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Power, buyer trustworthiness and supplier performance: evidence from the Armenian dairy sector

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Research Highlights

- We model the relationships between buyer-seller power, buyer trustworthiness and supplier performance

- Buyers are more trustworthy where there is greater competition for supply

- Marketing cooperatives strengthen the bargaining power of suppliers and reduce buyer opportunism

Abstract

The paper presents a Multiple Indicators and MultIple Causes (MIMIC) model for explaining the relationships between buyer-seller power, buyer trustworthiness and supplier satisfaction / performance. The model draws on an organizational supply chain perspective of power and is verified using data relating to dairy farmers' relationships with their main buyer in Armenia. The analysis indicates that buyers are more trustworthy where there is greater competition for supplies. Buyer trustworthiness is also positively correlated with both the size of a supplier, as well as a supplier being a member of a marketing cooperative. Buyer trustworthiness has a positive impact on suppliers' satisfaction (regarding their relationship with their main buyer) and enhances the quality and quantity of suppliers' output.

Keywords

1. *Introduction*

The nature of buyer-supplier relationships has long been recognized as a factor influencing business performance. Early work on supply chain management (e.g. Spekman, 1988, p. 78) regarded collaboration between firms in a supply chain as being built on a "win-win" model. However, this ignores how asymmetries in power affect the distribution of outcomes (Hingley, 2005a), particularly in explaining why buyers and sellers often enter into relationships for which they do not desire long-term mutual benefits and 'have no qualms about "win-lose" scenarios' (Cox, 2004b, p. 411). Power asymmetry has thus become an important topic within supply chain research (Nyaga, Lynch, Marshall, & Ambrose, 2013). This recognizes that less powerful actors may be vulnerable to opportunism with power asymmetry amplifying the potential for conflict and disaffection (Nyaga, et al., 2013).

Previous studies investigate the effect of power asymmetry between buyers and suppliers on: relationship trust (Handfield & Bechtel, 2002; Kumar, Scheer, & Steenkamp, 1995), relationship strength (Maloni & Benton, 2000), relationship orientation (Ganesan, 1994), supplier responsiveness (Handfield & Bechtel, 2002), supplier performance (Benton & Maloni, 2005), and relationship satisfaction (Benton & Maloni, 2005). Such studies typically consider the relationships between a small number of variables / constructs with single measures of power asymmetry so that 'future research could develop a more in-depth assessment of power asymmetry measures and examine how perceptions of power use and their implications differ at different levels of asymmetry' (Nyaga, et al., 2013, pp. 59-60). The first contribution of this paper is thus to introduce a more comprehensive model, incorporating five dimensions of relationship power, as well as buyer trustworthiness, supplier

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satisfaction and supplier performance. For this a Multiple Indicators and MultIple

Causes (MIMIC) model is developed and verified using data on Armenian milk

producers' (farms) relationships with their main buyer (e.g. dairy processors). MIMIC

models, which are underutilized in the literature on buyer-supplier relationships, are

suited to this task (Diamantopoulos, Riefler, & Roth, 2008), including, in this case, a

set of manifest (directly observable) variables (measures of buyer-supplier power)

which impact on a latent variable (trust), which, in turn, impacts on another set of

manifest variables (satisfaction and supplier performance).

While numerous studies acknowledge asymmetric power in contemporary

supply chains, there is less agreement on what should be the response of the actors

concerned and policy makers. One viewpoint is that weaker partners have to accept

and learn to live with the imbalance of power, recognizing that they have limited

room for maneuver (Hingley, 2005b).   Others seek to identify strategies for

improving the position of weaker actors (i.e. sources of countervailing power) in

buyer-seller relationships (Etgar, 1976). The second contribution of this paper is to

assess the extent to which membership of a marketing cooperative can improve a

buyer's trustworthiness by providing countervailing power to suppliers. While the

theory of countervailing power is long established (Galbraith, 1954), with a

recognition that marketing cooperatives may act as a mechanism for achieving this

(Hendrikse & Bijman, 2002), empirical evidence remains scarce. The latter may

reflect that the generic literature on buyer-supplier relationships overwhelmingly

draws on manufacturing and retail cases, where marketing cooperatives are relatively

uncommon, rather than agriculture which has a far stronger tradition of cooperative

buying and selling (Jang & Klein, 2011). Considering the potential role of marketing

cooperatives as a source of countervailing power is important for policy makers who

seek to improve the fortunes of small-scale producers within supply chains characterized by increasingly concentrated and powerful downstream actors (FAO, 2014a).

Finally, while the literature on power and trust in buyer-supplier relations is extensive, to date it draws overwhelmingly on data and examples from North America and Western Europe (Zhao, Huo, Flynn, & Yeung, 2008) so that many important regions of the world remain under-studied. There is thus a need to extend research to other locations, considering the determinants of constructs such as trust in emerging economies, which may have far higher levels of opportunistic behavior (Burgess & Steenkamp, 2006). The third contribution of the paper addresses this and the call of Cannon, Doney, Mullen, and Petersen (2010) for the examination of buyer trust and supplier performance in a wider range of different geographical contexts.

