Delayed adoption of specific practices in uncertain environments:

the case of the fresh fruit and vegetables in Turkey

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Abstract

Contractual arrangements aiming at decreasing the probability of investment holdup were widely studied in stable environments. However, when contract enforcement is impracticable, like in some developing countries, agents cannot rely on expressed terms to ensure their transaction against opportunism. We show analytically that, in these highly uncertain environments, the sequentiality of investment decisions in specific practices can overcome the risk of hold-up. Whereas the existing literature mostly assumes that investment decision and governance choice are made simultaneously by players, we focus on the information exchange in repeated transactions as a way to decrease the uncertainty governing the transaction. When learning about market outlets, the supplier is more likely to implement relationship specific investments to a special buyer.

We collected data from 205 wholesale markets' brokers (commissioners) in the most important fresh fruit and vegetables producing regions in Turkey in 2006. We implement a two-stage econometric method to assess the question: we distinguish thereby between the decision to engage in the transaction with supermarkets and the decision to invest in relationship specific practices for supermarket. We find evidence for the sequentiality of investment decisions. However, while we expected the experience acquired in the modern marketing channel would be a determinant factor for supermarket specific practices implementation, empirical results show that the experience as a commissioner is more important to explain these specific investments. In fact, relationship specific practices for supermarket imply not only uncertainty on supermarket transaction but also moral hazard on producer-suppliers transaction. Commissioner experience is thus more relevant factor to explain sequential decision in relationship specific practices.

Keywords: Specific investment, sequential decision, uncertainty, developing economies

JEL: D23, L14, Q13

Introduction

Why do we observe market agents investing in relationship specific assets or practices outside contracts in uncertain environments? In this article, we argue that this extreme form of the holdup problem linked to the absent of any safeguard can be solved (or at least ameliorated) by sequential decisions from the party who invests (delayed adoption), as parties learn about each other though initial transactions.

We explore this question by a reassessment of the discriminating alignment hypothesis between transaction type and governance structure expounded by Williamson (1996).

Firstly, whereas the existing literature mostly assumes that investment decision is exogenous to governance structure, we follow Masten's proposition that presents specific investment as a decision variable. Secondly, we argue that these decisions may not only be endogenous, but also sequential. Indeed, modern contract literature shows how holdup can be solved when contracts are incomplete or even absent (leading thus to an extreme form of the holdup problem analysed by Pitchford and Snyder, 2004) if investments are sequential. These models imply to move from the static game typically analysed by this strand of literature to a dynamic game framework.

Following the model of Pitchford and Snyder (2004), we focus in this paper on investment in relationship specific practices (short term holdup) adopted by only one party without any formal contract. However, the model assumes complete and symmetric information throughout the game. Yet, economic relationships often begin in a state of uncertainty: there is two-sided incomplete information about each partner's incentives to behave opportunistically. According to Watson model (1998), this uncertainty can vanish along a

gradualism phenomenon, that involves initiating the relationship at a modest level of interactions and gradually raising the stakes over time as the parties learn about each other. Thus, sequential decisions of entering into the market, and then deciding about the specific practices level to invest, decrease holdup problems.

In this paper, we test empirically the importance of sequential decisions in determining relationship specific practices implemented by FFV wholesale markets' brokers (commissioners) selling to supermarkets in Turkey. We expect that the decision to engage in the supermarket transaction predates the decision to invest in specific practices, because of new information discovered in the initial transactions. However empirical results invalidate our hypothesis. In fact, the experience as a commissioner is more important than the one acquired in the modern marketing channel, to explain specific practices implementation. We interpret this result by the fact that specific practices are linked to the upstream relationship of commissioners, namely their relationships with the producers. Thereby, beyond the risk of holdup by the supermarket, commissioners face moral hazard from their suppliers. Thus, uncertainty on two transactions affects the probability of adoption of specific practices. The commissioner's experience is thus more relevant to predate specific practices than a long-term insertion in a marketing channel.

