Third-Party Facilitation of Investments in Private Enforcement Capital: Evidence from Armenian Dairy Industry

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1. Introduction

1.1 Theme and problem statement

Over the past two decades the global agri-food procurement systems have undergone dramatic changes due to various factors including market liberalization, globalization and the internationalization of the food retail sector. These transformations have created unprecedented opportunities and threats to agricultural producers and small and medium sized enterprises throughout the international agri-food supply chain (Boselie & Van de Kop, 2004; Shepherd, 2007). Many chain participants in developing countries were able to adjust to these changes. However not all the actors along the supply chain have access to the necessary resources, competencies or capacity to respond appropriately to presented opportunities and threats. This is especially true for small-scale agricultural producers in developing and transition countries who due to the technological, financial, and institutional constraints are exposed to the risk of being permanently excluded from agri-food procurement systems (Dries & Swinnen, 2004); Dries et al, 2004; Dries and Reardon, 2005).

Governments and international development community have recognized the need for assistance programs designed to link farmers to markets. Consequently, they are shifting their efforts from traditional technology push assistance approach towards programs focused on linking farmers to markets through high value added contractual marketing relationships (World Bank, 2008; 2002; USAID, 2004). This shift has however provided an immense challenge. The design, implementation and delivery of market driven development is substantially more complex and requires a completely different set of competencies and metrics for measuring delivery success and impact compared to traditional technology transfer and capacity building approaches. New agri-food systems require new models of governance structures and channel coordination and therefore new models of facilitation of marketing linkages between producers and processors.

Assistance programs designed to promote development of producer organizations and contract farming are among some of the most commonly discussed approaches for linking farmers to markets. Research shows that marketing cooperatives can provide effective mechanisms for linking small farmers to formal markets, as they can reduce transaction costs through economies of scale in collection, transportation and extension, and simplify information flow between

small-scale widely dispersed buyers and sellers (Cook & Iliopoulos, 1999; Key & Rusten, 1999; Holloway et al, 2000). Their long-term success has however been limited as their failure rate is often high due to free-rider problems, insufficient trust and conflicts over governance structures, and influence cost problems. Ad hoc estimates within the development community indicate that the long run failure rate of marketing cooperatives is very high (Shepherd, 2007). Non Governmental Agencies (NGO) were shown to have positive effects on creating market linkages through contract farming in developing countries by facilitating relationships between firms and farmers, providing technical assistance, and helping with input purchases (Porter & Philips-Howard, 1997; Glover & Kusterer, 1990). However the experience shows that the withdrawal of NGO services very often results in a collapse of those market linkages. Among the main reasons for high failure rate are inappropriate business models, artificial incentive structures, and absence of contract enforcement mechanisms (Shepherd, 2007).

The presence of effective contract enforcement mechanisms is one of the critical pre-conditions for establishing economically sustainable value chain linkages. Public institutions play an important role in providing such mechanisms (North, 1990). However, in many developing and transition economies public institutions are either weak or undergoing reforms and often ineffective in enforcing contractual relationships (Gow & Swinnen, 2001). Moreover, relying solely on contract laws and using court for enforcing relationships proved to be ineffective when dealing with large number of small-scale resource constrained farmers in developing and transition economies (Shepherd, 2007). The literature on transaction cost economics and game theory emphasizes the role of private contract enforcement mechanisms based on mutual dependence and reputation for ensuring reliable business relationships (Kreps et al, 1982; Macaulay, 1963; Williamson, 1985, 1998). Recent empirical evidence from Central and Eastern European Countries shows that the foreign direct investment (FDI) and the entry of multinational enterprises (MNE) provided sufficient capital and reputation to establish private contract enforcement mechanisms and ensure productive contractual relationships between producers and processors in the absence of effective public enforcement (Dries & Swinnen, 2004; Gow & Swinnen, 2001; Gow & Swinnen, 1998). Due to a number of reasons, however, for many developing and transition countries FDI and MNE are not an option. Moreover, the domestic private sector in those countries has limited reputation and is lacking necessary resources for

investing in private enforcement capital. Consequently, in many countries both public and private contract enforcement is poor resulting in high hold-up risk and underinvestment into relationships by actors.

The absence of contract enforcement creates an immense challenge for donors and policy makers in facilitating sustainable relationships along the supply chain. Firstly, it is difficult to engage parties into relationships due to distrust and unwillingness to invest. Secondly, even if the relationships are developed they are not sustainable and are likely to fail even with the smallest changes in market conditions. In many cases once the assistance project or external funding is over the linkages are breaking down due to nonperformance of parties (Shepherd, 2007). The big challenge for governments, development organizations, and NGO's is to design assistance programs that can address the problem of missing contract enforcement mechanisms and lead to self-enforcing, long-term sustainable linkages.

The international agribusiness research and agricultural development literature are beginning to explore the appropriate structures of third-party facilitated market linkage programs that involve various contractual and institutional arrangements within environments with weak public enforcement mechanisms. However limited research is currently available to provide strategic solutions that international agencies can use to externally facilitate the establishment of private enforcement mechanisms and improve long-term sustainability of contractual relationships between small-scale, limited-resource, financially-distressed, producers and local, regional and international markets. Even though large number of market linkage facilitation programs has been implemented the lessons are not well disseminated (Shepherd, 2007). It is important to analyze practical cases and identify strategies that proved to be effective in facilitating alternative contract enforcement mechanisms where the public enforcement is ineffective.

