

Relational Contracts and Comparative Efficiency in the Brazilian Specialty Coffee Supply

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The recent demand trend for specialty coffee has been fostering the organization of new relational contracts that include special attributes of quality. Based on the analysis of two contract models adopted in the coordination of the supply of specialty coffee grains in Brazil, this paper discusses which contract type is more effective for motivating the production of quality attributes. The analysis of two typical contracts (called *loose* and *tight* contracts) was based on the Incentive Theory and in the light of the experience of growers in Brazil. Among the results, it was observed that, in the case of the loose contract, despite first-best outcomes, there might be supply scarcity in the recontracting when the bonus decreases, i.e., processors may not find quality products because the decrease in growers' revenue hinders investments in quality coffee. As for the tight contract, although first-best outcomes are not implemented, growers have more incentive to produce quality coffee and thus the possibility of holdup decreases. These findings suggest that tight contracts are more efficient to impel a continuous production of quality coffee contracts over time, according to the presuppositions of New Institutional Economics.

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To increase our economic understanding of contracts, it is necessary to get one's hands dirty and discover how particular contracts actually work in practice.

(Klein, 2002: 69)

1. Introduction

In the 1990s, a new dynamic emerged in the coffee market, offset by the increased consumption of specialty coffee. In that period, according to Pascoal (1999), while the world consumption of the beverage grew by 1.5% per year, specialty coffee sales grew at a much faster pace, i.e., of over 15% per year.

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Specialty coffee negotiations rely on attributes characterized by a wide range of concepts related either to the drink itself or to features not previously considered in trade deals. These attributes encompass parameters all the way from physical attributes, such as origins, varieties, color and size, to social and environmental concerns, such as those related to production systems and the labor conditions under which the coffee is produced.

By and large, specialty coffee production requires specific investments from rural growers in new crop techniques and/or processing practices in order to yield the attribute that is required in the roasters' strategies. Specialization, however, does have costs: information needs sharing and actions need coordination (Bogetoft and Olesen, 2004)

Inasmuch as different strategies affect the attributes of intermediate inputs, creating distinct modes of governance, specialty coffee demands have motivated the appearance of relational contracts in order to include special attributes of quality (Raynaud and Sauvee, 2004).

This paper will analyze two contract models adopted in the coordination of the supply of specialty coffee grains to compare their efficiency, with a view to verifying which is more efficient in terms of generating the quality attributes required by the processing firms.

Based on the Incentive Theory, the two typical agreement forms, loose and tight contracts, are analyzed in the light of the experience of Brazilian growers of origin and exceptional quality coffee beans.

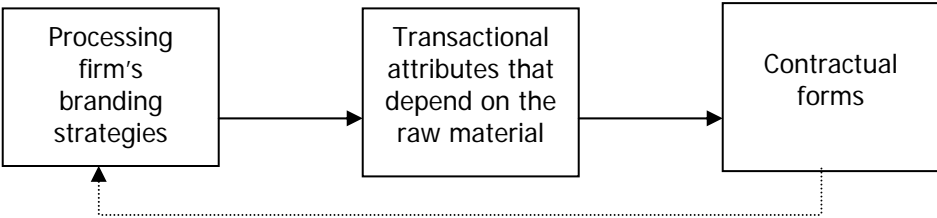
The article is divided into four parts, besides this introduction. Section 2 presents the two theoretical contracts. Section 3 and 4 discuss the loose and tight contracts, respectively. Section 5 brings brief conclusive remarks.

2. Specialty Coffee Supply Contracts

The issue of differentiation in a supply chain presumes the underlying problem of how to draw up organizational arrangements that foster input suppliers to produce the specific assets that will enhance the differentiation strategy desired or adopted by the processing firm.

Analyzing incentives becomes crucial whenever a productive segment has to produce inputs with a specific attribute to another segment whose branding strategy is associated with that attribute. The **chosen contractual form** should motivate the raw material supplier to produce the input in alignment with the processing firm's branding strategy, as shown in Figure 1 below. The processing firm chooses a quality branding strategy and depends on this strategy to induce the supply to produce the specific raw material. That implies in new contractual forms.

Figure 1: Branding Strategies and Contracts Forms



An efficient contract determines that the price of a specific input should not only be high enough for the grower to feel encouraged to offer it, but also low enough for the processing firm not to be motivated to produce it itself. When incentives and individual returns are aligned, efficient decisions are made.

