The "New Economy" and Efficiency in Food Market System: -A Complement or a Battleground between Economic Classes?

by

Gerald Schluter and Chinkook Lee
Economic Research Service
U.S. Department of Agriculture
Room 2148, 1800 M St. NW
Washington, D.C. 20036-5831
(202) 694-5395. Email:schluter@ers.usda.gov

A Contributed Paper for the 25th International Conference of Agricultural Economics, International Association of Agricultural Economists, Durban, South Africa, August 16-22, 2003

Abstract

Rapid developments in E-commerce can bring efficiency in the food market system by cutting transaction costs. However, it can also bring a battleground between developed and developing countries and also within developed countries because the New Economy emphasizes knowledge-based labor practices and low-skilled workers of trading nations compete for a shrinking need for their services. An Input-Output model is used to examine the effects on high-skilled and low-skilled worker demand, particularly in food and agriculture. The food and agricultural industries are significant employers of low-skilled labor. Food and agricultural trade has reduced low-skilled labor demand in the United States.

Keywords - Food and Agricultural Trade, Demand for High-skilled and Low-skilled Labor, Input-Output Analysis

The authors are economists with the Food and Rural Economics Division of the Economic Research Service, USDA. The views expressed herein are those of the authors and do not necessarily represent those of the United States Department of Agriculture.

The "New Economy" and Efficiency in Food Market System:
-A Complement or a Battleground between Economic Classes?

I. Introduction

The rapid development in E-commerce in market transactions can bring efficiency in the food market system by cutting transaction costs and stages from the farm to consumer delivery system. However, it can also bring a battleground between developed and developing countries and also within developed countries because the New Economy emphasizes knowledge-based labor practices. Compared to developed countries, developing countries are endowed with relatively more low-skilled labor in their labor force and therefore may be able to make and export low-skilled labor intensive products to developed countries. If these imports in the developed countries reduce the demand for domestic low-skilled workers, the displaced low-skilled workers whose skills don't fit those needed in the New Economy will be further "left behind" adding to the already occurring widening wage gap between high-skilled and low-skilled workers. While these are broad economywide issues, the relatively heavier use of low-skilled workers in U.S. agriculture and agricultural processing suggests developments in agriculture, food processing, and textile and apparel manufacturing will have a significant influence upon whether New Economy developments lead to greater or less equal income distribution within the economy. The familiarity of agricultural economists with the economics of these sectors places agricultural economists at the forefront of monitoring and analyzing the effects of these developments.

This paper expands upon the importance of this topic, documents the relatively heavier current use of low-skilled workers in U.S. agriculture and agricultural processing, and discusses potential policy relevant points where E-commerce could affect the New Economy to either bring more efficiency into agriculture and agricultural processing and benefit the whole economy

or bring the efficiency, but at a cost of providing a battleground between economic classes, or both.

In this paper, we empirically estimate trade-related demand for high-skilled and low-skilled labor in three specific industries: processed food, farm, and non-food processed agricultural products[1]. These industries employ a larger than average share of low-skilled workers in their workforce compared to other sectors of the U.S. economy (Tables 1 & 2, Figure 1). While most previous studies of trade-related labor demand concentrated on an aggregated analysis, focusing on the economy as a whole or on manufacturing industries we are interested in the Food and Agricultural industries because of their importance as employers of low-skill workers and because of their varying trade experience in the last quarter of the Twentieth Century. The U.S. processed food industry started this period as a net importer, but, led by meat exports, experienced significant growth in exports in the last 15 years. The U.S. exports of three major meats-beef, pork, and poultry- totaled $7.4 billion in 2000, compared with $4.0 billion in imports. Within the world meat trade the U.S. has evolved from being primarily a meat importer to also being a large exporter and now has become a net exporter. In contrast to the changing fortunes in processed food trade, during this entire period, the U.S. remained a net exporter of farm products and a net importer of non-food processed agricultural products. Finally, because Food and Agricultural industries embody a unique combination of resource-based production of biological products, many that are perishable, the effects of trade on labor and level of labor skills required in the Food and Agricultural industries' workforce may differ from that in the generic content of manufactured goods study. We explore if it does and if it does, if it matters.