The Armenian dairy sector is an exemplary case for investigating the relationships between asymmetric power in buyer-seller relationships, buyer trustworthiness and supplier performance as it is characterized by sufficient variance in these variables for robust modelling. The dairy industry requires close relationships between producers and manufacturers given the highly perishable nature of the good, the flow of production (twice daily milking) and typically daily collections (Bijman, 2012; Dries, Germenji, Noev, & Swinnen, 2009). As in most emerging and transitional economies, Armenian dairy processors confront a supply base characterized by suppliers that vary significantly in size with a large number of small-scale producers, which are generally poorly capitalized. The Armenian sample analyzed in this paper records a mean herd size of 13.36 cows, with 50% of farms having eight cows or fewer and an average yield of 2,246 kg per milking cow. Worldwide there are 122 million dairy farms, with a mean herd size of 3 cows and an

average yield of 2,100kg per milking cow (IFCN & ICARE, 2013). In China, the world's fastest growing and third largest dairy market, the average herd size is 6.7 cows with a mean yield of 2,282 kg per milking cow (FAO, 2014b). In the EU, the mean herd size and yield is higher (34 cows and 7,068 kg respectively), but this masks important variations with some New Member States having much smaller-sized operations, for example in Romania the mean herd size and yield is 6 cows and 3,917 kg respectively (European Commission, 2013). Armenia thus shares many characteristics of dairy sectors in other emerging and transitional economies, enhancing the applicability of the analysis to other regional and national contexts.

2. *Conceptual Framework and Hypotheses*

The quality and quantity of a manufacturer's output is highly dependent on the capabilities and performance of its suppliers (Benton & Maloni, 2005). Specifically, previous research identifies that supplier performance depends on the actions of both buyers and sellers (Maloni & Benton, 2000), the balance of power in the buyer-supplier dyad (Benton & Maloni, 2005; Kumar, et al., 1995) and the degree of relationship trust (Meehan & Wright, 2012). The model depicted in Figure 1 seeks to capture the associative relationships between buyer-seller power, buyer trustworthiness, and supplier satisfaction / improvements in output performance (quality & quantity of supply). The remainder of this section briefly reviews the literature on power and trust and details how they are conceptualized in this paper, before justifying each hypothesis in turn.

Place Figure 1 here

The literatures on power and trust are both large and multidisciplinary. Pinnington and Scanlon (2009) identify three main viewpoints on power: personal, social, and organizational supply chain perspectives. The literature on *personal power* derives from French and Raven (1959) and later amendments (Raven, 1993), and identifies six bases of power: reward, coercion, legitimate, expert, referent, and informational. These bases vary in terms of the necessity of surveillance and social dependence. French and Raven's (1959) approach informed much early research on supply chain relationships (e.g. Hunt & Nevin, 1974) but has been criticized for associating power with control and having an undue focus on the negative, subjugating connotations of power with no recognition of mutuality (Pinnington & Scanlon, 2009). The *social power* literature focuses on the sources and application of power in relation to social groups, drawing on the insights of Foucault (1977). For the latter, the self is a constructed identity that implicates us in our subordination to a regime of power. This paper adopts the third, organizational supply chain approach to power (Cox, 2004a; Cox, Ireland, Lonsdale, Sanderson, & Watson, 2002).

The organizational supply chain approach assumes that power in buyer-seller relationships depends on the relative strategic significance and the availability of alternatives (scarcity) to the resources that are exchanged between the two parties (Cox, et al., 2002). Power thus depends on the relative positions of each actor, it is not an absolute concept, and emerges from the specific context of the relationship. This implies that actors behave and interact with others differently, depending on their relative power sources.

Regarding how actors exercise their power, this paper follows the logic of Kumar, et al. (1995). The latter draws on bilateral deterrence theory to explain the

relationship between buyer-seller power and trustworthiness. They argue that the likelihood of opportunistic behavior is reduced where power between a buyer and seller is symmetric as the stakes each has in the relationship, the costs of conflict and dangers of a retaliatory strike are similar. However, increasing asymmetry reduces the impediments to the more powerful firm acting opportunistically as it has less need to be cooperative, trustworthy or committed (Kumar, et al., 1995). The greater the relative power of a buyer *vis-à-vis* a supplier, therefore, the less likely the former is to be trustworthy. Following Doney and Cannon (1997, p. 36) trust is defined for the purpose of this study as 'the perceived credibility and benevolence of a target of trust'. Buyer trustworthiness therefore refers to the extent to which a supplier perceives its primary buyer as reliable (credible) and interested in the supplier's best interests (benevolent) (Dyer & Chu, 2003).

It is proposed that buyer trustworthiness depends on five dimensions of the relative power of buyers and suppliers, which following the logic of Cox (2001) capture the relative strategic significance and scarcity of resources exchanged between the two parties. Specifically these are: the potential number of other commercial buyers realistically available to the supplier (x_1), the ease with which the supplier can switch to a different main buyer (x_2), the ease with which the buyer can replace the supplier (x_3), the size of the supplier (x_4), and whether the supplier is a member of a marketing cooperative (x_5). The first four measures capture substitutability, scarcity and the attractiveness of the supplier's resources (Cox, et al., 2002; Ramsay, 1996) while membership of a marketing cooperative is considered as a potential mechanism for providing suppliers with countervailing power (Galbraith, 1954). Buyer trustworthiness is assumed to influence suppliers' satisfaction, and stimulate improvements in the quantity and quality of a supplier's output.

Based on the model presented in Figure 1, eight hypotheses are proposed and the rationale for each is detailed in turn.

2.1 The number of potential buyers

The number of potential buyers for a supplier's output varies across markets. The most restrictive case is a monopsony (single buyer). With a monopsony, the buyer can act opportunistically with suppliers remaining highly dependent on that buyer owing to a lack of alternatives. As such, power resides almost entirely with the buyer (Cox, et al., 2002). In markets where a seller faces a large number of potential buyers, the level of dependency is lower (Christopher, 2011), so that if the buyer acts opportunistically, it risks the danger of the seller terminating the relationship. In the case of a monopsony, the seller has no alternatives, however, so for the buyer the danger of conflict and retaliatory action by the supplier is weak (Kumar, et al., 1995). This implies that:

H1: The potential number of commercial buyers for a supplier's output positively influences buyer trustworthiness.

