Impacts on the US Economy Of Shipping International Food Aid

A report prepared for

USA Maritime

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EXECUTIVE SUMMARY

The United States has long been the leading provider of international food assistance and is the primary donor to the United Nations World Food Program. The principal US food aid program is known as Food For Peace, which was also formerly known as PL 480 Title II. It is supplemented by three other programs. Collectively they have a number of objectives, ranging from alleviating hunger and improving nutrition in struggling populations around the world, to promoting democracy, expanding trade, and supporting US foreign policy. While all these goals are significant, it is important to note that processing and transporting American food commodities has the added benefit of positively affecting the US economy as well.

The combination of handling, processing and transporting the commodities from the farm to US ports, plus the cost of moving the commodities from US ports to foreign ports, had the following overall impacts on the US economy in FY09, based on Department of Commerce multipliers:

- **$1,984,000,000 in output of all US industries**
- **$523,000,000 in earnings of households**
- **13,127 jobs.**

About half of the economic impact results from processing and transporting the commodities within the United States, and half from transporting the food aid from the United States to foreign recipients. Economic impacts at the state level were quite significant. The ten states most affected were the following:

	Total Impacts		
State	**Output**	**Earnings**	**Jobs**
	$million	$million	number
Texas	712	177	4,070
Illinois	201	54	1,374
Iowa	110	31	871
Louisiana	149	37	866
Nebraska	72	21	570
Minnesota	71	20	565
Kansas	71	20	561
Virginia	94	23	529
Indiana	56	16	440
Oregon	72	18	404

Reducing or eliminating appropriations for food aid would shrink the size of the US-flag fleet because it affects the economics of being a US-flag vessel. Owners would simply re-flag vessels in other nations until the ratio of preference cargos to regular cargos is back to a level that makes the economics work.

If we look at all of the US jobs directly involved in transporting ocean freight – not just food aid but all types of cargos – the Bureau of Labor Statistics puts the number at approximately 11,500.

- **The 11,500 US jobs in deep sea freight transportation result in more than 97,000 jobs in other parts of the US economy, based on Department of Commerce multipliers.**
- **Elimination of food aid preference cargos would shrink the US-flag merchant fleet by 15-30 percent. Using the direct effect multiplier of 8.567 jobs for every water**

transportation job, we estimate total job losses, were this to happen, of 16,500-33,000 jobs.

The employment impact of transporting food aid cited earlier – 13,127 jobs – is a part of the 16,500-33,000 jobs that could be lost.

USAID's most recently published annual summary of US food aid covering the 2008 fiscal year indicates that the total budget cost of getting the products to the ultimate recipients was about $0.45 per pound. To put that in perspective, it is less than US consumers pay in grocery stores for basic foodstuffs despite the fact that food aid commodities are moved halfway around the world. According to the US Bureau of Labor Statistics, the average retail prices paid per pound by US consumers in March 2010 were as follows:

- Flour – $0.48
- Rice – $0.76
- Beans – $1.36.

In Fiscal Year 2009, the United States exported 2.8 million metric tons of food aid to countries in need, of which 2.4 million metric tons were provided through PL 480 Title II.

- **For PL 480 Title II, ocean freight costs of $336 million represented 14.5 percent of the $2.3 billion appropriated in FY09. After Maritime Administration reimbursements to USAID and USDA for most of the additional cost of using US vessels for some of the shipments, they represented only 10.6 percent of appropriations.**

SECTION 1: US INTERNATIONAL FOOD AID PROGRAMS

The United States currently provides international food assistance under four main programs that authorize food aid procurement, financing and delivery:

- Food for Peace Act, commonly called "Public Law 480"
- Food for Progress (FFPr)
- Section 416(b)
- McGovern-Dole International Food for Education and Child Nutrition Program (FFE)

The purposes of these programs are many and varied. Clearly the most important is to help alleviate hunger and improve nutrition in struggling populations around the world. However, the stated purposes also include food security, broad-based economic growth, promotion of democracy and private enterprise, and support for broader US foreign policy objectives.