II. Theoretical Considerations Underlying Factor Content of Trade

Studies that estimate the factor content of trade are commonly used to analyze the links between changes in international trade and supporting factor markets. The effects of trade on factor markets, thus, indirectly could influence changes in the wage distribution. Production for exports adds to the effective demand for domestic labor. Competitive imports, on the other hand, embody high-skilled and low-skilled labor that would have been used to produce the domestic consumption the imports replaced. Thus, other things equal, higher exports raise the demand for domestic labor and exert wage increasing forces. Imports augment the supply of domestic labor and exert wage-decreasing pressures.

Our analysis is founded in the HOV (Hechscher-Ohlin-Vanek) theorem, which states that, a factor (i.e. skilled-labor) abundant country exports goods and services which intensively use that factor (i.e. skilled-labor). The HOV theorem assumes a universal technology available in all economies. Both Helpman [1999] and Harrigan [1997] emphasize that there are differences in technology across countries and that these differences are related to differences in net export performance. Because we analyze the effect of trade on one economy, the U.S. economy, for our analysis we only need to consider the U.S. technology because is the decision point for trade – if a U.S. sector can profit by selling at the world price it is likely to export, if U.S. sector buyers find the world price lower than the price of goods and services produced with U.S. technology they are likely to buy imports.

We focus only indirectly on the application of factor content of trade to measuring the effect of trade on wage inequality. There is a substantial professional diversity of opinion on

---

[1] For ease of presentation in this paper we use the term, Food and Agricultural, to refer to these three industries.

whether it is valid[2]. Panagariya [2000], however, comprehensively analyses the factor content approach to measuring the effect of trade on wage inequality and answers affirmatively to:

1. Can factor content of trade be used to measure the effect of trade on wage inequality in a given year, with tastes and technology constant?
2. Can factor content of trade be used to measure the contribution of trade to the changes in wage inequality between 2 years, with tastes and technology allowed to change?

In a theoretical review of the effects of globalization, Wood expands on the direct factor content of trade approach to include the effect on trade of transportation and coordination on wage inequalities within developed and developing countries. He argues that from this perspective, the effect of globalization on income inequality can be explained by combining three theoretical insights:

1. Heckscher and Ohlin show how the reduction of barriers to trade, by causing production to become more specialized tends to increase wage inequality in the developed nations and to reduce wage inequality in developing nations.

2. Tang and Wood show how cheaper travel and communications, by enabling highly-skilled workers in developed nations to co-operate more extensively with workers in developing nations, widen the wage gap between highly-skilled workers and other workers in developed nations;

3. Feenstra and Hanson show how the transfer of production activities from the developed nations to developing nations, by increasing the skill intensity of output in both regions, tends to widen wage gaps between skilled and unskilled workers both in developed nations and in developing nations;

[2] For an example of this continuing debate, in year a 2000 issue of the *Journal of International Economics*, four of its ten articles [Deardoff, Krugman, Leamer, and Panagariya] were devoted to the relationship of factor content of trade and factor prices.

In our analysis we use the factor content of trade approach to measure high-skilled and low-skilled labor use and, indirectly, changes in economic forces influencing wage inequality. We use occupational differences in labor market to classify high-skilled and low-skilled labor, link this classification to our estimation of the factor content of trade in skill levels detail, and infer potential effects on wage inequalities from the results.

III. Methodology

The empirical base of this paper is an input-output (I/O) analysis using the U.S. Department of Commerce national I/O tables, Bureau of Labor Statistics (BLS) employment by industry statistics, U.S. Census commodity trade statistics, and a special tabulation of major occupational categories of U.S. workers as classified by BLS. Our results address employment demand for low-skilled, medium-skilled, high-skilled, and total workers. As such, we emphasize the demand side of the wage setting labor markets, addressing the level of and change in demand forces on the low-skilled to high-skilled wage gap.