2.2 Suppliers' switching ability

The ability of a supplier to switch to another buyer depends on more factors than simply the number of potential buyers. For the seller, switching costs are the expenses associated with changing from one buyer to another. Three types are commonly acknowledged: (i) transaction costs, (ii) learning costs, and (iii) artificial or contractual costs (Klemperer, 1987). In a B2B context, transaction costs have received most attention (Williamson, 1983), namely the costs of searching for, negotiating, monitoring and enforcing a business relationship. To meet the requirements of a

particular buyer, a seller may have to invest in relationship specific assets, which have

little value outside of that specific relationship (high asset specificity). Such

investments are an important form of switching cost, which may tie a supplier to a

particular buyer (Heide & John, 1988; Williamson, 1983). Consequently, when

supplier switching costs are high, power typically rests with the buyer (Cox, 2004a)

so that suppliers are 'captive' (Gereffi, Humphrey, & Sturgeon, 2005). High

switching costs therefore increase the likelihood that opportunistic behavior on the

part of the buyer goes unpunished by the seller (they do not exit the relationship), so

that:

H2: The difficulty of a supplier switching to another main buyer negatively influences

buyer trustworthiness.

2.3 Buyers' substitutability of suppliers

The ability of a buyer to switch to a different supplier affects the balance of power. In

a market characterized by numerous suppliers possessing similar capabilities, the

balance of power is tilted towards the buyer (Cox, 2004a). There is empirical

evidence for this: in the pharmaceutical market competition between suppliers, with a

high degree of substitutability between them in the case of generic drugs, is critical

for large buyers to obtain more favorable terms (Ellison & Snyder, 2010). The more

generic the suppliers' output, the less the substitution of suppliers influences a buyer's

goals and outcomes, making switching decisions between suppliers less risky. A

negative association between the ease with which a supplier can be substituted and

buyer trustworthiness is therefore proposed:

H3: The ease with which the buyer can substitute the supplier negatively influences

buyer trustworthiness.

2.4 Size of supplier

Research on agri-food markets suggests that buyers prefer to maintain relationships with a small number of larger suppliers rather than a mass of small-scale producers (Fearne & Hughes, 2000; Hingley, 2005a). The former reduces transaction costs (particularly negotiation and monitoring costs), yields economies of scale and typically gives the buyer greater control over the offering (Christopher, 2011; White, 2000). This logic has underpinned the rationalization of the global agri-food supply base, with the marginalization and exclusion of some small-scale producers from restructured supply chains (Van Der Meer, 2006). Larger suppliers are thus of greater strategic importance to buyers than smaller counterparts (Kähkönen & Virolainen, 2011). *Ceteris paribus*, the buyer should consequently value a relationship with a larger producer to a greater extent than with a smaller one, so that:

H4: The size of a supplier positively influences buyer trustworthiness

2.5 Membership of a marketing cooperative

Galbraith (1954) refers to countervailing power as the mechanism by which power evolves between buyers and sellers. He argues that the motive for countervailing action emerges where power is asymmetric, so that weaker parties are impelled to cooperate with others in a similar position for their own protection and with the hope of capturing some of the gains of the currently stronger actor(s). Galbraith (1954) acknowledges a number of potential mechanisms for realizing countervailing power, citing, as an example, the emergence of European consumer cooperatives in the face of oligopolistic producers. Global agri-food markets are characterized by increasing concentration at processing and retail levels (Dobson, Waterson, & Davies, 2003),

while most branches of agricultural production, in contrast, remain characterized by family farms and relatively fragmented production (Allen & Lueck, 1998). Several studies of agri-food supply chains thus identify power being skewed toward downstream buyers (e.g. Bourlakis & Weightman, 2004; Fearne & Duffy, 2004; Hingley, Lindgreen, & Casswell, 2006; Simons, Francis, Bourlakis, & Fearne, 2003; Touboulic, Chicksand, & Walker, 2012). In this environment, individual farms lack bargaining power so that collective action between suppliers becomes an attractive option (Hendrikse & Bijman, 2002). Marketing cooperatives are one form of collective action, which may generate countervailing power with membership decreasing the likelihood of buyer opportunism. This is because any loss in supply from a collective group of sellers would be more damaging to the buyer than the termination of a relationship with a single seller. In other words, the strategic importance to the buyer of a collective group of suppliers is greater than that of a supplier independently (Kumar, et al., 1995), so that :

H5: A supplier's membership of a marketing cooperative positively influences buyer trustworthiness.

2.6 Supplier satisfaction

Satisfaction in a buyer-seller context can be defined as 'a positive affective state resulting from the appraisal of all aspects of a firm's working relationship with another firm' (Lam, Shankar, Erramilli, & Murthy, 2004, p. 295). Ganesan (1994) argues that trustworthiness and satisfaction are related in that actors are more likely to be dissatisfied with a relationship in which the other party acts opportunistically and is perceived to be untrustworthy. Such exploitative relationships generate feelings of anger and resentment (Ganesan, 1994). Conversely, a relationship in which actors are

concerned about one another's welfare engenders satisfaction. This can be hypothesized as:

H6: Buyer trustworthiness positively influences supplier's satisfaction with the relationship with their main buyer.