1.2 Objective and methods

This study explores the key elements in the design and implementation of assistance programs that could stimulate development of private contract enforcement mechanisms and improve sustainability of market linkages where the public enforcement is inadequate and the FDI is not present. More specifically, we are interested in identifying strategies that can be used by a third-

party (NGO, government agency, and others) to facilitate development of self-enforcing contractual arrangements between parties along the supply chain. The major emphasis is placed on the role that a third-party external facilitator can play in assisting producers and processors to develop "internal" private enforcement mechanisms for ensuring efficiency and reliability in their business relationships. In doing so, we make an important distinction between third-party enforcement of contracts and third-party facilitation of self-enforcing contractual relationships.

We base our analysis on the probabilistic hold-up framework that Klein (1996) introduced to analyze the complementarity between public and private contract enforcement mechanisms and the role of private enforcement capital in explaining contractual arrangements adopted by transactors in the marketplace. Gow, Streeter and Swinnen (2000) used this framework to illustrate how the FDI induced investments in "internal" private enforcement mechanisms can succeed where public enforcement fails. In this paper we use the probabilistic hold-up framework to develop a theoretic model for third-party facilitation of investments in private enforcement mechanisms by processors and producers in an environment where private enforcement is poor and FDI is not present. We introduce a general hypothesis that the establishment of self-enforcing relationships can be facilitated by a third-party through design and implementation of assistance programs that stimulate investments in and rearrangement of private enforcement capital by transacting parties. The question we ask is: what are the key components in third-party market linkage facilitation strategy that could lead to investments in and rearrangement of private enforcement capital? To answer this question and to establish an empirical framework for testing our hypothesis we examine the case of USDA Marketing Assistance Program in Armenian dairy sector.

We use the USDA Marketing Assistance Program (MAP) in the Armenian dairy industry as an instrumental case for examining third-party facilitation strategies for linking producers to markets in the absence of adequate public and private contract enforcement. Through an integrated market driven approach encompassing marketing, financial, and technical assistance USDA MAP was able to facilitate investments in private enforcement capital on both processing and farm levels. As a result, many dairy farmers gained access to formal marketing channels and became engaged in procurement relationships with processors. We use the data from an

enumerated survey of 745 dairy farmers collected in 2004 from thirty three villages in major dairy producing regions of Armenia to examine the relationship between the degree of private enforcement capital, level of trust, contract structures, marketing channel structure, and the extent of hold-up problems.

Our findings indicate that incorporation of strategies that stimulate development of private enforcement mechanisms in the design and implementation of market linkage programs by donor and development agencies can lead to establishment of self-enforced supply chain relationships and a higher likelihood of long run economic sustainability, hence higher program impact for their constituents. These findings have important implications for policy makers and international development community. A better understanding of third-party facilitation strategies of promoting contract enforcement mechanisms will help to design policies and foreign assistance programs that are more effective in linking producers to markets.

The rest of the paper is organized as following: Section 2 presents the conceptual framework, followed by Section 3 where we present the case of USDA Marketing Assistance Program in Armenian dairy industry. The conclusions and implications are discussed in final Section 4.

2. Conceptual Framework

2.1 Contract enforcement, hold-ups, and private enforcement capital

One of the critical pre-conditions for establishing economically sustainable value chain linkages is the ability of actors along the supply chain to ensure certain degree of efficiency and predictability in their relationships. The traditional view is that this can be achieved through public contract enforcement mechanisms supported by well functioning legal system and powerful state institutions (North, 1990). However, the legal enforcement can become costly and not always feasible since all contracts are inherently incomplete and the performance is often unobservable and difficult to verify by third-party (Hart, 1995). Contractual incompleteness combined with the presence of high uncertainty and opportunism often results in parties exposing themselves to the occurrence of hold-ups. Hold-ups occur when one of the transacting parties attempts an ex-post renegotiation of the contractual understanding in order to extract the

quasi-rents from other party's sunk investments in relationship-specific assets (Klein, Crawford, & Alchian, 1978; Williamson, 1998).

The alternative view, embodied in transaction cost economics and game theory, is that the productive economic relationships can be established through "internal" private enforcement mechanisms by constructing mutual dependence and building reputation (Macaulay, 1963; Kreps et al., 1982; Willamson, 1985, 1998). Klein (1996) introduced a probabilistic hold-up framework which implies a fundamental complementarity between public and private contract enforcement mechanisms. He defined the self-enforcing range of contractual understanding and demonstrated how the presence of sufficient private enforcement capital can compensate for limitations of legal enforcement and lead to desired level of performance and long-term sustainability of business relationships (Klein, 1996). This framework was used by Gow et al (2000) to illustrate how the FDI induced contract innovations and investments in "internal" private enforcement mechanisms resulted in "self-enforcing" relationships between suppliers and processors during transition in Central and Eastern Europe (Gow et al, 2000; Gow and Swinnen, 2001). We use the conceptual framework based on Klein's model to analyze strategies for third-party facilitation of sustainable market linkages through stimulation of investments in development and reallocation of private enforcement capital. In this section we present a brief overview of the probabilistic hold-up model followed by the third-party facilitation strategy framework and the general hypothesis regarding the "external" facilitation of investments in "internal" private enforcement capital.

