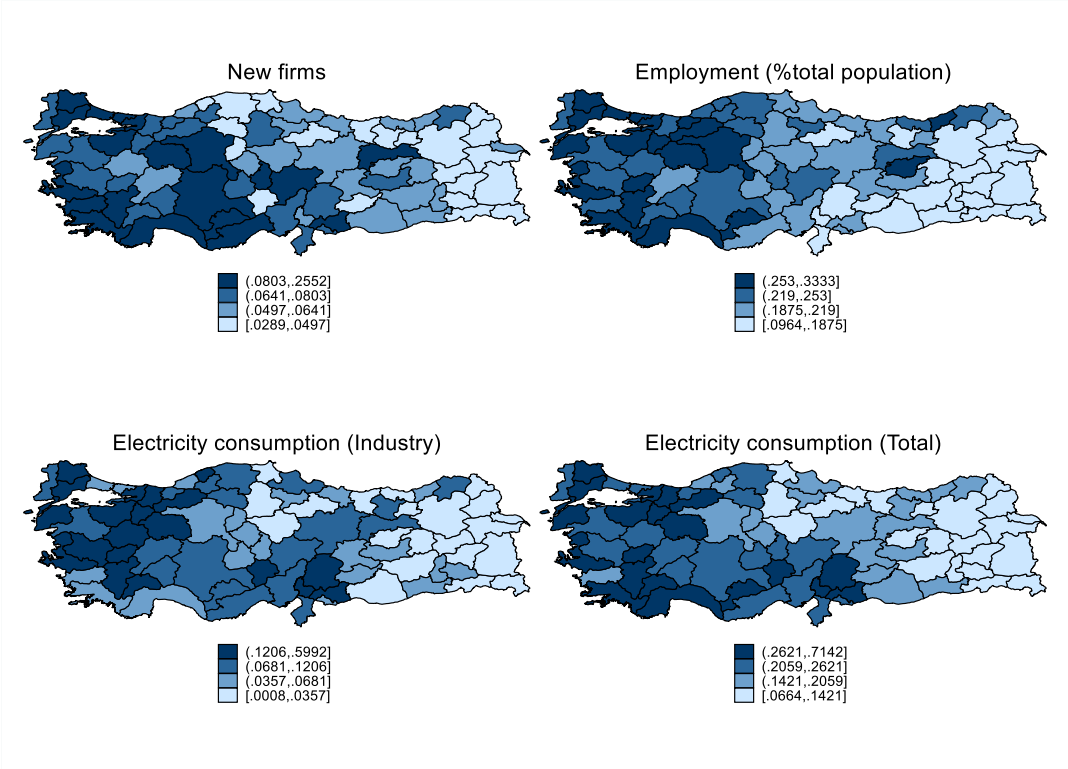
3.1 Data

In our empirical analyses we construct our sample at the monthly basis for the 2009-2021 period at the NUTS-3 level. New firm formation data is provided by The Union of Chambers and Commodity Exchanges of Turkey (TUCCET, 2021). Since no sectoral data is provided, we use the total new firm formation data. Most of the existing studies use the Labor Force Survey to control for regional differences in employment figures. This data set enables researchers to examine employment figures at the NUTS-2 level. In this study we utilized administrative employment figures collected from the Social Security Institute (SII, 2021) which has NUTS-3 representation. Finally, electricity consumption data is provided by the Energy Market Regulator Authority (EMRA, 2021). We acknowledge that electricity consumption can be upward biased in more industrialized areas. However, there is growing interest in the international literature for

the use of electricity consumption as an indicator of economic activity (Arora & Lieskovsky, 2016; Blonz & Williams 2020). Motivated by this development, we use the monthly electricity consumption as a measure of regional income. We have to remark that use of electricity consumption enables us to work with high frequency data (monthly basis). It should be kept in mind that the most commonly used per capita income data can only be obtained in annual terms. Note that, we use two separate indicators for electricity consumption (i) industrial electricity consumption, (ii) total electricity consumption. Additionally, potential seasonality in the data is corrected by applying the methodology of the United States Census Bureau (X-13 ARIMA-SEATS method).

Spatial distribution of new firms' location decision (per population) and local economic activity are plotted in Figure 1. All figures clearly indicate the spatial polarization of economic life in Turkey. While, western regions host more new firms and realize higher levels of economic activity (measured by employment and electricity consumption) eastern topography of Turkey is less developed in terms of the same indicators. This pattern mimics the already known regional disparities in Turkey.

Figure 1: Spatial Distribution of New Firms and Local Economic Activity (sample average)



Source: TUCCET (2021), SSI (2021), EMRA (2021)

3.2 Methodology

In order to explore the dynamic inter-relationship between new firm formation, employment and local economic activity, we employ a panel vector autoregression (P-VAR) model. Within this context our baseline model with p lags as follows,

$$y_{it} = \sum_{q=1}^{p} A_q y_{it-q} + \mu_{it} \quad [1]$$

$$y_{it}: \begin{pmatrix} F_{it} \\ X_{it} \end{pmatrix} \quad [2]$$

where y_{it} represents the vector of variables including, new firm formation (F) in region i at time t and X_{it} which stands for economic activity that we control with two separate variables: (i) electricity consumption, (ii) employment. Finally, μ_{it} is a vector of orthogonalized shocks and have the following characteristics: $E(\mu_{it}) = 0, E(\mu'_{it}\mu_{it}) = \Sigma$ and $E(\mu'_{it}\mu_{is})$ for all $t > s$.

Note that, in the standard P-VAR setting we do not allow for spillover between regions. However, an important dimension of regional analyses is the potential spatial externalities. While spatial econometric analyses receive huge interest within the regional science community spatio-temporal patterns also start to receive interest recently. Therefore, we carry-out additional exercises to incorporate spatiality into the standard P-VAR model. The main idea behind spatial externalities stems from the existence of spatial auto-correlation. We measure the spatial auto-correlation by using the Moran's I statistics as follows:

$$I_i = \frac{n}{s} \frac{\sum_i \sum_j w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum (x_i - \bar{x})^2} \quad [3]$$

where *n* and *s* represent number of regions and the summation of all elements of the weight matrix (*w*). Among different weight matrices we use the contiguity weight matrix which assigns a value of 1 if two regions share the same administrative border and 0 otherwise.

