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ABSTRACT. This study provides a qualitatative assessment of the overall outcomes of the dairy supply chain in Greece. Based on the framework of the Taskforce for Agricultural Markets, a questionnaire survey with in-depth interviews was conducted to farmers, industries and supermarkets in Greece in order to gain knowledge about trading practices, market transparency, risk management, contracts, access to finance and the role of Producer Organizations. The analysis did not reveal significant unfair trading practices and showed positive prospects for the overall supply chain.

Keywords: supply chain, dairy sector, unfair trading practices, market transparency

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INTRODUCTION

In April 17 2019, the European Commission issued the Directive (EU) 2019/633 (in the remainder of the paper 'Directive') of the European Parliament and of the Council on Unfair Trading Practices (UTP) in business-to-business relationships in the agricultural and food supply chain. The Directive formally introduced important adjustments for the smooth functioning of food supply chains. In particular, within six months after the introduction of the Directive all Member States would have to put into place national legislation regulating UTP and to designate a competent public body to play the role of "enforcement authority" (EA) (Article 4 of the Directive). The EAs would be in charge of inspecting the occurrence of UTPs such as short notice changes in orders; unilateral and retroactive changes in supply agreements; unagreed returns of unsold products; delayed payments more than 30 days after delivery (Article 3). In addition, EAs would receive complaints from suppliers who are victims of such practices and will investigate them at their own initiative (Articles 5 and 6). In fact, collaboration among EAs across Europe would be expected to address supra-national UTP issues (Article 7). Towards this direction, all Member States should report regularly to the Commission in order to share experience and to provide relevant data (Article 9).

In policy debate, the Directive is the outcome on numerous reports, documents and discussions regarding the consequences of deviations from fair trading practices (Velazquez and Buffaria (2017)). The latest was the Report by the Taskforce for Agricultural Markets (TAM) (2016) in November 2016. The TAM adopted a rather holistic approach that went beyond commenting UTP. Their report proposed an integrated plan of action to improve food market outcomes with interventions in seven specific domains. With this in mind, Velazquez and Buffaria (2017) provided a review of existing literature in order to assess whether the policy framework (before the introduction of the Directive) would be sufficient to ensure a smooth functioning of food supply chains. They proposed that Producer Organizations (POs) could play a very important role, especially in the dairy supply chain, although the UTP Directive could impede the process of strengthening their role if proper adjustments were not provided.

It is not surprising that the EU has focused on UTP, market transparency and, in general, on a holistic approach of food supply chains. All relevant actors (farmers, processors, traders, wholesalers, retailers, consumers) have revealed that frequent and damaging UTP are present in the food supply chain (European Commission, 2018), while 96% of suppliers in the EU food chain claim to have been faced with at least one form of UTP (European Commission, 2014). In fact, the estimated costs of such practices rise to an impressive 30-40 bil € (EESC, 2016), as they can be detected across all links of the food supply chain. Therefore, these issues are important from an economic and social standpoint and affect the overall performance of businesses and actors across the supply chain and therefore EU intervention is required (European Commission, 2018).

The economic repercussions of UTP have been pointed out by numerous authors (see a comprehensive discussion in Falkowski, 2017). However, it is intriguing that the presence of UTP even in a small segment of or in particular supply chains could possibly have 'spillover' effects, thus 'spreading' malpractices throughout markets and supply chains (Menard, 2017). In examining the economic effects of UTP, Sexton (2017) referred to problems related to inefficiency, uncertainty, low innovation and investment. Ambiguous relationships were reported between UTP and innovation and also between UTP and variety of products (Falkowski, 2017), implying that these issues are highly context-related. The European Commission (2014) pointed out the negative effects of UTP on productivity and stressed that markets operating under such practices provide disincentives for actors to enter and operate.

Nonetheless, the problem is not purely economic but also has social dimensions (Menard, 2017). In general, UTP stem from imbalanced distribution of power (Falkowski, 2017), which translates to the relationships among actors. Farmers are the ones most vulnerable to UTP due to their weak bargaining power. According to the Commission *"they are often dependent on bigger downstream partners ... and long production lags and the perishability of many of their products limits their room for manoeuvre"*. It is also widely acknowledged that UTP affect also the relationships between industries and retailers (Sexton, 2017; Falkowski, 2017). Therefore, it is not particularly useful to focus on specific relationships or actors, but it is rather imperative to examine the effects of UTP across the supply chain as a whole, keeping in mind the interdependencies among actors (Cafaggi and Iamiceli, 2017). Despite the importance of trad-

ing malpractices in food markets, available literature on such holistic approaches is disproportional.

The purpose of this study is to contribute to this part of literature by presenting a qualitative study of the dairy supply chain in Greece[1]. In particular, the study provides an overall evaluation of market outcomes alongside with an assessment of the position of each link. The choice of the dairy supply chain is based on three characteristics. First, particular efforts have been made for improving transparency and tackling UTP in this supply chain (for instance, the "Milk package"). Second, dairy farming in Greece has witnessed significant structural changes in the past few years, leading to transformations from which large farms with higher bargaining power emerge. Third, Cooperatives tend to make an innovative appearance and to become strong competitors in processing, which is, however, highly concentrated. These characteristics are explained in detail in subsequent Sections

This study is based on a survey of actors across the supply chain. In particular, selected farmers and representatives of dairy industries and of big supermarket chains were interviewed using a semi-structured questionnaire with open-ended questions. By drawing on their opinions, a qualitative assessment of the overall outcomes of the dairy supply chain was elaborated based on the TAM (2016) framework. The qualitative approach was chosen for two reasons. The first was that until now there are very few integrated assessments of the whole supply chain in Greece. For instance, a survey of manufacturers' opinions regarding trading practices in the Greek food sector was undertaken by Maglaras et al. (2015), but primary producers and retailers were not interviewed. This study aspires to fill in this gap by shedding light on key issues that affect market performance and to propose issues that require further research. The second reason was to address the challenge to assess the suitability of the TAM framework in understanding the dynamics of food supply chains.