The estimation procedure relies upon Leontief's I/O model (1953). The Leontief-type empirical estimation continues to be a standard method for analyzing the factor content of trade because of its inclusion of all intersectoral linkages in its estimation of direct and indirect factor content of final demand - export and imports in this case. We estimate the level of high-skilled and low-skilled labor used to produce exports and the level that would have been used if the imports had been produced in the domestic agricultural and food industries.

The system can be expressed in a matrix form, by:

$$\mathbf{(1)\ X = AX + F.}$$

In our empirical analysis, **X** is an 80 by 3 matrix of sectoral output, **A** is an 80 by 80 I/O direct requirements matrix, and **F** is an 80 by 3 matrix of aggregate final demands consisting of

exports, imports, and domestic use. We used the earliest published U.S. I/O table, 1972, that was conceptually compatible with the latest published U.S. I/O table, 1992, to examine the factor content of U.S. raw and processed product agricultural trade. We aggregated the 500+ sector U.S. I/O tables published by BEA, USDC to an 80-sector model. Our characterization of food and agriculture consists of 17 agricultural sectors, 11 food processing sectors, and 4 nonfood processed agricultural product sectors. Sector classifications are shown in the Appendix. At the level of aggregation chosen, problems due to sector definitions were minimal.

The equilibrium output levels required to satisfy final demand **F** are obtained by,

$$\mathbf{(2)\ X = [I - A]^{-1} * F}.$$

The equilibrium output to satisfy net trade can be obtained by,

$$\mathbf{(3)\ X_t = [I - A]^{-1} * Nt,}$$

where **Nt = (Ex-Im)** is the vector of net trade and **Ex** and **Im** are vectors of export and import levels respectively and labor demands for net trade are estimated by,

$$\mathbf{(4)\ L_{nt} = \mathit{dl} * X_t},$$

where ***dl*** is an 80 by 80-diagonal matrix of labor coefficients, showing amounts of labor required per unit of output in each industry. Similarly, labor content of domestic use can be estimated by,

$$\mathbf{(5)\ L_d = \mathit{dl} * X_d},$$

where $\mathbf{X_d}$ is the output needed for domestic household consumption, inventory change, gross private investment, and government purchases of goods and services. Thus, $\mathbf{L_{nt} + L_d}$ is the total labor employment in the U.S. economy for a particular year. The sectoral details of the U.S. I/O tables published by US Department of Commerce offer a range of flexibility of disaggregation at which these economic activities can be identified. Our estimation procedure uses measures of output, exports, imports, and domestic final use in 1987 dollars for all years analyzed.

Any classification scheme, which reduces the wide range of capabilities of a nation's labor force into skill groups, is by necessity subjective and arbitrary. We avoid having to make judgments on individual skills and occupations by using a broad set of nine major occupational categories of U.S. workers as classified by BLS[3]. Using this classification scheme makes an analysis of the farm, food processing, and nonfood agricultural processing sectors a "natural" test of the concern that trade has contributed to a varying demand for workers by skill group and thus potentially to varying demand conditions for workers that contribute to a widening wage gap between skill groups. This "natural" test follows from the predominance of farm workers, operators, fabricators, and laborers within the work force of these three broad sectoral groups. Because our classification scheme classifies them as low-skilled workers, an exploration of the effects of trade conditions on these sectors from 1972 to 1992 may provide insight into the effect of trade on sectors that are potentially at risk from competition with low-skilled foreign workers. Our estimation provides us estimates by sector of nine skills groups and, therefore, evidence to determine the importance of the net trade effects on the demand for high-skilled and low-skilled labor compared with the labor demand by domestic use in the economy. We estimate the levels of high-skilled and low-skilled labor embodied in U.S. exports and the levels of high-skilled and low-skilled labor that would be needed to produce domestically the goods and services imported. The net differences in demand for the two classes of labor embodied in imports and exports is then calculated to infer the influence of trade on demand for high-skilled and low-skilled labor.

