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Coordination Strategy Decisions in São Paulo's Fresh Produce Markets: An Empirical Validation of the Peterson, Wysocki & Harsh Framework

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Abstract

This paper provides an empirical validation of the Peterson, Wysocki & Harsh (PWH) framework for coordination strategy decisions, drawing evidence from four firms' procurement strategies in São Paulo's fresh produce markets. The results support the hypothesis that the PWH framework provides empirical and theoretical insight into firm managers' coordination decisions. The cases show how asset specificity and complementarity affect the costliness of coordination decisions, how this costliness drives the decision to change coordination strategies, and how feasibility and risk/return criteria also apply. Additional insights into coordination strategy decisions that were generated in applying the framework and their potential relevance to the framework are discussed.

Keywords: Coordination strategy, decision-making, fresh produce, transaction cost economics, strategic management

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Introduction

Managerial decisions about vertical coordination strategy (a.k.a. supply chain management) are increasingly critical to agribusiness executives as open markets have given way to various forms of managed coordination (e.g., strategic alliances, joint ventures, and contracted production). For economists, transaction cost economics (TCE) revolutionized understanding of coordination strategy decisions, bringing into the economic arena questions of how the attributes of a transaction affect the governance decision, particularly given the reality of bounded rationality and possibility for opportunism among partners in an exchange. Given the needs of managers to make effective coordination decisions, it would be helpful to translate this enhanced understanding based on TCE into a decision framework for managers.

Despite the explanatory power of TCE, it has been subjected to some criticism on theoretical grounds and for operational shortcomings. For example, Dow asserts that in order to compare transaction costs across different governance structures, the characteristics of the transaction must be constant regardless of the governance structure in question (Dow in Dietrich p 4). This is rarely the case in reality. In fact, the characteristics of both the transaction and production tend to shift between coordination strategies, making it more difficult to assign solely transaction cost explanations to governance structure decisions. Related to this is another issue: implicit in the transaction cost framework is the assumption that costs are the primary driver of transaction cost decisions, while benefits, particularly strategic benefits (which can not be written off merely as negative costs), play an insignificant role. Several operational shortcomings of the transaction cost model have also been named. For one, transaction cost economics has been criticized as providing such a general explanation of coordination strategy decisions that one can always find what one is looking for, making it impossible to reject hypotheses related to their determinants. Another criticism concerns the lack of discussion in transaction cost literature of the cognitive process by which transaction costs are taken into account. Together, these criticisms point to the need for an approach to analyzing governance structures that is both theoretically consistent and operationally sound. The need for such an approach has been felt not only in economics but also in the strategic management fields, where there have been appeals for a business literature that offers insight into strategic decision-making and also offers general theoretical insights into coordination issues for use in research and hypothesis testing (e.g., Zylbersztajn).

In their 2001 article, Peterson Wysocki and Harsh (PWH) address these issues, offering a theoretical decision-making framework for firms' coordination strategy decisions. The current paper applies the PWH framework to the analysis of coordination strategy decisions among firms in São Paulo, Brazil's fresh produce markets. The objective is to provide additional validation of the framework's

explicative power and to explore the unique insights that it offers into firms' coordination strategy decisions.

The paper proceeds as follows: The analytical methods and data are outlined, then the PWH coordination strategy framework is summarized. Next, the case study context and firms are introduced and the coordination strategies of each firm are analyzed using the PWH framework. The paper concludes with a discussion of the results focusing on the unique contribution that the PWH framework lends to the analysis of coordination strategy decisions and the implications for managers.

Methods and Data

Data is drawn from case study analyses of the evolution of coordination strategy decisions of three retailers and one processor in the fresh produce sector of São Paulo, Brazil. The case study approach is a suitable method of analysis in situations where a small sample permits in-depth consideration of the complex and interdependent factors entering into a decision (Yin). The PWH framework is itself a result of grounded theory (Bitsch; Glaser and Strauss) based on both review of the literature on coordination and inductive analysis of 25 producer case studies in two sectors of agriculture, celery and seed potatoes (Wysocki, Peterson, and Harsh). "Grounded theory is a methodology of developing inductive theories that are grounded in systematically gathered and analyzed data. Data collection, analysis, interpretation and theory development proceed interdependent and iterative [sic]." (Bitsch p77). The current research follows a case study design in which a firm's decision to change its coordination strategy is the unit of analysis, and each individual case is a theoretical replication used to confirm or refute the relevance of the PWH framework in explaining the decision (Yin). Consistent with qualitative research based on grounded theory, the cases thus support the external validity of the PWH framework if they confirm, or cause the framework to be revised if they disconfirm. Disconfirming evidence would include the observation of critical decision variables not hypothesized to be part of the framework, or the irrelevance of variables that are part of the framework (see footnote 2 for an example).

To collect the case data, a survey of the firms' fresh produce marketing and procurement strategies was implemented and interviews were conducted with each firm's management. To confirm the consistency and relevance of the data, at least two separate interviews were conducted for each firm, with multiple managers present for the interviewing. A total of eight coordination strategy decisions were analyzed among the four firms, thus generating eight cases for applying PWH. It is important to note that the data were collected as part of a larger study on the evolution of the firms' procurement strategies and was done without reference to the PWH framework (in fact, the interviewer was unaware of the PWH framework at the time of interviews). Data were collected in semi-structured interviews that had both open-ended and close form questions regarding the evolution of the firm's

procurement strategy and management's insight into the underlying factors that drove the evolution of their strategy. The interviewees were in no sense led to include or exclude particular factors. They were asked to be exhaustive in their recall of events and decision factors. The primary author (again without reference to the framework) wrote the case narratives based on the interview materials. Both authors, now conversant in PWH, then independently reviewed the case material and coded it with regard to the variables of the PWH framework. They then met to synthesize their independent analyses into one. As will be shown in the discussion section of the paper, the framework was able to fully explain the evolution of the procurement strategies, and an examination of the interview results failed to reveal any additional variables that were relevant to the coordination strategy decisions. An explicit search was made for disconfirming evidence.