It is worth noting that an efficient market is that which reproduces the conditions of the competitive market. This means that in the relationship between suppliers and buyers, the latter will induce the agents' effort, in the cheapest manner, leaving no extra rent to their

supplier. However, the definition of efficiency becomes more complex when the production of specific assets is required in the relation.

Three factors can generate incomplete contracts: the cognitive boundaries of the economic agent (bounded rationality), the difficulties in forecasting all the relevant future events (uncertainty), and the institutional failures deterring the parties' commitment to certain variables (contract non-enforceability).

Therefore, the full enforcement of contracts can be impossible, either because the relevant result of the activity may not be observable or because the relevant information may be too complex to be listed (Bolton and Dewatripont, 2005).

This type of difficulty generally induces the parties to leave contractual gaps to be filled during the contracting procedures. These uncovered issues may result from the cost or the impossibility of taking all possible eventualities into account. If the contract is more restrictive (tight), a list is made specifying certain vectors like price, quantity and quality. In this case, the parties limit the set of results about which they are free to bargain *ex-post*. Alternatively, if the bargain takes place after the investment has been made, the contract is said to be open (loose). The "non-contract" (market spot) illustrates this latter structure, once nothing is specified in it (Hart and Moore, 2004).

Whenever the transaction requires specific investments, tight contracts may be necessary. Nevertheless, Prendergast and Stole admit that the parties may be interested in leaving a few rules out of the contract precisely to encourage specific investments (Hart and Moore (2004).

To verify this question, an analysis will be made of two typical contracts (tight and loose) used in differentiated coffee production, both involving asset specificity. Loose contracts refer to exceptional quality coffee, and the tight contracts to origin coffee.

3. Loose Contract: The branding strategy of the processing firm requires the rural producing segment to invest in specific assets (coffee quality)

In the coffee market there is a small group of processing firms investing in quality-focused branding, or high quality specialty coffee. That signals an embedded premium for its suppliers, i.e., the growers.

The aim of the processing firms that exploit the high quality coffee market niche is to roast a characteristic blend by consistently mixing grains from different origins. Consequently, the production of all raw material used, or the integration, is unfeasible. To solve that situation, agricultural units in several regions and producing countries would be necessary, but that would imply significant diseconomies of scale. So, according to the theory of the firm's vertical integration, the economy of scale of using the market could bring greater gains than production internalization.

Thus, a loose contract is generally drawn up in this type of activity. No commitment exists between the parties and nothing is specified *ex ante*. Though recontracting frequently occurs between the parties, once the grower invested in specific assets, he has interest in continuing to supply the processing firm because that allows him to receive a higher income than if he sold to the spot market.

This transaction is voluntary, i.e., each party can refuse to cooperate. The buyer pays nothing if the transaction is not closed. Even though, it is verified that the processing firm will try to induce bean producer to make a greater effort and yield the maximum efficiency.

Also, the negotiation involves two steps: in the first round processing firms only signal their interest in acquiring the desired attribute. This can be done, for instance, through quality contests they conduct. The second round of the transaction may or may not take place.

Rural growers have the control over the result of the activity, i.e., the production of high quality coffee. Production requires two actions on the part of the grower: investment in specific asset (physical)³ and investment in dedicated asset, mainly, in coffee harvest and processing.

Once the specific investment has been made in the first round, the production of quality initially depends only on the growers' efforts and, obviously, on the random effects of possible conditions of nature. A good state of nature means ideal weather conditions to produce coffee and the bad state the opposite.

Due to a high monitoring cost, processing firms are not able to directly observe the grower's level of effort; nor can they ensure that the same effort always generates the same level of profits, insofar as the result depends on the state of nature.