---

[3] BLS classifies; 1. Executive, administrative & managerial, 2. Professional specialty, 3. Technicians and related support, 4. Sales occupations, 5. Administrative support, incl. clerical, 6. Precision production, craft & repair, 7. Service occupations, 8. Operators, fabricators & laborers and 9.Farming, forestry, & fishing. We combined occupational categories and defined categories 1 through 3 as high-skilled, categories 4 through 6 as medium-skilled, and categories 7 through 9 as low-skilled.

IV. Empirical Analysis

Tables I and II present our estimates of the U.S. Food and Agricultural industry's output and high, medium, and low-skilled labor content of trade and domestic use in 1972 and 1992. The tables contain labor requirements for agriculture, processed food, nonfood processed agricultural products, and the total U.S. economy. We analyze the ratios of the high-skilled and low-skilled labor requirement for imports and exports for evidence of different configurations of high-skilled and low-skilled labor content. Before discussing our results we remind readers of several inherent characteristics of this type of analysis. First, when comparing employment embodied in exports with the domestic employment equivalent of imports as a measure of the employment effect of net trade, similar employment requirements for exports and imports and a negative trade balance yields a negative employment effect of trade. Second, differing sectoral trade balance and differing sectoral employment requirements can yield differing sectoral effects of net trade.

For the two years examined, the employment impacts of net trade were negative for processed food and nonfood processed agricultural products and positive for agriculture. As a share of total subgroup employment, the net trade employment impacts of both years were small for agriculture (0.3%) and processed food (-2.2% and -0.1%). For nonfood processed agricultural products these impacts were relatively large and increasing (-11.4% and –55.4%). The net trade impact on the U.S. economy was also small (-0.3% and –0.5%). Production for domestic use was the dominant factor affecting employment during the period, 1972-92.

As stated above, agriculture was a net gainer from trade. Agricultural jobs related to exports exceeded the domestic equivalent of jobs related to imports such that agriculture had a positive net trade employment of 9,100 workers from $3,819 million output related to net trade

in 1972 and 59,000 from $9065 in 1992 (Table I and II). Employment losses from net trade for processed food were 38,500 from output losses of $7,348 million in 1972 and 16,800 from $3,545 million in 1992. For nonfood agricultural processing employment losses were 317,400 from output losses of $11,109 million in 1972 and 1,002,300 from $70,230 million in 1992. The breakdown of high-skilled vs. low-skilled workers shows that net trade resulted in demand increases for all skill levels of labor in agriculture. For the processed food and nonfood processed agricultural product subgroups, the reverse was true.

An examination of Table II provides another perspective from which the Food and Agricultural industries are heavier users of low-skilled labor in production. While they account for 5.2% (6.4 of 122.3 million) of total U.S. employment in 1992, they account for 14.5% (5.3 of 36.4) of low-skilled employment. And they are trade-oriented. Their share of export-related employment, 11.4% and import-related employment, 20% also exceed their 5.2% of total U.S. employment. Their share of trade-related low-skilled labor was 18.3% for exports and 27.3% for imports. For the United States as a whole, exports used a higher ratio of high-skilled over low-skilled labor (.43) compared with imports (.34), last row, table II). The ratios of high-skilled to low-skilled labor used in exports (.073) compared with imports (.067) were also higher for non-food and agricultural processing.

The occupational distributions changed in a pattern consistent with the wage disparity during the period analyzed. The low-skilled labor share of total employment in the U.S. declined from 36.2% in 1972 to 29.0% in 1992. Domestic use effects dominated the net trade effects on low-skilled labor demand.

The sectoral composition of U.S. exports and imports did not change much between 1972 and 1992. In 1972 the agricultural sector was among the top sectors positively contributing to

the net trade balance. It also was in 1992. On the other hand, the nonfood agricultural processing sectors (such as leather, apparel, and textiles) showed the biggest employment vulnerability to imports at the start of this period. By the end of this period, these sectors' roles had not changed.