Conceptual Framework: The PWH Framework¹

The main objective of the PWH theoretical framework is to identify the critical factors in the decision making process that lead to appropriate selection of coordination strategies. Appropriate strategies are those which accommodate issues of asset specificity, complementarity, and coordination strategy feasibility at an acceptable cost to the firm. As a foundation to the framework, PWH present a continuum of coordination strategies that range from low to high levels of intensity of control over the relevant transaction. At the level of least intense control are spot market transactions, which rely entirely on control methods that are ex ante to the transaction. Ever-increasing intensities of coordination control are seen in specifications contracts, relation-based alliances, and equity-based alliances, with accompanying shifts towards reliance on ex post rather than ex ante transaction coordination. At the far extreme of the continuum is vertical integration, in which one organization has complete control over the coordination transaction. Vertical integration occurs in situations where a single firm owns production resources at consecutive levels of the marketing chain.

PWH hypothesize that managers are motivated to adopt a new coordination strategy when an existing strategy results in unacceptably costly coordination errors (e.g., stock outs, poor quality, and inconsistent supply). The key variables that determine the costliness of a coordination error are asset specificity and complementarity. Asset specificity is the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrificing its productive value. Complementarity exists when individual activities produce more in combination than in sum across a specific transaction interface, so that the marginal productivity of each input cannot be measured. Asset specificity and complementarity are affected by private institutional arrangements or public

¹ The full paper is available at Peterson, H. C., A. Wysocki and S. B. Harsh (2001). "Strategic Choice along the Vertical Coordination Continuum." *International Food and Agribusiness Management Review* 4: 149-66.

institutions including those that govern transactions, by technology, and by the structure of the marketing chain. Asset specificity and complementarity can be experienced differently by individual firms. As asset specificity and complementarity increase, the optimal coordination strategy shifts from low intensities of control to higher intensities of control. The issue of complementarity is distinct from that of asset specificity. In the case of complementarity, it is in the interest of both buyer and seller to achieve smooth coordination, whereas asset specificity means that there are incentives for one to profit at the expense of the other, for example through holdup and re-negotiation of the terms of exchange. Put succinctly, the concept of asset specificity emphasizes opportunities for gains through opportunistic behavior, while the concept of complementarity emphasizes opportunities to gain through cooperative behavior.

PWH use results of inductive research to outline a decision process by which firm decision makers synthesize issues of asset specificity and complementarity with consideration of the firm’s characteristics and environment to determine a beneficial coordination strategy. The decision process consists of four sequential assessments, each of which must be answered in the affirmative in order for a shift in strategy to be made (Figure 1).

Initiating the decision process is the subjective question of whether the current strategy is too costly. Costliness can be judged on an absolute scale (for example the current strategy is too costly if it is causing coordination failures that are driving the firm to bankruptcy) or on a relative scale (where the coordination strategy is considered too costly relative to some perceived alternative). A strategy may be too costly if it causes costly coordination errors or if the cost of operating the strategy is too high, which can occur in situations where complementarity and asset specificity are present. An affirmative response to the question of whether the current strategy is too costly will lead the firm to initiate the process of considering specific alternative coordination strategies.

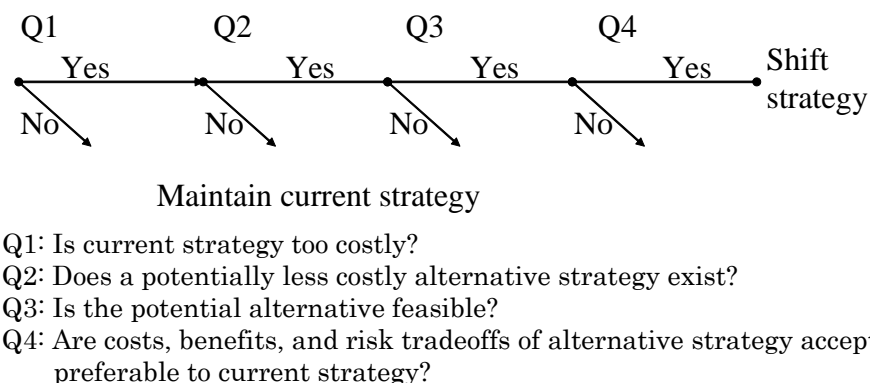


Figure 1 PWH Decision-making Process

Next is the question of whether an alternative strategy exists that might be less costly than the current one. Determining a potential alternative is a matter of matching the intensity of control offered by an alternative strategy to the combined levels of asset specificity and complementarity inherent in the transaction.

The third question is whether an alternative strategy that the firm has identified is feasible for the firm to implement and sustain. Four aspects of this feasibility question can be discerned: two internal and two external to the firm. They are 1) capital availability (including financial, labor, and other resources necessary to the successful implementation of the alternative strategy), 2) control competence (in terms of the firm managers willingness and ability to manage the coordination strategy effectively), 3) availability of willing and able transaction partners consistent with the alternative, and 4) institutional acceptability e.g., whether the alternative is considered a “fair” business practice under both cultural and legal views.

Finally, having ascertained the feasibility of the alternative strategy, the firm must reconsider the benefits, costs, and risks anticipated to result from its implementation. If these risks and returns are expected to be favorable relative to the current strategy, the firm will choose to implement it; otherwise they can be expected to maintain their current strategy.