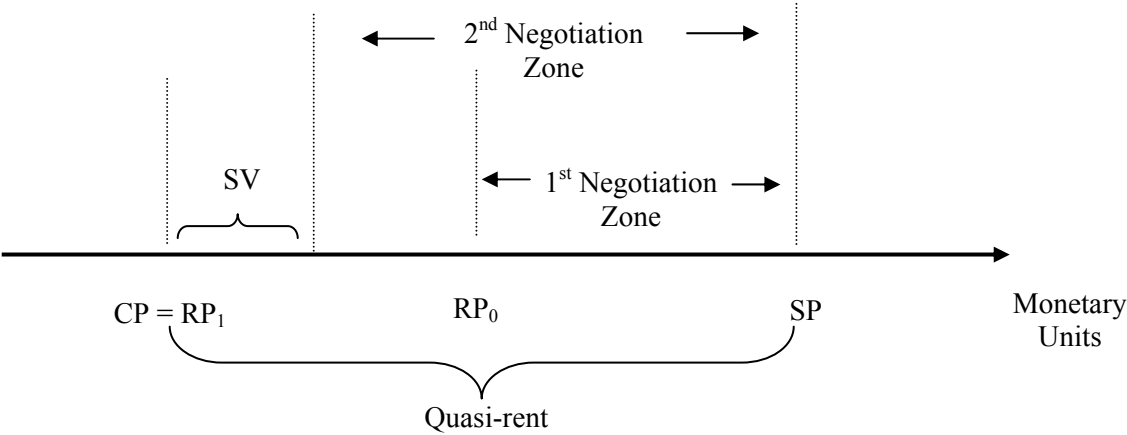
It is worth observing that buyers can increase the probability of a good result by investing in growers' development, for instance, providing training on irrigation technology to adapt

³ Generally, high quality coffee growers need to invest in the improvement of the soil and acquire processing equipment, among the latter a coffee-peeling machine.

crops to weather changes or on the adoption of better cultural practices and crop handling strategies.

At the end of the harvest the processing firm offers a fixed remuneration, i.e., the value paid by the commodity coffee in the region. This remuneration has, as a reference point, that of the New York Stock Market plus flexible revenue related to quality, which depends on the profitability of the processing firm. If the quality does not comply with the minimum quality standards required by the processing firm, the latter will simply not make a purchase. If the quality does fit the required standards, the firm will decide on a value to be paid that ensures an incentive for the following years. In other words, in the second round the grower’s payment will influence his own decision to continue making efforts to produce quality. Diagram 1 shows the grower’s reserve price in the first and second round. The grower’s reserve price is the minimum value that he will accept to negotiate the product.

Diagram 1 –Negotiation zone: in the first and second round



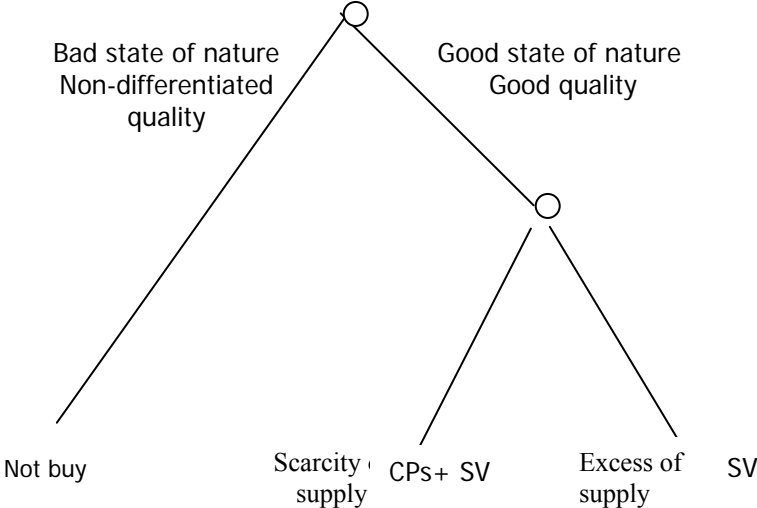
If the negotiation had occurred in the first round, i.e., before the investment in specific physical assets, the grower’s reserve price would be RP_0 , which includes the values spent on specific physical and human assets. However, as the negotiation only occurs in the

second round, after investments were made, the grower's reserve price (RP_1) becomes equal to the commodity price (CP).

Being the sale price of coffee on the retail market defined as SP, the processing firm could make use of their bargain power, increased in the second round, to try and expropriate the grower. Nevertheless, both are interested in maintaining the relationship, insofar as both have made investments in quality brand building. Thus with a view to maintaining quality coffee, the firm will propose a rent that compensates the investments in human assets, i.e. salvage value (SV). Added to CP, the salvage value would be the value paid by processing firms to the growers (CP + SV).

Based on the analysis above we can build the firm's decision tree (diagram 2), taking into consideration the variations in the market coffee. It is worth observing that coffee price quotations present cyclical movements in the short and long term. The short-term movement is associated with the biennial production cycle. Long cycles are mainly explained by the lags in the reaction of production (around 4 years) to price stimuli, caused by strong climate alterations (Saes, 1997).