Based on the potential role of spatial externalities we perform the second set of P-VAR analyses. The main objective is to assess whether spatial proximity plays any role in understanding the bi-directional links between new firms and regional economic activity. To assess the impact of spatiality we concentrate on the spatial dimension of agglomeration economics and compute the spatial lag of new firms' formation (WF_{it}). Similar to the earlier analyses, X_{it} represent the economic activity (employment and electricity consumption). The spatially augmented P-VAR models transforms into:

$$y_{it} = \sum_{q=1}^{p} A_q y_{it-q} + \mu_{it} \quad [4]$$

where

$$y_{it}: \begin{pmatrix} WF_{it} \\ X_{it} \end{pmatrix} \quad [5]$$

4. Empirical Results

Prior to the estimation of P-VAR we first determine the integration order of the variables of interest. Table 1 supplies the unit root test results. For panel unit root tests, Levin, Lin & Chu (LLC) assumes common unit root process and Im, Pesaran & Shin (IPS) assumes individual unit root process, and for both tests null hypothesis asserts variables contain unit root. Results indicate that new firm formation and electricity consumption variables are stationary, while the employment variable is trend stationary.[1]

Table 1: Unit Root Test Results

	Levin, Lin & Chu (LLC)				Im, Pesaran & Shin (IPS)			
	Intercept		Intercept + Trend		Intercept		Intercept + Trend	
	Stat.	p-value	Stat.	p-value	Stat.	p-value	Stat.	p-value
New Firm Form.	-50.358	0.000	-73.773	0.000	-47.046	0.000	-57.413	0.000
Employment	1.086	0.861	-3.221	0.001	4.994	1.000	-10.659	0.000
Electricity Cons. (total)	-19.556	0.000	-36.531	0.000	-23.252	0.000	-33.516	0.000
Electricity Cons. (industrial)	-12.231	0.000	-23.739	0.000	-15.712	0.000	-21.435	0.000
New Firm Form. - Spatial Lag	-56.420	0.000	-83.588	0.000	-48.552	0.000	-62.826	0.000

In our analyses we use 6 as the optimal lag length. To our view this allows for controlling for the potential business cycles in the economy. Throughout the P-VAR estimations we focus on the impulse response analyses which basically shows the

[1] In the PVAR estimations we include a trend dummy as an exogenous covariate.

response of a variable to a given shock to the other variable.[2] We must highlight that our objective is not to make causal statements as these kinds of models are not particularly designed to assess causality. Moreover, we are aware of the fact that we are keeping many other factors outside the model. In that sense, our basic exercises in this study should be perceived as descriptive analyses of the potential networks between new firms and local development.

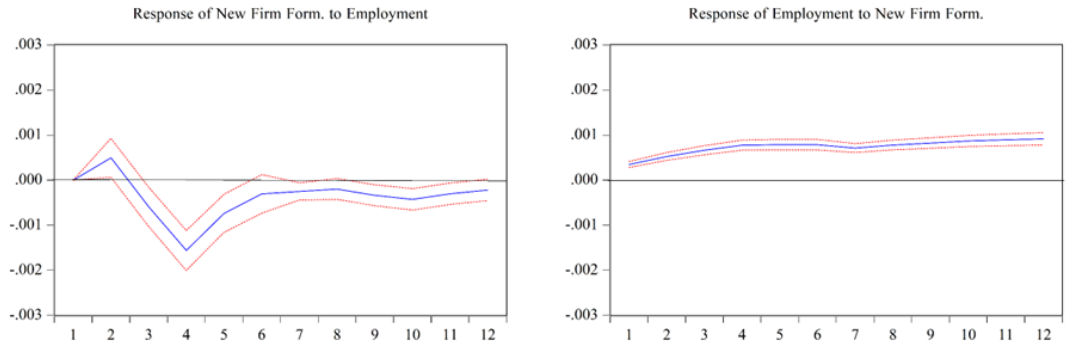
Figure 2 shows impulse response functions obtained from our baseline model. According to the results, one standard deviation shock to new firm formation leads to significant increases in employment. Remarkably, this effect is permanent over periods. Likewise, a one standard deviation shock to new firm formation also increases total electricity consumption by 0.04%. The impact of new firm formation also applies to industrial electricity consumption. Accordingly, a one standard deviation shock increases industrial electricity consumption by 0.03%. In addition, the effect of new firm formation is persistent in both types of electricity consumption.

On the contrary, one standard deviation shock to employment has a positive effect on new firm formation for 1 period after which the effect disappears. On the other hand, the response of new firm formation to a one standard deviation shock of total electricity consumption, which we use to measure economic activity, is statistically insignificant. Similarly, if we look at economic activity in terms of industrial electricity consumption, a one standard deviation shock is also insignificant.

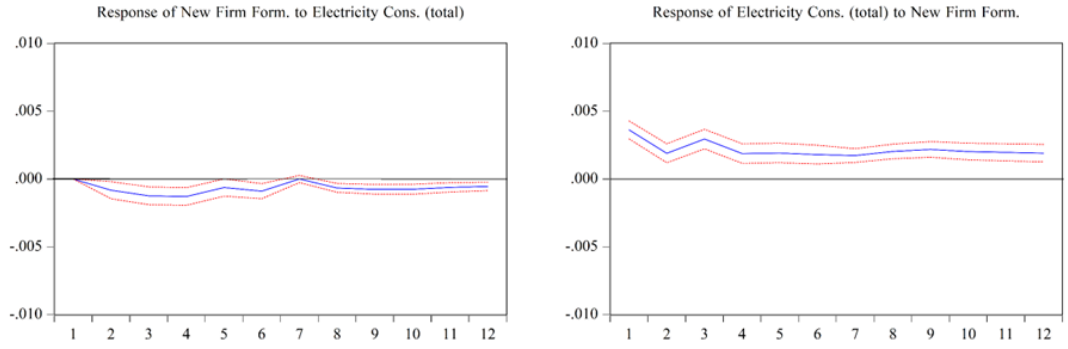
Overall, our results from the baseline P-VAR analyses show that the impact of new firms on local economic activity is stronger compared to a reverse case scenario. As we highlighted before there are other potential local factors which will influence the bi-directional relations. However, controlling these factors with monthly data seems difficult. Therefore, these preliminary results should give us preliminary clues on the potential links between new firms and local economic activity.

[2] Stability condition for the estimated models evaluated through the moduli of each eigenvalue and the results reported in the Appendix (Figure 1A). Our stability analyses confirm that all eigenvalues are inside the unit circle. As a result, the estimated P-VAR specifications satisfy the stability condition. Stability condition implies that the estimated models are invertible and has an infinite-order vector moving average (VMA) representation, providing known interpretation to estimated impulse-response functions (Abrigo & Love, 2016).