The paper is organized as follows: Section 2 presents the seven domains of the TAM (2016) framework, Section 3 provides an indicative picture of the Greek dairy sector and Section 4 describes the methodological framework of the study. Section 5 contains

the empirical results and Section 6 their implications. Section 7 concludes the paper.

THE TASKFORCE FOR AGRICULTURAL MARKETS FRAMEWORK

As mentioned in the Introduction, policy debates regarding UTP and market transparency have been consolidated in the Report of the TAM (2016). The seven domains for intervention proposed by the TAM are briefly outlined below, along with references to other prior related work.

1. Market transparency. The Taskforce proclaimed the need to strengthen market transparency especially for the benefit of the numerous small producers, notably with regard to information on producer and consumer prices, production/supply and consumption/demand trends and patterns. Information asymmetries have been pointed as a factor reducing market transparency, affecting price transmission mechanisms and being the cause of UTP (Falkowski, 2017). A measure to achieve better market information was the establishment of Dashboards at the central EU level.

2. Risk management. The Taskforce endorsed risk management instruments in agricultural production to mitigate the effects of variations in product quality and production volumes as well as price volatility, using the toolkit available by the Common Agricultural Policy (CAP). Risk management is inherently related to innovation and investment, as an external environment bearing low risks or helping actors to manage risks provides higher potential for novelties. The availability of relevant tools affects the decision-making processes and strategies of firms.

3. Futures and other derivative instruments. Such instruments have been used extensively in the grains, oilseed, potato and sugar sectors and, during the last few years, for milk powder, butter and pigmeat. In all cases, they hold the potential to become crucial risk management tools in times of price volatility. Their applicability, however, in the Greek setting is low and no relevant paradigms exist, so this domain was excluded from the analysis.

4. Trading practices in agricultural markets. Unfair Trading Practices have been defined as ".... practices which significantly deviate from good commercial conduct and are contrary to good faith and fair dealing " (European Parliament, 2016). There is a variety of practices that could potentially be cate-

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[1] This paper investigates exclusively the dairy cow supply chain. Although sheep and goat milk production is important for the Greek setting, it is not examined in this paper.

gorized as UTP (see Sexton (2017) for a discussion) and the distinction between driving a hard bargain and UTP is sometimes blurry (Taskforce for Agricultural Markets, 2016; Falkowski, 2017). The important economic implications of UTP have led to legislative action as described in Sections 1 and 3 of this paper.

5. Contractualization. This domain referred to strengthening Contract Farming by introducing compulsory contracting among actors as well as the provision of "standard" contract templates to facilitate the parties involved. Sexton (2017) noted that such contracts are used in the USA, but they mainly describe litigation resolution processes rather than the terms of the agreement. A more widespread use of written contracts is an issue that needs to be discussed in improving market outcomes.

6. The CAP and competition law. The TAM specifically urged the Commission to provide sufficient clarifications regarding the institutional framework governing POs. In particular, the TAM calls for additional legislative exceptions to POs in competition law. According to Bijman et al. (2012), in 13 EU-countries POs command more than 50% of the market, therefore their potential expansion could increase even more their market shares, thus opposing to competition laws. Velazquez and Buffaria (2017) underlined that the current upper limit of control of the quantity of a specific product by a PO is not very strict (for instance for milk POs it is 33% of the total national milk production per Cooperative), however

the whole framework of POs under the light of competition law needs to be revised in order to ensure that it should not become a factor hindering their development. In addition, the TAM proposed that specific derogations from Competition Law regarding the milk sector should be maintained.

7. Access to finance. Facilitating farmers' access to finance even by providing guarantees for farmers' loans from local banks through the European Investment Bank. This domain is highly relevant for Greece under the economic crisis, which has deprived farms and businesses from liquidity and has brought serious adverse effects in all sectors (Karanikolas and Martinos, 2012; Ragkos et al., 2015; Ragkos et al., 2016).

THE GREEK DAIRY COW SUPPLY CHAIN

The Greek dairy cow supply chain has witnessed great changes since early 2000s. The number of farms has been decreasing constantly since 2006 (decrease by 53.1% or 6.5% annually), while milk production has remained relatively steady (only 5% reduction from 2000 to 2016) (Table 1). This adjustment denotes the intensification of production, which resulted in an increase in average milk production per farm by 4,8% annually. Indeed, large dairy farms of predominantly entrepreneurial nature emerged - either new or existing which decided to intensify. These farms have better access to information, technical support and innovation and have the possibility to access competitive markets.

