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# Outstanding Master's Thesis for 1987

## An Economic Demand and Supply Analysis for Fresh Groundfish The Impact of Imports on Domestic Prices

Tryggyi Felixson

University of Massachusetts

Advisor: P. Geoffrey Alien

The United States groundfish industry has claimed hardship from increases of fresh fish imports from Canada and has persuaded the U.S. International Trade Commission to increase tariffs. This study measured the impact of fresh Canadian groundfish imports on domestic groundfish prices and the effectiveness of tariffs limiting imports and raising prices paid to the domestic fishing industry. Neoclassical microeconomic theory and econometric methods were used to develop a supply and demand model for fresh groundfish in the northeastern United States.

In the model cod, haddock, flatfish, and ocean perch are aggregated into one product. Six equations describe the supply, demand and prices for fresh groundfish: one final demand equation, two equations describing the behavior of domestic and Canadian supplies, one market clearing identity and two price determining equations. Parameter estimates indicate that real total disposable income, real exchange rate and imports play a significant role in the determination of prices.

For the period 1985 to 1988 the impacts of different tariff rates and of a change in the real exchange rate and real disposable income were simulated. The results showed

that economic growth has a great impact on groundfish demand and prices. Without economic growth, *ceteris paribus*, prices fall and Canadian imports stay at their current level. With a 2.5% annual growth in real disposable income, *ceteris paribus*, prices remain at their present level and imports increase somewhat.

Tariffs are an effective economic policy for reducing imports and pushing up domestic prices, when other things are held constant. However, if the real exchange rate of the Canadian dollar keeps falling, tariffs have little effect. It was calculated that a 5% drop in the real value of the Canadian dollar will more than offset a 10% tariff.

A tariff benefits the domestic fishing industry and hurts the consumer. With a 20% tariff, *ceteris paribus*, consumers may pay 9% more for fresh groundfish fillets. Further, the consumers will consume 8% less fresh groundfish than without a 20% tariff.

Finally, a tariff tends to push up domestic groundfish prices. The model also predicts that the higher ex vessel price will encourage fishing effort with a subsequent increase in catch. The long term effect of an increased fishing effort on the fishing stock was not evaluated.

# Master's Thesis Award of Merit

## An Analysis of the Regional Structure of Dairy Production in the United States—A Profit Function Approach

**Annemarie Birgit Huy**

**University of Delaware**

**Advisor: G. Joachim Elterich**

This study examined structural aspects of dairy production for the major milk-producing regions of the United States. For each region, price elasticities for milk, livestock, concentrate, roughage, hired labor, and miscellaneous inputs, and shadow prices for two aggregated fixed factors were estimated and analyzed for the years 1981 to 1985. In addition, returns to size was estimated to compare the relative economic efficiency between regions. Since government policies have had an influence on regional disparities, the regional effect the dairy assessment was captured.

A profit function based on duality theory was estimated. The data were pooled cross-sectional time series budget information on average farms for twenty regions from 1981—85. The restricted, dual-output, translog variable profit function incorporated eight variables and binary variables for the six regions and for the dairy assessment. The system of profit function and share equations was estimated using Zellner's Iterative Seemingly Unrelated Regression method.

A log-likelihood-ratio test confirmed that significant differences exist in the production structure of different regions across the U.S., making a national production function meaningless. Great regional variation was found in own-price elasticities for milk supply, own-price input demand elasticities and input elasticities with respect to the milk price. Generally, farmers in the Upper Midwest and Corn Belt were least and farmers in the Southern Plains and Pacific region most responsive to price changes.

The returns to size estimates indicated that farmers across the country have been overproducing. Within that constraint, efficiency was highest in the Pacific region and lowest in the Upper Midwest. Negative shadow prices suggested that farmers have over invested into capital and should substitute family labor and land with positive MVPs for capital. The dairy assessment affected profits adversely with a regionally differing lag, and the potential for reducing supply. All findings imply that policy should account for regional differences in structure and needs.

## Master's Thesis Award of Merit

# Evaluating the Impact of Rail Deregulation A Spatial Equilibrium Model of the Northeast Feed Economy

**Thomas F. Randolph**

**Cornell University**  
**Advisor: David R. Lee**

The Staggers Act of 1980 resulted in large-scale deregulation of rail freight transportation in the United States. This is important to Northeast agriculture because of the region's large deficits in feed grain production and consequently high feed import requirements, particularly from Midwestern sources. This study analyzes the impact of rail deregulation on Northeastern agriculture through construction and estimation of a spatial equilibrium model of the Northeastern feed sector and allied animal production industries.