Despite some limits on our empirical results linked to the difficulty for collecting and exploiting informal data, we believe our paper is a contribution: by testing modern contract theory's propositions regarding holdup problem in uncertain environments; by bringing new understanding keys in development economics literature to explain safeguards mechanisms used by specialized and dedicated wholesalers to avoid holdup from their specific buyers.

The paper is organized as follow. First, we review the theoretical models and theories highlighting the implication of the sequential assumption. We then describe the empirical context of our case study before developing the model specification. Finally we present the econometric results and conclude.

1. Adoption of specific practices under uncertainty: analytical proposition

A risk of hold-up occurs during a transaction when one of the parties, let us say the buyer, can ex post expropriate the returns to an investment made by the other party, let us say the seller. This is due to the fact that the investment may not be transferable to other transactions, but is relationship specific: in other words, the returns to this investment are far less in alternative transactions. This risk is higher when the contractants' behaviour can't be observed by a third party that may enforce the clauses of the contract (Hart and Moore, 1988); the degree of specificity of the investment and its amount also influence positively the probability to bear a risk of hold-up, as the quasi-rent in the transaction increases, giving thus place to opportunistic behaviours (Masten, 1995).

Relationship specific investments include specific assets but also, for some of their specifications, specific practices such as sub-contracts or any contractor's efforts to adapt their products to the specific needs of their customers (Masten, 1995; Che and Sakovics, 2004). Indeed; adopting these practices implies a cost whose returns may be lost in the short or medium run when transferred to another transaction. In this respect, we consider in the remainder of the text that specific practices adopted by suppliers which create more surplus within a relationship than outside, may be subject to a hold-up problem, at least in the short run.

The result is a sub-optimal investment in relationship specific practices, when no safeguards can secure the transaction (Klein et al., 1978; Hart and Moore, 1988).

However, the literature identifies numerous ways of solving market failures incurring when a transaction is probably subjected to hold-up.

First, transaction costs theory (Williamson, 1985) proposes various choices in governance structures according to the dimensions of the transaction (alignment). On this basis, it is shown that when hold-up may occur, vertical integration and contractual arrangements are preferred to other governance structures (Riordan & Williamson, 1985).

An empirical literature also developed on this framework (see Klein and Shelanski, 1995 for a review). But, in most of these studies, specific assets are treated as exogenous to the choice of governance structure. However, Masten (1995), cited here by Saussier (2000) observed that "the specificity of assets and the level of investment in those assets that determine the size of appropriable quasi-rents are themselves decision variables. The location of facilities, the adoption of specialized designs and equipment, and the scale of investment should all, by rights, be treated as endogenous variables." (p. 201). This definition is then empirically applied in Saussier (2000) whereby he controls for the endogeneity of choice of governance structure¹ and investment in specific assets.

Even though inserting our analysis in this literature, the present paper underlines the fact that these decisions may not only be endogenous, but also sequential.

Indeed, recent developments focus on the incompleteness of contracts, and on the fact that they are often non enforceable by a third party, either because behaviours are not observable or because enforcement is too costly. It is shown that sequential investment in specific assets can solve the hold-up problem in this specific case: for instance, Pitchford and Snyder (2004) develop a non contractual framework where a seller is investing in specific assets. In this case

¹ Here, degree of completeness of contracts. An incomplete contract is defined by Hart (1995) as one where « the parties would like to add contingent clauses, but are prevented from doing so by the fact that the state of nature cannot be verified (or because states are too expensive to describe ex-ante)."

the probability of hold-up is extreme as the buyer can capture the returns on the seller's investment without any compensation. In a static game, the seller has no incentive to invest. But turning to a dynamic analysis, the authors show that an incremental investment scheme can be such as the buyer has no incentives to deviate from the optimal strategy: if the return to a present deviation is less than the expected revenue of future cooperation with the seller, the buyer can commit to play fair, that is to pay a price premium if the seller invests. The seller chooses thus to invest gradually at each period. Referring to this framework, the following development focuses on non enforceable, that is informal, contracts in the case of developing countries; moreover, we add that only one party of the contract bears the whole cost of the investment. The latter considers the cost of adopting specific practices for the current production: thereby, we adopt a short term analysis.