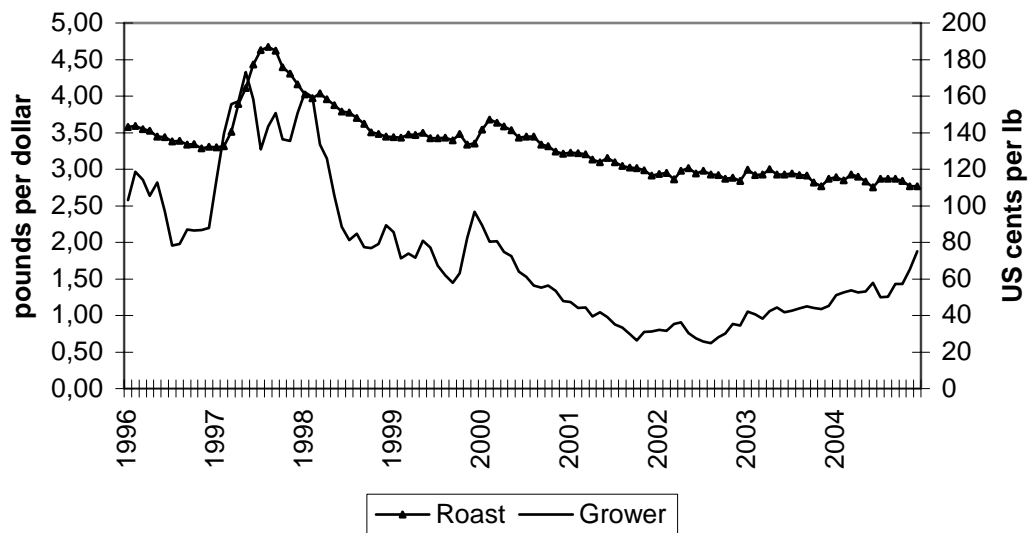
Diagram 2: The processing firm's decision tree



The Diagram above shows two possible conclusions: i. If the state of nature is bad, the processing firm will not buy low quality coffee even if the grower has made efforts. Thus it induces high effort in a cheap manner and creates a disincentive for growers from those regions more likely to suffer from climatic problems that inhibit their producing high quality coffee; ii. Being $CPs + SV < CPe + SV$, the value paid to the growers can become too low when offer is too scarce, inasmuch as the relation between prices received by commodity and quality coffee growers tends to decrease.

Graph 1 below illustrates the high volatility of green coffee prices (raw material), besides showing the relative stability of the product in the retail. Those factors imply a decrease in the margin of the industrial sector when the price of the commodity rises.

Graph 1 – Average prices paid to Brazilian growers of Arabica coffee (US cents per lb) and in the roast and ground coffee North-American retail market (pounds per dollar).



Source: ICO (2005).

The result above leads to the following question: why would the grower engage in high quality coffee production if all risks are shifted onto him?

3.1 Empirical Evidence

Such question can be answered in the light of the observation of the transactions conducted in Brazil's coffee producing regions. It is worth explaining that the quality processing firms do not buy the growers' overall production, but only a small part of their harvest.

For these growers, the processing firms' interest in quality coffee has fostered the dissemination of the quality strategy and created a virtuous cycle of investment and growing offer.

Specialty coffee production represents a status that generates a positive externality for growers. Although only a small part of each grower's crop is negotiated to the firm, the investment in quality creates a culture of quality that raises those growers' coffee prices,