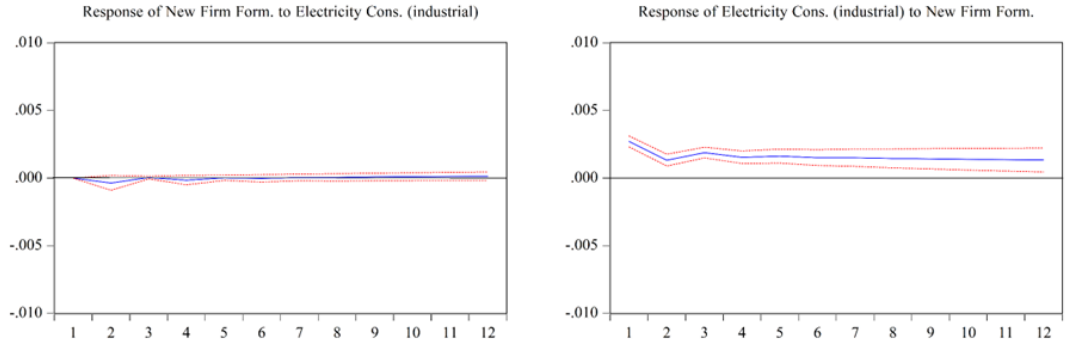
Figure 2: Non-spatial P-VAR Models (IRFs)



Note: Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E. Variables constructed as per capita.



Note: Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E. Variables constructed as per capita.



Note: Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E. Variables constructed as per capita.

Source: Authors' own calculations

In line with our prior discussions in the methodology part we would like to check for the potential role of spatial externalities. Table 2 gives the results for the spatial auto-correlation test and shows that our variables of interest are all spatially auto-correlated. This reminds the importance of potential spatial externalities which can influence the responses of the economic variables. While estimating the P-VAR models by fully using

spatial terms is an option we prefer to be selective and focus on the spatial dimension of agglomeration economies. Our reasoning departs from the location decision of the new firms. The main intuition is that firms' location decision represents an agglomeration behavior which is rooted beyond the administrative borders of the regions. Therefore, we compute the spatial lag of the new firms and the apply spatially augmented P-VAR model.

Table 2: Spatial Auto-correlation Tests Results

	Moran's I	Std. dev	Z-score
New Firm Formation	0.369***	0.069	5.567
Employment	0.751***	0.072	10.636
Electricity Consumption (industry)	0.327***	0.068	4.976
Electricity Consumption (total)	0.456***	0.07	6.733

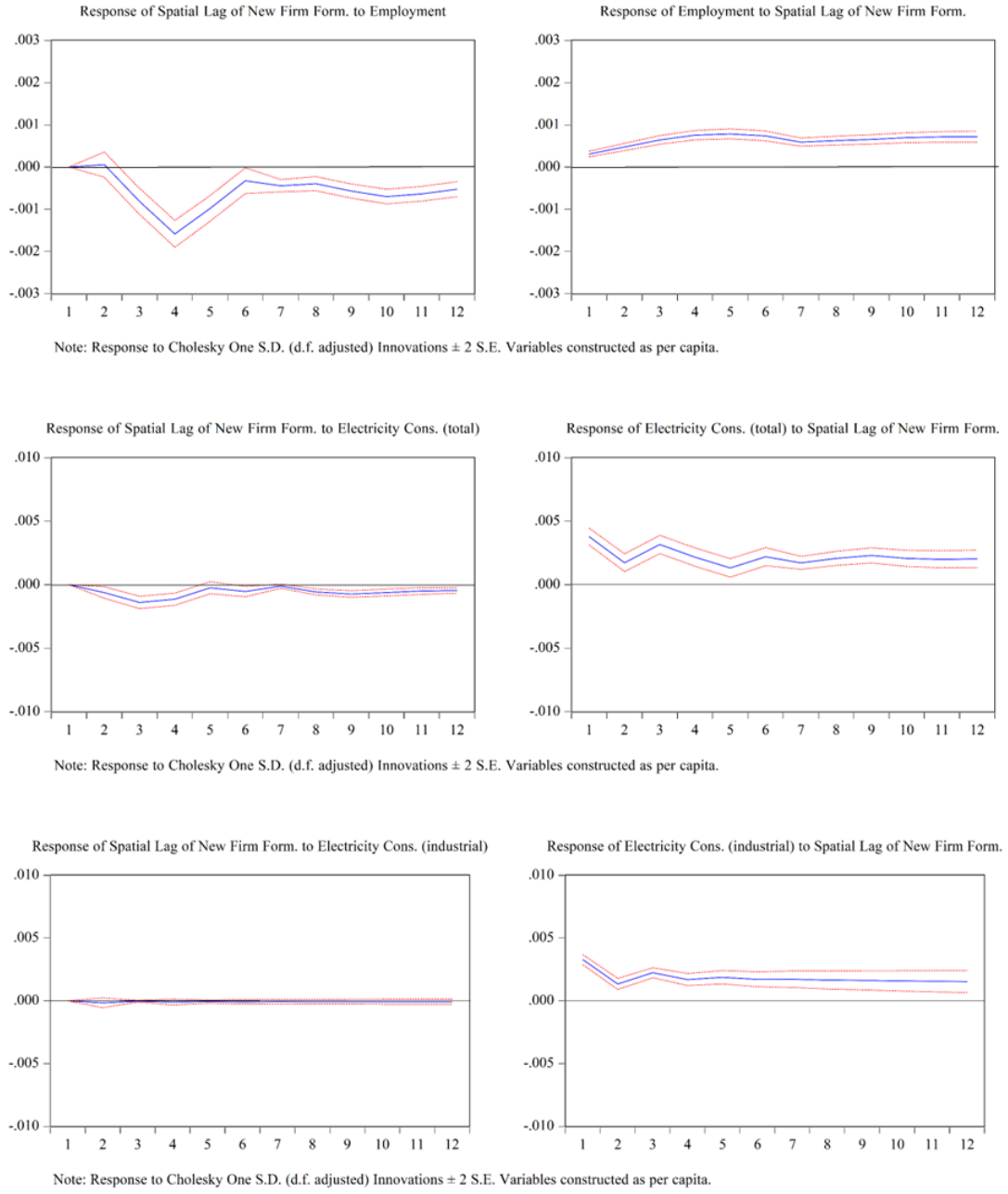
Notes: *** represents significant spatial auto-correlation at 1% level

Results for the spatially augmented P-VAR model are supplied in Figure 3. Our findings indicate that a one standard deviation shock to spatial lag of new firm formation leads to significant increases in employment and this effect is permanent over periods similar to non-spatial findings. Likewise, a one standard deviation shock to spatial lag of new firm formation raises total electricity consumption by 0.004% approximately. Furthermore, if we look at economic activity in terms of industrial electricity consumption, a one standard deviation shock to spatial lag of new firm formation leads to by 0.003% increase in industrial electricity consumption and this effect is also persistent.