Furthermore, dealing directly with the concept of uncertain environments, Swinnen and Vercammen (2006) show that we may expect the delayed investment (due to the hold-up problem) to be even accentuated in situations defined by uncertainty. By uncertainty, they mean risky prices that are difficult to foresee. We are drawing on this proposition to widen the concept of uncertainty and riskyness they use. In fact, the Pitchord and Snyder model, even though very insightful, is dealing with symmetric information on the type and return of all the parties.

However, another strand of literature assumes that delayed or gradual investments are useful to collect information that agents don't dispose over when entering into the relationship. The type of agents is revealed though the transactions. The hold-up problem is then decreasing with the updating of believes on the agents' type which is allowed by the information gather through repeated transactions. Such an assumption is put forward by Watson (1998): he shows that opportunistic behaviours may be avoided when the engagement in the relationship

is low at its beginning. Low amount of investments enable parties to learn about each other before reaching an optimal investment level when information asymmetries about the agents' type decrease.

Such a framework is invoked by Bellemare et Barrett (2006) in an empirical paper dealing with the choice of volumes marketed on the livestock market in Kenya and Ethiopia. The authors show that the decision to market precedes the decision of the volume that is marketed. In fact, as animals are killed, the decision of the amount of them that are brought to the market is irreversible. The proposition of the paper is that when deciding to go to the market, agents acquire information about the supply and demand elasticity. Therefore, producers reinforce their negotiation power when facing the buyers, because they have got information about threat points above which they don't want to buy. Sequential decisions of entering the market, and then decide about the volumes they want to sell decrease sellers' vulnerability. They acquire private information that enters into their trade-offs.

We adopt this framework to investigate the choice to adopt specific practices required by supermarkets in Turkey. We focus on wholesale market agents, and wonder if the experience accumulated in the relationship is one of the determinants of this adoption. Sequential decisions in investment should allow them to use private information acquired in this specific channel.

2. The development of specific practices in the fresh fruits and vegetables in Turkey

The case study focuses on the Fresh Fruit and Vegetables (thereafter FFV) market in the developing context of Turkey. Actually, this market faces a fast growth of supermarkets. Today, supermarkets account for 45% of total market shares in Turkey (ME & SIMSEK, 2003). However, the share of FFV marketed through supermarket chains remains low and is

estimated at about 12 % of the total FFV marketed volumes (Coudel, 2003). In fact, FFV are mostly sold on open street markets as Turkish consumer are price sensitive and thus prefer to procure from the shortest marketing channels.

However, FFV are at the basis of the Turkish food diet with 20% of total food expenditures, that is 100 kg fruits and respectively 230 kg vegetables per person each year (Saunier-Nebioglu, 2000). As a result, supermarkets highest the priority on FFV departments. They thus try to increase their FFV market share by differentiating their supply from traditional open markets, by posting a reasonable price and by providing consumers with regularity, quality, homogeneity and packaging, but also with a wide range of varieties. Yet, these requirements need specific practices of upstream stakeholders, as products are time specific (perishability).

With regard to the cost they may bear in case of vertical integration of upstream activities (namely, costs in terms of production, supervision and monitoring), supermarkets tend to externalize these processing stages (collecting, sorting, grading...) at the producer and wholesaler levels. There is a wide development economics literature referring to market restructuring in emergent countries (Reardon and Berdegué, 2002; Weatherspoon and Reardon, 2003): it gives some insights in the adaptation of marketing channel actors. In particular, it focuses the emergence of specialized and dedicated wholesalers who invest in specific assets in order to fit with supermarkets requirements, as individual small farmer often can not bear the costs or fulfill the requirements associated with standardization (Bienabe and Rondot, 2004). However even though it is well-known that institutional environments are often weak and uncertain in these countries, very few papers analyse the safeguards mechanisms used by these middlemen to avoid holdup from their buyers.