Table 1. Structural development of the dairy cow sector in Greece (2006 - 2016)

Year	Farms		Total milk production		Average production	
	Number	Change (%)	(thousand ton)	Change (%)	(ton./farm)	Change (%)
2006-2007	6270		736		117,4	
2007-2008	5627	-10,3	716	-2,7	127,2	8,3
2008-2009	5074	-9,8	699	-2,4	137,8	8,3
2009-2010	4561	-10,1	682	-2,4	149,5	8,5
2010-2011	4259	-6,6	666	-2,3	156,4	4,6
2011-2012	3930	-7,7	642	-3,6	163,4	4,5
2012-2013	3686	-6,2	627	-2,3	170,1	4,1
2013-2014	3558	-3,4	615	-1,9	172,8	1,6
2014-2015	3356	-5,6	609	-0,9	181,5	5,0
2015-2016	3215	-4,2	605	-0,6	188,2	3,7
Total change (2006-2016)	-3055	-48,7	-131	-17,8	70,8	60,3
Annual rate of change (%)	-6,5		-1,95		4,8	

Source: Hellenic Agriculture Organization "Demeter", processed data

The milk processing sector in Greece is oligopolistic, with six companies controlling 70% of the fresh cow milk processing. Recently mergers and takeovers have increased even more concentration in the sector. Multinational dairy companies and large Cooperatives have also penetrated the market (Friesland Campina), while also Greek Cooperatives are becoming increasingly competitive. In the retail sector, the top five retailers account for 56% of the grocery retail market (ICAP, 2013), representing a high degree of concentration, while 80% of retail sales of dairy products are controlled by five supermarkets.

Table 2 presents the actual legislative framework and initiatives for the improvement of the Greek dairy supply chain, organized according to the seven TAM (2016) domains. In addition to the information of Table 2, specific reference should be made to the Rural Development Program of Greece (RDP) 2014-2020, which includes numerous measures aiming to boost the performance of the primary sector in general in terms of better access to finance, risk management and promotion of collective actions (POs). Furthermore, the "Milk package" (Regulation (EU) No 261/2012; OJ L 94, 30.3.2012, p. 38.) is a set of measures that have been proposed at the European level regarding the overall performance of the dairy supply chain. The "Milk package" proclaims important issues, such as the necessity of written contracts, milk delivery reports, Producer Organizations, collective negotiations and other important market transparency issues. Being of pan-European importance, the specific provisions of the "Milk package" are not explicitly presented in Table 2. However, it should be stressed that many of them are crucial to the Greek dairy sector as well, but most of them have not been incorporated in national regulatory framework and only recently action was taken - for instance with Law 4492/2017 (Table 2).

Table 2. Existing framework to improve market outcomes in the Greek dairy supply chain

Domain of intervention	Existing framework/Initiatives in Greece
Market transparency	All milk buyers, including farms which process their own milk, are obliged to access the «ARTEMIS» system (Common Ministerial Decision 1678/111284/2015 (FEK B' 2257/20-10-15) which was repealed by Common Ministerial Decision 838/51008/2019 (FEK B' 964/21-03-19)) and submit electronically the «Monthly Dairy Balance Statements» (Article 3, Common Ministerial Decision 175180/11 (Government Gazette 1721 / 02-082011) (Article 151 of the CMO). The purpose of milk balances is to control the legal use of all types of milk in dairy products as well as to ensure that legal requirements are followed by processors subsidized by national or EU frameworks and the correctness of the claims of the geographical origin of the raw material used in the production of certain dairy products and the handling, disposal and delivery of milk by-products. All businesses involved in buying or processing raw milk (cow, sheep and goat) are obliged to upload data of the milk quantities they process each month. The Hellenic Agriculture Oorganizaton (HAO) 'Demeter' manages data regarding raw milk production and reports monthly volumes of milk processed and corresponding prices. Information from the EU Milk Market Observatory is open to all interested actors (https://ec.europa.eu/agriculture/market-observatory/milk_en)
Risk management	There are no specific policy measures supporting the risk management strategies undertaken by farms and other businesses downstream the supply chain. According to the RDP 2014-2020, Law No 3877/2010 created *".... a national system of protection and insurance of agricultural activity"*. With the same Law a «Directorate for Crisis and Risk Management in the Agricultural Sector» was introduced. However, risk management (agricultural production, income and risks in food chain) is in primitive form in Greece. The insurance of production by the Greek Insurance Organization (ELGA) is compulsory.
Futures/ Derivatives	-

Trading practices	Law 4492/2017 seeks to harmonize the Greek framework with the European, especially when it comes to late payments, in order to ameliorate the performance of supply chains. Under this Law, payments should be done at 60 days from delivery the latest and 30% penalties would be imposed to those who do not comply. Farmers and processors are obliged to announce all data regarding their transaction to designated services. In addition, the Law introduced a new branding scheme for milk, discerning the country where the milk was produced and/or processed and/or packaged, thus reducing problems relating to false labelling. However, the Law did not provide for trade relationships between Supermarkets and dairy industries, which is an issue tackled by the UTP Directive in order to contribute further towards reducing UTP in food supply chains in Greece.
Contractuali-zation	As part of the «Milk package» all Member States have the option to make written contracts between farmers and industries compulsory. This has not happened yet in Greece.
The CAP and competition law	Law 4384/2016 defined the legislative framework for the establishment and operation of Agricultural Cooperatives and Producer Groups. Numerous measures of the RDP 2014-2020 (for instance M01, M02, M07, M16 etc) provide specific opportunities and/or higher support to Cooperatives and Producer Groups. In Greece there are actually no POs of the magnitude described in the «Milk package» (33% of the total national production), while since the total national production stands for 0.45% of the total EU production, neither does the second «milk package» restriction apply (<3.5% of total EU milk production).
Access to finance	One of the most serious problems of the Greek primary sector. It affects farm management and ability to invest. The RDP 2014-2020 provides funding opportunities relating to farm modernization, generational renewal etc. Moreover, the Greek development law 4399/2016 provided aid schemes to support the country's less developed areas and improve competitiveness in high added value sectors. In Greek legislation, however, there is no clear provision for a financial institution geared to financing the agricultural sector.