However, the response of spatial lag of new formation to one standard deviation shock of employment is statistically insignificant. Similarly, a one standard deviation shock to our other economic activity measure total electricity consumption, is also statistically insignificant on spatial lag of new firm formation. Moreover, this also applies to industrial electricity consumption.

Overall, our results from the spatially augmented P-VAR models indicate that impact of new firms exceed the administrative borders of regions and both demand and supply side effects of region and its neighbor regions are influential in the location choice of new firms. In addition, new firm formation in periphery has a permanent impact on local employment.

Figure 3. Spatial P-VAR Models (IRFs)



Source: Authors' own calculations

5. Conclusion

Importance of new firms has been densely discussed in the literature. Moreover, role of local factors to understand how firms decide the right location for production receives huge interest in the empirical literature. However, which channels dominates the other

is relatively less examined. Motivated from this gap, we compare the strength of these two channels for a developing country example. Our results from a spatially polarized country, Turkey, show that impact of new firms on local economic activity is extremely strong. On the contrary, the reverse channels are either weak or statistically insignificant. Moreover, we also find statistically significant spillovers from the surrounding regions. Our results point-out that firm formation of the spatial proximity is as important as the regions' local economy.

These results imply that agglomeration of new firms in a given region is central for local development and territorial cohesion. Therefore, new firms should be regarded as one of the most vital elements of the territorial policies which targets regional integration. Policies supporting the formation of new firms should be prioritized by the policy makers. Not only, economic incentives to spur new firm formation but also structural reforms and institutional improvements are central for providing the suitable investment climate for the new economic agents.

We believe our results contribute to our knowledge on the place of new firms for local development. First, it is one of the first attempts for Turkey where we use high frequency data in a regional model to assess bi-directional links between agglomeration and local economic conditions. Moreover, we incorporate the role of spatiality in the P-VAR analyses. These to aspects of our study enables a better understanding for the spatio-temporal patterns of new firm formation and evolution of local economic activity.

Finally, a number of points are worth highlighting. Our analyses cover the post 2009 period during which Turkish economy is affected from both internal and external shocks. Lagged impact of the 2008 Global Financial Crises, rising internal instabilities, macroeconomic turmoil after 2018 and the COVID-19 crises are important developments of the period. In this study, we do not investigate the potential role of these exogenous shocks and evaluate our results under the potential impact of these development. At this stage, we have to remind that our analyses do not aim to construct a causal framework. Moreover, in our empirical exercises we do not control for a host of other factors that can also be a part of the bi-directional links between new firms and local development. We are also aware that new firms' impact on local economic activity can be moderated by certain regional factors. Likewise, there can be various mediating channels which define the true impact of the new firms for economic activity. Working on these potential improvements should be perceived as future lines of research that deserves specific attention.

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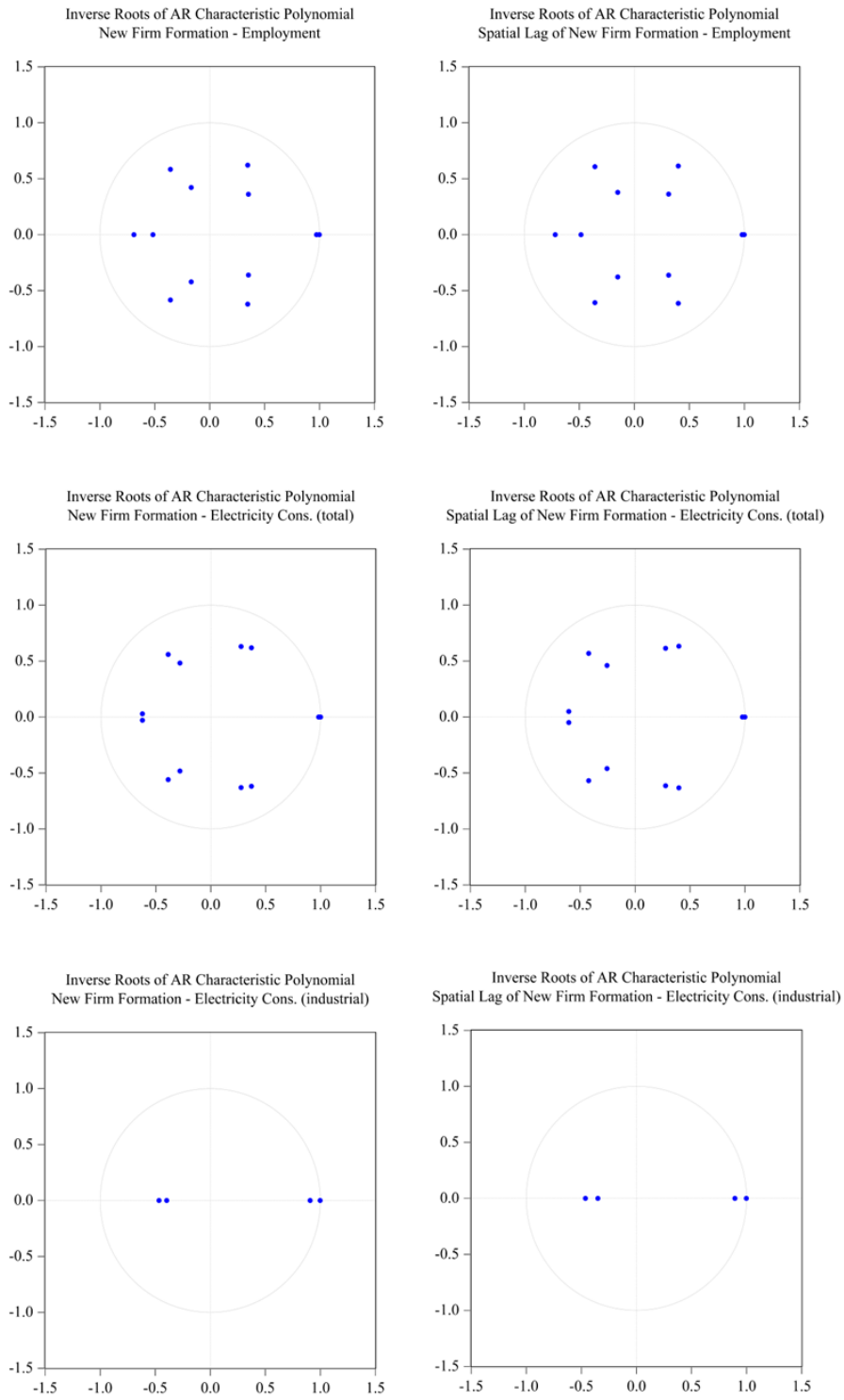
Appendix

Figure A1: Stability Graphs of P-VAR Models



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What did the Turkish Competition Authority Ignore in its First Hub-and-Spoke Cartel Decision?