Background to São Paulo’s Fresh Produce Markets

From the early 1980s to about 1994, the Brazilian economy was in a state of instability and stagnation. Inflation rates were high and consumers were extremely price sensitive. Correspondingly, there was little profitability in food retail markets. In the fresh produce sector, there was little specialization at the production level, and there were large fluctuations in the volume, price, and quality of produce available in the market.

Beginning in 1994 with the Real Plan, the economy stabilized and disposable incomes grew for consumers across all income strata. The potential to profit through investment in the food industry increased, drawing new retail entrants and increasing competition. Mergers and acquisitions increased the market share of large retailers—supermarkets currently account for 75% of retail food sales in Brazil (Farina 2002 p3). The emergence of supermarkets as major players and their competitive strategies stimulated investments upstream in the marketing chain, leading many suppliers to expand, modernize, and specialize their operations. This brought some reduction in the variability of prices, quantities, and quality of fresh produce available in the market.

Fresh produce markets are one area where large retail chains have had a significant impact on the structure and organization of the market, yet have not

come to dominate in terms of market share. Currently, fresh produce markets in São Paulo exhibit a remarkable diversity in terms of the nature of the retailers and their competitive strategies. Five coordination strategies for fresh produce procurement are common in São Paulo's fresh produce markets. Their places along the spectrum defined by PWH are depicted in Figure 2, and they are explained in greater detail below.

<i>PWH Coordination Strategies</i>				
Spot Market	Specification Contract	Relation-based Alliance	Equity-based Alliance	Vertical Integration
<i>São Paulo FFV Coordination Strategies Observed</i>				
Spot Market	Supplier Registry Contract			Vertical Integration
	Informal Relations			

Figure 2: Coordination Strategies

The coordination strategy reflecting the lowest intensity of control that is observed in São Paulo is spot market coordination, as defined by PWH. Two more coordination strategies, supplier registries and ongoing, informal exchange relationships, are observed lying between the spot market and specifications contracts. Supplier registries are lists of approved suppliers that retail buyers maintain. In applying to be listed on the registry, suppliers are apprised of basic parameters that will guide all transactions, such as product specifications, methods for price formation, and other rights and responsibilities of each party. Thus, they serve as an explicit foundation on which repeated at-will transactions take place, but do not actually include product orders or any commitment to buy or supply produce.

Informally-governed exchange relationships are based on familiarity between buyer and seller, and a sense of mutual benefits to be gained from the continuance of the relationship though there is no explicit commitment for these relationships to continue. In this situation, actors do not make relationship-specific investments on behalf of the other party, so that they maintain their autonomy and flexibility to leave the relationship with minimal losses. Thus these relationships do not reflect the degree of commitment and control seen in specification contracts.

Showing an even higher intensity of control are formal contracts between retail buyer and supplier. These include explicit provisions for exchange (for example a

commitment to buy or sell produce at regular intervals), in addition to the guidelines found in supplier registries.

Furthest to the right along the spectrum is vertical integration. Vertical integration is most commonly observed directed downstream, for example, by a farmer who decides to market his or her own produce; and involves single-ownership of production resources involved in several stages of the supply chain.

In fresh produce markets, a number of factors give rise to asset specificity and complementarity throughout the production, processing, and marketing process, with one of the above coordination strategies being chosen as a consequence. The major factor bringing about asset specificity is the perishability of fresh produce, which causes a loss in the value of the product if there is a time-delay in its delivery, such as might be caused by a transaction falling through (Farina and Machado). Investments that are specific to the needs of a buyer, such as greenhouses or cultivation of special varieties, are also asset specific. The primary factor inducing complementarity in fresh produce is the heterogeneity of supply and demand (Codron et al.), particularly given the perishability of the product. Large variations in the quality of what is produced and what is sought by consumers, and the fact that once it is produced it must move quickly along the marketing chain to the consumer so as to not lose value through natural processes of degradation, make it important for buyers and sellers to have some means of coordinating the product flow with one another.

Case Analyses

First firm: Companhia Brasileira de Distribuição

Companhia Brasileira de Distribuição (CBD) is the largest food retail firm in Brazil with approximately 15% of market share. With more than 400 retail outlets among three supermarket and hypermarket chains, CBD offers a broad line of food and general merchandise to consumers of all income categories. Perishables, including fresh produce, account for 33% of CBD's sales and are their most important sector strategically. Among perishables, fresh produce can contribute anywhere from 4% to 16% of each individual store's revenue depending on the clientele served and product line carried. Though they offer a broad range of fresh produce items, the focus here is on CBD's procurement of bulk produce.

Case 1:

Table 1 summarizes the case facts leading to CBD's first procurement strategy shift. CBD's challenge is to coordinate procurement of sufficient volume of consistent quality produce to serve their 400+ stores, and to distribute it among these stores in an efficient and timely manner. In the 1980s, CBD bought produce at the

traditional wholesale market from a registry of approved suppliers. Procurement was decentralized, with each store undertaking its own procurement activities. Quality was controlled by inspections of produce prior to purchase and subsequent sorting at the store level.

With economic stabilization, consumers' incomes grew and consumption patterns began to change, increasing demand for fresh produce. At the same time, in part responding to new opportunities in food retail sales, CBD began to expand both through increased sales per store and mergers and acquisitions that increased the number of stores. At this point, CBD's management was faced with the initiating question: Was their current coordination strategy too costly? The answer to this question was affirmative. They had difficulty obtaining adequate quality and volumes of produce and experienced high rates of waste. Furthermore, quantity and quality fluctuations in the market made planning difficult, and they had to compete with the rest of São Paulo's retailers for what produce was available in the market. Moreover, CBD saw an opportunity to reduce costs and improve quality by constructing centralized purchase and distribution centers for produce that would offer economies of scale and scope. They knew, however, that investment in a centralized procurement and distribution (P&D) center would only yield good results if they were able to assure a constant flow of produce throughput. This made them vulnerable to re-negotiation and holdup by suppliers that they could not control effectively under their current coordination strategy.