V. Summary and Conclusions

The Food and Agricultural industries are indeed relatively low-skilled labor intensive. This situation matters to the U.S. because U.S. food and textile and apparel trade account for a disproportionately large share of low-skilled workers whose jobs are trade-related. We estimate that nearly a million fewer domestic workers were needed in 1992 because of net trade in Non-food agricultural processing industries. While this million workers compared to the 120 million plus U.S. civilian workforce may seem small, as discussed in the Introduction many of the developed nation jobs in the New Economy emphasizes knowledge-based labor practices. Low-skilled workers accounted for 835,000 of the one million fewer workers needed. Because our analytical model estimates the effect on total labor and skill level demand, we do not have other identifying characteristics of these workers. But, it would be surprising if all 835,000 low-skilled workers had the ability to train for and work in information-based jobs in the new economy.

The low-skilled / high-skilled wage gap is not just a U.S. domestic issue. As Wood suggests, with globalization low-skilled workers in developed nations face competition from both freer trade-induced exposure to foreign low-skilled workers who earn lower wages and the cost lowering effects on trade of E-Commerce businesses streamlining transactions within the Food and Agricultural industries. While our estimation approach does not allow us to identify the relative contributions to these lower employment needs of Wood's three theoretical sources of the effects of globalization on wage inequalities within developed and developing countries,

for the low-skilled workers in developed nations it matters not. They all work to these workers' disadvantage. In developed nations, if worker training/retraining options are limited, the jobs of low-skilled workers whose jobs are trade-related loom important as either a safety valve for displaced domestic low-skilled workers if export-related low-skilled jobs can be expanded or a need for adjustment assistance if there is additional import supplementation of domestic production. On the other hand, HOV economic forces work to the advantage of low-skilled workers in developing nations. If E-commerce in market transactions does bring efficiency in the food market system by cutting transaction costs and stages from the farm to consumer delivery system does bring about a battleground between developed and developing countries and also within developed countries because the New Economy emphasizes knowledge-based labor practices the Food and Agricultural industries will host some major battles.

References

Deardoff, A. (2000). "Factor Prices and The Factor Content of Trade Revisited: What's The Use?," *Journal of International Economics*, (volume 50 No.1), pp. 73-90.

Feenstra, Robert and Gordon Hanson (1996). "Foreign investment, outsourcing and relative wages," in R. Feenstra, G. Grossman and D. Irwin (Eds), *Political Economy of Trade Policy: Essays in Honor of Jagdish Bhagwati*, Cambridge: MIT Press.

Harrigan, James, (1997). "Technology, Factor Supplies, and International Specialization: Estimating the Neoclassical Model, " *American Economic Review, 87: pp. 475--494.*

Helpman, Elhana, (1999). "The Structure of Foreign Trade," *Journal of Economic Perspectives,* Vol. 12, # 2, pp.121-144.

Krugman, Paul, (2000). "Technology, Trade and Factor Prices," *Journal of International Economics*, (volume 50 No.1), pp51-72.

Leamer, Edward, (2000). "What's The Use of Factor Contents?," *Journal of International Economics*, (volume 50 No.1), pp. 17-50.

Leontief, Wassily W., (1953). "Domestic Production and Foreign Trade: The American Capital Position Re-Examined," *Proceedings of the American Philosophical Society*, (4), pp. 332-49.

Panagariya, Arvid, (2000). "Evaluating the Factor-Content Approach to Measuring the Effect of Trade on Wage Inequality," *Journal of International Economics*, (volume 50 No.1), pp. 91-112.

Tang, Paul and Adrian Wood, (2000). "Globalisation, co-operation costs and wage inequalities," unpublished paper, Netherlands Planning Bureau, The Hague, and Institute of Development Studies, Brighton (www.ids.ac.uk/ids/global/ttint.html).

