Final Scientific Report

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BARD Project Number: IS-3527-04

Date of Submission of the report: February 28, 2008

Project Title: The Economics of Contracts in US and Israel Agricultures

Investigators

Principal Investigator (PI): Israel Finkelshtain

Co-Principal Investigator (Co-PI): Tigran Melkonyan

Institutions

Department of Agricultural Economics and Management, Hebrew University of Jerusalem

Department of Resource Economics, University of Nevada

Collaborating Investigators:

Keywords not appearing in the title and in order of importance. Avoid abbreviations.

Abbreviations commonly used in the report, in alphabetical order:

Budget: IS: $122,000 US: $122,000 Total: $244,000

Signature
Principal Investigator

Signature
Authorizing Official, Principal Institution
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Publication Summary (numbers)

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Postdoctoral Training: List the names and social security/identity numbers of all postdocs who received more than 50% of their funding by the grant.

Israel: Nira Yacouel, Yael Kachel

Cooperation Summary (numbers)

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Description Cooperation:
Cooperation among the researchers was very important for achieving the objectives of this project. In addition to frequent e-mail communications, the principal researchers have met in the US to discuss research findings and further research directions. Especially important was the exchange of ideas on survey design and econometric issues. While the papers written within this project did not involve researchers from both countries, the Israeli Principal investigator and the American researcher are planning to collaborate in the near future on further analysis of the collected data.

Patent Summary (numbers)

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Research Objectives

1) Reviewing the rich economic literature on contracting and agricultural contracting; 2) Conducting a descriptive comparative study of actual contracting patterns in the U.S. and Israeli agricultural sectors; 3) Theoretical analysis of division of assets ownership, authority allocation and incentives in agricultural production contracts; 4) Theoretical analysis of strategic noncompetitive choice of agricultural production and marketing contracts, 5) Empirical studies of contracting in agricultural sectors of US and Israel, among them the broiler industry, the citrus industry and sugar beet sector.

Background

Recent decades have witnessed a world-wide increase in the use of agricultural contracts. In both the U.S. and Israel, contracts have become an integral part of production and marketing of many crops, fruits, vegetables and livestock commodities. The increased use of agricultural contracts raises a number of important economic policy questions regarding the optimal design of contracts and their determinants. Even though economists have made a substantial progress in understanding these issues, the theory of contracts and an empirical methodology to analyze contracts are still evolving. Moreover, there is an enormous need for empirical research of contractual relationships.

Conclusions

In both U.S. and Israel, contracts have become an integral part of production and marketing of many agricultural commodities. In the U.S. more than 40% of the value of agricultural production occurred under either marketing or production contracts. The use of agricultural contracts in Israel is also ubiquitous and reaches close to 60% of the value of agricultural production. In Israel we have found strategic considerations to play a dominant role in the choice of agricultural contracts and may lead to noncompetitive conduct and reduced welfare. In particular, the driving force, leading to consignment based contracts is the strategic effect. Moreover, an increase in the number of contractors will lead to changes in the terms of the contract, an increased competition and payment to farmers and economic surplus. We found that while large integrations lead to more efficient production, they also exploit local monopsonistic power. For the U.S, we have studied in more detail the choice of contract type and factors that affect contracts such as the level of informational asymmetry, the authority structure, and the available quality measurement technology. We have found that assets ownership and decision rights are complements of high-powered incentives. We have also found that the optimal allocation of decision rights, asset ownership and incentives is influenced by: variance of systemic and idiosyncratic shocks, importance (variance) of the parties’ private information, parameters of the production technology, the extent of competition in the upstream and downstream industries.

Implications

The primary implication of this project is that the use of agricultural production and marketing contracts is growing in both the US and Israeli agricultural sectors, while many important economic policy questions are still open and require further theoretical and empirical research. Moreover, actual contracts that are prevailing in various agricultural sectors seems to be less than optimal and, hence, additional efforts are required to transfer the huge academic know-how in this area to the practitioners. We also found evidence for exploitation of market powers by contactors in various agricultural sectors. This may call for government regulations in the anti-trust area. Another important implication of this project is that in addition to explicit contracts economic outcomes resulting from the interactions between growers and agricultural intermediaries depend on a number of other factors including allocation of decision and ownership rights and implicit contracting. We have developed models to study the interactions between explicit contracts, decision rights, ownership structure, and implicit contracts. These models have been applied to study contractual arrangements in California agriculture and the North American sugar beet industry.
Achievements

The theoretical and empirical achievements include:
Hueth and Melkonyan (2004a) study the influence of multitasking and identity-preservation on the design of agricultural contracts. They find that both forces reduce the value of quality measurement. In particular, identity preservation tends to serve as a substitute for quality measurement, and the existence of outside activities increases the marginal costs of the quality measurement.