2.7 Improvements in suppliers' production quantity and quality

Handfield and Bechtel (2002) conceptualize that trust in a buyer-supplier relationship is positively associated with supplier responsiveness. They argue that suppliers 'go out of their way (beyond contractual agreements)' for trustworthy buyers (Handfield & Bechtel, 2002, p. 373) and present supporting empirical evidence. Similarly, Gow and Swinnen (2001) contend that buyer trustworthiness increases supplier responsiveness. They explain this by drawing on theories of private contract enforcement, reasoning that in markets characterized by high levels of buyer opportunism suppliers will be less willing to make relationship-specific investments. However, if a buyer is perceived to be trustworthy, a supplier will be more confident about investing. This is particularly the case when the buyer pays on time (Gow & Swinnen, 1998). Investment by suppliers is likely to be critical, positively impacting on their performance, especially in markets characterized by undercapitalized firms with deficiencies in both the quantity and quality of output (Swinnen & Vandeplas, 2010). This suggests that:

H7: Buyer trustworthiness positively influences improvements in suppliers' production quantity.

H8: Buyer trustworthiness positively influences improvements in suppliers' production quality.

3. *Overview of Armenian dairy farmer – milk buyer relationships*

By the end of the Soviet era, there were around 1,000 *sovkhozy* (state farms) and *kolkhozy* (collective farms) in Armenia specializing in milk and meat production. Collectively these farms maintained approximately 800,000 cattle and supplied 40 relatively large-scale and over 100 small-scale milk processing facilities. After the collapse of the Soviet Union, the dairy sector suffered as real incomes declined. The volumes of dairy goods produced by the former *sovkhozy* and *kolkhozy*, which were privatized in the mid-1990s, dropped from 130,000 to about 5,500 tons per year. Most ceased to function and were partially replaced by more than 150,000 micro dairy 'farms' which became the main suppliers of raw milk supplying a population for Armenia of 3 million people (Alpha Plus Consulting & DAI 2003).

From 1995 onwards the dairy sector started to recover. A few privatized dairy processors restarted production, albeit at much reduced volumes. Many new small plants emerged, largely producing cheese often with inadequate food safety systems. Outside of the capital city, Yerevan, home-made products largely dominated consumption (Urutyan, 2009).

The United States Department of Agriculture (USDA) provided significant financial, technical and marketing support to revitalize the Armenian dairy sector. The USDA Marketing Assistance Project (MAP) ran from 1992 until 2005. It issued around 328 loans totaling $11 million to new or expanding agribusinesses (Urutyan, Aleksandryan, & Hovhannisyan, 2006). USDA MAP and later the Center for Agribusiness and Rural Development Foundation (CARD), a spin-off organization of MAP, contributed to the development of the dairy sector by helping processors to modernize their equipment and apply good manufacturing practices and by supporting

the establishment of milk marketing cooperatives and milk collection centers in many villages.

By 2012 there were around 180,000, mostly small, dairy farms in Armenia although there are some relatively large farms with more than 70 cows each (IFCN & ICARE, 2013). The total dairy herd was 303,000 cows in 2012 (Table 1) with almost 50% of the produced milk delivered to dairy processors. The rest was used on farm and within the household. Milk yields per cow are about 30% of the EU average (Eurostat, 2012).

Place Table 1 here

In autumn 2013 there were 70 dairy processors operating in Armenia, none of which were foreign owned. Not all processors provide prompt payments to milk producers (Urutyan, 2009). In Armenia, farmers or cooperatives do not own a processing company, and usually their relationship with dairy processors is based on informal contracts. Cooperative - dairy processor relationships emerged in the early 2000s after USDA MAP introduced a development program which established more than 30 milk marketing cooperatives. Marketing cooperatives possess cooling tanks and storage facilities (mostly donated), which enable them to continuously procure milk from farmers.

4. Model Operationalization

4.1 Data Collection

As the focus of the study is dairy farmer – milk processor relationships, sampling was restricted to primary producers who sell cows' milk. Consequently, those farmers without dairy cows or who did not sell any of the milk produced were excluded from the study. The sample was constructed to achieve a representative cross-section of commercial dairy farms, agricultural companies and household producers (providing they marketed at least some milk).

Respondents were drawn from Armenian regions (*marzes*) with significant commercial milk production. Quotas, in proportion to the region's share of national output, were selected (Table 2). Data collection occurred thus in all regions apart from Yerevan City, Armavir and Vayots Dzor where milk production is of minor importance (collectively less than 10% of national output). Respondents were identified using a combination of sources, namely: local and regional authorities, agricultural agencies, local livestock experts and village mayors. In total, the sample comprised 300 useable responses. Data collection occurred via face to face interviews, conducted on-farm, using a standardized questionnaire.

Place Table 2 here

4.2 Variable Measurement

Appendix A details the measures used to operationalize the MIMIC model. The construct *buyer trustworthiness* is based on Doney and Cannon's (1997) scale of trust (y_1 - y_7), which has been applied and verified extensively in the context of buyer-supplier relationships (Ivens, 2005; Terawatanavong, Whitwell, Widing, & O'Cass, 2011; Wagner, Coley, & Lindemann, 2011). As discussed above, five formative variables captured each of the dimensions of relative power between buyers and

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suppliers, namely: the supplier's estimate of the potential number of other commercial buyers for their milk (x_1), the perceived ease with which the supplier can switch to another main buyer (x_2), the perceived ease with which the buyer can replace the supplier (x_3), number of milking cows as a measure of supplier size (x_4) and whether the supplier was a member of a milk marketing cooperative (x_5). The number of milking cows is the most commonly used measure of the size of dairy farm operations (Foltz, 2004). The three endogenous indicators were supplier satisfaction (SAT) and measures of the degree to which the relationship with the main buyer was perceived to have improved the quantity of output (QNT) and product quality (QLT). All questions referred to the supplier's relationship with their *main* buyer.

Appendix B lists the means and standard deviations for all of the variables included in the research model. The minimum and maximum values are also provided for each of the continuous measures. A correlation matrix is reproduced in Appendix C. The tables in Appendices B and C confirm the suitability of variables in the model and the standard deviations do not reveal any restrictions in range across measures (Winklhofer & Diamantopoulos, 2002). The exception to this was the *supplier size* variable, which was positively skewed. Consequently, as discussed below, we based analysis of this variable on estimation techniques known to counteract issues of multivariate normality (MVN).