U.S. Department of Commerce, Bureau of Economic Analysis (1979). The Detailed Input-Output Structure of the U.S. Economy, 1972.

" (1998).The 1992 Benchmark Input-Output Accounts for the U.S. Economy, 1992.

U.S. Department of Labor, Bureau of Labor Statistics, Employment and Earnings. (various issues).

Wood, Adrian, (2002). "Globalization and Wage Inequalities: A Synthesis of Three Theories," *Weltwirtschaftliches Archiv – Review of World Economies*, (volume138, no. 1), pp 54-82.

Fig-1 Low-skilled share of Total Employment

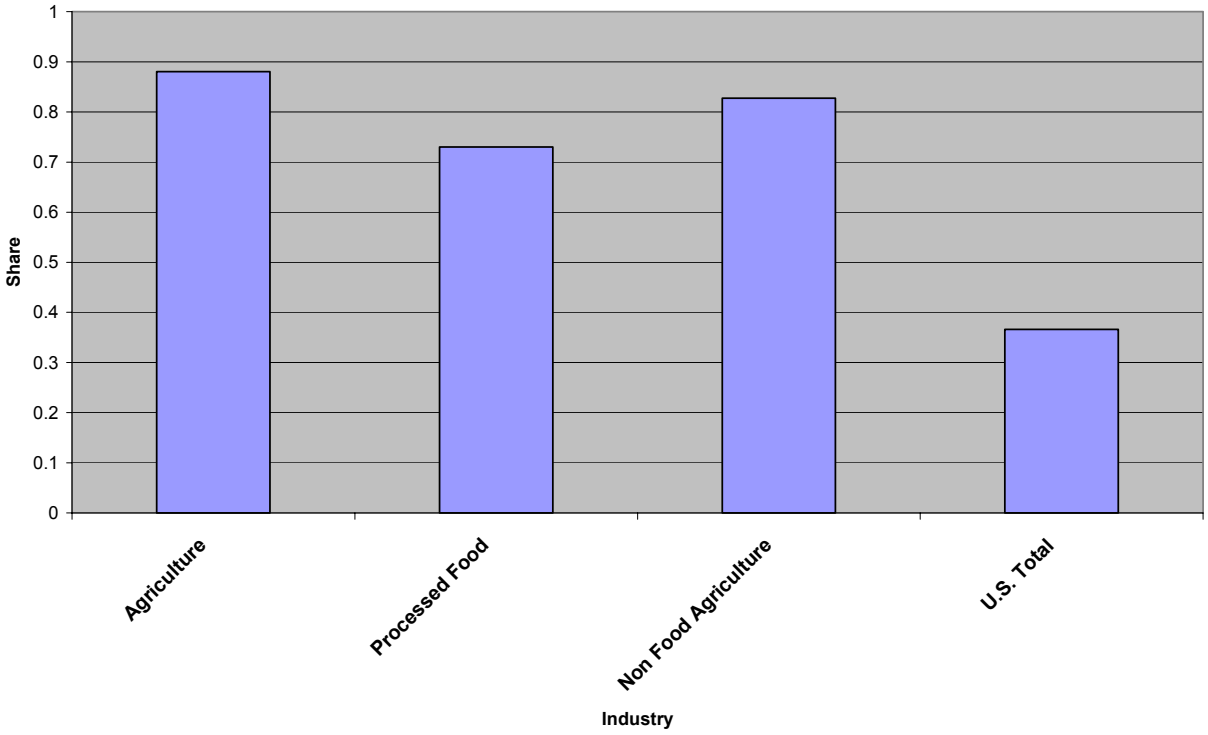

Table I. Output and Labor Demand by Skill Category, 1972

	Exports	Imports	Net trade	Domestic use	U.S. total	Nt/total
			Output (in $million '87 prices)			
Agriculture	13,133.1	-9,313.9	3,819.2	131,423.5	135,242.7	0.0282
Processed food	8,659.3	-16,007.8	-7,348.5	266,472.5	259,124.0	-0.0284
Nonfood ag. proc.	9,137.2	-20,246.3	-11,109.1	170,384.6	159,275.5	-0.0697
U.S. total	294,214.5	-367,251.1	-73,036.6	5,586,729.2	5,513,692.6	-0.0132
			Labor Demand (in 1,000)			
Agriculture	254.3	-245.2	9.1	2,826.7	2,835.8	0.0032
high-skilled	13.2	-12.7	0.5	146.7	147.2	0.0034
medium-skilled	17.2	-16.7	0.5	191.3	191.8	0.0026
low-skilled	223.9	-215.9	8.0	2,488.7	2,496.7	0.0032
ratio (Hs/Ls)	0.0590	0.0588	0.0625	0.0589	0.0590	1.0601
Processed food	49.5	-88.0	-38.5	1,833.4	1,794.9	-0.0215
high-skilled	5.2	-8.5	-3.3	168.3	165.0	-0.0200
medium-skilled	8.3	-15.1	-6.8	326.3	319.5	-0.0213
low-skilled	36.0	-64.6	-28.6	1,338.7	1,310.1	-0.0218
ratio (Hs/Ls)	0.1444	0.1316	0.1154	0.1257	0.1259	0.9162
Nonfood ag. proc.	97.6	-415	-317.4	3,093.9	2,776.5	-0.1143
high-skilled	6.7	-23.2	-16.5	170.6	154.1	-0.1071
medium-skilled	12.2	-49.5	-37.3	363.1	325.8	-0.1145
low-skilled	78.8	-342.3	-263.5	2,560.3	2,296.8	-0.1147
ratio (Hs/Ls)	0.0850	0.0678	0.0626	0.0666	0.0671	0.9333