It is also the case that processing and transporting the food commodities to where they will be consumed has positive economic impacts here at home. Following a description of the main programs, we describe the types, quantities and destinations of US food aid, and how it gets where it is going. This then serves as the basis for assessing the domestic economic impacts of supplying that aid.

1.1 PL 480 (Food for Peace Act)

Public Law 480 is one of the country's oldest export assistance programs and is currently the main instrument for US international food assistance. The 83rd Congress of the United States approved the law in 1954 as part of the Agricultural Trade Development and Assistance Act.

The program was originally designed to address surplus commodity situations in the United States through sales and donations to developing countries in need of the products, but it has evolved to focus on the food security and development needs of such countries. Rechristened in recent years as the Food for Peace Act, it contains three titles that have distinct food assistance objectives.

- **Title I** provides for sales of agricultural commodities to developing countries and private entities under long-term concessional loans. Recipient countries repay those loans in either US dollars or local currency on credit terms of up to 30 years with a grace period of up to 5 years. This program has generally not been funded in recent years because grant programs have usually been judged to be more appropriate tools.
- **Title II** provides donations in the form of US agricultural commodities through the US Agency for International Development (USAID) to meet humanitarian food needs in foreign countries. Donations are made on both an emergency and non-emergency basis. A set amount is provided each fiscal year (currently $400 million) for non-emergency programs, which are conducted by private voluntary organizations and cooperatives (jointly called "PVOs"). In those cases, commodities support activities such as mother-child health care and increasing agricultural productivity among indigent farmers. Three fourths or more of Title II funds are used to meet emergency needs. Some commodities used for emergencies are provided directly through PVOs.

However, they are predominately provided through the United Nations World Food Program (WFP), which typically delivers the food to a warehouse in the affected country, after which PVOs and other agencies deliver the food to the people and communities in need. The program is eligible for support from the Bill Emerson Humanitarian Trust, a food reserve that is a combination of cash and commodities administered by the Secretary of Agriculture. If the USAID Administrator determines that Title II funds are insufficient to meet emergency needs, the Trust can provide additional resources. At the end of 2009, the Trust held $315 million in cash and no commodities.

- **Title III**, the Food for Development program, provides government-to-government grants to be used for supporting long-term economic development in the world's least developed countries. The focus is on addressing food and nutritional problems within an individual country. Title III has not been funded since FY 2003.

While Titles II and III are administered by USAID, Title I is under the purview of the US Department of Agriculture (USDA).

Title II is the centerpiece of US international food aid, typically accounting for 85-90 percent of the volume and value of total aid. The table below summarizes the appropriations for this program in recent years, and includes the Administration's proposal for FY11.

Appropriations for PL 480 Title II

Fiscal Year	Original	Supplemental	Total
		$million	
2001	837		837
2002	850		850
2003	1,200	369	1,569
2004	1,192		1,192
2005	1,183	240	1,423
2006	1,150	350	1,500
2007	1,215	350	1,565
2008	1,219	850	2,069
2009	1,229	1095	2,324
2010	1,693		1,693
2011	1,693		1,693

Source: Review of Public Laws

1.2 Food for Progress Act of 1985

The Food for Progress Act of 1985 (FFPr) authorizes the US Department of Agriculture to donate or offer credit for sales of US commodity food aid shipments to developing countries and emerging democracies. Under the program, the USDA purchases the commodities from the US market and pays the cost of shipping the commodities to the recipient country. Implementing organizations include private voluntary

organizations, foreign governments, cooperatives, the U.N. World Food Program, as well as non-governmental organizations.

Recipient nations for food aid under the FFPr program are considered based on per capita income, greater than 20 percent prevalence of undernourishment among the total population, and/or positive developments in governance for freedom, political rights, and civil liberties. The latter criteria also consider targeted countries in transition in terms of positive steps towards market reform and economic development.

The FFPr is limited by law in the amount of annual payment for freight costs to $40 million. Accordingly, the FFPr administers only 15 to 20 projects annually. Depending on the project, the donated commodities may be sold in the recipient country and the proceeds used for approved development activities. This is generally referred to as monetization. Monetization is allowed in cases where it will not disrupt typical levels of commercial imports of similar commodities or act as a disincentive to local production.