4.3 Buyer Trustworthiness: Construct Specification and Modification

Prior to specifying the MIMIC model, an exploratory factor analysis in SPSS 21 using varimax rotation revealed that the seven items for the reflective component of the *buyer trustworthiness* construct loaded on a single factor with an acceptable level of internal consistency ($\alpha = .75$) (Hair, Black, Babin, Anderson, & Tatham, 2010).

Further, this same construct was specified within the Mplus 7.0 package using the

more restrictive confirmatory factor analysis framework (Muthén & Muthén, 2012).

The initial model yielded a reasonable fit to the data as denoted by conventional

standards outlined in the literature (Bagozzi & Yi, 2012; Hu & Bentler, 1999) (χ^2 =

38.97, df = 14, p<.01; CFI = .94; TLI = .91; RMSEA = .07). However, closer

inspection of the standardized estimates (Table 3) revealed that two reflective items in

the *buyer trustworthiness* scale (Trust2 and Trust6), both with reverse order scales,

had low factor loading scores (<.50), compromising convergent validity, and making

them candidates for deletion (Iacobucci, 2010). The use of reversed-scaled items in

creating unidimensional constructs for structural equation modeling has long been

considered as problematic, despite the benefit of reducing acquiescence bias (Herche

& Engelland, 1996). To improve the measurement properties of the construct

(Anderson & Gerbing, 1988) these two items were removed.

Place Table 3 here

Following these initial checks, the MIMIC model for the *buyer trustworthiness*

construct, with formative covariates and consequences, was specified and each

hypothesis assessed.

4.4 MIMIC Model

Robust maximum likelihood (MLR) in Mplus 7.0 (Muthén & Muthén, 2012), known

for its lower sensitivity to deviation from multivariate normality (Chou, Bentler, &

Satorra, 1991), was selected to estimate the model. The main difference between the

MIMIC and (aforementioned) measurement model was the inclusion and specification

of five formative variables representing the dimensions of power (i.e. the potential number of other commercial buyers, supplier's switching ability, buyer's ability to substitute the supplier, supplier size and supplier membership of a marketing cooperative), as well as three consequences (supplier satisfaction, perceived improvement in suppliers' production quantity, perceived improvement in suppliers' production quality). The resulting model had a reasonable model fit (χ^2 = 87.30, df = 52, p<.01; CFI = .95; TLI = .93; RMSEA = .05). The selected covariates account for 22% of variation in buyer trustworthiness, with the latter explaining 32% of the variance in supplier satisfaction, 37% of perceived improvements in suppliers' production quantity and 38% of perceived improvements in suppliers' production quality.

Next, we evaluated specific relationships (i.e. standardized paths) between variables in the model (Table 4). It is worth noting that each of the covariates (formative indicators) has a statistically significant effect on the endogenous construct (*buyer trustworthiness*). The number of potential other commercial buyers (x_1) has a positive effect on buyer trustworthiness confirming *H1* (β = .12; p=.05). From the total sample, 9.7% indicated that they had no other potential commercial buyers for their milk, with an average of 2.03 other commercial buyers reported (see Appendix B). A significant proportion of suppliers thus have no alternative marketing options (monopsony) but this is not universally the case.

Switching ability (x_2) (β = -.31; p<.01) and buyer substitution (x_3) (β = -.25; p<.01) has a negative effect on trustworthiness supporting *H2* and *H3*. Consequently, as it becomes easier to be replaced as a supplier and, the difficulty of switching to

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another buyer increases, levels of buyer trustworthiness correspondingly decrease. As the size of a supplier (x_4) increases, buyer trustworthiness also increases (β = .11; p=.05). *H4* is therefore *accepted*. Finally, membership of a marketing cooperative (x_5) is associated with higher levels of buyer trustworthiness (β = .21; p<.01), so that *H5* is accepted. The model also supports each of three hypothesized consequences of buyer trustworthiness (*H6, H7, H8*). As such, when buyer trustworthiness increases, so do supplier satisfaction (β = .57; p<.01), suppliers' production quantity (β = .61; p < .01) and suppliers' production quality (β = .61; p <. 01).

Place Table 4 here

5. Discussion

Drawing on an organizational supply chain perspective of power and Kumar et al.'s (1995) application of bilateral deterrence theory, this paper presents a novel model of the relationships between buyer-supplier power, buyer trustworthiness and supplier satisfaction / performance. All hypotheses are accepted and the findings verify the viability of the framework.

The results support a key tenet of the organizational supply chain perspective (Cox, 2001, 2004b; Cox, et al., 2002), namely that the execution of power in buyer-seller relationships depends on the relative positions of each actor. Specifically, buyers are perceived to be more trustworthy where there is greater competition in the buyer's market, i.e. where there are more alternative buyers that a supplier can choose from and when it is easier for suppliers to switch to them. The analysis also shows that greater buyer trustworthiness has a significant, positive effect on suppliers' satisfaction with the relationship and their performance both in terms of output

quantity and quality. This supports the notion that high levels of buyer opportunism curb suppliers' willingness to 'go the extra mile' (Handfield & Bechtel, 2002, p. 373) or make investments (Gow and Swinnen, 2001), and thus acts as a brake on improvements in the quality and quantity of suppliers' output. Such an outcome thus impedes attempts to improve productivity and international competitiveness.