METHODOLOGICAL FRAMEWORK

Numerous approaches to the assessment of trading practices have been proposed. Rosa et al. (2015) applied an econometric model to analyze the efficiency of the dairy supply chain in Italy and found that decreases in producer prices can be attributed to higher competition rather than information asymmetries. Gorton et al. (2015) also employed a quantitative analysis to study UTPs in food supply chains in the USA and confirmed that trustworthiness was positively related to fair practices. Using a Global Value Chain framework, Lianos and Lombardi (2016) provided a theoretical framework to examine food value chains in contrast to competition law. Sexton (2017) identified three main approaches and four types of methodologies for empirical investigations of trading practices (interpretive methodologies based on interviews; surveys, either online, by phone, or face to face; case studies; modelling).

As this study attempts to provide an assessment of a food supply chain based on the TAM framework, a qualitative approach was chosen in order to acquire rich information to shed light to practices affecting the overall performance and outcomes of the supply chain. Qualitative research can be used to generate knowledge about the perspectives of a phenomenon

or a situation and especially in-depth interviews may yield important highlights based on the experience of individuals (Hammarberg et al. 2016). According to Sexton (2017), in-depth knowledge of the relationships among actors in the supply chain could provide explanations of the sources and implications of UTP and demonstrate why such practices are present in some settings and are less important in others. Examples of such approaches in food chain analysis include the work of Broderick et al. (2001), Alonso and O' Neill (2001), Ilbery and Maye (2005) and Connelly et al. (2011).

The study area for the qualitative assessment of the dairy supply chain in this study is the northern part of the country (Thrace, Macedonia and Thessaly) where 80% of Greek cow milk is produced, almost 80% of dairy cows are reared and more than 70% of farms are situated. In-depth interviews were conducted from August to October 2017 using three versions of a carefully designed semi-structured questionnaire. The first was for dairy farmers, the second for industries and the third for Supermarkets. In all versions, questions were open-ended and were categorized in the six domains proposed by the TAM framework (excluding Futures and Derivatives) (Table 2). In more detail, all actors were asked regarding their understanding of

market transparency and the use of information sources; UTP phenomena they had been subject to; use of risk management tools and relevant strategies; access to finance and liquidity (e.g. bank indebtedness and willingness to make loans); use of written contracts and agreements upstream and downstream the supply chain. Furthermore, respondents were asked about their future investment plans but also questions about the profile and development of their businesses. All participants were encouraged to state their opinions for issues not explicitly included in the questionnaire but related to the scope of the study.

Interviews were conducted by at least two enumerators, who noted all responses, and then all notes were systemized and combined. In total, 11 dairy farmers, 8 representatives of dairy industries and two representatives of Supermarket chains were surveyed, all of which are situated in Northern and Central Greece (Thrace, Macedonia and Thessaly). All surveyed dairy farms were family-run; they reared 142 dairy cows on average and yielded 7975 kg milk per cow annually. Among the eight dairy industries, two were Cooperatives and five private companies, while in the eighth the staff and other companies were shareholders. Their common characteristic was that they all processed and distributed fresh cow milk, while for seven of them this was their main activity. Apart from that, each company also produced other dairy products, mainly yoghurt and desserts. Most of these industries also processed sheep and goat milk for cheese, yoghurt or even fresh pasteurized goat milk (two companies). Out of the six private companies, three were family-run and three were S.A.s with numerous shareholders. In addition, all these six companies exported their products, while the two Cooperatives only targeted the Greek market. In the retail sector, the Supermarkets surveyed here were major actors in retail sales in Greece. Since anonymity was guaranteed, no other characteristics of respondents are reported here.

The presentation of the research findings was enriched with original quotations of respondents. This method was preferred to add credibility to the results and to help derive meaningful conclusions from this study. This approach has become standard practice in several similar studies, as the inclusion of whole quotations generally helps readers assess the accuracy of the findings presented and thus adds credibility, while it also enables more in-depth understanding of the importance of the results described (Corden and

Sainsbury, 2006; Corden and Sainsbury, 2007; Anderson, 2010; Bryman, 2016). Examples of previous studies using this technique in order to generate more detailed and in-depth knowledge of respondents' attitudes and opinions include the work of Clark and Gerrig (1990), Austin et al. (2005) and Hammarberg et al. (2016), while no relevant study was found for the dairy sector and for the assessment of the overall value chain performance. Quotations in the Results Section are identified only in terms of the type of respondent (Dairy Farmer (DF); Dairy industry (Ind.); Supermarket (SM)), while Industries are further discerned into Privately owned (Pr), family businesses (Fam) and Cooperatives (Coop).

RESULTS

Market transparency

Milk price was one of the most important factors - if not the most important - affecting the overall performance of the market. For Industries, this was a critical success factor and this was supported further by one respondent who stated that

The development of our firm was largely based on the high milk prices at the time we started (Ind, Coop)

According to most dairy farmers and industries, producer prices changed on a monthly basis and were usually formed according to the distance of the farm from the industry (transportation costs) and, of course, quantity. Milk quality was another important factor, affecting not only the final producer price but also the quality of cooperation between the industry and the farmer. Some dairies tended to set very high quality standards and discard milk of lower quality, while others (especially large ones) processed milk of standard quality but at lower producer prices. Most farmers felt strongly in favour of this strict quality policy and claimed to follow very carefully all the management guidelines provided by industries and veterinarians. For example, one dairy farmer stated that

I am very happy with the Industry, so I do my best to follow their rules. When I do, we both win (DF)

All respondents agreed that in the bargaining process, downstream actors were stronger than the ones upstream. This means that for farmers, Industries were the strong competitor and for the latter *"Supermarkets play the game" (Ind, Pr)*. On the other hand,

even Industries were sometimes in a weak bargaining position and most of the respondents mentioned that the Law 4427/2017 would impact them adversely, as they would have additional responsibilities against farmers, without, however, having any assurance for timely payments from retailers. Quoting a characteristic statement from an Industry respondent

We are the weakest link of the supply chain, as we are pressured from upstream (farmers) for better producer prices and from downstream (supermarkets) for lower retail prices. We cannot shift this pressure to farmers, because they will stop producing and this will be even worse (Ind, Fam.)