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Abstract

Hub-and-spoke cartels have recently come under the spotlight of competition authorities. The Turkish Competition Authority (TCA) found five grocery retailers and a cooking oil supplier in breach of Article 4 of the Turkish competition act (the equivalent of Article 101 TFEU). In this article, we discuss some of the drawbacks and limitations of the TCA's first hub-and-spoke cartel decision. We examine how failure to conduct a simple economic analysis misled the TCA in its theory of how the hub-and-spoke cartel was formed and in its treatment of retailers' sequential price setting.

JEL Codes: L41, L42

Keywords: Hub-and-spoke cartel, Turkish Competition Authority, organized retail market

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Rekabet Kurulu İlk Topla-Dağıt Karteli Kararında Neyi Göz Ardı Etti?

Öz

Topla-dağıt kartelleri son zamanlarda rekabet otoritelerinin ilgi odağı haline geldi. Rekabet Kurulu (RK), beş perakendeci ve bir bitkisel yağ tedarikçisinin Rekabet Kanunu'nun 4. Maddesini (ABİHA'nın 101. Maddesinin eşdeğeri) ihlal ettiğini tespit etti. Bu makalede, RK'nın ilk topla-dağıt karteli kararının bazı eksiklik ve sınırlamalarını tartışıyoruz. Basit bir ekonomik analiz eksikliğinin, topla-dağıt karteli iddiasının değerlenedirilmesinde ve perakendecilerin sıralı fiyat geçişlerine ilişkin yaklaşımında RK'yı nasıl yanılttığını inceliyoruz.

JEL Kodları: L41, L42

Anahtar Kelimeler: Topla-dağıt karteli, Rekabet Kurulu, organize perakende pazarı.

1. Introduction

Hub-and-spoke cartels have recently come under the spotlight of competition authorities. Unlike horizontal collusion between suppliers or between retailers, a hub-and-spoke cartel exhibits a sophisticated formation that requires the involvement of both supplier(s) and retailer(s). In 2021, the Turkish Competition Authority (TCA) found five grocery retailers and a cooking oil supplier liable for such behavior (Turkish Competition Authority, 2021a). Although the hub-and-spoke finding of the TCA is its first, it is not unique. While writing this paper, the TCA made its second hub-and-spoke cartel decision. However, the reasoned decision has not been published yet. Therefore, the current paper solely focuses on its first hub-and-spoke cartel decision.

Instead of unpacking the TCA's decision in detail, in this article, we discuss some of its drawbacks and limitations. We examine how the lack of a simple economic analysis misled the TCA in how it believed the hub-and-spoke cartel was formed and in its treatment of the retailers' sequential price setting. First, we show that the pricing conduct of the companies cannot be appropriately assessed without first considering the extraordinary cost-push inflation in the Turkish economy. Second, we provide a basic price competition setting that describes the competition between the grocery chains and shows how the TCA has misjudged the retailers' sequential pricing.

We organize the article as follows: Section 2 introduces the theoretical background of a hub-and-spoke cartel. Section 3 lays down the background of the TCA's decision. In Section 4, we provide the fundamental economic analysis that the TCA failed to conduct. Then, in Section 5, we posit an alternative theory for the formation of the collusion and assess the retailers' sequential price setting. Finally, Section 6 sets out our conclusions.

2. Economics of Hub-and-Spoke Cartels

Horizontal collusions between competitors have been frequently examined both in theory and practice. However, collusions involving horizontal and vertical relationships have been examined under the concept of hub-and-spoke in recent years. In such a collusion formation, a seller in the downstream market or a supplier in the upstream market orchestrates the information flow between the participants.

To better understand hub-and-spoke collusion, we can consider a setup consisting of a formation that includes both horizontal and vertical relationships, including competing sellers and a common supplier. Based on the above analogy, we can say that hub-and-spoke collusion consists of the following three elements: (1) a *hub* to coordinate sellers: the common supplier, (2) *spokes* in the downstream market: the sellers, and (3) a *rim* that connects the spokes: the collusive agreement between the sellers.

At this point, it is crucial to mention that hub-and-spoke collusion refers to an agreement that functionalizes a conspiracy between competing undertakings (spokes), not the vertical relationship between a hub and a spoke (Orbach, 2016). More concretely, it is the existence of the rim (collusive agreement) that turns vertical relationships into horizontal collusion. Therefore, a rim agreement connecting the spokes – aiming at price fixing or customer/region sharing – is critical to arriving at a judgment in competition law (Klein, 2020; OECD, 2019). While the existence of such a horizontal agreement indicates a collusion that breaches the competition law, the absence of such an agreement requires an effect analysis examining vertical constraints.

Examining hub-and-spoke collusion in an economic framework can provide important outputs in terms of competition policy on deterring such collusion by revealing how it occurs and operates. Based on this idea, it would be helpful to examine such collusion formations, albeit simply, within the framework of industrial economics and game theory. In this context, it would be appropriate to question the function of the vertical relationship that makes hub-and-spoke collusion privileged, especially the element that functions as a hub.

Industrial economics and game theory literature provide three conditions for collusion: (1) participation, (2) coordination, and (3) stability (Harrington, 2017). Very roughly, participation indicates the inclusion of a sufficient number of undertakings in the market into an initiative to determine a price/output level different than the competitive level. While coordination defines a process of which price/output level will be targeted due to the information flow between the undertakings, stability indicates the discipline and continuity of collusion. Unlike the horizontal collusion created only by competing undertakings, the existence and function of the hub is one of the most critical issues to be dealt with in a hub-and-spoke collusion (Garrod, Harrington & Olczak, 2021).

In summary, hub-and-spoke collusion has a different structure and dynamic than any horizontal collusion. The hub's position and function play the leading role in this difference. From the legal perspective, the conclusion of a judgment may not differ, whether the structure is in the form of a horizontal collusion or a hub-and-spoke collusion. However, economics may help to detect the structure and the dynamic of the collusions and deter future collusive attempts. Based on this argument, we examine the TCA’s first hub-and-spoke decision.