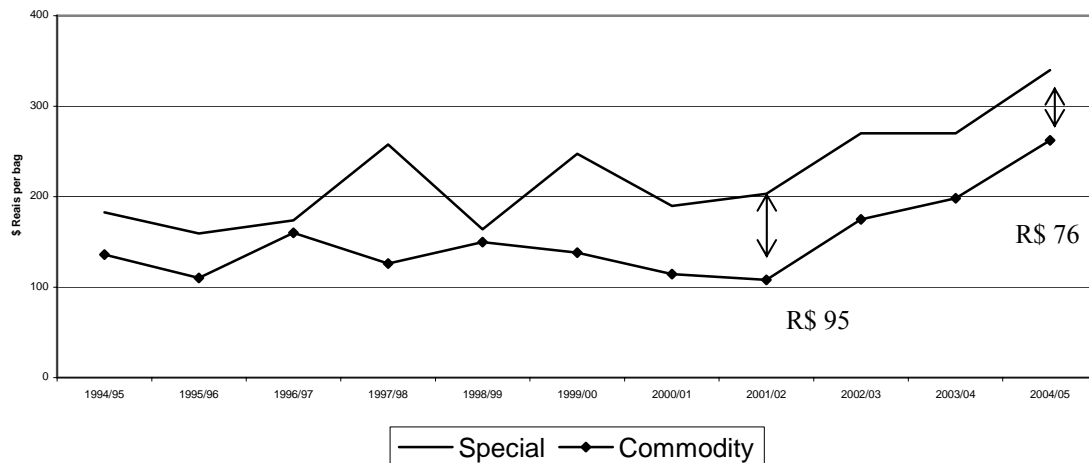
including in other negotiations.⁴ In a survey conducted with specialty coffee growers, 83% of 46 interviewees declared that being a specialty coffee grower is likened to having a guarantee certificate. The main external gain is reflected in an easier negotiation with competing buyers, inasmuch as they start to value the region's and the grower's product (Saes, Boldrini Jr and Rezende, 2003).

Those gains lead to the creation of an elastic offer of quality products that fosters an extremely favorable situation for buyers. Thus the competition in the market of factors would lead to productivity increase (maximum effort). A grower concerned with his market reputation exerts a high effort in his production so as to assure recontracting in the following years.

On the downside in this type of contract is the renegotiation, the period in which offer is scarce and the grower may prefer to sell quantity and implement less effort. The decrease of the difference between the commodity price and quality coffee price can be illustrated in Graph 2 below. It is worth noting that in 1998/99 crop an atypical transaction took place: the processing firms had bought the coffee before the effects of the market changes brought about by the new break crop in the world that increased the price of the commodity product.

Graph 2 – Prices paid to the specialty and commodity coffee growers (R\$ / bag)

⁴ Brazilian specialty coffee sales account for less than 5% of the total coffee negotiated per crop.



Source: CEPEA (commodity) and Interview with suppliers (special).

That would cause the processing firm to have difficulty in obtaining the required quality. For instance, the following fact happened in 2003 in Brazil. Not finding quality coffee in the market, an important processing firm had to reject a large number of coffee samples. Besides climatic problems, which had led to a fast ripening of the coffee beans, the other factors accounting for that rejection were: acceleration in the drying process, lack of care in the drying of the coffee terrace and probable lack of water and fertilizers (Alves, 2002).

Why would the processing firm offer a loose contract if there is the risk of not finding quality coffee?

Despite the possibility of not finding the product, the loose contract is better for the processing firm because the current value of the revenue in this type of contract probably compensates the impossibility or temporary difficulty to find the product in a punctual period.

In sum, although the loose contract is the most efficient way to induce the grower's effort at the lowest cost in this market of high quality coffee, the processing firm may eventually not find the required product.

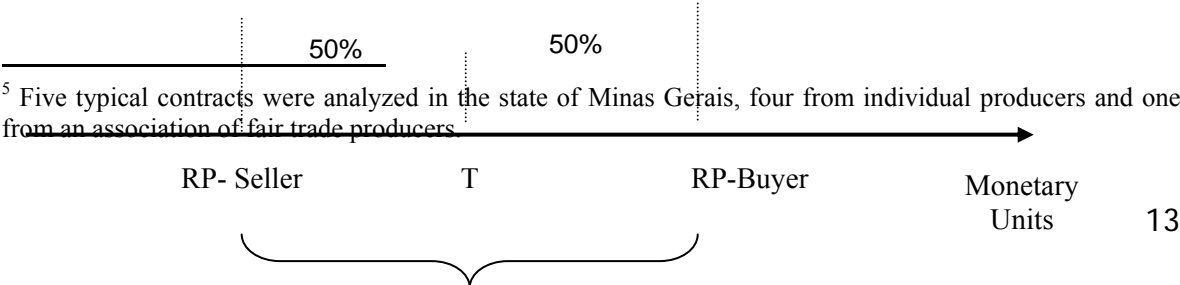
4. Tight contract: The processing firm's brand strategy determines the origin and requires the rural producing segment to invest in specific asset (organic coffee)

Let us analyze now the tight contract between the processing firm and the grower.⁵ In this case, the processing firm strategy seeks to enjoy the growing demand for socially and environmentally-friendly products, which allows small firms to survive in a competitive scenario.