5.1 Managerial implications

For suppliers, the results reveal three strategies to improve their relative power and position *vis-à-vis* buyers: grow in size, positively differentiate themselves from other suppliers in a way in which is beneficial to buyers so that they are less easily substitutable, and / or join a marketing cooperative. Generally, larger suppliers are of greater value to buyers, lowering transaction costs, particularly when the supply base is very fragmented. In the case of milk, being highly perishable, bulky and costly to transport, it is size relative to other suppliers on the *domestic* market which matters as there is minimal international trade in fresh milk. For goods which can be procured across borders, relative size on the international market will be more important.

The second strategy for suppliers to improve their position *vis-à-vis* buyers is to reduce the degree to which they can be substituted by competitors. This involves differentiating themselves from other suppliers in a way in which is valued by the buyer and not easily copied by others. Regarding the form of differentiation, it would be best for the supplier to look at attributes that are valued by a number of buyers. If suppliers differentiate themselves in a manner which is valued only by their current main buyer, it would increase their dependence on the latter and involve risky, relationship-specific investments.

Thirdly, for managers, the analysis demonstrates the benefit of joining a marketing cooperative as a solution for curbing buyer opportunism where suppliers individually lack power. In the Armenian case, milk buyers have generally been supportive of attempts to stimulate marketing cooperatives as a way of reducing transaction costs given a fragmented supply base. In other cases, when production is less fragmented, buyers may be more wary of dealing with marketing cooperatives as the benefit to the buyer of lower transaction costs can be more than offset by the extra rents accrued by suppliers acting collectively.

Finally, many treatments of power recommend that parties maximize their power over other actors. Being the most powerful actor does bring enormous advantages and these should not be ignored or downplayed (Hingley, 2005b). However, if the power imbalance toward buyers is so great, supplier trust in that buyer is compromised and the former will be reluctant to invest in a relationship in which they are so vulnerable. This hurts improvements in supplier performance. Thus, in some regards, high power imbalance can be counterproductive, particularly where the buyer seeks to stimulate improvements in the quality and quantity of suppliers' output. Buyers that forego some of the potential to exploit a favorable power imbalance in the short-term may yield long-term benefits in supplier performance.

5.2 Policy Implications

The results demonstrate that competition policy matters not just for downstream customers but also that monopsonies can be detrimental to suppliers. In the Armenian case the number of other commercial buyers available to a supplier is a significant determinant of buyer trustworthiness. Other research demonstrates that the lack of alternative buyers also depresses the prices received by suppliers for their output and

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can lead to the latter being charged vastly inflated fees for inputs provided by buyers (Perekhozhuk, Glauben, Teuber, & Grings, 2014; Sadler, 2006; Sauer, Gorton, & White, 2012). An effective competition authority which breaks up monopsonies will improve the situation of small-scale suppliers, whose welfare, in an environment of weak social safety nets, tends to depend heavily on the returns to their output. At the same time as improving suppliers' position, breaking up monopsonies also improves downstream (consumer) welfare (Perekhozhuk, et al., 2014). Small-scale producers are often ignorant of the prices and services received by their counterparts and in such an environment there is a case for a publically funded market information service (Sadler, 2006; Shepherd, 1997). To be successful the latter should be combined with an effective competition policy which breaks up monopolies and monopsonies.

Second, the results support initiatives to establish marketing cooperatives. This has been a policy objective in Armenia, financially supported by USDA MAP (Cocks, Gow, & Dunn, 2003), as well as in the EU (Bijman, 2012) and some other emerging economies (FAO, 2014a). Marketing cooperatives have the potential to strengthen the bargaining power of farmers as well as reduce transaction costs and improve the coordination of operations (Bijman, 2012). However in practice, marketing cooperatives have not always delivered these benefits (Bhuyan, 2007). Establishing and maintaining a marketing cooperative demands effective leadership and recognition of the importance of 'people' related factors (Bhuyan, 2007; Bijman, 2012). This requires attention from both domestic policy makers and international donor programmes, particularly for capacity building and managerial and organizational assistance. There is a clear rationale for educating farmers about the benefit of marketing cooperatives and using successful cases to demonstrate what can be achieved.

In the context of Armenia, as in much of Central and Eastern Europe, a further complication for extending the role of marketing cooperatives is related to the Soviet legacy and farmers' negative perceptions of *kolkhozy*. In Armenia, most farmers confuse marketing cooperatives with former *kolkhozy* (Urutyan, 2009). Moreover, even if they become a cooperative member, farmers often fail to realize the ideas behind marketing cooperatives, namely user-control, user-benefit, and user-ownership. These problems are not insurmountable (Cocks, et al., 2003) but require integrated policy support that aids cooperative decision-making (governance and accounting), understanding (education and training), and upgraded production practices (traditional agricultural extension).

6. Limitations and future research

The MIMIC model presented has been verified with data for Armenia. While this country's dairy sector shares many of the characteristics of agri-food markets in other emerging and transitional economies, testing the model in other contexts is warranted. Ideally, replication studies should involve the collection of data from more than one point in time to better capture the evolution of buyer-supplier relationships and evaluate the importance of length of relationships.

In the model presented, in keeping with organizational supply chain perspectives (Cox, et al., 2002), power is assumed to be based on the relative position of buyers and sellers within a specific dyad. There may be other sources of power that affect the degree of buyer trustworthiness; for example, political connections and links to organized crime. These are not captured in the study and may be difficult for researchers to measure in an accurate, verifiable manner.

The results establish that marketing cooperatives can provide countervailing power and curb buyer opportunism. However, their establishment has often proved problematic. Case study research considering successful and unsuccessful marketing cooperatives, particularly in emerging and transitional economies, could generate insights into how they can be best managed, for instance regarding rules governing membership entry and exit, internal decision-making and how best to structure collective bargaining with buyers. Such research would generate practical lessons to guide the management of new and established marketing cooperatives.