Super markets were the most powerful links in the supply chain, they do not leave much room for bargaining and there was total unanimity in this argument. Methods, strategies and practices followed by farmers and dairies to increase their power are presented in other parts of the Results Section and are discussed further in Section 6.

Regarding the formulation of retail prices, a common mechanism was described by Industries with slight variations. The procedure started with Industries proposing a *starting price* (common price list) to all retailers, including Supermarkets. After negotiation, both parties decided a commonly accepted *baseline price*, based on product type and diversity, as well as on their quantity. The difference between *baseline prices* and *starting prices* varied according to the bargaining power of each player. For instance, industry respondents reported a good level of mutual understanding with small retailers (pastry shops etc), but mentioned that bargaining with supermarkets was not flexible because of their power. This was also due to the fact that Supermarkets control much higher proportions of the whole market, compared to Industries, which also demonstrates a lack of horizontal collaboration among Industries, as was explained by one respondent

We work together well in general with other industries, when this is needed, but competition is high and there is very little room for communication. This is one of the reasons why supermarkets define the prices (Ind, Pr)

Nevertheless, differences between *starting prices* and *baseline prices* were lower for high quality products. According to one Industry respondent

While in the beginning super markets did not want to bargain with us and rejected our products, now they come to us and bargain. This is all because of our quality: if your product is good, you will find a decent way to sell it (Ind, Pr)

Supermarket representatives also referred to quality, which they posed in a very central position in their development strategies. It was mentioned that

We are always open to new quality products: we want consumers to connect us with quality and we pay more for that (SM)

In addition, it was ascertained that dairies which fail to provide products of at least acceptable and stable quality in a timely manner were excluded from their shelves.

The prices paid by Supermarkets to industries were usually lower than the agreed *baseline prices* because - in most cases - the contracts also included promotional activities for industries which were translated to lower payments. Such activities (as described by respondents) included: better shelf positioning, separate promotion spot inside the store, television advertisement, in-store promotional activities, supermarket leaflets, availability in more branches of the same chain etc. These promotional activities were somehow "compulsory", in a sense that industries were pushed to choose at least some of them. In other cases, supermarkets agreed to undertake the transportation costs or, in cases of hard bargaining, they agreed to incur part of the marketing costs. Under another type of agreement - explained by one respondent -, the baseline price was fixed, but then, periodically, a "sales price" was set, which brought a reduction of the final payment to the industry. As a result of these practices, Industries got significant lower prices and this was explained specifically by one respondent

When this whole issue with promotional activities started, things were reasonable and price reductions were up to 15%. In the past few years this changed and now price reductions are significantly higher. Supermarkets are far off (Ind, Pr)

Because of this practice, the final price of the product is generally formulated usually 1-3 months after the initial agreement. This method does not allow prices to be revealed to competitors early.

Regarding information sources, there was a considerable divergence between respondents. All indus-

try respondents mentioned that Artemis system was useful and relevant and that they regularly visited EU observatories; however, they expressed different views as to their practical importance. On the other hand, dairy farmers were in general more skeptical about the importance and contribution of Artemis system, while only two of them were aware of the EU Milk Market Observatory.

Risk management

Risk management relative to liquidity and the overall economic environment was discussed with all respondents. Industries did not specifically refer to the availability and/or use of such tools, which could help them overcome financial stress. On the other hand, most farmers had used at least once financial help from an EU-funded measure for investments (e.g. financial support for modernization and investments or the "Young Farmers" measure) and explicitly acknowledged the importance of their decision. However, still this was not a risk management tool but rather a measure to increase economic performance and competitiveness.

During the interviews, the discussion about risk management was expanded to their overall strategies for reducing risks or dealing with it, because this issue was particularly relevant to the overall adverse economic environment. Risk management differed among industry respondents. In general, most of them did not refer to particular strategies and mainly mentioned the ability to foresee market trends, high product quality and stable exports as key aspects to reduce risks. Apart from that, one industry respondent also mentioned the importance of adequate liquidity and of diversification to many products and activities while another one stated that

Only products with added value can support the normal operation of our company. This is why we have turned to yoghurt and ice cream (Ind., Fam.)

One of the topics of this discussion concerned attitudes and practices regarding new investments. All respondents (farms, industry, supermarket) described relatively concrete strategic expansion plans, which all included planning or even actually realizing investments but differed in terms of timing and resources. For farms, common investments included infrastructure (new machinery, expansion of buildings etc), genetic improvement of cows, increases in flock size and novel herd management practices. For dairy industries expansion of infrastructure and

capacity as well as research and development of new products (customized for specific markets) were the main investments planned, because, as one Industry respondent mentioned

Quality products will ensure high bargaining power (Ind, Pr)

Another issue which respondents related to risk management was the number and size of suppliers. Upstream the value chain, industries stated that they preferred to collaborate with a relatively large number of dairy farms of all sizes, in order to avoid dependence on specific suppliers. Industry respondents also affirmed that farm size was not related to the quality of cooperation between them. Some indicative responses are presented below

Medium and/or big farms (2tn/day) are better to work with, because they are more viable due to low production costs and usually, they achieve higher milk quality (Ind, Fam.)