3. Background of the Decision

At the onset of the COVID-19 pandemic, the TCA launched a preliminary examination in the organized retail market focused on price increases in food and hygiene products. Following its preliminary examination, the TCA decided to launch in May 2020 an

investigation of 29 retailers and suppliers in the organized retail market. It also imposed an interim measure on the investigated parties to report weekly price increases until a final decision was issued. A year and a half later, on October 28, 2021, just after an uninterrupted oral hearing lasting 17 hours and concluding at 3 a.m., the TCA rendered its short decision that indicated a record[1] monetary fine.

The TCA found five grocery retailers (BİM, A101, ŞOK, Migros, and Carrefoursa) and a cooking oil supplier (Savola) in breach of Article 4 of the Turkish competition act (the equivalent of Article 101 TFEU). The TCA concluded that the five grocery retailers fixed the timing of price increases by communicating through their common suppliers. In that sense, the grocery retailers were accused of organizing a hub-and-spoke cartel with their common suppliers. However, in its decision, the TCA charged only the cooking oil supplier (Savola) for its role in the hub-and-spoke cartel. The TCA also fined Savola for maintaining resale prices. Nevertheless, in the decision, it is unclear whether Savola's conduct is related to the hub-and-spoke or an independent vertical restraint.

The legal analysis in the decision is based on internal communication documents and communication messages between retailers and suppliers. The TCA used the text messages of an internal WhatsApp group of Savola (between May 2018 and February 2021) as the primary reference for its hub-and-spoke cartel allegation. However, the TCA did not perform any economic analysis or provide any assessment related to the pricing behavior of the investigated parties. We argue that this has resulted in some drawbacks and limitations in the TCA's decision. Before examining these shortcomings, we provide a simple economic assessment that is significant to the decision.

4. Missing Economic Background in the Decision

We agree that performing an economic analysis may not be helpful for explicit price-fixing collusion. However, for the TCA's decision, at least two economic issues should be examined to appropriately understand the firms' pricing behavior in question. First is the extraordinary cost-push inflation during the investigated period. The second is the nature of competition between the retailers. We argue that disregarding these issues has misled the TCA in its theory of how the hub-and-spoke was formed and in its treatment of the retailers' pricing behavior.

4.1. Cost-push inflation in the Turkish economy

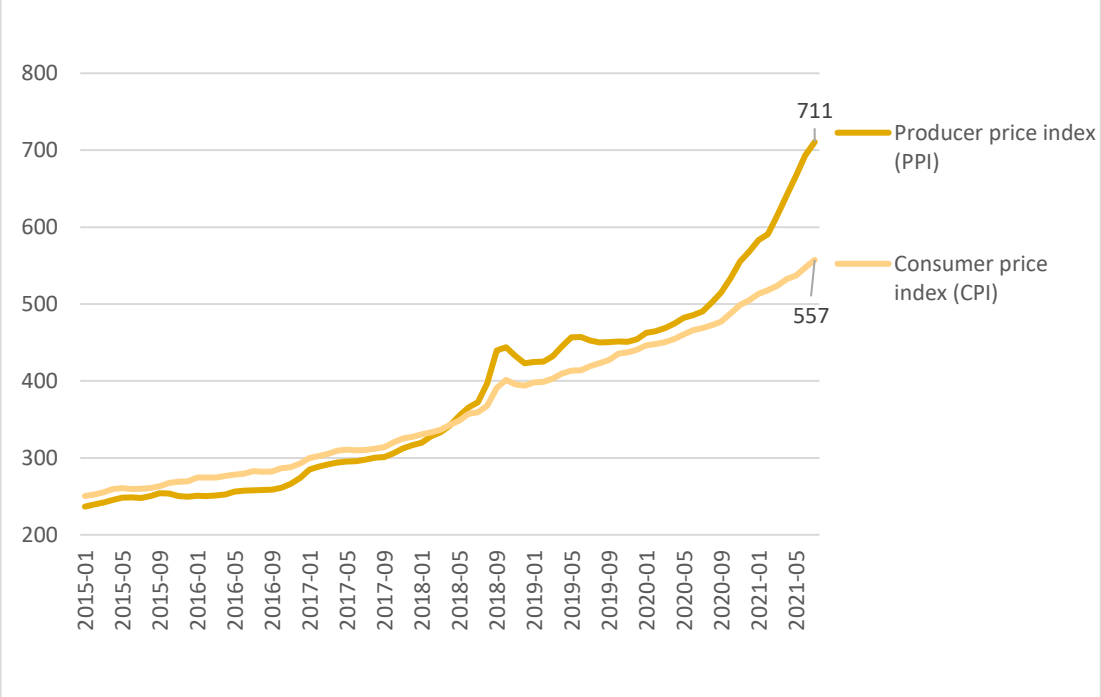
The communication evidence taken into consideration in the decision began in mid-2018 and lasted till mid-2021. During this time, the Turkish economy was subjected to extraordinary cost-push inflation. However, the TCA did not take this into account and

[1] When the decision was announced, the fine was about €243 million.

failed even to include the word “inflation” in its decision. Yet, this cost-push inflation has a fundamental role in clarifying the incentives and roles played in vertical relations, inherently in alleged hub-and-spoke collusion.

Chronic high inflation has been a feature of the Turkish economy since the 1970s. Although relative stability was achieved between 2004 and 2016, since 2017, the rates of both producer inflation (increase in producer price index – PPI) and consumer inflation (increase consumer price index – CPI) have returned to double-digit levels with an increasing trend.[2] Since 2018, a dramatic devaluation of the Turkish lira has increased the cost-push inflation significantly through imported raw materials, oil, and intermediate goods. Recently, failure in supply chains due to the COVID-19 pandemic and rising instability in the Turkish lira has amplified this process. As seen in Figure 1, cost-push inflation has gradually increased its effect and eventually created a significant divergence between producer and consumer prices.