U.S. total	3,526.4	-3,750.0	-223.6	84,745.4	84,521.8	-0.0026
high-skilled	624.6	-595.2	29.4	18,081.2	18,110.6	0.0016
medium-skilled	1,054.3	-875.8	178.5	35,656.7	35,835.2	0.0050
low-skilled	1,847.5	-2,278.8	-431.3	31,007.5	30,576.2	-0.0141
ratio (Hs/Ls)	0.3381	0.2612	-0.0682	0.5831	0.5923	-0.1151

Table II. Output and Labor Demand by Skill Category, 1992

	Exports	Imports	Net trade	Domestic use	U.S. total	Nt/total
			Output (in $million '87 prices)			
Agriculture	26,445.2	-17,380	9,065.2	159,329.6	168,394.8	0.0538
Processed food	23,937	-27,484	-3,547	357,508	353,961	-0.0100
Nonfood ag. proc.	22,078	-92,308	-70,230	234,931.2	164,701	-0.4264
U.S. total	976,312.4	-1,239,750.0	-263438	9,191,217	8,927,779.4	-0.0295
			labor demand (in 1,000)			
Agriculture	282.3	-223.3	59.0	1,908.9	1,967.9	0.030
High-skilled	14.6	-11.5	3.1	99.1	102.2	0.030
Medium-skilled	19.1	-15.1	4.0	129.2	133.2	0.030
Low-skilled	248.6	-196.7	51.9	1,680.6	1,732.5	0.030
ratio(Hs/Ls)	0.0587	0.0585	0.0597	0.0590	0.0590	1.0126
Processed food	99.8	-116.6	-16.8	1,695.5	1,678.7	-0.010
High-skilled	9.2	-11.1	-1.9	151.4	149.5	-0.013
Medium-skilled	15.8	-20.0	-4.2	288.2	284.0	-0.015
Low-skilled	74.7	-85.5	-10.8	1,256.0	1,245.2	-0.009
ratio(Hs/Ls)	0.123	0.130	0.176	0.121	0.120	1.465
Nonfood ag. proc.	220.3	-1,222.6	-1,002.3	2,811.5	1,809.2	-0.554
High-skilled	13.2	-64.2	-51.0	151.0	100.0	-0.510
Medium-skilled	26.6	-142.8	-116.2	327.3	211.1	-0.550
Low-skilled	180.5	-1,015.5	-835.0	2,333.3	1,498.3	-0.557
ratio(Hs/Ls)	0.073	0.063	0.061	0.065	0.067	0.915
U.S. total	9,006.2	-9,661.7	-655.5	122,275.6	121,620.1	-0.005
High-skilled	1,757.1	-1,764.8	-7.7	29,075.2	29,067.5	0.000
Medium-skilled	3,186.9	-2,700.6	486.3	56,761.8	57,248.1	0.008
Low-skilled	4,062.1	-5,196.3	-1,134.2	36,438.6	35,304.4	-0.032
ratio(Hs/Ls)	0.433	0.340	0.007	0.798	0.823	0.008