The firm's investment in brand is specific to the relation and depends on a single grower, since its brand strategy implies the identification of the farm (grower) on the label of the product. The contract is drawn *ex ante* at a fixed price, determined for the next three / four crops. This price has the bonus which depends on the quality. There is a location specificity, besides the need to invest in crop cares to produce quality, i.e., the grower possesses the asset.

The contract is made before the production is made effective. It assumes that the parties will share the surplus in equal parts (Nash's bargain), considering the buyer's reserve price (RP- buyer) and that of the seller (RP - Seller), which include expenses with specific investments and being T the value of the possessing firms transfer to growers, as seen in Diagram 2.

Diagram 2 – Negotiation Zone in the First Round



According to the theory of incentives, the division of the rent in the first round is inefficient since it would reflect in a low incentive for the grower to produce quality coffee, inasmuch as the price is set before the effort has been made. That in turn would leave the firm exposed to a high risk. Why then would the company make the contract?

The understanding of this question comes from the recognition of the role of self-enforcement in assuring contractual performance. The institutions and the mechanism of economic governance induce individuals to carry cooperative or honest actions that achieve and sustain mutually beneficial outcomes in their interactions, avoiding temptations to engage in opportunist behavior that promote one's interest at the expense of others' (Dixit, 2004).

The decision rule is based on the evaluation of the short-term costs for not performing in consistency with the contract or with the contractual unwritten understanding (T_1) with the discounted expected future profit stream they will lose if the relationship is terminated for such non-performance (T_2) (Klein, 2002).

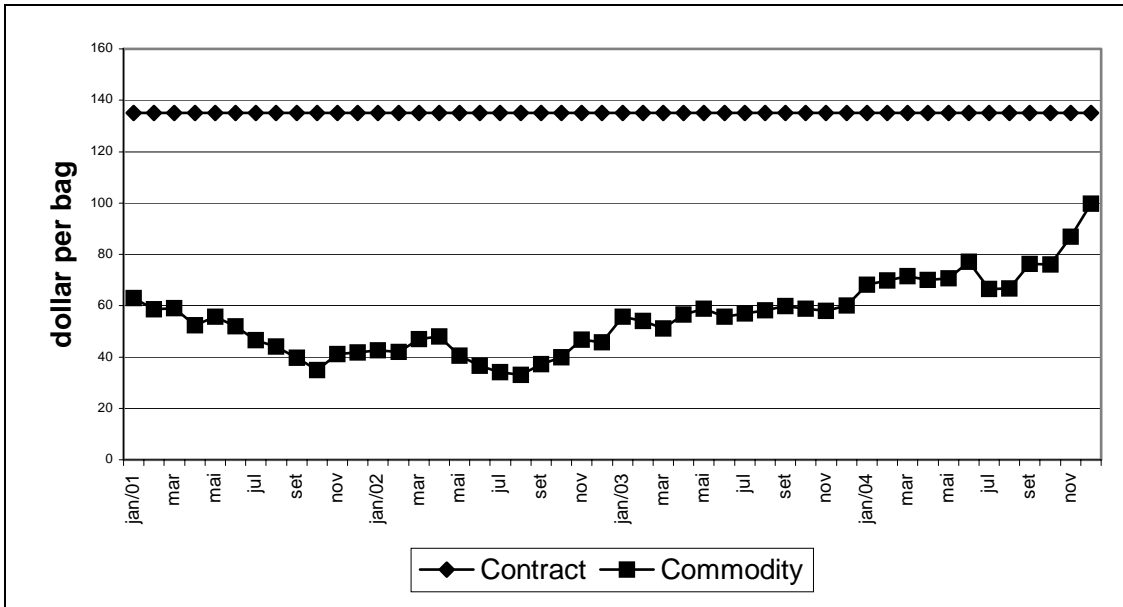
$$T_1 < T_2 \quad \text{where, } T_2 = \pi_0 + \frac{\pi_1}{1+r} + \frac{\pi_2}{(1+r)^2} + \dots$$

It is worth noticing that the decision rule in this model practically depends on the analysis of the grower's short and long-termed gains resulting from an external pressure, such as that from the community in which he is inserted. For instance, a community can be an association of rural growers. Thus the sale is collective and adds complications to the decision rule. On the one hand, not being honest may be easier if the monitoring and, subsequent social sanction from the other members of the community is deficient. The higher is the possibility of not being caught in a wrong act, the stronger is the incentive to behave opportunistically. On the other hand, collective sanction adds a restrictive factor to the opportunist behavior since cheating the community may mean to be socially outcast.