2.2 Probabilistic hold-up model

In his model Klein (1996) defines the self-enforcing range of contractual performance and illustrates how the presence of sufficient private enforcement capital can prevent hold-ups and lead to improved efficiency and reliability of business relationships. The self-enforcing range measures the "extent to which market conditions can change without precipitating a hold-up by either party" (Klein, 1996 p 449). It is determined by considering the degree of private enforcement capital of each party involved in transaction. The degree of private enforcement capital can be defined by the magnitude of the losses from private sanctions that could be imposed on a transactor who attempts a hold-up. Private sanctions include termination or non-

renewal of the relationship and the damage of the reputation in the marketplace. The potential losses associated with termination of the relationship are equal to the discounted value of the future quasi-rents from the relationship specific investments present in a transaction. The damage of the reputation can impose additional costs on future transactions of the party that attempted hold-up due to distrust and unwillingness of others in the marketplace to engage into relationship.

The hold-up potential can be affected by changes in market conditions which may alter the possible gains from breaching the contractual understanding. When the changes in market conditions move the relationship outside the self-enforcing range so that one-time gain from hold-up exceeds the losses from private sanctions the hold-up treat will become credible. However, as long as the relationship remains within the self-enforcing range where each party's gains from potential hold-up is less than the costs from private sanctions, a hold-up will not take place (Klein 1996).

The concept of self-enforcing range can be illustrated by the following example adapted from Gow et al., (2000). Assume a situation where firm A produces product *x* which can be used as an input by firm B to produce product *y*. In order for firm B to procure *x* from firm A, firm A has to invest into production assets specific to the delivery to firm B. In an attempt to prevent potential hold-up by firm B after firm A makes the specific investments, both firms agree on a contractual understanding which specifies quality, quantity and a fixed price for product *x* set at the expected market price p_0. The ex post market price realization is denoted by p and may deviate from ex ante expected price p_0. If $p > p_0$, the contract provides unanticipated rents to firm B and the potential benefits of breaching the contract for firm A since it could get a higher price by selling its product in the market. Similarly if $p < p_0$, firm A receives benefits from higher contractually agreed price and firm B has incentives to breach the contract and procure from the market at the lower price. The difference between actual market price p and the contractual price p_0 generates potential gains H^j for breaching the contractual understanding, with *j*=A, B. As illustrated in Figure 1, at some $p > p_0^A$ the benefits from breaching contractual understanding for firm A, $H^A(p)$ become larger than the costs K_0^A, where K_0^A denotes the sum

of losses from reputation damage and capital costs. Similarly, p_0^B represents the market price below which firm B will have incentive to breach the contractual understanding and procure from the spot market. As long as ex post market price is within $p_0^B - p_0^A$ range, parties will have no incentive to breach the contractual understanding. Thus $p_0^B - p_0^A$ range defines the "self-enforcing range" of the contractual understanding (Klein, 1996; Gow et al, 2000).

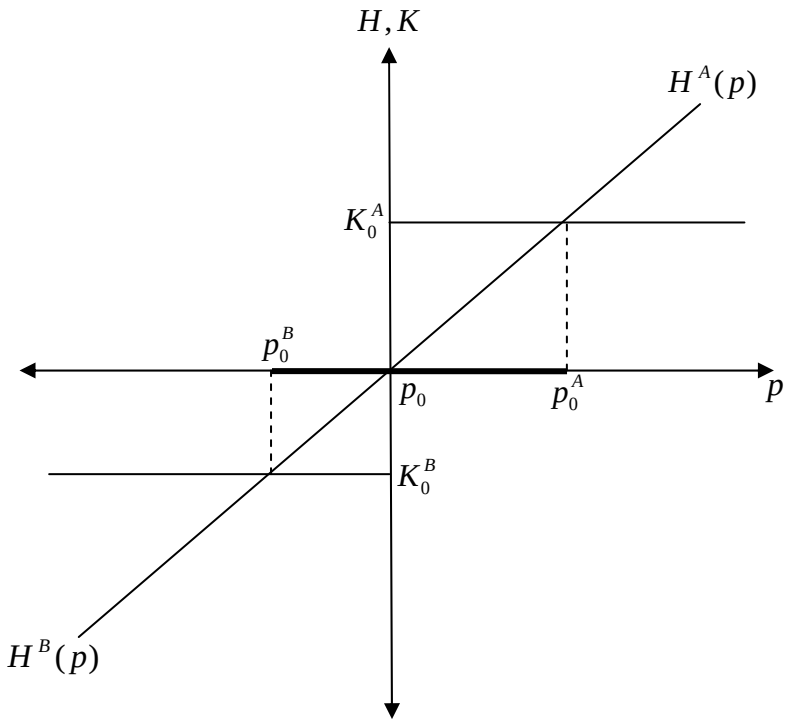

Figure 1. The self-enforcing range of contractual understanding
Adapted frm Gow et al., (2000)

According to this framework, a hold-up will never occur if market conditions are fully anticipated. If the ex-post market conditions and the resulting hold-up potential were anticipated by a transacting party it would not enter into the relationship or would insist on rearrangement of private enforcement capital so that the relationship stays within the self-enforcing range under anticipated market conditions. However, at each point in time, parties only have an expectation on the future market conditions (for example price) and the resulting potential hold-up benefits. Figure 2 illustrates the expected probability distribution $f(H^j)$ of the hold-up benefits, which is

based on the underlying probability distribution of market price p. When the actual price p is same as the ex ante expected price p_0, the hold-up benefits are zero, $H^j(p_0) = 0$. Given the costs K_0^A to firm A from breaching the contractual understanding, the probability of firm A breaching the contract can be defined by area a_0. Similarly, the area b_0 defines the probability of firm B holding-up the relationships given the costs K_0^B it will incur. Consequently, under the presence of the private enforcement capital defined by the magnitude of K_0^A and K_0^B, the expected probability that the contractual understanding will be honored is $1 - a_0 - b_0$ (Gow et al, 2000).