Big farms tend to by unsteady. They change industries very easily, so you cannot rely on them (Ind, Pr.)

It is easy to become highly dependent on a Cooperative and then you lose all your flexibility (Ind, Pr.)

Downstream the supply chain, industries pursued deals with super markets (large chains or local ones) while sales to small retailers only stood for a small part of their total revenues. However, the opposite point was raised regarding the quality of cooperation, which translated to stability and reduced risks for most industries. As one respondent stated

It is sometimes easier to get by with small local retailers: They don't ask too much and they are loyal (Ind, Fam)

Supermarkets were in line with industries, as they tended to develop a large network of suppliers of all types (family, local, nation-wide industries).

Own label products constituted a particular type which was gaining high market shares but also served as a risk management tool for industries. One industry respondent explicitly described the benefits of involvement in this type of production

With these products, we have no unexpected returns. The demand from retailers is regular and the price is fixed, there are not many changes in orders

and supermarkets do not drive a hard bargain. Thus, we operate better. This regularity in orders - production - storage - payments/prices allow us to concentrate on our own brand. Also, these regular payments stand for a significant part of our revenues, which provides us financial stability. (Ind, Pr)

However, own label products could have a negative impact on the overall reputation of the firm, if not enough focus was given on the brand name. This would affect adversely the market demand of the products (branded and private-label) and, consequently, its bargaining position with super markets and retailers. As one Industry respondent explained

Our brand name is our most important asset in bargaining with Supermarkets (Ind, Coop)

Supermarkets also seemed to favor the development of own label markets, as illustrated in the following quotation.

We gain consumers' trust with our own label products and we reduce our reliance on strong labels (SM)

A different pricing policy was described for private label products. These products received a *baseline price* mutually agreed between the Industry and the Supermarket, which was usually explicitly mentioned in the contract and remained steady for a relatively long period. Then, the supermarket covered for a part of this *baseline price* and for the cost of all promotion activities, so that the product finally reached the consumer at a lower price (mark up). In this context, Industries undertook the sole obligation to provide the agreed quantities. Therefore, risk in this type of production lied mainly in the internal processes of the firm and not on external factors, including pricing.

Two issues which are closely related to risk management of dairy industries are logistics and packaging. Having an own transportation and distribution network provided them flexibility to a certain level. All firms had such infrastructure, however the extent of their own distribution network varied significantly. Two types of logistics organization were basically described. The first was adopted by large firms and involved a well-developed own network within a significant radius and external transport only for very long distances. The second type involved a small but well-organized transportation infrastructure for local markets and collaboration with external companies for more remote areas. For this type, written

contracts between dairy industries and transportation companies were rare, however steady cooperation was maintained with specific companies. Concerning packaging, dairy industries involved most commonly worked closely with two or three companies, which provided them with all the necessary materials. Most firms mentioned that Greek local companies of this type were lacking, so they collaborated with nation-scale or foreign companies. None of the respondents mentioned any type of written agreement with this type of suppliers

Trading practices

All respondents referred to the developments of the market and to the leading role that Supermarkets had undertaken and still played. For actors downstream the supply chain, Supermarkets were the strongest link, which puts pressure on them, but the Supermarket respondent also explained that even his company was receiving pressure from multinationals. The following quotations illustrate the diverse opinions of the two types of actors

Supermarkets have been expanding in an irrational way during the past few years: Many new branches, thus high needs for liquidity. The pressure for more funding has been passed on to us (Ind, Pr)

We always try to maintain our shares in markets and it is true that we receive a lot of pressure from multinational suppliers (SM)

Not all industries accepted unsold product returns (in particular one respondent revealed that this was an explicit written term) and also no unsold product returns were accepted for own label (confirmed by at least three respondents). Returned products were usually used for animals (e.g. in swine farms) and one industry used them for biogas production, which covered for 70-80% of their energy needs.

Late payments

One industry respondent discussed the issue of late payments from Supermarkets to dairy industries. He mentioned that the whole issue started from the dairies themselves, initially as a tool for market penetration. Quoting his own words:

Some small local industries proposed to super markets to pay them later instead of lowering the price of products. They considered late payments better than lower payments. Little by little, this practice became popular (Ind, Pr)

It was confirmed by industries and supermarket respondents that Supermarkets pay dairy industries within 90-150 days from delivery. However, it should be stressed that one supermarket denied that this is a form of UTP, as the time of payments was always agreed by both sides, not in written though. It was mentioned that only one Supermarket chain currently makes monthly payments, but mainly for private label products. However, it was described that in some cases supermarkets provided a kind of an advance payment. The Supermarket respondent elaborated extensively on his opinion of UTP and explained that his firm avoided such practices, because in the long run they have negative effects on the market and of the business. In a specific part of this discussion he mentioned that

Unilateral changes do not favor any link of the supply chain. The new Law will not be of any use if the market itself does not decide to abolish UTP (SM)