In the Turkish context, we can observe the specialisation of country-specific wholesalers who are commission brokers (commissioners). Indeed, the Turkish FFV marketing system is highly regulated: since 1995, a law on wholesale markets obliges all FFV to pass through wholesale market halls where the commissioners sell the produce on behalf of producers. Commissioners are registered at the wholesale market level, and traditionally endorse the charge of sorting products coming from numerous small-scale and heterogeneous producers and sell them to wholesalers or retailers. According to the law, commissioner's fee can not exceed 8% of the selling price. Contrarily to other retailers that may procure volumes illegally, supermarkets are heavily constrained by the law since they need invoices from these wholesale market halls². Despite the large illegal market the total amount of FFV marketed through wholesale markets should be higher than 65%³. Among buyers, there are numerous exporters (especially for Eastern Europe, but also in a more limited way, for the European Union on a seasonal basis). Buyers exporting to Eastern Europe (especially Russia) are less demanding with respect to quality, homogeneity or varieties requirements. Their choices are made relatively to proposed volumes. When we compare the supermarkets' marketing channel with that of exporters, we observe that the delays in payment are roughly the same, and can reach two or three months. They are high relatively to those of traditional street brokers, namely around 3 weeks. Furthermore, commissioners prefer to transact with exporters as the price they can get in this channel is higher, nevertheless the foreign market is very unstable (for instance, the quota system from the E.U.) and payments are sometimes uncertain(because of an enforcement problem at the international level, especially for Russia).

From a qualitative point of view, we can distinguish between commissioners who are regularly supplying supermarkets and those who are only occasionally supplying them, as

direct procurement by the producers is possible, but costly as the fee imposed by municipalities reaches 15% of total sales.

³ Source: interviews by wholesale markets' directors and state inspectors.

supermarkets adapt their procurement when products are rare on the market. But, supermarkets have difficulties to set the right incentives to get specific products from the commissioners. When products require specific practices supermarkets have the choice between two decisions: they can integrate the production, and the sorting and processing activities. But this turns out to be costly in term of monitoring. We draw from qualitative surveys conducted in 2005 and 2006 that supermarkets are grading and packing about 70% of the products they sell. However, they have also the possibility to procure from commissioners who apply specific practices in order to gather quality, homogeneous products with a wide range of varieties. Actually, more and more commissioners implement specific practices for supermarket outlets.

However, these practices increase the transaction costs supported by commissioners who can't rely on explicit contracts. In Turkey, because of weak institutional environment, firms cannot use a contract to secure their bilateral investment and exchange relationship. Firms, instead, rely on implicit self-enforcing agreements. Even though reputation mechanisms are often used in informal markets, they are not very efficient since commissioners do not constitute an homogeneous social group. Moreover, the responsibility are not clearly defined, in case of a failure in an implicit contract.

In this context of highly uncertain environment and weak contract enforcement, we wonder why commissioners adopt specific practices in their relationships to supermarkets. Our initial proposition leads us to put forward one main hypothesis concerning mechanisms avoiding a holdup problem linked to RSP:

We assume that commissioners first decide to engage in a modern marketing channel and then adopt a specific practice which is less rewarded on alternative markets (traditional and export markets). A sequential decision allows commissioners to retain greater flexibility by making their RSP decisions ex-post, whereby the latter is based on new information on the type of the agents present on this market. Learning through entering first the market can thereby reduce the probability of holdup from the buyer.

3. Data and empirical strategy

Surveys were conducted on three wholesale markets of the Antalyan region (Antalya, Kumluca and Serik) located by the Mediterranean Sea in the Southern part of Turkey. This region was chosen because of the weight of the fresh fruit and vegetables production in the economy, both in terms of employment and revenues; furthermore, its exposure to international trade is very high, and supermarkets mainly procure from the Antalyan wholesale market. Commissioners were interviewed on a face-to-face basis in January and February 2007. The data set consists in 208 individuals, namely firms' managers: we collected characteristics on the firms, on the products they sell, and on their upstream and downstream relationships. In order to avoid product-specific bias, we selected commissioners who market fresh tomatoes among other products.