Hueth and Melkonyan (2004b) suggest a new explanation for the observed variation in North American sugar beet contracts, when processors in one set of regions use contract that conditions grower payment on both total sugar production and sugarbeet purity, while in the remaining regions contract payments depend only on total sugar production. The authors find that growers’ use of nitrogen to fertilize their crops requires managing a tradeoff between total sugar content and sugarbeet purity. Hence, differences in growing conditions may alter the informativeness of sugarbeet purity as a signal of performance, and thus affect contract structure.

Kachel et al. (2004) explain the common use of consignment contracts in the Israeli citrus industry. The authors suggest that the exporters strategically offer consignment contracts in order to conceal price information and reduce price competition.

Melkonyan and Lapan (2005) contribute to the international economics literature by developing and studying optimal trade policies under private information. They show that optimal tariff leads to a signaling equilibrium with higher tariffs and lower welfare than under complete information, whereas the optimal import quota replicates the complete information equilibrium and thus is superior to the tariff.

Finkelshtain and Kachel (2006) study the impact of liberalization of the agricultural export sector in Israel, on export performance and growers’ revenues. The authors find that the competition among Israeli exporters did not reduce prices and revenues. However, the noncompetitive market structures for export services that developed after the reforms and the prevailing consignment contracts lead to unfair division of the export profits and in the long run may lead to a decline in production and exports.
Bar-Shira et al. (2006) analyzed the special water supply contracts that prevail in the Israeli agriculture. The authors estimated Israeli farmers’ demand for irrigation water under increasing block-rate tariffs, assessed its effect on aggregate demand and inter-farm allocation efficiency. In accordance with common belief, switching from a single to a block-price regime yields a 7% reduction in average water use while maintaining the same average price. However, switching to block prices results in a reduction of about 1% in agricultural output due to inter-farm allocation inefficiencies.

Melkonyan (2008) examines how the decision to delegate decision-making power affects the contract offered to the agent and the agent’s effort incentives. Two possible allocations of authority are considered, *principal authority*, and *agent authority*. Melkonyan finds that the principal authority is optimal when: (i) the level of informational asymmetry between the principal and the agent is high, (ii) the effect of the agent’s effort on the principal's private payoff is large, (iii) the agent’s cost of effort under the agent’s preferred decision is relatively high, and (iv) the cost of implementing the agent’s preferred decision is high.

Hueth et al. (2008) examine interactions between *explicit* and *implicit* contracting practices in California fruit and vegetable markets. Firms that manufacture processed foods, and that grow in house a portion of their total farm input, are significantly more likely to report use of both explicit and implicit contracting practices. Additionally, unobserved factors that influence the use of explicit and implicit contracting are positively correlated. These findings suggest a complementary relationship between formal and informal contracts.

Hueth and Melkonyan (2008) study the tradeoff between enhanced investment incentive of *farmer ownership* (owner operation) versus improved monitoring of farmer effort under *intermediary ownership* (vertical integration). The authors find that intermediary ownership is favored when it affords the intermediary an opportunity to monitor the farmer, and when the intermediary can easily substitute for the farmer’s investment, whereas a farmer ownership is favored when noncontractible investments are complementary, when opportunities for monitoring a farmer-employee under intermediary ownership are limited, and when the farmer’s investment is not very relationship specific.
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Stern and Finkelshtain (2008) study the influence of growers’ organizational association and contract type on production efficiency and the risk to which they are exposed in the Israeli broiler industry. The authors find that growers working with integrators produce larger quantities, are exposed to smaller risks, and exhibit higher productivity. However, estimates of the risk premium, which is charged by the integrators, show that the latter exploit local monopsonistic power and pay to farmers no more than the opportunity profits. Finkelstein et al. (2008) argue that contracting of a central agency with many small growers to pull their products and market it under a common brand name may have positive welfare effects by promoting more efficient investment in quality. The authors study the optimal collective brand size, when facing two opposing effects on member growers’ incentives to invest in quality. On one hand, a collective brand creates an incentive to free ride on the group’s reputation, which can lead to less investment in quality. On the other hand, it increases the visibility and transparency of individual member firms, which increases the return from investment in quality.

Cooperation among the researchers was very important for achieving the objectives of this project. In addition to frequent e-mail communications, the principal researchers have met in the US to discuss research findings and further research directions. Especially important was the exchange of ideas on survey design and econometric issues. While the papers written within this project did not involve researchers from both countries, the Israeli Principal investigator and the American researcher are planning to collaborate in the near future on further analysis of the collected data.

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