CBD took an alternative strategy which was to make entry onto their registry of suppliers more demanding, and to seek more services such as classification and delivery from suppliers. At the same time, they could vertically integrate the assembly part of the wholesale function using the centralized P&D centers as a base. CBD anticipated that these changes could reduce their coordination costs—tighter relations with suppliers would facilitate planning and the better product classification would improve the quality of incoming produce and reduce waste. Likewise, a smaller cadre of suppliers with whom they had more regular relations would help to ensure a constant supply of produce throughput for their centralized procurement activities.

The feasibility of the strategy seems apparent. Construction of a centralized P&D center would require much financial capital, but as a large firm that was well reputed in financial circles, CBD had adequate access to such capital. They also had the managerial sophistication (demonstrated in other areas) necessary to coordinate the logistical and contractual functions associated with a more intensely controlled supplier registry and centralized P&D. CBD anticipated that they would have an adequate number of suppliers who would be willing and able to serve their needs: suppliers would benefit from the smoother flows of information and product too, and appreciated the large volumes of product that CBD needed. Institutional acceptability of the alternative options also presented no challenge.

Given its feasibility, CBD apparently evaluated positively the risks and returns of making these large shifts in their strategy. The potential benefits—improved control over quality, and savings of from 20-30% on procurement costs through centralization—were clear, and CBD opted to make the shift.

Table 1 PWH Analysis of CBD Cases Facts in 1st Stage of Evolution

PWH Variable	Realization in Case
Initial strategy:	Informal supplier registry with individual store purchases from wholesale market. CBD then processes goods as needed.
Is initial strategy too costly?	Yes. Quality and volume requirements not met. Issue heightened by increasing demand and competition during decision period.
Does an alternative exist that is potentially less costly?	Yes. Alternative is centralized purchases direct from producers on a supplier registry with enforced quality standards. Supplier does processing. Alternative trades off low asset specificity of conducting decentralized purchases in wholesale market in favor of high asset specificity of investing in centralized facilities. Complementarity is high due to increased profit opportunities from having volume and quality demands met through tighter chain coordination. In balance, alternative is expected to be less costly.
Is alternative feasible?	Yes. CBD has financial capacity to make investment. Sophisticated management ensures control competence. Tighter relationship benefits producers ensuring availability of willing suppliers and alternative is legally and culturally acceptable.
Favorable risk/return?	Yes. Anticipated risk and return of alternative deemed preferable to current strategy.
Outcome	Alternative adopted as predicted by PWH—all decision process answers “yes.”

Case 2:

Table 2 summarizes the case facts relevant to CBD’s next shift in procurement strategy. Several years after making a shift to vertically integrated assembly functions and a more tightly controlled supplier registry, CBD found itself facing new challenges that made it once again reconsider the costliness of its coordination

strategy. CBD’s managers felt that the strategy of vertically integrated assembly operations was working well and felt no need to change. They saw, however, that the supplier registry was working sub-optimally given current market conditions. Consumers had become increasingly sophisticated and were concerned with issues like food safety. At the same time, CBD suspected that there were opportunities to increase their profitability by further improving the quality and regularity of their produce supplies, which was difficult under the current coordination strategy because some suppliers still lacked loyalty in times of product shortages. Moreover, the shift in coordination enacted in the previous period had increased the level of investment required for suppliers to qualify for the registry, and there were complaints from suppliers who perceived power imbalances in the registry system—particularly their having made investments to qualify for the registry without CBD making any commitment to buy from them on a regular basis.

CBD considered contracts with suppliers as an alternative coordination strategy for input procurement. These contracts could resolve the asset specificity and complementarity problems that were present in the existing strategy. A commitment on the part of CBD to purchase output from suppliers might pacify suppliers’ current frustrations and also provide them the security they needed to make even more specialized investments, for example in greenhouses and sophisticated irrigation systems, that would improve the quality and regularity of the produce they supplied. At the same time, contracts would help CBD weed out those suppliers who were not willing to commit to supply them regularly, regardless of market conditions.

Instituting such a shift would require investments to form the contracts, as well as additional managerial expertise to manage them, but these requirements did not present a barrier to CBD given its large size, ready access to investment capital, and highly sophisticated managerial expertise. Likewise, CBD anticipated that an adequate number of experienced suppliers would be willing to make investments to improve the quality of their production if they had an assured buyer. Institutional acceptability was also not perceived to be an impediment. The anticipated return and perceived riskiness of the shift was favorable to CBD, as increased sales and lower costs of coordination were anticipated. Thus, at the time of data collection, CBD was beginning to undertake activities to make this change.

Table 2 PWH Analysis of CBD Cases Facts in 2nd Stage of Evolution

PWH Variable	Realization in Case
Initial strategy:	Alternative adopted in first stage (centralized purchasing direct from producers, formal supplier registry with enforced standards; supplier does processing).
Is initial strategy	Yes. There is insufficient assurance of food safety given

too costly?	increasing consumer safety concerns, and a lack of loyalty exists among suppliers given their perceptions of a power imbalance with CBD.
Does an alternative exist that is potentially less costly?	Yes. Specification contracts—build on registry to include commitment to buy/sell. Asset specificity is high for suppliers (fixed investments to join registry and respond to new demands) but contracts guarantee purchase. Complementarity is also high due to additional opportunities for farmers to profit if they respond to food safety demands but need to more tightly coordinate supply to realize these opportunities.
Is alternative feasible?	Yes. Capital to institute contracts is available. Sophisticated management ensures control competence. Buy/sell commitments now make asset-specific investments by suppliers worthwhile. Alternative is legally and culturally acceptable.
Favorable risk/return?	Yes.
Outcome	Alternative adopted as predicted by PWH—all decision process answers positive.