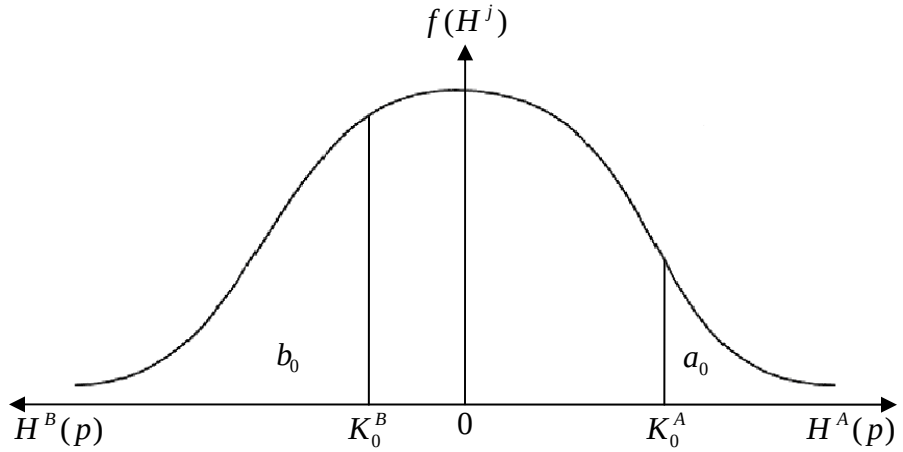

Figure 2. The probability of contract self-enforcement
Adapted from Gow et al., (2000)

Based on this framework, the probability of contract self-enforcement can be increased by rearranging the private enforcement capital. This can be achieved by enlarging the self-enforcing range through investment in private enforcement capital by one or both parties. Alternatively, one party can finance other party's investments into specific assets thus redistributing present enforcement capital from a party with a low hold-up potential to a party with higher hold-up potential. In this regard contract terms can serve as means for economizing on the limited or unequal amounts of private enforcement capital of transacting parties, conditional on the presence of effective contract laws and public institutions. If the adequate

public enforcement is not present then the greater degree of investments in private enforcement capital will be required to ensure high probability of contract self-enforcement.

Recent studies from Central and Eastern Europe provide empirical evidence in support of this framework and demonstrate how the foreign direct investment and the entry of multinational enterprises has led to rearrangement of private enforcement capital and improved efficiency of contractual relationships in the environment characterized by the absence or ineffectiveness of public enforcement institutions (Dries & Swinnen, 2004; Gow et al., 2000; Gow & Swinnen, 2001; Gow & Swinnen, 1998). In particular the study conducted by Gow et al (2000) illustrates how the FDI induced investments in "internal" private enforcement mechanisms resulted in "self-enforcing" relationships between suppliers and processors in Slovakian sugar industry. In the case of Slovakia (similar to other cases from CEE) processor, powered by FDI, was the initiator of the process of building private enforcement capital through introduction of input provision and investment facilitation programs for its suppliers. These investments expanded the self-enforcing range enough to compensate for the lack of effective public enforcement mechanisms (Gow et al., 2000).

The underdeveloped and inefficient public institutions are common characteristic for many developing and transition countries. Thus public mechanisms such as court enforcement are not a viable option to rely on for ensuring efficient contractual relationships between producers and processors in these countries. In CEE countries the role of FDI and MNE's was critical for providing necessary resources and reputation to invest in private enforcement capital and solve a problem of contract enforcement. However the FDI and MNE's are not present in many countries due to number of reasons such as instable political-legal environment, high prevalence of corruption, unattractive domestic market, and high transaction costs associated with procurement. For some of the same reasons the domestic private sector in those countries lacks resources to make investments necessary for ensuring effective private enforcement of contractual relationships with suppliers. Without effective contract enforcement the economic transactions in many of these countries are limited to highly instable spot market option and the large number of agricultural producers is forced to resort to subsistence production.

This is where the role of international donors, development agencies, and NGO's in linking farmers to markets becomes vital. In the presence of inadequate public enforcement they may be able to compensate for the absence of FDI induced private enforcement through design and delivery of appropriate assistance programs. In this paper we use the probabilistic hold-up framework to develop a theoretic model for third-party facilitation of investments in private enforcement mechanisms by processors and producers in an environment where private enforcement is poor and FDI is not present. We introduce a general hypothesis that the establishment of self-enforcing relationships can be facilitated by a third-party through design and implementation of assistance programs that stimulate investments in and rearrangement of private enforcement capital by transacting parties. Then the important question becomes: what are the key components in third-party market linkage facilitation strategy that could lead to investments in and rearrangement of private enforcement capital? To answer this question and to establish an empirical framework for testing our hypothesis we examine the case of USDA Marketing Assistance Program in Armenian dairy sector.