Industries did not report late payments for farmers. On average payments were actually made within 30-60 days after delivery. According to the industries, whenever there was a contractual agreement, payments were always made according to the contract: one part was deposited in the farmer's bank account and the rest was paid by cheque. Farmers confirmed that late payments were actually very rare - especially compared to 1-2 years ago - and that especially in cases of trustworthy relationships with family-run industries, late payments were treated with understanding. Some farmers also mentioned that industries provided them deposits in times of increased need for liquidity and retained the amount from future milk sales. A dairy farmer mentioned that

They have helped me in times of need, so I should also be understanding when are in too deep (DF)

Contracts with farmers

There are cases of written contracts, which were explicitly described by few farmers and two dairy industries. One dairy farmer - owner of one of the largest farms in the survey - described a type of written contract by means of which the industry provided technical advice, veterinary support and drugs and retained the value of these services from monthly milk payments. Apart from this example, however, it was common not to make written contracts because prices changed monthly while milk production by farms

remained relatively stable throughout the year, unlike sheep and goat milk (especially from September to November). In addition, the survey revealed that most farmers were risk-averse and preferred long standing collaboration based on mutual understanding and trustworthy relationships. This was also confirmed by all Industry respondents. The following quotations illustrate this point of view.

Contracts with farmers are not necessary. We maintain long-standing cooperation with most of the farms, while also new farms who join us, they do so based on trustworthy relationships. (Ind., Fam.)

I trust my industry, but even if I didn't, I 'm not sure that a contract would help me a lot (DF)

Cooperatives operated under a different rationale. Although their management resembled private firms, they primarily worked with their members, with which, obviously, there was no need for a further contractual agreement.

CAP and competition

It has already been discussed that Greek cooperatives are away from the maximum thresholds set by European legislation concerning competition. When it comes to farms, this is also the case as most Greek dairy farms are not of a large size that would render them capable of affecting market prices (Table 1).

Access to finance

As was expected, many respondents made specific reference to the overall fiscal environment. Although some industry respondents made particular references to taxation and social security payment rates, none of them revealed relocation to neighboring countries as an option that they would consider. One respondent from a Supermarket chain assessed access to finance as the most important issue in the operation of the firm, although he did not report such problems. He also confirmed that Supermarkets provided deposits to dairies in order to improve their liquidity "*...especially during the first period of capital controls*".

Liquidity was pointed out one of the key issues for survival, performance and expansion. Especially Cooperatives found it more difficult to use existing funding tools from banks, so specific adjustments were needed. Nonetheless, most businesses managed to survive and even thrive during the crisis. Liquidity did not seem to be a serious constraint, as is highlighted in the quotation below. The fact that all of them

planned some type of investment and/or expansion confirms this allegation made by respondents.

There was never a problem with liquidity, even during the crisis. The crisis only reduced our high growth rates (Ind, Fam)

Liquidity and financing issues were also raised by farmers, although to a less degree. Two farmers claimed not to have suffered from the crisis in this respect. In fact, financing issues were mentioned mostly in terms of low prices rather than because of irregular cash flows, although in the past there were periods of late payments. Bank loans were scarce and none of the respondents mentioned high indebtedness to banks.

Most industry respondents referred to the recent bankruptcy of a major Supermarket chain. All of those who raised this issue agreed that it caused a major turbulence in the market, not only at the actual period of the bankruptcy but also before, and that the consequences are still evident. In fact, this was one of the sources of reduced liquidity for industries for one period. As explained by one Industry respondent

Things are not the same in the market after this bankruptcy. Supermarkets started to ask us to accept more in-store promotional activities and the situation became more suffocating for all of us (Ind, Pr)

DISCUSSION

Table 3 summarizes the findings of the survey. The Table shows the main issues actually affecting the outcomes of the Greek dairy supply chain. In what follows some additional points are discussed and compared to previous findings.

The fact that retailers are the strongest link in the supply chain has also been pointed out by other authors. Maglaras et al. (2015) noted that this was a global phenomenon, attributable, *inter alia*, to high retail market concentration and closer outlook on consumer preferences as well as to the increasing market shares of own brands. Lianos and Lombardi (2015) proclaimed the need for specific legislative adjustments to address this issue, while Sexton (2017) provided a list of specific cases where retailers were found to exerce UTP. This fact was partially due to information asymmetries, which compromised market transparency. Indeed, although industry respondents stated constant use of Milk Price Observatories, dairy farmers did not know about their existence and only used the

Artemis system to input milk production data. Therefore, actors did not share a relatively equal level of information. This implied that there was considerable room for improvements and that the implementation of the Directive could play an important role towards this direction, for instance by facilitating the exchange of information and experience between States and by collecting and publishing complaints about UTP.

The survey showed that the use of written contracts was not widespread. Written contracts was avoided by risk-taking farmers who sought to profit from temporal increases in prices and grasp market opportunities, while risk-averse farmers preferred to build their collaboration upon trust. These findings were in line with Gorton et al. (2015), who found that trustworthy relationships were affected by (i) the number of commercial buyers, (ii) the ease of farmers' costs of switching among buyers, (iii) the size of the supplier, and (iv) the supplier's membership in a marketing cooperative.

The issue of dependence (also highlighted by other authors e.g. Maglaras et al. (2015); Dobson (2005); Sexton (2017)) was raised by survey respondents. Farmers and industries tried to reduce their dependence on their buyers (industries and retailers respectively). One type of this strategy was the improvement of quality. Although Sexton (2017) argued that quality reduction was a relatively common way to reduce costs under UTP, this was not supported by the qualitative data of this survey. In fact, most industries stated the opposite i.e. that they sought to increase quality in order to improve their bargaining position. Farmers were in line with this and also wanted to increase their quality. Another type of this strategy was innovation and investment, for which the survey revealed high potential, contrary to what would be expected under UTP (e.g. Sexton, 2017). Dairy farmers tended to increase their size and to produce more in order to increase their bargaining power. The R&D departments of industries launched new products in order to increase their bargaining power against supermarkets and to diversify towards covering the demands of international markets. This type of behavior was also pointed out by Inderst and Wey (2007) in their elaboration of a theoretical framework to explain retailers' market power. Hence, the overall operation of the Greek dairy supply chain did not hinder product innovation and market development. Quality, innovation and investment in food supply chains were context-related and should be treated as such.