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Appendix A: Variable operationalization for MIMIC model

Formative Variables: Dimensions of Relative Supplier – Buyer Power

No. Commercial Buyers (x_1)   Supplier estimate of potential number of other commercial buyers for their milk

Switching Ability (x_2)   Ease of which supplier can switch to another main buyer. 5 point scale where 1 = very easy and 5 = very difficult

Buyer Substitution (x_3)   Ease with which buyer perceived as being able to replace supplier. 5 point scale where 1 = very difficult and 5 = very easy

Supplier Size (x_4)   Number of milking cows of productive age

Cooperation (x_5)   Membership of milk marketing cooperative. Dummy variable where 1 = member and 0 non-member

Latent Variable

Buyer trustworthiness   7 item scale of trust derived from (Doney and Cannon (1997)). Likert scale, where 1 = strongly agree and 5 = strongly disagree. The specific items are:

(y_1): Our main buyer keeps the promises it makes

(y_2): Our main buyer is not always honest with us (RS)*

(y_3): Our main buyer is genuinely concerned that our business succeeds

(y_4): When making important decisions, our main buyer considers our welfare as well as its own

(y_5): We trust our main buyer keeps our best interests in mind

(y_6): We find it necessary to be cautious with our main buyer (RS)*

(y_7) Our main buyer is trustworthy

Endogenous Indicators

Supplier satisfaction (SAT)   Overall supplier satisfaction with their relationship with their main buyer. 5 point scale, where 1 = very dissatisfied and 5 = very satisfied

Production Quantity (QNT)   "Being able to sell to our main buyer has improved production quantity", Likert scale where 1 = strongly disagree and 5 = strongly agree

Production Quality (QLT)   "Being able to sell to our main buyer has improved production quality", Likert scale where 1 = strongly disagree and 5 = strongly agree

* RS= reverse scaled

Appendix B: Summary Statistics for Variables included in the Model

Variable	Mean	S.D	Min.	Max.
Trust1 (y_1)	4.08	.78	1	5
Trust2 (y_2)	3.93	1.07	1	5
Trust3 (y_3)	3.85	.76	1	5
Trust4 (y_4)	3.44	.93	1	5
Trust5 (y_5)	4.27	.64	2	5
Trust6 (y_6)	2.95	1.14	1	5
Trust7 (y_7)	3.76	1.04	1	5
No. of other commercial buyers (x_1)	2.03	1.87	0	20
Switching Ability (x_2)	2.16	.97	1	5
Buyer Substitution (x_3)	2.80	1.05	1	5
Supplier Size (x_4)	13.36	8.55	3	100
Membership of mkg. co-op (x_5)	NA	NA	NA	NA
Satisfaction (SAT)	4.02	.73	2	5
Production Quantity (QNT)	3.80	.98	1	5
Production Quality (QLT)	3.63	.88	1	5

Note: x_5 is a binary variable.

Appendix C: Correlation Matrix

	(y₁)	(y₂)	(y₃)	(y₄)	(y₅)	(y₆)	(y₇)	(x₁)	(x₂)	(x₃)	(x₄)	SAT	QNT	QLT
Trust1 (y_1)	1.00													
Trust2 (y_2)	.47**	1.00												
Trust3 (y_3)	.32*	.28**	1.00											
Trust4 (y_4)	.44**	.32**	.51**	1.00										
Trust5 (y_5)	.51**	.39**	.42**	.39**	1.00									
Trust6 (y_6)	.28**	.24**	.25**	.35**	.23**	1.00								
Trust7 (y_7)	.42**	.39**	.38**	.35**	.37**	.33**	1.00							
No. Commercial Buyers (x_1)	-.03	.04	-.04	.08	-.10	.11	-.05	1.00						
Switching Ability (x_2)	-.16*	-.07	-.24*	-.18*	-.11	-.12*	-.19*	.32**	1.00					
Buyer Substitution (x_3)	-.09	-.16*	-.29*	-.25*	-.18*	-.07	-.12*	.07	.18**	1.00				
Supplier Size (x_4)	.08	.07	.09*	.12*	.10	.08	.02	.14*	.09	-.11	1.00			
Satisfaction (SAT)	.38**	.30**	.32**	.37**	.14*	.21**	.35**	.09	-.12*	-.29*	.09	1.00		
Production Quantity (QNT)	.37**	.28**	.43**	.41**	.36*	.25**	.34**	.05	-.24*	-.14*	.14*	.30**	1.00	
Production Quality (QLT)	.38**	.33**	.46**	.40**	.36*	.22**	.35**	.09	-.19*	-.11	.12*	.39**	.56*	1.00

Note: x_5 not included

Table 1: Armenian Dairy Sector Indicators, 2008-2012

	Unit	**2008**	**2009**	**2010**	**2011**	**2012**
Number of cows	1,000 head	283	274	273	283	303
Production of milk	1,000 tons	662	616	601	602	618
Average milk yield per cow	kg	1992	2027	2035	2127	2039
Average fat content	%	3.8	3.75	3.77	3.79	3.79
Average protein content	%	2.93	2.94	3.03	3.02	3.02
Milk delivered to processors	1,000 tons	310	264	225	241	324
Household / on farm use	1,000 tons	352	352	376	361	294

Source: IFCN and ICARE (2013) and NSS (2013a)

Table 2: Quota sampling plan

Milk production by region	'000 tonnes	% of total	Proportional sampling	Final sample
Yerevan City	2.2	0.4	1	0
Aragatsotn	76.5	12.4	37	20
Ararat	38.2	6.2	19	23
Armavir	37.4	6.0	18	0
Gegharkunik	116.3	18.8	56	57
Lori	77.7	12.6	38	39
Kotayk	53.5	8.7	26	20
Shirak	101.5	16.4	49	71
Syunik	57.2	9.3	28	60
Vayots Dzor	21.1	3.4	10	0
Tavush	36.6	5.9	18	10
Total	618.2	100.0	300	300