Second Firm: Sapori

Sapori markets premium quality preserves and fresh produce items to the upper-income strata of metropolitan São Paulo’s consumers through independent retail outlets (i.e. ones not owned by Sapori) . Sapori has a 30-item product line, oriented to consumers who seek the healthfulness and novelty of premium and exotic products, such as mini-eggplant, mini-corn, and recipe-of-the-week combinations. The firm has also developed some of its own varieties for some of the exotic vegetables it markets.

Case 3:

Table 3 summarizes the case facts leading to Sapori’s first shift in procurement strategy. In order to market premium-quality, specialized fresh produce products, Sapori needs moderate volumes of a highly specialized input. When Sapori began operations, they were able to meet these special needs through vertical integration of their production and processing operations. As demand for their products grew, however, they found this strategy to be too costly. Though they had tight control over the quality of their produce, their volume and variety needs came to outstrip

their production and managerial resources. Acquiring all the produce they needed in this manner was too costly in terms of the firm-specific resources that it required. Case 3 is thus distinct from the first two cases. The existing strategy successfully avoided coordination errors, but the strategy itself became too costly to feasibly replicate for growth. Thus, a new strategy had to be found to avoid the re-emergence of significant coordination errors.

An alternative coordination strategy that was available to Sapori was to make purchases from the local wholesale market using spot market relations. Sapori hoped that purchases from the local market would be able to provide them with the volumes and types of produce that they needed, permitting them to specialize their firm resources on the value-added processing activities that were key to their success.

This option seemed feasible—it carried virtually no capital requirements and little control competence was needed to make such purchases. Likewise, numerous suppliers were already situated in the wholesale market who would be willing to supply them, and it was institutionally acceptable. Given the costs that they were facing at that point, the risk/return tradeoff of implementing the alternative seemed favorable, and Sapori took the step to vertically dis-integrate their production activities in favor of spot market purchases of raw material inputs.

In an explanatory sense, PWH works for this case as it did for the first two. However, changing the use of the framework to a predictive one proves useful. Given the highly specific input requirement, asset specificity and complimentary were high in this situation, which is consistent with the original decision to vertically integrate into production and intensely control the transaction. Moving from vertical integration all the way across the coordination continuum to spot markets, would thus not be advisable. The framework would predict that this strategy should not work to solve the problem, i.e., the selected strategy will decrease the costs of control but it will open the firm to costly coordination errors.

Table 3: PWH Analysis of Sapori Cases Facts in 1st Stage of Evolution

PWH Variable	Realization in Case
Initial strategy:	Vertical integration of production and processing activities
Is initial strategy too costly?	Yes. Growth in sales over-extends Sapori’s production capabilities. Managerial capital and space became inadequate to meet scope and volume requirements for inputs.
Does an alternative exist that is potentially less	Yes. Informal (spot market) purchases of raw material from local wholesale market would satisfy volume and scope requirements. [PWH model would question benefits of spot

costly?	market purchases given high asset specificity and complementarity of input (which are accommodated through current strategy of vertical integration) but actual decision makers expect alternative to be less costly given need to meet volume and scope requirements.]
Is alternative feasible?	Yes. Alternative has low capital and control requirements. Willing suppliers exist and the alternative conforms to common business practice. Alternative is legally and culturally acceptable.
Favorable risk/return?	Yes.
Outcome	Alternative adopted as predicted by PWH given all decision process questions answered “yes” by decision-makers, but PWH analysis brings into question ability of new strategy to accommodate asset specificity and complementarity.

Case 4:

Having made the strategy shift, Saponi came to realize that in resolving some of their coordination problems, they had created others! They were now able to get the volumes and types of produce that they needed, but they found that they were having trouble getting the quality that they were looking for. The day-to-day nature of spot market transactions meant that there was no advance planning, and Saponi could only purchase what was available in the market. They needed produce with special characteristics, however, such as “baby” cuts (harvested before full maturity) and they were also developing their own varieties of exotic produce and needed to be able to coordinate in advance if farmers were to grow these. As it was, with spot market purchases, suppliers were unwilling to accommodate these special needs because there was no guarantee that Saponi would be there to purchase from them, and the value of produce grown to meet Saponi’s needs was low for alternative buyers. Thus, the new strategy was generating costly coordination errors, as suggested by the predictive use of the PWH framework. Table 4 analyzes case facts relevant to Saponi’s second shift in procurement strategy.

To combat this problem, Saponi considered another change in strategy—they could establish relationships with a subset of highly qualified farmers, with specific transactions being guided by written purchase orders. The advance purchase orders permitted growers to plan their planting activities with the expectation of having a buyer for their output. This facilitated complementarity in moving high-value products more smoothly along the marketing chain, benefiting both Saponi and its suppliers. The ongoing relationships would assure suppliers of a buyer for their

product and permit them to make investments that would enhance their production for Sapori.

Table 4: PWH Analysis of Sapori Cases Facts in 2nd Stage of Evolution

PWH Variable	Realization in Case
Initial strategy:	Alternative adopted in first stage (spot market purchases of input)
Is initial strategy too costly?	Yes. Volume and scope needs met through shift, but advance planning of purchases precluded by spot-market nature of transaction. Sapori can't get special input needs met (early harvest, exotic varieties). Failures to accommodate asset specificity and complementarity make current strategy too costly.
Does an alternative exist that is potentially less costly?	Yes. Informal relation-based alliances with provision of some inputs and technical assistance. Asset specificity and complementarity will still be high, but the new strategy offers a better chance of accommodating them than the spot market.
Is alternative feasible?	Yes. Alternative has low capital requirements, and control is facilitated by full-time agronomist employees and Sapori's close proximity to most growers. Capable suppliers familiar with Sapori's needs exist. No challenges to institutional acceptability anticipated.
Favorable risk/return?	Yes.
Outcome	Alternative adopted as predicted by PWH—all decision process answers positive.