Appendix: 80-Sector Representation of U.S. Input-Output Economy

Sector			Sector		
Number	Name	Group Name	Number	Name	Group Name
1	Dairy"	Agriculture	41	Leather "	Non-food Ag. Proc
2	Poultry"	“” “”	42	Lumber and wood products	Others
3	Meat animals"	“” “”	43	Furniture"	“” “”
4	Miscellaneous livestock"	“” “”	44	Paper & paper products"	“” “”
5	Cotton"	“” “”	45	Printing & publishing"	“” “”
6	Food grain"	“” “”	46	Fertilizer manufacturing"	“” “”
7	Feed crops"	“” “”	47	Agricultural chemicals"	“” “”
8	Grass seed"	“” “”	48	Other chemicals"	“” “”
9	Tobacco"	“” “”	49	Petroleum refining"	“” “”
10	Fruits"	“” “”	50	Plastic & rubber"	“” “”
11	Treenuts"	“” “”	51	Glass,stone,clay"	“” “”
12	Vegetables"	“” “”	52	Metal manufacturing"	“” “”
13	Sugar crops"	“” “”	53	Fabricated metal"	“” “”
14	Miscellaneous crops"	“” “”	54	Farm equipment"	“” “”
15	Oil crops"	“” “”	55	Industrial machinery	“” “”
16	Farm forest products"	“” “”	56	Computers"	“” “”
17	Greenhouse & Nursery"	“” “”	57	Electrical equipment"	“” “”
18	Fishing"	Others	58	Motor vehicles"	“” “”
19	Forestry"	“” “”	59	Other transportation equip.	“” “”
20	Ag services"	“” “”	60	Ordnance"	“” “”
21	Metal mining"	“” “”	61	Other manufacturing	“” “”
22	Coal mining"	“” “”	62	Transportation"	“” “”
23	Crude petroleum"	“” “”	63	Wholesale & retail trade	“” “”
24	Other mining"	“” “”	64	Eating & drinking Places"	“” “”
25	Construction"	“” “”	65	Communication"	“” “”
26	Meat packing"	Processed Food	66	Electric services"	“” “”
27	Poultry & egg processing"	“” “”	67	Gas services"	“” “”
28	Dairy plants"	“” “”	68	Water services"	“” “”
29	Canning, freezing, & drying	“” “”	69	Finance & Insurance"	“” “”
30	Flour milling"	“” “”	70	Real estate"	“” “”
31	Prepared feeds"	“” “”	71	Hotel"	“” “”
32	Sugar Processing"	“” “”	72	Personal & repair services	“” “”
33	Oil mill"	“” “”	73	Business services"	“” “”
34	Baking & confectionery	“” “”	74	Amusements"	“” “”
35	Beverages"	“” “”	75	Health services"	“” “”
36	Fish & seafood"	“” “”	76	Educational & social"	“” “”
37	Misc. food processing"	“” “”	77	Government enterprises"	“” “”
38	Tobacco manufacturing"	Non-food Ag. Proc	78	Noncomparabe imports"	“” “”
39	Textiles"	“” “”	79	Scrap"	“” “”
40	Apparel"	“” “”	80	Special industries"	“” “”