Source: NSS (2013b) and survey data

Table 3: Reflective Measurement Model for Buyer Trustworthiness

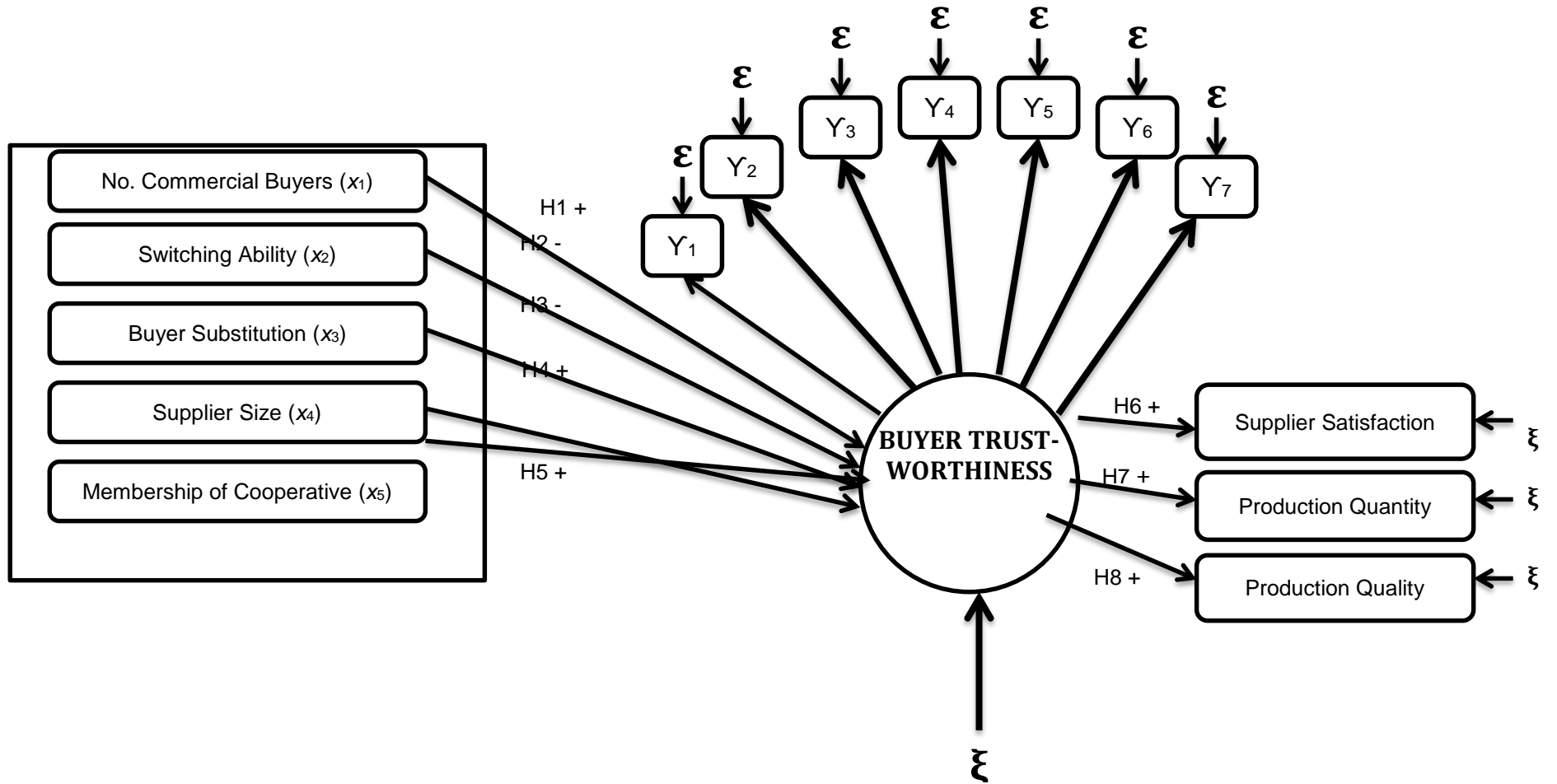|	Standardized Coefficient (β)	S.E.	*Sig. (p-value)*
Trust1 (y_1)	.70	.04	.00
Trust2 (y_2)*[+]	.49	.06	.00
Trust3 (y_3)	.65	.05	.00
Trust4 (y_4)	.65	.05	.00
Trust5 (y_5)	.65	.05	.00
Trust6 (y_6)*[+]	.44	.06	.00
Trust7 (y_7)*	.64	.05	.00

Reverse-scaled item; [+]*Loading set to zero in final measurement model*

Table 4: MIMIC Model – Antecedents & Consequences

Model No.		Standardized Coefficient (β)	S.E.	Sig. (p-value)
Model 1	**Covariates**			.00
Direct Effects	No. Commercial Buyers (x_1)	.12	.06	.05
	Switching Ability (x_2)	-.31	.08	.00
	Buyer Substitution (x_3)	-.26	.07	.00
	Supplier Size (x_4)	.11	.06	.05
	Membership of mkt coop (x_5)	.21	.06	.00
	Consequences			
	Buyer Trustworthiness→Supplier Satisfaction	.57	.05	.00
	Buyer Trustworthiness→ Production Quantity	.61	.05	.00
	Buyer Trustworthiness→ Production Quality	.61	.05	.00

Fit Statistics: χ^2 = 87.30, df = 52, p<.01; CFI = .95; TLI = .93; RMSEA = .05

Figure 1: Conceptual Model

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