Figure 1. Producer Price Index (PPI) & Consmer Price Index (CPI) (2003 = 100)



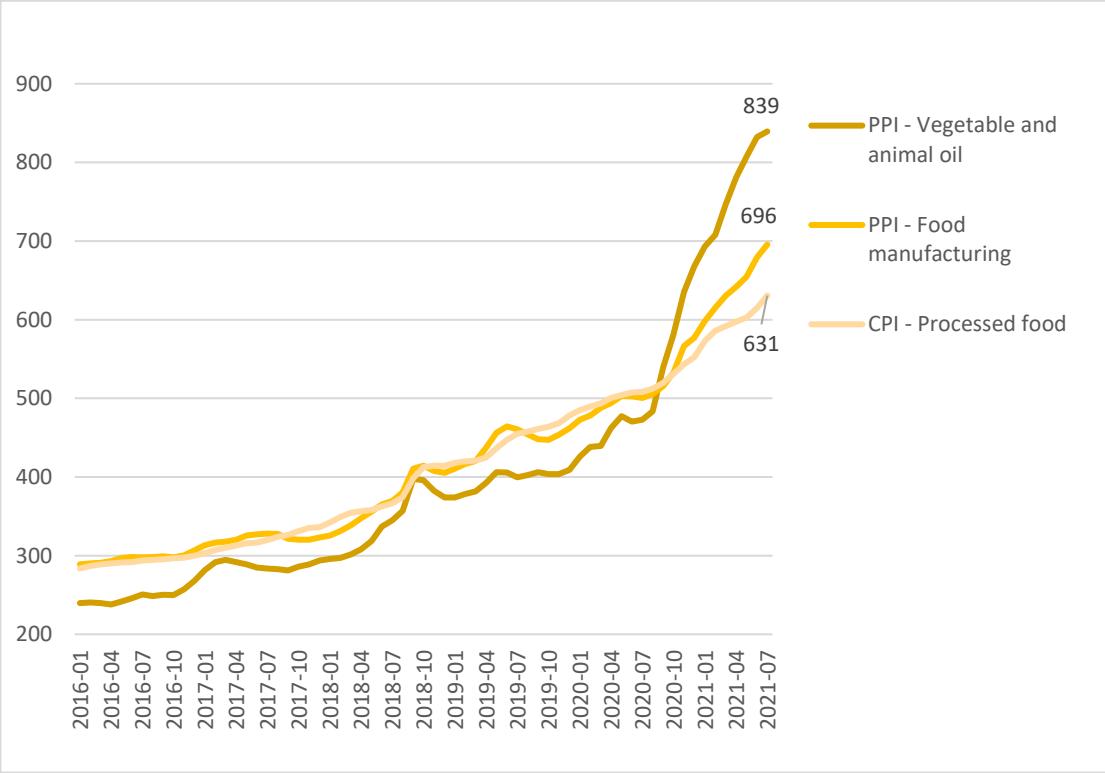
Source: Central Bank of the Republic of Turkey

The divergence in Figure 1 indicates that producers have struggled to pass their costs to consumer prices. Thus, cost pressure on the producers has increased. Figure 1 shows

[2] At the time of writing this article (on 5 January 2023), annual consumer inflation rate is 64 percent and producer inflation rate is 98 percent.

an overall picture of the Turkish economy. However, depending on the nature of the product, the divergence may take a different form. For instance, the divergence should be smaller for fast-moving consumer goods (FMCG) due to the high frequency of consumption and production. To get a rough picture of the products subject to the investigation, we provide selected sub-indexes in Figure 2.

Figure 2. Selected sub-indexes (2003 = 100)



Source: Central Bank of the Republic of Turkey

Figure 2 points out that, by mid-2020, consumer prices for processed food and producer prices for food manufacturing diverged. Although the producers faced increasing costs, they could not pass them on to consumers. Moreover, vegetable and animal oil producers faced unprecedented cost increases. Thus, Figure 2 documents how suppliers—including those subject to the investigation—have been under increasing cost pressure.

Without a doubt, the situation mentioned above has affected suppliers' pricing behavior. To avoid profit margin erosion, they tried to pass on the cost increases as much as possible. However, as Figure 2 indicates, they struggled to pass them on. What explains that inability? How important is that fact to the investigation? Without

considering the nature and dynamic of competition in the downstream market—where grocery retailers are the major players—it is impossible to get a clear picture of the situation. In the following subsection, we examine this issue, which the TCA did not consider in its decision.

4.2. Nature of competition in the organized retail market

While the investigation proceeded, the TCA published a preliminary report of its FMCG sector inquiry (henceforth *Preliminary Report*) (Turkish Competiton Authority, 2021b). The main findings of the *Preliminary Report* indicate (1) the transformation of retail through the growth of grocery chains and (2) the increasing buyer power of the discount chains. The *Preliminary Report* noted how mergers and acquisitions in recent decades and the organic growth of discount chains had created an oligopolistic structure in the organized retail sector. On the other hand, it also pointed out the increasing buyer power of discount chains against suppliers due to their increasing nationwide scale. Although the TCA referred to these findings at the beginning of its decision, it did not use them effectively when evaluating the conduct of the firms.

The organized retail market in Turkey is a concentrated market that forms an oligopoly. Three discount chains (BİM, A101, and ŞOK) and two national retailers (Migros and Carrefoursa[3]) are the leading players in the organized market. The local retailers' effects are relatively negligible on market parameters. Significantly, the discount chains have been aggressively enlarging their scale and have played a significant role in transforming retail—from unorganized to organized. While the number of stores in these discount chains varies from 7,000 to 10,000 (A101 has 10,001, BİM has 8,383, ŞOK has 7,882), other national chains have relatively fewer stores (Migros has 2,302; Carrefoursa has 714) (Food Retailers Association, 2021a). The discounters have a cost advantage and can assure buyer power against suppliers by concentrating a relatively limited number of products, relying on large scales, bulk purchasing, and by having an efficient distribution system. Among discounters, BİM is by far a leader in this, which was also mentioned in the decision (Turkish Competition Authority, 2021a, para.67). It is worth noting that BİM is also ranked 137th among the largest global retailers. With more than US$7 billion in annual revenue, it is double the size of its nearest competitor, A101 (Deloitte, 2022).

Creating a comprehensive model to describe the competition between grocery chains is complicated and controversial. However, a price competition model is reasonable for the products subject to the investigation. Considering the homogenous products subject to investigation (the same brand, size, type, model, etc.), the Bertrand price competition model is realistic and informative. Two phenomena support this claim. First, according

[3] Carrefoursa has stores in 40 of 81 provinces.

to a recent report based on market surveys at the national level, consumers have become highly sensitive to price differences, and they prefer the cheapest retailer for each product in their consumption basket (Food Retailers Association, 2021b). Second, as put by the TCA in the *Preliminary Report*, rival retailers have become physically closer due to the increasing number of stores. Therefore, besides the homogeneity of the products, highly price-sensitive consumers and ignorable transportation costs to customers contribute to the validity of the Bertrand model in this situation.