3. The Case of USDA Marketing Assistance Program in Armenian Dairy Industry

3.1 Introduction and background

Armenia has arguably faced one of the most difficult economic and social transitions of all the former Soviet Republics (World Bank, 2002). Independence form Soviet Union, privatization, trade liberalization, war and resulting economic blockade by Azerbaijan and Turkey had a combined impact of 60% decline in GDP between 1991-1993, and widespread poverty and financial distress. The privatization in 1991 handed ownership and control of agricultural production to over 300,000 inexperienced and resource constrained household farmers. The agroprocessing sector was privatized in the period of 1995-1996 through restitution to employees or direct sales to local buyers (FAO, 2000). The traditional business practices were no longer appropriate due to broken business relationships, constrained trade and market access, limited capital, and a nonexistent legal enforcement system. The result was Armenian agri-food system in total disarray.

By the mid 1990's the traditional Armenian dairy sector had collapsed as well (World Bank, 1995). Dairy processors were constrained by poor quality milk supplies that arrived in inconsistent quantities, limited financial capital, inexperienced management stuck in a Soviet era mentality, poor sanitation, poor safety standards, and most importantly, inadequate or missing procurement relationships with farmers. Processors where unable to extend trade credits to farmers; instead, they actually borrowed from farmers through extreme payment delays, worsening farmers' already distressed cash flow situation. (Gow et al, 2006). These problems forced processors to either close or severely reduce output resulting in a dramatic drop in capacity utilization. At the farm level, transition had left farmers financially distressed, credit constrained and unprofitable due to increased input prices, decreased output prices, and limited market opportunities for selling their milk surplus. Excess livestock were liquidated to access scarce capital resources and farmers retreated to subsistence agriculture and barter as a result. This adversely affected farmers' production and investment incentives and resulted in a substantial drop in milk production. The overall consequence was the significant disinvestment in assets by both processors and producers which reduced private enforcement capital and increased the probability of hold-ups within Armenian dairy industry. Figure 3 illustrates the increased hold-up potential ($a_0 - b_0$) within Armenian dairy procurement channel resulted from decline in private enforcement capital of dairy processors and farmers denoted by K_0^P and K_0^F respectively.

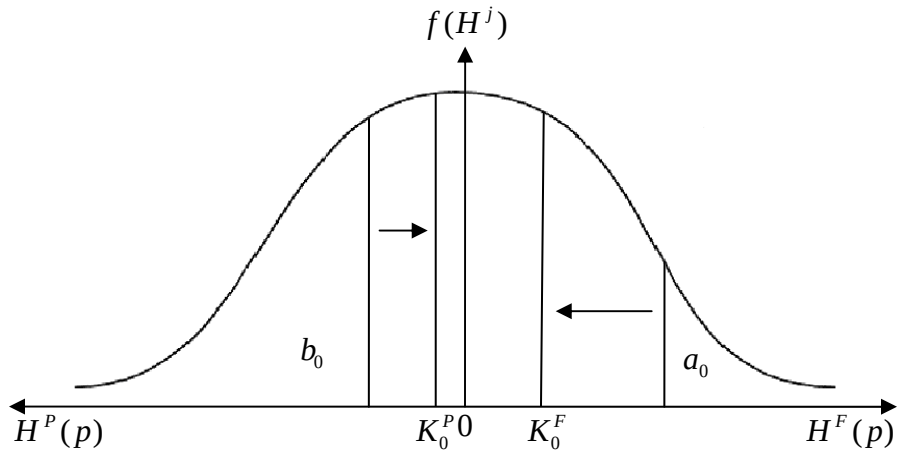

Figure 3. The degree of private enforcement capital and resulting hold-up probability in Armenian dairy industry

Until recently the Armenian agricultural sector had not experienced the economic recovery observed elsewhere in CEE. Unlike other CEE countries, Armenia has not been able to rely on FDI to quickly restore an economically viable and sustainable market structure (World Bank, 1995). With its small domestic consumption base, both in terms of population and purchasing power, Armenia provided an unsuitable foreign investment location for multinational food companies. Without the presence of FDI-induced private solutions that create self-enforcing relationships, encourage relationship specific investment, and drive diffusion of innovation (Gow et al, 2000), the Armenian agricultural sector remained in a sub-optimal equilibrium characterized by low quality output, delayed payments, deep financial distress and limited investment. There was a need for an alternative external stimulus.

In 1992 Armenia requested USDA assistance in facilitating agricultural transition. The USDA responded by providing a traditional extension-driven development assistance. However, after three years of operation it was apparent that this production focus was not meeting industry needs. So in 1996, a USDA advisory team redesigned the project from technology-push to market-pull and with that shifted the focus from farmers and production to market and business development. The result was the USDA Marketing Assistance Project. Essentially, MAP changed the question from, "What can we produce?" to "what does the market demand and how can we link producers to markets?"(Cocks et al, 2003; Gow et al, 2009).