An assessment of the feasibility of this alternative was positive. The strategy carried moderate capital needs that Sapori could meet, and Sapori anticipated being able to maintain adequate control by providing technical assistance to their suppliers by the full-time agronomist they employed. Suppliers were available who were willing to specialize their activities to meet Sapori's needs, and they had the incentive to do so given the premium prices that Sapori was willing to pay. Institutional acceptability likewise did not present any problems.

Given the apparent feasibility of the alternative and its potential to alleviate the costly coordination problems that they were facing, Sapori's managers perceived the

risks and returns on the project to be favorable. The anticipated benefits were clear—making the shift could ensure Sapori the quality, scope, and volume of input that they required. Sapori thus ceased to make spot market purchases from the local wholesale market and instituted a system of ongoing purchases from a core of highly qualified suppliers. In a predictive sense, PWH would also lend support that this strategy as opposed to the spot market one had a much greater probability of success.

Case 5:

The shift in strategy improved Sapori's raw material procurement results remarkably. Eventually however, they once again had to face the question of whether errors and operational costs incurred under their current strategy were too costly. Two issues led them to consider another change: First, like CBD, Sapori became aware that their end consumers were increasingly concerned with the safety of the food they ate, and the level of control offered under the current coordination strategy (based on ongoing informal relations with suppliers and written product orders), seemed insufficient to truly guarantee a safe product. Second, they had become aware that some of the suppliers to whom they had provided seed (for exotic varieties that Sapori had developed) had sold the product of this seed to buyers other than Sapori. The growers who had done this lacked commitment to the relationship, and were apparently willing to compromise it for short-term opportunistic gain. Table 5 summarizes the case facts relevant to Sapori's final shift in procurement strategy.

The next change that Sapori contemplated for their coordination strategy was to institute written contracts with their suppliers that would specify the rights and responsibilities of each party, define planting schedules, and make other aspects of the relationship clear. Sapori's managers felt that by formalizing the relationship with suppliers, they would increase complementarity in the relationship—especially as it related to the marketing of a safe product—by further tightening coordination. They also hoped to protect the asset specificity of their investments in varietal development by making it explicit that they had the right to all the output from the seed they provided.

Consideration of the feasibility of this strategy yielded encouraging results. Relatively little capital was required to define and establish the contracts, and Sapori had the managerial competence required to successfully implement them. Sapori anticipated that suppliers with whom they already worked would be amenable to the change, as it carried little implication for actual operations, facilitated their planning, and strengthened their market. Institutional acceptability was not expected to be a problem.

The benefits that were anticipated in instituting a contract seemed apparent/ At the time of data collection, Sapori was poised to initiate this shift in strategy.

Table 5: PWH Analysis of Sapori Cases Facts in 3rd Stage of Evolution

PWH Variable	Realization in Case
Initial strategy:	Alternative adopted in second stage (informal, relation-based alliance with producers)
Is initial strategy too costly?	Yes. Consumer concerns for food safety increase coordination requirements for input acquisition and a lack of commitment on the part of some suppliers (who divert seeds to other uses) threatens the value of investments in exotic varieties.
Does an alternative exist that is potentially less costly?	Yes. Formal contracts with some input provision and advance purchase commitments. High asset specificity faced by suppliers (specialized production) is already accommodated through current strategy; however Sapori's asset specific investments in exotic varieties are threatened by some farmers' diversion of these to other uses, Sapori anticipates formal contracts might quell this activity, increasing long-term profitability. Furthermore, they anticipate formal contracts will increase farmers' willingness to investment in traceability and other food safety assurances, increasing complementarity.
Is alternative feasible?	Yes. Capital is available for the definition and implementation of contracts and little change to control needed. Suppliers of proven availability are already working with Sapori. No problems with institutional acceptability are anticipated.
Favorable risk/return?	Yes.
Outcome	Alternative adopted as predicted by PWH—all decision process answers “yes”.

Third firm: Sacolão FLV

Sacolão FLV (SF) is one of metropolitan São Paulo's government-promoted discount green grocers. Established in 1992, SF is oriented to lower income consumers and sells a range of about 80 fresh produce items at a uniform price per kilogram. SF

falls into the class of “small” food retailers for São Paulo with a sales area of approximately 500 square meters, all of which is used for fresh produce sales. Though privately administered, the government supports many discount green grocers through provision of space in which to operate and basic utilities such as water and light, in exchange for which the discount green grocers must adhere to the municipal government’s price guidelines.

Case 6

SF’s primary challenge is to obtain a consistent volume and quality of fresh produce so that it can meet its clients’ needs. A key constraint is the single price per kilo format and the need to keep the costs below this price, while covering their costs despite fluctuating fresh produce supply and prices.

When the firm opened in 1992, SF purchased fresh produce in São Paulo’s wholesale market, relying entirely on spot market coordination. Each day a buyer would compare prices, inspect products, and choose a supplier on the basis of the day’s product availability. This strategy was appropriate for the time—economic instability meant that fresh produce was a relatively unprofitable sector, and although SF’s procurement would have been facilitated through tighter coordination in order to mitigate the high variability in prices, volumes and quality of produce that was available in the market, the low profitability of the sector left neither SF nor suppliers with incentive to do so.

Gradually market conditions shifted, and SF considered the costliness of their strategy given current market conditions. With economic stabilization, demand for fresh produce had grown, stimulating greater levels of production and investment in specialized production by many suppliers who were now able to offer consistent quality produce on a regular basis. SF’s management suspected that they could have better control over supplies and lower costs if they updated their strategy to reflect these changed conditions. Table 6 summarizes the case facts relevant to SF’s shift in procurement strategy.