Table 3. Overall assessment of the Greek dairy cow sector based on respondents' views (TAM (2016) framework)

Market transparency	Prices are formulated based on numerous factors, including strict quality standards. Final product prices are formulated after a few months. Information asymmetries.
Risk management	Industries did not declare the use of risk management tools, while for farmers the use of CAP funding has been used extensively, still not as a risk management tool. Regarding risk management practices and strategies, «Own label» products help the firm to operate in a smoother way. Regular payments provide financial stability. Dairies seek to combine branded, private label and exportable products to minimize risks. Specialization on products with high added value (yoghurt and ice-cream) and new products. Most investments during the crisis were made with own funds (see also (7)). Various strategies in terms of choice of packaging suppliers and logistics. Risk-averse farmers tend to sell to the same dairy for long periods, while others (especially big) prefer to change dairies for higher prices. Dairies in general prefer to sign deals with large supermarkets as a risk-aversion mechanism.
Trading practices in agricultural markets	Supermarkets are the strongest link and "set the rules" in negotiations. Unilateral changes only during negotiations. Payments from industries to farmers are usually not late. There are delayed payments from supermarkets to industries (2-5 months), which, nevertheless, were initiated by some dairy industries. Own label products gain market shares, without causing explicit problems to actors in the supply chain. In-store promotional activities decrease the final price paid to industries and this is going to be tackled by the Directive.
Contractua-lization	Written contracts are not usual either for farmers/industries or for industries/suppliers. Even when contracts are signed with farmers, prices are not fixed (they change monthly according to market trends, quantity and quality). Trustworthy relationships are important. Agreements between supermarkets and industries are written and formal and include a basic level of information about promotional activities, product process, returns of perished products. No contracts with small retailers
The CAP and competition law	Issues here are not highly pertinent to the Greek dairy cow sector, however a facilitation of the process for access to finance by POs would be beneficial. In general, the provision of the «Milk package» are not implemented in the Greek setting and there is much room for improvements towards this direction.
Access to finance	Adequate liquidity would boost even more the operation and performance of industries. The crisis and late payments reduce it. For farmers, liquidity is not a serious issue and they plan to make investments mostly with own funds. Cooperatives find it more difficult to use existing funding tools from banks. Industries and Supermarkets make easement payments to their respective suppliers.

Own label products have been identified as a potential source of UTP (Maglaras et al., 2015) but in this study this was not confirmed. None of the respondents expressed negative assessments of the impact of these products on their performance. On the other hand, two industry respondents claimed that these products help them to balance their activities and reduce risks, while Supermarkets were also in favour of promoting such products.

Regarding POs, the survey revealed an alternative operation model. Although it is acknowledged that larger POs are able to provide better services to members and contribute to higher producer prices, not only locally and for their members, but also for other settings ((Velazquez and Buffaria, 2017; Bijman et al, 2012), the institutional framework in Europe hinders the development of large Cooperatives, as they oppose the Competition Law lacking relevant derogations. In Greece, dairy Cooperatives are now expanding and it is interesting to see how this process will evolve in the future.

CONCLUSIONS

This study constitutes a first endeavor to implement the TAM (2016) framework in assessing the market outcomes of the dairy cow supply chain in Greece. Using qualitative survey data, the supply chain was evaluated in six out of the seven domains, as futures were not applicable to the context of the study. The assessment of the views of farmers, industries and supermarkets showed that the TAM (2016) framework is a useful tool to collect qualitative market information and to assess outcomes and performance for the supply chain as a whole and not only for specific actors, links or segments. Since the qualitative analysis did not reveal any important UTP or other practices that are particularly harmful to the overall performance of the Greek dairy supply chain, the sector showed positive prospects. Indeed, as Sexton (2017) pointed out, loosely concentrated market structures entail worse results for farmers that highly concentrated markets, the current developments in the structure of the sector show a transition towards a more efficient organization, maybe as a result of

modernization. However, a good level of horizontal collaboration among Greek dairy industries might be what is actually missing from the sector, as this lack of cooperation was identified as a cause of late payments and potentially a source of UTP between Supermarkets and dairy industries. From the primary production point of view, the provisions of the "Milk package" could be important in improving market outcomes in Greece in general.

One of the main conclusions of this study is that there is ample room for further research, both in the dairy sector and in the field of trading practices and improvement of market outcomes in general. In fact, the main limitation of this study is that it only com-

prises a relatively small number of farmers and supermarkets and a part of dairy industries. Nonetheless, the in-depth interviews have raised important issues to be investigated and analyzed in the future. More qualitative studies of trading relationships are necessary to understand supply chain dynamics and these should be complemented by quantitative assessments of their true repercussions. This is in line with Sexton (2017) who also pointed out a gap in the analysis of UTPs in food supply chains. One more specific issue to be addressed is the role of consumers in maintaining or combatting UTPs and the effects of the latter to their consumption patterns. Falkowski (2017) provided a discussion of available methods and approaches in this domain, which remains relatively unexplored.

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