3.2 USDA MAP facilitation of relationships between producers and processors

USDA MAP market linkage facilitation activities in Armenian dairy industry began by strategic assistance aimed towards the processing sector knowing that farmers would benefit through backwards vertical spillovers. The assistance included flexible and customizable package of financial, technical, and marketing assistance aimed at increasing production, improving product quality, and marketing. Marketing assistance was focused on providing dairy processors with promotional assistance, trade show support, new product development and export assistance to access new markets. As a result processors gained access to previously unavailable markets and recognized the potential of higher profits if they can serve these markets effectively. Driven by this value proposition number of processors were motivated to invest in improving their

procurement facilities and establishing relationships with milk producers. Still only some of the processors were able to make necessary investment in procurement on their own, many of them were lacking necessary capital and competencies. USDA MAP facilitated this process by providing financial and technical assistance directed on improving procurement channels. In the design and delivery of financial assistance USDA MAP was careful to avoid creation of artificial incentives and dependence. The financial assistance was provided predominantly through working capital loans and leases for capital assets such as pasteurizers, milk cooling tanks, and other equipment. The technical assistance was directed towards improving both raw milk procurement and final product quality. At the procurement level technical assistance helped processors and their farmer suppliers to establish contractual arrangements to improve quantity and quality of raw milk. The result was a significant investment in raw milk procurement by dairy processors. The examples included one of the largest dairy processor Ashtarak Kat which invested in building number of milk collection centers in ten regions of Armenia providing large number of farmers in remote villages with access to formal milk marketing channel. Other processors invested in trucks for collecting and transporting milk. These investments in relation specific assets effectively increased private capital of processors and reduced probability of breaching contractual understanding with their suppliers (Figure 4.).

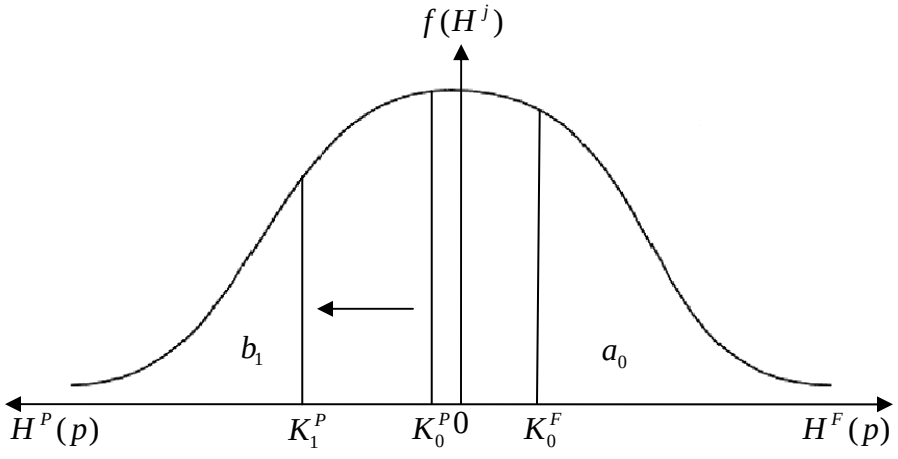

Figure 4. The investments in private enforcement capital by processors and the resulting decrease in hold-up probability

This in turn restored the trust and willingness of farmers to engage into contractual arrangements with processors; however they were short of resources to make necessary investments in order to meet increasing supply requirements. Low quality and inconsistency of raw milk supply was still a source of treat to the relationship between processors and farmers.

Recognizing this USDA MAP initiated the farmer assistance program in 1999 which included facilitation of establishment of milk marketing associations, microcredit program, and farm level technical assistance to improve cow genetics and management practices. The central concept behind the formation of the associations was that they had to be driven by the villagers themselves and not dictated by a centralized governmental or aid agency plan. Farmers needed to come together on the basis of common economic interests (Cocks et al., 2003). Once established, a board of directors was elected who registered the association and negotiated a processor marketing contract. It was important that the processor marketing relationship was established independent of USDA MAP to ensure long run sustainability. Concurrently, a collection center was established. The milk cooling tank was provided on a lease-to-buy agreement, interest free loan for the first six months while the association was getting established. The milk cooling tank served two purposes; improving raw milk quality, and secondly, providing an initial capital gain for bringing villagers together to join the association (Cocks et al., 2003; Gow et al., 2009).

To assist financially distressed small scale farmers with upgrading milk production and delivery the Agricultural Production Credit Club (APCC) microcredit program of USDA MAP was extended to dairy sector. The program was providing small production loans to groups of ten to fifteen self-selected dairy farmers on a group liability basis (Gow et al, 2006). Farmers were able to finance investments in increasing heard size and improving housing and sanitation. These were complimented by farm level technical assistance to improve heard genetics through implementation of artificial insemination.

Through carefully designed farmer assistance program USDA MAP was able to provide dairy farmers with access to resources for upgrading their production without creating misaligned incentives and dependence culture. As a result farmers were able to make investments in

additional number of cows and increase milk production capacity. In the context of the procurement relationships with processors these investments can be seen as dedicated assets that increased private enforcement capital of the farmers. Figure 5 illustrates the increase in cost of breaching contractual understanding by farmers from K_0^F to K_1^F thus increasing the probability of self-enforcing relationship.