As an alternative to their spot market coordination strategy, SF considered forging ongoing, informal relations with a relatively small number of suppliers. An informal alliance could permit mutual familiarity between SF and a limited number of regular suppliers, providing benefits of cooperation from longer term “preferred supplier-preferred buyer” relations. The give and take of the relationship would increase complementarity, benefiting both buyer and suppliers. The provision of services such as protection from price fluctuations and responsiveness to the specific quality and price needs would make the acquisition of fresh produce easier and less costly. At the same time, neither firm would need to make any relationship-specific investments so that they could maintain their autonomy and exit the relationship at will.

This shift in strategy was feasible for SF—it required no explicit capital requirements and an increasing number of specialized suppliers in the market would be interested in having a relatively assured outlet for their product on a longerm basis. Control competence was not a problem as it required little change in management, and institutional acceptability was not anticipated to be a problem, given that such relationships were common.

The risk and return assessment was likewise favorable—SF expected to benefit by having easier access to produce and lower price fluctuations, without having to incur any significant costs in making the transition. Thus, the strategy was implemented as envisioned.

Table 6: PWH Analysis of Sacolão FLV Case Facts

PWH Variable	Realization in Case
Initial strategy:	Spot market purchases from wholesale market from many suppliers
Is initial strategy too costly?	Yes. Gradual increases in supply in market, reductions in price, volume, variety variability cause difficulty getting consistent volume and quality needed.
Does an alternative exist that is potentially less costly?	Yes. Purchase from the wholesale market but rely on informal relations (specification contract) with fewer specialized suppliers. Asset specificity is low—only perishability of product. Initially little complementarity because suppliers profit by playing market. Complementarity increases because increased market supply makes having pre-arranged outlet preferable and buyers want quantity, quality and availability needs to be met.
Is alternative feasible?	Yes. Alternative has no explicit capital requirements. Little change in management needed for control competence. Willing partners exist in specialized suppliers who will benefit from having an assured buyer. Alternative is legally and culturally acceptable.
Favorable risk/return?	Yes.
Outcome	Alternative adopted as predicted by PWH—all decision process answers “yes”.

Fourth Firm: Galeria dos Pães

Galeria dos Pães (GP) is an upscale self-service restaurant and supermarket located in one of São Paulo's most affluent neighborhoods. Established in 1992, GP enjoys a strong reputation for the provision of fresh, premium quality food through both its restaurant and retail sectors. The supermarket specializes in perishables, bakery items, and imports, and contributes approximately 50% to GP's approximately US\$300 thousand monthly revenue. GP sells approximately 200 fresh fruit and vegetable items in the 100 square meters of its fresh produce department. Many of the supermarket products are produced on-site in complement to the restaurant's activities guaranteeing that maximum quality and freshness are consistently maintained. Their marketing strategy emphasizes their premium quality, variety, and convenience to its demanding clientele with a small area dedicated to the presentation of each item and quick turnover. GP doesn't sell any bulk produce items—approximately 50% of its sales are of select quality, pre-packaged produce, with the remaining 50% divided among sales of organic, hydroponic, and pre-processed produce. Profit margins for individual products can reach over 30%.

GP is an interesting case in that it has not enacted any significant shift in its procurement strategy since its inception in 1992, nor do they plan to alter their current strategy. This case analysis attempts to validate the PWH framework by (1) examining the explanation for the lack of change, and (2) explaining the difference in coordination strategy between two different types of produce—pre-packaged produce, and fresh-cut and organic produce, which present coordination challenges given their high value attributes—convenience and food safety, and production with organic processes, respectively. The firm has significantly different coordination strategies for the procurement and marketing of each of these.

Case 7

Pre-packaged produce: Table 7 presents case facts relevant to the PWH analytical model. GP's strategy for the marketing of pre-packaged produce is to use a hybrid of a spot market and specifications contract (reflected in ongoing informal relations with suppliers, much as SF has) for the assembly of produce. GP then sorts and packages the produce on site. Ongoing relations with suppliers permits GP ready access to high qualities of produce in the market—they intentionally buy from relatively small suppliers to maximize the complementarity inherent in two firms selling to one another on a regular basis, and suspect that if they bought from a larger supplier it would not appreciate their business sufficiently and complementarity would be lost. The potential asset specificity inherent in purchases of fresh produce is low, and moderate in processing. By conducting their own processing operations, GP minimizes this asset specificity because they have relatively small investments in equipment, and use produce that is not sold in their

restaurant operations. The strategy is highly feasible because it is relatively simple and has minimal managerial requirements, and because it takes advantages of resources that GP readily has at hand, such as a large labor force for the processing activities. Numerous trade partners are willing to supply them and benefit from the ongoing relationship, and the strategy is acceptable institutionally.

Table 7: PWH Analysis of Galeria dos Pães Case Facts for Pre-packaged Produce

PWH Variable	Realization in Case
Initial strategy:	Spot market – specification contract hybrid for coordination of purchases; vertical integration of processing.
Is initial strategy too costly?	No. Asset specificity and complementarity are accommodated through on-site processing. Operational costs are low.
Does an alternative exist that is potentially less costly?	No.
Is alternative feasible?	—
Favorable risk/return?	—
Outcome	No change to coordination strategy.

Case 8

Fresh-cut and organic produce: Fresh-cut and organic produce present a different challenge to GP. They present a high degree of complementarity in that their highly valued attributes (food safety in the case of fresh-cut, and organic production in the case of organic produce) are highly specialized and need to be marketed effectively (e.g., identity to be preserved) in order for their value to be realized. Vertical integration of production would not be in GP’s interests as it requires substantial managerial competence and investment, and because if they are not sold their high value is forfeited. There is also a relatively competitive supply of these products in São Paulo’s market. A summary of case facts for the PWH analysis of GP’s organic and fresh-cut produce coordination strategy is presented in Table 8.