Over the 208 individuals, 71 are delivering the major part of their produce to traditional markets (*pazars*) (namely, 34,6% of the whole sample), 92 are procuring exporters who direct the produce to Central and Eastern European countries (44,8%) and only 15 commissioners are specialized in procuring modern retailers (7,3% who sell more than the half of total volumes to supermarkets).⁴ However, 82 commissioners (40%) are at least partially but not marginally⁵ engaged in transactions with retailers. This criterion is used to identify those that are engaged in modern channels (then *super* equals 1).

⁴ The remaining 27 commissioners are not specialized, by procuring each of the marketing channels at the same level.

⁵ We selected those who sell their produce for at least 10% to supermarkets.

When looking at specific practices, we observe that 44% of the commissioners selling to supermarkets adopted them, whereas their proportion in the total sample is 21%. We define the variable accounting for the use of specific practices as a dichotomous variable indicating if the commissioners promote a mix of varieties and the standardization of products, that are requirements specific to modern channels.

The variable *specific* refers both to the fact that the commissioners is advising the producers about the products and the varieties of tomatoes they should grow but also to the fact that the number of varieties and the tomatoes quality he is selling on the market are high. More precisely, the variable is 1 if

- the commissioner advices to the producer about the product AND

- he advices the producer about the varieties OR the number of varieties proposed is high

OR

- the number of varieties proposed by the commissioner is high AND

- he or the customer is grading the product

In fact, we consider first that advising the producer on the variety is more demanding than advising on product type. But if the producer already knows which variety he should grow, the variable standing for the wideness of the range of products is observe by the number of varieties. Therefore, we consider the case when the producers are sorting, but also the case where the supermarkets are sorting (because, these customers only accept high quality products, with low level of waste).

This observation is particularly important as formal contracts are very rare, every when engaging modern retailers: only 8 commissioners procuring supermarkets and 2 procuring Eastern Europe oriented exporters report that they signed a contract. However, in those cases, contracts mostly stipulate the quality required by the buyer, and not prices and quantities. We want to investigate the determinants of the decision to adopt a specific practice in modern marketing channels, and to measure of this adoption with respect to the dates at which firms enter into these marketing channels.

We turn to a probit model with selection to take into account the sequential nature of the commissioner's decision: in fact, commissioners first decide to engage in a modern marketing channel and then adopt a specific practice which is less rewarded on the traditional market. We consider thereby that the determining modern marketing channel consists in supermarkets, as the fact to export to Russia is not discriminating in this region.

Thus, $\forall i$, we consider:

$$\begin{cases} \sup ermarket_{i} = \beta X'_{i} + \varepsilon_{1i} \\ specific_{i} = \alpha Y'_{i} + \varepsilon_{2i} \text{ if } \beta X'_{i} > -\varepsilon_{1i} \end{cases}$$

Where X (resp.Y) is a set of individual characteristics explaining the choice to enter into a modern marketing channel (resp. the propensity to adopt a specific practice). In order to identify the econometric model, X differs from Y for at least one variable which is not correlated to variable *specific*.

For the first step estimation, we used two sets of variables referring to firms' internal characteristics and to their relationships to other agents of the marketing channels (see appendix 1 for descriptive statistics).

Firms' own characteristics

- To capture the influence of firms' specificity, we include the firms' size (*medium* stands for firms selling between 10000 and 20000 tons of produce, and *large* stands for

firms marketing more than 20000 tons, the reference being firms with less than 10000 tons).

- Moreover, we take into account the experience of the firm: *comdate* is the number of years of establishment.
- *Grade1* is 1 if the commissioner himself grades the products, namely sorts the products according to their sizes and qualities.