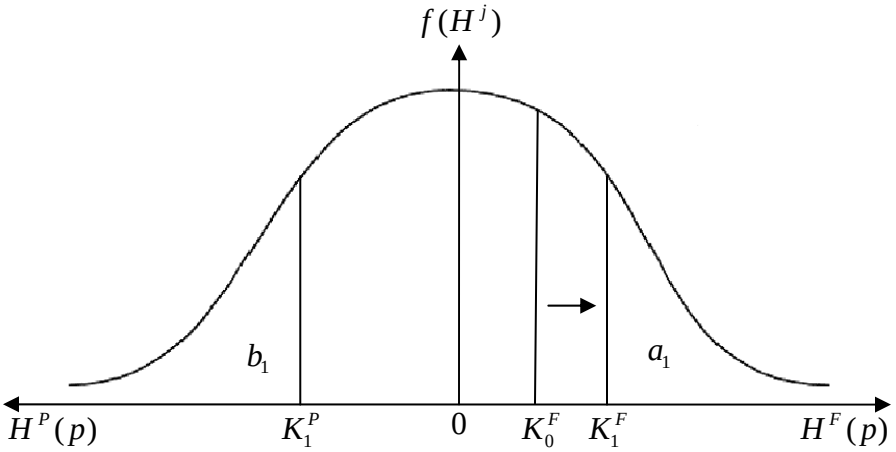

Figure 5. The investments in private enforcement capital by farmers and the resulting increase in relationship self-enforcement.

The USDA MAP unique facilitation strategy initiated rapid revitalization of procurement relationships between processors and farmers within Armenian dairy sector. Within the context of this case we hypothesize that the third party market linkage facilitation strategy pursued by USDA MAP stimulated investments in private enforcement capital by processors and producers and resulted in establishment of self-enforcing relationships between dairy farmers and processors based upon timely payment and cash-flow stream from processor to farmers, and a secure supply of high-quality milk from farmers to processors. In this paper we establish an empirical framework for testing our hypothesis and provide some descriptive statistics on the relationship between USDA MAP programs and the degree of private enforcement capital, level of trust, contract structures, marketing channel structure, and the extent of hold-up problems between processors and farmers. It is important to recognize that this is an exploratory study of the effects of third-third party facilitation strategies on investments in private enforcement capital and intends to provide ground for the development of relevant empirical model for future

confirmatory research. Therefore the objective of this study is not to prove causality and impact with a certain level of statistical accuracy but only to explore and identify the presence or absence of possible relationships between third-party facilitation strategies and rearrangement of private enforcement capital by actors to ensure self-enforcing contractual relationships.

3.3 The data evidence

The data used in this study was collected by the USDA MAP in 2004 as the part of the larger effort to conduct an impact assessment of the USDA MAP initiatives in four major sectors of Armenian agriculture. A stratified random sampling frame was established to collect data on economic, financial, social stance of Armenian dairy farmers. Thirty three villages in eight regions were selected for survey. The survey was conducted over the fall of 2004. A total of 745 farmers were surveyed within the dairy industry. The survey was primarily cross-sectional, although some reflectionary questions were included regarding income, farm productivity, milk production, number of cows, and choice of marketing channel. The survey included information on household demographics, income generation, asset ownership and investment, production, finance, land use, business relationships, and marketing channel structures.

The data indicates that within the total sample about 71% of farmers were in subsistence production before 1999, with majority of produced milk going to household consumption and barter. During USDA MAP facilitation in the period of 1999-2004 more than half of these formerly subsistence farmers entered into formal procurement relationships through milk marketing associations or direct sales to dairy processor. The average number of cows per household in the total sample increased from 2.9 to 4.8 between 1996 and 2003. For the farmers supplying formal marketing channel the average number of cows almost doubled, increasing from 3.2 cows in 1996 to 6 cows in 2004. The average milk yield per cow was almost 20% higher for farmers supplying milk to processors compared to subsistence farmers. These findings indicate investments in number and quality of cows by farmers who established procurement relationships with processors.

Approximately 40% of farmers within formal procurement channel supplied on the basis of written contract, the rest of them supplied based on verbal arrangement. Farmers who singed

written contract mentioned guaranteed market for milk as a most common reason. However 41% of farmers who delivered based on verbal agreement indicated that the formal contracts provide no advantage. The most common contractual specifications included price, frequency of delivery and payment, and minimum quality requirements. More than half of them had no specified penalties for breaking the contractual arrangement. Over 90% of farmers said that their procurement partner never breached terms of contractual understanding. Among farmers supplying dairy either directly or through cooperative approximately two thirds reported that they have received advanced payments for milk.

Two third of the farmers linked to markets reported strong trust towards their procurement partner measured on the seven-point Likert scale. Approximately same number of farmers indicated that their trust increased within past two years (2002-2004). The average percent of household income from dairy operations in 2003 for the farmers linked to formal marketing channel was 50% higher compared to farmers with no access to formal marketing channels.

Although these results are purely descriptive, they provide a starting point for understanding the possible relationships between third-party facilitation strategy implemented by USDA MAP and development of self-enforcing contractual arrangements between processors and farmers within Armenian dairy industry. Further econometric analysis of the data is required to test the impact of specific strategy components such as integrated concurrent marketing, financial, and technical assistance by USDA MAP and investments in physical and dedicated assets such as collection centers and cows by processor and farmers respectively. As well as the impact of these investments on the degree of contractual specifications, hold-ups, and trust among transacting parties. In order to test long-term sustainability of established marketing linkages the follow-up survey of the farmers in the 2004 sample was implemented in 2009 by the authors. This will provide additional empirical base for a further analysis of third-party facilitation strategies and models for “external” stimulation of “internal” private enforcement mechanisms in the environments with inadequate public enforcement and limited FDI. Further research plans also include comparative studies across different value chains and country settings.