A relevant factor that may lead to a holdup is the term of the contract. Tight contracts with long terms may create the favorable conditions for opportunist behavior due to the difficulty to foresee the consequences. The classic case of Body-Fisher shows that no problems occurred in the first years of contracting. However, because of a period of change in the business environment, causing an increased demand, the contractual rigidity did not allow for the necessary adaptation that would be required to take into account the new environment and the contract had to be broken.

In the case of the agricultural commodities, long-termed tight contracts are still more complicated due to the high price volatility. Graph 3 below shows how in the last years there has been a narrowing in the difference between the prices paid to commodity growers and to quality growers in the tight contract.

Graph 3 – Average coffee prices paid to commodity growers and to quality growers in the tight contract



Source: ICO (2005).

4.1 Empirical Evidence

This type of tight contract is found in the state Minas Gerais, Brazil's main coffee producing region. All the five cases studied address small-sized Japanese processing firms that buy from Brazilian growers. They differentiate by adopting the strategy of origin of the farm, which may or may not require that the product be organic.

This coffee is acquired through a long-termed contract at an average price ranging from US\$135.00 to US\$ 160.00, depending on the type of product. The price is fixed, but it has a bonus of quality. When associated with organic cropping practices, the origin product receives a higher premium. The price is set after several meetings with the grower, mainly to discuss the cost spreadsheet. The Japanese firms usually finance the Brazilian growers, buying the quality coffee through a tight contract usually valid for a period of three or even four years.

Roast coffee is sold in Japanese coffee shops with the name of the farm on the label of the packaging and, generally, with a brief story of the property / production and photos of the

farm or grower. Brochures can also show consumers the origin of the coffee they are buying.

This growing market trend in developed countries of formatting tight contracts seems to be in accordance with the theoretical model proposed herein, consisting in an alternative less subject to variable income than that in the loose contracts. Differently from the risk involved in loose contracts, the risk here is shared among the parties and thus the first best is not achieved. It is a situation of bilateral dependence relations: the grower depends on the industry to place his product of specific investment and the industry depends on its supplier, and that creates an environment of trust for the grower to create a reputation, which insures that hold up will not occur.

It is worth noting that tight contracts are recent in the history of the Brazilian coffee industry, having been established at a time when the market was at low ebb. A demand for renegotiation was started with the growing trend in coffee prices. The increasingly small differential leads many growers to question the validity of maintaining the language of the contract. Nevertheless, growers wish to keep the contract as they recognize the value of the support from the firm when prices were low. Besides, there are other advantages, such as advanced payments for expenses with costs. This recognition guarantees the contract, as well as a non-opportunistic behavior of the agents involved. The fact that the grower is portrayed in the packaging of the product also allows for a co-responsibility that leads to a relation of reciprocity.

5. Conclusion

This article aimed to present a model of analysis of two contracts existing in the coffee activity. The analysis took into consideration the distinct differentiation strategies for the coffee product and the economic cycles. It was verified that whenever a strategy is easily

disseminated, such as that of exceptional quality coffee, the contracts tend to be loose and the grower assumes risks of the activity.

Which contract is better? That which leads to most efficient level of investment for the processing firm is. It was observed that, in the case of the loose contract, in spite the first-best outcomes, there might be supply scarcity in the recontracting when the bonus decreases. Processor firms may not find quality products because a decrease in growers' revenue implies difficulties in investing in quality coffee. As for the tight contract, although the first-best outcomes are not implemented, growers have more incentive to produce quality coffee and the hold up possibility decreases.

Table 1 - Comparison between Loose and Tight contract:

	Loose	Tight
Grower's Incentive	Higher price and positive externality	Higher price and lower activity risk
Processing Firm's Incentive	Higher price in the market	For small firm, better capacity to compete in the market
Enforcements	None	Reputation
Strategy problem	The processing firm can have difficulty to find quality coffee and that increases its costs.	If the margin decreases for the growers, they can threat to break the contract.

These findings suggest that although both contracts have downsides, both are efficient to motivate growers to adopt the processing firms' strategy. Thus the type of contract is chosen depending on the quality strategy sought by the processing firms.

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