We also integrate variables describing the interactions of an individual firm with other stakeholders of the marketing channel:

- *hotel* is 1 if the commissioner is also selling to hotel whose requirements are close to the ones of supermarkets, except that hotels don't require a large variety of tomatoes.
- *Advprod* equals 1 if the commissioner advices the producers about the products he should grow.
- Loanbank equals 1 if the commissioner is borrowing from the traditional banking system
- Last, *knowsosm* equals 1 if the commissioner reports that he knew someone selling to the supermarkets before he did

For the second step estimation, we put the emphasis on variable susceptible to explain the differentiated behaviour of those that are engaged in transactions with big retailers:

- first, we collected data on the timing of their integration in this marketing channel, *comdate*, presented above, and *smdate* which is the number of years since when an individual is selling to supermarkets. Those variables stands for the probability of relying on a large information set when taking decisions, as the period of time spent in the marketing channel is correlated with revealed information on agents' type and

market requirements. Contrarily to Joskow (1987) that empirically tested that the negotiated duration of contracts is positively correlated to the level of investment in relation-specific assets, our theoretical framework leads us to think that firms are more likely to adopt specific practices when engaged in the relationship for a long time. In fact, as no contracts secure the transaction, this observation can only be made ex post.

- As for the first step, we include also dummies for the firm's size, and the access to the traditional banking system. We suppose at this point that large commissioners are less likely to adopt specific practices whose monitoring costs are high, for instance in terms of supervision, as selling high volumes without getting a price premium can be more profitable than trying to promote quality. In fact, the price differential between generic products and high quality ones is low.
- We add to these variables the variable *paycheck* which is 1 if the advanced payments made to producers (needed for production inputs) by the commissioner are made with checks. 91% of commissioners give advance payments to producers in cash or check. Advance payment by check allows commissioners to supervise how money is spent.
 - Last, we chose variables characterizing the relationships between commissioners and supermarkets: *paytime* is the difference between delay in payments made by the exporter and delay in payments made by supermarket; and *smvol* is the proportion of the volumes that are sold to the supermarkets. We suppose that an increase in the proportion of total volumes sold to the supermarkets will increase the probability of adopting specific practices as the relationship with the supermarkets is then more significant.

4. Empirical results and discussion

Supermarket	coefficient	P> z		
Comdate	0,019	0,379		
Medium	-0,851	0,035**		
large	0,793	0,132		
grade1	-0,737	0,040**		
hotel	0,731	0,088*		
loanbank	0,838	0,175		
knowsosm	2,729	0,000**		
_cons	-2,348	0,001		

Table 1.1 estimation results for the first stage of the Heckprob model

Number of Observations =205

Table 1.2 estimation results for the second stage of the Heckprob model

Specific	coefficient	P> z		
Comdate	0,036	0,103*		
Smdate	-0,046	0,167		
Large	-0,257	0,552		
Medium	-0,099	0,805		
Paytime	-0,019	0,164		
loanbank	1,237	0,069*		
paycheck	0,820	0,061*		
smvol	0,002	0,876		
_cons	-1,799	0,071		
Log likelihood = 78.3572	Prob > chi2 = 0.2444	1		

Number of Observations =188

Censored observations=121

Uncensored observations = 67

We will first review the results of the first step estimation (table 1.1). The volumes sold by the commissioners affect the probability to procure supermarkets. In particular, the small size firms and larger firms (even though less significantly) are more likely to procure supermarkets. This observation may sustain the hypothesis that small but more specialized commissioners find a niche in selling to supermarkets, but that the latter's procurement system relies also on larger commissioners that are able to provide them with regular flows.

When integrating as exogenous variables those that refer to a value adding behaviour (in this case, *grade1*), we show that commissioners that are engaged in transactions with supermarkets are less likely to sort the products themselves. In fact, statistics give evidence to

the fact that they either rely on producers (or on supermarkets for volume with few waste) to sort the products.

Moreover, the results show that the fact to know someone who was selling to supermarkets before the decision to engage in this marketing channel increases the likelihood to effectively engage in it. In fact, we can assume that the access to information should be easier in this case.

Last, it should be put forwards that the experience accumulated when working as a commissioner (*comdate*) does not affect the probability of selling to supermarkets. Recently established commissioners also decide to enter into this marketing channel.

Compared to the previous observations, the preliminary results of the second step estimation are quite unsatisfactory. The size of the uncensored sample is rather low, and the variability in individual characteristics is not high. For these reasons, most of the variables are not significant. For instance, the firm's size and the difference of payment delay for sales to a supermarket or to an exporter shipping the produce to Eastern Europe have no impact on the adoption of specific practices.