However, in the standard Bertrand setting, the firms are symmetric. Then, how would the cost advantage and buyer power of a discounter (like BİM) change this setting? We argue that the low-cost firm (BİM) acts as a price leader, and the others follow. This was also confirmed in the communications discovered by the TCA. More specifically, BİM sets the price levels credibly, and the other retailers match this price. This argument has empirical roots widely accepted in the Turkish organized retail market and is theoretically backed by the industrial organization literature (see Amir & Stepanova, 2006).

The oligopolistic market structure and price leadership in the Bertrand setting are important for analyzing the hub-and-spoke allegations and retailers' sequential price setting. In the coming section, combined with the cost-push inflation, we use this framework to reveal the shortcomings in the TCA's decision.

5. What Did the TCA Miss Without an Economic Analysis?

After reading the more than 200-page decision, two fundamental issues have emerged from the economic point of view. The first one is the TCA's theory regarding the formation of the hub-and-spoke collusion. The second is its treatment of the retailers' sequential price settings.

5.1. Theory of Formation of the Hub-And-Spoke Collusion

In its decision, the TCA asserted that five grocery chains initiated the collusion to fix cooking oil prices and used the supplier Savola as a hub for coordination. Considering the cost-push inflation in the Turkish economy and the nature of competition in the retail market, examined in Section 4, we do not find this theory of formation to be economically feasible. A series of questions remain unanswered, as well as indications of the communications used by the TCA in its analysis that do not support the TCA's theory of how the hub-and-spoke collusion was formed.

Why would the grocery chains fix only the price of Savola's products? There are already rival products competing on the same shelf of the grocery chains.[4] Why would grocery chains divert their customers to rival products and take the risk of decreasing their sales? Those are the questions that remain unanswered from the retailers' side. One may argue that grocery chains might also try to fix the price of the other brands' products. However, the TCA found no evidence, nor did it assert any allegations in that direction. Similar questions can be asked from the supplier side. Why would Savola, which has rivals in the market and on the same self, get involved in a collusion initiated by the grocery chains? Why would it take the risk of losing its market share to its competitors?

Instead, using the economic background in Section 4 as a basis, our theory of formation is as follows: Facing increasing cost pressure, as mentioned in Section 4.1, Savola wanted to increase its prices to retailers, hence to the consumers. However, considering the nature of competition in the retail market mentioned in Section 4.2, no grocery chain wants to be the first to increase its price. The buyer power of the discount chains has contributed to that process and has obstructed the efforts of Savola. Under these circumstances—as most of the internal documents in Determination #1 indicate[5]—Savola was trying to organize a simultaneous price increase through communication with each grocery chain.

In fact, the TCA already mentioned the theory of formation that we put here with the following words: "… *Savola, which wants to pass the cost increases to retailers' shelves, tried to do it by sharing information among the retailers to incentivize a collective price increase when it cannot do it through an individual retailer*." (Turkish Competition Authority, 2021a, para. 641). Although this is a feasible theory and compatible with the economic background, the TCA did not mention it elsewhere in its decision.

What would happen if the TCA's theory of formation was wrong? First, the resale price maintenance (RPM) charge asserted to Savola would find an explanation. More specifically, the TCA might distinguish the individual role of retailers in the collusion. The retailer that was exposed to the RMP and the retailer that actively contributed to the collusive organization would be identified more confidently. Yet, with the current theory of formation, the TCA cannot make such a distinction, and the RPM charge remains unexplained.

[4] According to the publicly available information, Savola's market share in the cooking oil market has been varying between 14 percent to 23 percent.
[5] In its decision, the TCA gathers the documents around 26 findings.

5.2. Sequential Price Setting of Retailers

As we described in Section 4.2, the competition between the retailers exhibits a Bertrand price competition, with BİM holding the cost leadership. In this setting, the leader sets the price level credibly, and the other retailers match this price. This is the nature of competition between grocery chains and cannot be considered as collusive behavior or concerted practice without any communication evidence.

However, in some (not all) of its evaluations, the TCA treated the retailers' sequential price settings as indicators of collusive behavior. More specifically, the TCA has argued that setting the same price on the same day or on consecutive days should be treated as a clear sign of coordination between the retailers. There are two prominent examples of such evaluation that should be examined here.

In Finding #13, in an internal communication document within ŞOK, it is said that the price of Doğanay branded turnip juice had increased in BİM, and other retailers would increase their prices on the following day. The TCA documented the price changes and confirmed that on subsequent days most of the retailers matched the price at BİM. Similarly, in Finding #18, again in an internal communication document within ŞOK, this time for Fairy brand dishwashing detergents, the price increases in BİM and other retailers' price-matching actions had been mentioned (Turkish Competition Authority, 2021a, para. 325). Again, the TCA documented that other retailers on consecutive days matched the price set by BİM.

In fact, the TCA's decision makes it clear that it is concerned with the risk of collusion due to the rivals maintaining a close watch on each other and systematically matching those rivals' prices. As mentioned in Finding #26, constructing indices to follow the leader's prices and systematically matching them are evaluated as facilitating factors for collusion (Turkish Competition Authority, 2021a, para. 338). Therefore, as a part of the decision, the TCA also resolved to send a notice to all 29 retailers and suppliers to take the necessary precautions to restrict the share of such sensitive information on both horizontal and vertical levels.

6. Conclusions

While the organized retail market in Turkey has been evolving by its dynamics at the industry level, it has also been affected by macroeconomic developments. The market structure has transformed into a loose oligopoly led by the discount chains. The sharp rise in inflation has seriously affected retailers' and suppliers' pricing behaviour in recent years. However, the TCA had not adequately examined these issues in its first hub-and-spoke decision.

The abovementioned assessments of the TCA show that without a simple economic analysis, even a textbook oligopolistic competition setting might be evaluated as a breach of competition law. Therefore, unless there is an explicit cartel agreement, dynamics in a market need to be considered in order to make a sound competition law assessment. Ignoring such dynamics and treating the nature of competition as a breach may have unintended consequences on the business models of suppliers and retailers. The TCA seems to view the matching rivals' prices as a contributor to inflation, and its decision is intended as an anti-inflationary measure. However, this measure may backfire in a market where a low-cost price leader sets the market price.

Moreover, the rising cost-push inflation in the Turkish economy has brought frequent price increases at the wholesale and retail levels. Ignoring the effects of this macroeconomic shock on the motivations and incentives of firms' pricing behavior may also mislead decision-makers when making further decisions. Limitations on suppliers and retailers to check market prices and preventing these vertically negotiating parties from avoiding such communication might result in higher prices due to the automatic adoption of supplier-cost increases at the retail level.

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