The relatively high risk in their production and marketing, high managerial requirements, and high level of complementarity result in an interesting coordination strategy, in which suppliers vertically integrate downstream,

conducting not only production and processing operations, but also taking responsibility for much of the marketing operations, for example deciding how much and what to stock in GP’s shelves, and even stocking it. They are also responsible for the value of any produce that is not sold.

GP is not presented with an incentive to change this coordination strategy. It allows them to offer a high value product that their consumers value, with little risk in either marketing or liability (e.g., in the case of a food safety failure) as their suppliers’ take on virtually all the responsibility. The suppliers benefit by the complementarity that is achieved—they overcome the barriers to market access by carrying out their own marketing activities and taking on risk inherent in these activities.

Table 8: PWH Analysis of Galeria dos Pães Case Facts for Fresh-cut & Organic Produce

PWH Variable	Realization in Case
Initial strategy:	Suppliers (vertically integrated downstream) responsible for production, processing and management activities.
Is initial strategy too costly?	No. GP does not bear risks in carrying fresh-cut and organic produce line. Suppliers accommodate asset specificity and complementarity through vertical integration, bear risk of participation in market, but this strategy allows them access to the market.
Does an alternative exist that is potentially less costly?	No.
Is alternative feasible?	—
Favorable risk/return?	—
Outcome	No change to coordination strategy.

Discussion and Conclusions

Analyses of the evolution of the three firms' coordination strategies appear to provide powerful evidence supporting the determinants and processes of decision-making that PWH posit in their framework. For all eight cases, the framework provides a theoretically consistent justification for the decisions made in practice. In five of the eight cases, costly coordination errors ultimately resulted in motivating an effective change in coordination strategy. In one case, the unacceptable cost of extending an existing strategy to support firm growth, resulted in a change in strategy. However, this change was not effective as would have been predicted by the framework. In two cases, the lack of change in strategy was explained in a theoretically consistent manner, as well the reason for the differences in strategy across two different product categories represented by the two cases. Collectively, the case study results provide considerable insight into issues of incentives and feasibility, as well as the influence that asset specificity and complementarity have on coordination strategy decisions. This case-based empirical work thus expands the external validity of the PWH framework beyond the prior theoretical development and empirical application. The framework proves useful in produce sectors and for grocery firms. Additional cases from additional sectors are needed to further support the validity of the framework as an explanatory and predictive tool.

Three additional insights into coordination strategy decision-making can be drawn. First, in seven out of the eight cases, the strategies were changed to increase the intensity of control over transactions, i.e., the firm moved to the right on the strategy continuum. In the one vertical integration case, the strategy proved too costly to expand with demand growth, yet an effective alternative emerged even if it took some trial and error to find it. Strategies in the middle of the continuum may thus be more effective today as demand increases for special attributes (and with them transaction asset specificity and complementarity) and contracting systems become more sophisticated. In general, the movement away from spot markets does not necessarily indicate that the firms initially made the "wrong" coordination strategy choice. Instead, it suggests that both retailers and suppliers benefited from the gradual intensification of coordination control, over which period they learned to work better with one another and adjusted to the greater levels of interaction and interdependence, while incompatible partners were identified and weeded out. There were also important driving forces, namely the shifts in underlying demand and supply conditions faced by the firm, that drove these strategic shifts towards ever-increasing levels of control.

Second, differentiation between issues of complementarity and asset specificity permit a considerably richer insight into issues of coordination than a single-minded focus on asset specificity. The defining difference between the two concepts highlights that coordination can be costly even where there is no reason to

anticipate opportunistic behavior on the part of either party, i.e., in situations of complementarity where both parties will benefit from the successful completion of transactions.

Third, as one moves from lesser to greater degrees of control intensity, one can observe early shifts rightward to be oriented to resolving issues of complementarity, with the resolution of these issues leading to gradual increases in the levels of asset specificity implicit in the transaction; and this in turn leading to the need for additional shifts in coordination strategy. For example, in the first phase of CBD's coordination strategy, they sought to facilitate the achievement of complementarity benefits by tightening control through the supplier registry, which led to relationship specific investments whose asset specificity later needed to be accommodated through further shifts in coordination. This observed phasing needs to be tested with additional cases to see if it can be generalized.

Three significant management implications come from this work. First, asset specificity and complementarity appear to be very useful in explaining and predicting effective coordination strategy. They are not merely theoretical niceties. They have their real world expression that practicing managers should know about and use to guide the coordination decisions. Second, and more broadly, the PWH framework appears to provide a concise and valid means of guiding the firm-level decisions about coordination strategy. Managers can assess four key variables related to such decisions: (1) is the existing strategy too costly in coordination errors generated or in expense of implementation; (2) what do the levels of asset specificity and complementarity suggest a better strategy to be; (3) can the alternative strategy be implemented in terms of capital, control expertise, availability of a compatible partner, and institutional acceptance; and (4) is the risk/return tradeoff sufficiently better for the new strategy than the existing one. Finally, vertical coordination strategies must evolve as the economic and competitive environment evolves. In only one of the six cases of strategy change was the change motivated by an ineffective strategy choice in the past. In five of the six cases, it was the changing external environment that rendered a once effective strategy ineffective and in need of change. Managers must continually assess the shifting levels of asset specificity and complementarity and their own changing capabilities to manage new forms of coordination strategy.

In conclusion, it is argued that the case study analyses provide significant support for the PWH framework, as well as new insight into the firms' coordination strategy decisions that might be forgone when analyzed using a framework that lacks the operational approach and consideration of incentives and feasibility guiding the PWH model.

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