4. Conclusions and Implications

The results of our study indicate that the USDA MAP facilitated investments into collection centers by processors and the establishment of milk marketing associations led to high investment response by farmers in the number and quality of cows. These investments into relationship specific assets on the processing and farm level resulted in improved trust and lower extent of hold-ups (instances of late payments by processors and side-selling by farmers) while contract specifications were minimal and transactions were often based on verbal agreements. The results indicate that donor and development agencies that pursue strategies to stimulate private enforcement capital in the design and implementation of market linkage programs can lead to self-enforced supply chain relationships and a higher likelihood of long run economic sustainability, hence higher program impact for their constituents. These findings have important implications for policy makers and international development community. A better understanding of third-party facilitation strategies of promoting contract enforcement mechanisms will help to design policies and foreign assistance programs that are more effective in linking producers to markets.

References:

Boselie, D., & Van de Kop, P. (2004). Institutional and organisational change in agri-food systems in developing and transitional countries: identifying opportunities for small-holders. *a programme of International Institute for Environmental Development (IIED)–Regoverning Markets. London: IIED.*

Cocks, J., Gow, H. R., & Dunn, D. J. (2003). Meeting Private Grades and Standards in Transition Agriculture: Experiences from the Armenian Dairy Industry. *International Food and Agribusiness Management Review*, *6*(1).

Dries, L., & Swinnen, J. F. M. (2004). Foreign Direct Investment, Vertical Integration, and Local Suppliers: Evidence from the Polish Dairy Sector. *World Development*, *32*(9), 1525-1544. doi:10.1016/j.worlddev.2004.05.004

FAO, (2000). FAO /WFP crop and food supply assessment mission to Armenia. Retrieved from the World Wide Web April 30, 2003: http://www.fao.org/DOCREP/004/X8408E/X8408E00.HTM

Gow, H. R., Streeter, D. H., & Swinnen, J. F. M. (2000). How private contract enforcement

mechanisms can succeed where public institutions. *Agricultural Economics*, *23*(3), 253-265.

Gow, H. R., & Swinnen, J. F. M. (2001). Private Enforcement Capital and Contract Enforcement in Transition Economies. *American Journal of Agricultural Economics*, *83*(3), 686-690.

Gow, H. R., Shanoyan, A., Abrahamyan, L., & Alesksandryan, M. (2006). Agricultural production credit clubs in Armenia: facilitating investment through market linkages, social capital, and microcredit. *Agricultural Finance Review*, *66*(2), 316 - 329.

Gow, H., & Swinnen, J. (1998). Up-and downstream restructuring, foreign direct investment, and hold-up problems in agricultural transition. *European Review of Agricultural Economics*, *25*(3), 331-350.

Gow, H., Shanoyan, A., & Cocks, J. (2009). Farmers' Choices Among Alternative Dairy Marketing Channels in Armenia: Can Appropriately Designed ODA Substitute for FDI? *Journal of Rural Cooperation*, *37*(1). Retrieved from http://departments.agri.huji.ac.il/economics/en/jrc/jrc-abs-jack.pdf

Hart, O. (1995). Corporate Governance: Some Theory and Implications. *The Economic Journal*, *105*(430), 678-689.

Klein, B. (1996). Why hold-ups occur: the self-enforcing range of contractual relationships. *Economic Inquiry*, *34*(3), 444–463.

Klein, B., Crawford, R. G., & Alchian, A. A. (1978). Vertical integration, appropriable rents, and the competitive contracting process. *The Journal of Law and Economics*, *21*(2), 297.

Kreps, D.M., Milgrom, P., & Roberts, J. (1982). Rational Cooperation in the Finitely Repreated Prisoners's Dilemma. *Journal of Economic Theory*, *27*(2), 245-252.

Macaulay, S. (1963). Non-contractual relations in business: A preliminary study. *American Sociological Review*, 55–67.

North, D. C. (1990). *Institutions, institutional change, and economic performance*. Cambridge Univ Pr.

Shepherd, A. W. (2007). Approaches to linking producers to markets. A review of experiences to date. *Agricultural Management, Marketing and Finance Occasional Paper (FAO)*.

USAID, (2004). *USAID Agricultural Strategy: Linking Farmers to Markets*, Washington D.C.: USAID

Williamson, O. E. (1985). The Economic Institutions of Capitalism: Firms, Markets. *Relational Contracting, New York*.

Williamson, O. E. (1998). *The Economic Intstitutions of Capitalism*. Free Pr.

World Bank, (1995). Armenia Agricultural Policy Update. Retrieved from the World Wide Web October 25, 2002: http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/1995/12/29/000009265_3961214152019/Rendered/PDF/multi_page.pdf

World Bank, (2002). *World Development Report 2002. Building Institutions for Markets*. Washington D.C., The World Bank.

World Bank, (2002). Armenia Poverty Update. Retrieved from the World Wide Web March 7, 2003: http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2003/03/14/000094946_03011404014222/Rendered/PDF/multi0page.pdf

World Bank, (2008). *World Development Report 2008:Agriculture for Development*. Washington D.C., The World Bank.