However, variables referring to the access to the traditional banking system are significant. Indeed, the fact to have a loan increases the probability to invest in specific practices; when referring to the credit scoring literature, the fact that a firm applies to a loan and that the bank accepts to give it is the sign of solvability and/or positive expected returns to investment.

Moreover, the significativity of the variable referring advanced payments to the producers made by check is insightful. In the case where checks are made, the producer can directly pay the inputs with them. When doing that, the commissioner collects information on the way the money is spent. Contrarily to cash advanced payments, the commissioner can monitor the production, as well as varieties and quality. This latter observation explains why this variable can influence positively the adoption of specific practices.

However, some key variables prove to be non significant. In particular, the number of years since which the commissioner is selling to supermarket is not impacting the probability to observe specific practices. The proposition of the model is thus rejected: in fact, we wanted to test whether a long-term insertion in a marketing channel with specific requirements in terms of investment increases the probability to effectively invest in these relation-specific assets or practices. In our case, commissioners adopt specific practices at a random pace after entering the channel (in fact, only very few commissioners belonging to the censored sub-sample have specific practices). We would have like to test the behaviour of commissioners by considering a more costly investment, namely the investment in a packing house, but those are too few to allow for tests (actually, 12 of them did in very recent years).

However, we can note that the year the individual established as a commissioner is roughly significant (10% in this specification, but less in some others). The hypothesis that individuals engage in specific investments as soon as they get experienced and collected more information about the markets and their stakeholders can't be fully rejected.

As a conclusion, the preceding results challenge our propositions: in order to explain the adoption of specific practices when no contract is securing the transactions, the relevant experience acquired on the market seems to be generic on not channel specific. In fact, the experience as a commissioner is more important than the one acquired in the modern marketing channel. Moreover, we notice when integrating exogenous variables referring to the upstream relationship of commissioners, namely their relationships with the producers, that we can't take into account only one transaction in the chain (between supermarkets and

commissioners). In fact, the uncertainty beard by parties in the producer-commissioner transaction influence the downstream relationships. The level of moral hazard determines the former relationship and affects the probability of adoption of specific practices to meet the requirements by the final agent in the chain (in our case, the retailer: supermarket, exporter or street shop).

Variables	Observatio	Description	Mean	Std.	Min	Max
	ns			Dev.		
supermarket	205	Selling share for supermarket	0.4	0.42	0	1
specific	205	Aggregate variable*	0.219	0.41	0	1
Comdate	205	Commissioner experience (years)	18.12	9.20	1	47
Smdate	75	Supermarket selling experience (years)	14.2	6.85	1	31
Small	205	Total sale volume: Less than 10 000 tons per year	.38	.49	0	1
Medium	205	Total sale volume: between 10 000 and 20 000 tons per year	.45	.50	0	1
Large	205	Total sale volume: More than 20 000 tons per year	.17	.38	0	1
Smvol	199	Total sale volume fraction for supermarket channel (%)	11,08	15,38	0	70
Divtomtot	205	Number of types of tomatoes sold	2.93	.77	1	4
Advprod	203	Producer advice for products	.39	.49	0	1
Advvar	203	Producer advice for varieties	.12	.32	0	1
grade1	204	Commissioner grades products	.53	.50	0	1
grade2	204	Producer grades products	.41	.49	0	1
grade3	204	Buyer grades products	.06	.24	0	1
Hotel	205	Selling share for hotels	.29	.45	0	1
Paytime	77	Difference between exporter time of payment and supermarket time of payment	4.28	11.84	-30	42.5
Paycheck	202	Producer advance payment by check	.74	.44	0	1
Loanbank	201	Loan from bank	.92	.28	0	1
Knowsosm	205	Knows somebody who sold to supermarket before him	.40	.49	0	1

Appendix 1 : description of the variables

* specific= 1 if (advprod==1 & (advvar==1 | divtomtot2==1)) | (divtomtot2==1 & (grade2==1 | grade3==1))

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