A two-period interregional model is constructed for two major feed concentrates, corn and soybean meal, for the pre-deregulation base year of 1980. These models incorporate regional feed supply and demand schedules, storage activities, and export and commercial sectors. Transportation cost scenarios for 1980 and the post-deregulation years of 1981 and 1984 are used to simulate the short and longer-run effects of rail deregulation.

The results show that lower transportation costs following deregulation result, *ceteris paribus*, in small but significant declines in regional feed prices and costs compared to what would have prevailed in the absence of deregulation. These declines lead to a slight expansion and improvement in the competitive position of regional livestock production. Regional feed producers are, however, adversely affected by the estimated decline in feed prices although this effect is moderated by the fact that most feed produced is consumed on-farm. Agricultural producers in the northern part of the Northeast are estimated to benefit relatively more from deregulation than those in the southern part. The competitive position of Northeast producers is improved relative to those in the Southeast as a result of declines in the feed price and transportation cost differentials that have traditionally favored Southeast producers.

# Master's Thesis Award of Merit

## A Political-Economic Analysis of U.S. Domestic and International Sugar Policies

**Kay G. Sachtler**

**Rutgers University**

**Advisor: Rigoberto A. Lopez**

The extent of government intervention in agriculture in virtually all nations and the interaction between economic and political markets suggests government behavior should be endogenized in economic analysis. For sugar, the U.S. government has direct payment to producers and import restrictions to protect them from foreign competition. These policies also have tremendous international implications as exporting sugar to the U.S. is vital to the economy of many developing nations. In light of this situation, this study investigated the structure of U.S. government behavior in devising domestic and international sugar policies.

A mathematical model of government behavior was developed positing the government as a utility maximizing agent responding to domestic producer and consumer welfares, the Federal budget balance, and the welfare of sugar quota holders. Expressions were derived for the "optimal" choices of policy instruments resulting from the policy formation process.

The theoretical framework was refined into an empirical model consisting of six structural equations: do-

mestic supply and demand, a flexible price expectation function, two government behavior equations for imports and price support decisions, and a market equilibrium identity.

Empirical results were plausible and consistent with a priori expectations. Results showed that price supports significantly influence price expectations. Short-run and long-run demand and supply adjustment parameters and economic surpluses from government intervention were computed, analyzed and implications outlined.

The results demonstrated that policies are far more responsive to producers' interests than to consumers'. In addition, Federal budget deficits encourage the use of quantitative import restrictions, reflecting the government's desire for the implementation of "cost-free" policies. Further, government is more sensitive to the welfare of the sugar producing sector rather than to the overall welfare of exporting countries. In terms of policy inertia, quotas were shown to be a more volatile policy than target prices.

# Honorary Life Member Award

## **RAYMOND H. TREMBLAY**

### **Professor of Agriculture Economics**

#### **University of Vermont**

Raymond Tremblay became a professor emeritus of Agricultural and Resource Economics in May 1987 after 40 years of dedicated service to his chosen profession and 33 years on the faculty of the University of Vermont.

After completing his B.S. and M.S. in Agricultural Economics at the University of Vermont, he joined the faculty on a temporary basis for 2 years. He then went to Cornell University where he completed work on his Ph.D. in 1952 under Professor Stanley Warren. Unlike most university professors, he decided to return to his home state and joined the University of Vermont faculty in 1953.

His major interest, by upbringing and by academic training, was Farm Management. Raised on a farm and drilled in the Cornell school of practical application of farm management principles to farming, he applied himself to studying the farms of Vermont and passing on his findings in publication after publication. Without computers or other modern data processing tools, he proved that much could be learned by observing the activities of successful—and not so successful—farmers.

He was a leader in the development of farm record clubs, later to be transformed into computerized record analysis programs. Development of these programs took farm management out of the dark ages by making accurate farm business records available to ordinary farmers at a reasonable cost. These records proved useful to

individual farmers for both management and tax accounting purposes. They also provided an accurate, up-to-date data base for Extension work with all farmers in the state.

His second major interest, the study of agriculture, food supply, and world population grew out of his knowledge of agriculture and his ability to speak French as a native language. Over the past 20-odd years, he has worked in most of the Francophone countries of Africa as a consultant on agriculture and national development. He has also spent some time in the near East, the U.S.S.R. and in the Peoples' Republic of China.

Dr. Tremblay will be remembered as the faculty member who always put students above all else. His door was always open. Their problems were his problems and his advice was key to the graduation of many a student. He devoted over a decade to advising his undergraduate fraternity and nearly that long as an advisor to Alpha Zeta. Over the past 33 years, he probably knew more students by name than any other faculty member of his college.

To honor his long and distinguished career of service to his profession and his service to his students, Dr. Raymond Herman Tremblay is hereby awarded the Honorary Life Member Award of the Northeastern Agricultural and Resource Economics Association.

June 1987