1.3 Agricultural Act of 1949, Section 416 (b)

Section 416(b) of the Agricultural Act of 1949 authorizes the donation of surplus commodities owned or acquired by the USDA's Commodity Credit Corporation (CCC). Domestic assistance is covered under Section 416(a) of the Act; Section 416(b) authorizes surpluses to be sent abroad under terms and conditions similar to Title II.

Commodities used in this program are not allowed to reduce the amounts of commodities traditionally donated to domestic feeding programs or agencies, or to disturb normal commercial sales. As in the case of Food for Progress, the commodities may sometimes be sold in the recipient countries so that the proceeds can be used for infrastructure, economic, or agricultural development programs.

The program has been infrequently used in recent years due to a lack of surplus commodities.

1.4 McGovern-Dole International Food for Education and Child Nutrition Program

The McGovern-Dole program was authorized in the 2002 Farm Bill and is administered by the USDA. It provides donated commodities and technical and financial assistance for school feeding programs and for maternal and child nutrition projects in developing countries. It targets net food importing countries with low per capita incomes, high rates of undernourishment, and adult literacy rates below 75 percent, but a commitment to education.

SECTION 2: CHARACTER OF US FOOD ASSISTANCE

2.1 Donated commodities

To be effective, food aid must be in a form that is easily transportable and serves nutritional objectives for the target population. US commodity donations are a mix of products aimed at meeting the energy, protein and cooking oil needs of the recipients. They include the major grains (wheat, corn, sorghum and rice), protein in the form of legumes (soy, peas, lentils and beans), and vegetable oil (usually soy). Most of these are transported in bulk.

Foods are also provided in more processed forms including wheat flour, cornmeal, and blends of soy protein with corn, wheat, sorghum or bulgur. These are normally bagged and shipped either in bulk or in containers.

We obtained data on food aid donations for the two most recent fiscal years, i.e. FY08 and FY09. The FY09 data was provided by USDA's Kansas City Commodity Office (KCCO) in December 2009. The FY08 data is also from the KCCO, but via the Department of Transportation's Maritime Administration (MARAD), and was obtained in January 2010.[1]

The reason for using data from two sources is two-fold. The MARAD data provides specific estimates of ocean freight costs, but at the time we requested it, the most recent fiscal year available was FY08. The KCCO was able to provide FY09 data with detail on both the delivery port and the destination country, which are sometimes different.

The first table below shows each program's shipments of the various commodities during FY08. PL 480 Title II was by far the biggest program, accounting for 2.5 million metric tons or almost 90 percent of the total volume. The second table presents a similar breakdown for FY09, during which Title II accounted for 2.4 million tons or 87 percent of the total volume. In that year the Bill Emerson Humanitarian Trust was drawn on to provide 22,000 tons of wheat to North Korea.

Of the 2.8 million metric tons of food aid in FY08, wheat and sorghum were most prominent with wheat accounting for 922,412 metric tons or 33% of the total, and sorghum accounting for 791,954 tons or 28%. Dry beans, peas and lentils comprise 9% of the total and vegetable oil makes up another 7%. Processed grain products were flour, corn-soy blend, wheat-soy blend, and cornmeal and comprised 14%. Rice at 144,463 metric tons was 5% of the total. The "other" category includes 4,800 tons of soybean meal and small quantities of potato flakes, nonfat dry milk, salmon, sorghum/soy blend, buckwheat, and soy protein. The Section 416 donation was nonfat dry milk acquired under the dairy price support program.

In FY09, wheat and sorghum added up to 1.8 million tons or 65 percent of the aid that was provided. The "other" category included 36,000 tons of soybean meal and smaller quantities of dehydrated potato flakes, defatted soybean flakes, and canned salmon.

[1] Agency data is based on the data available at the time. Historically, MARAD and the other agencies involved may make minor adjustments to previously published data to reflect newly available information.

Food Assistance by Program & Commodity: FY08

Commodity	AID PL480 Title II	AID Food for Progress	USDA Food for Education	USDA PL 480 Title I	AID Section 416	Total
	--metric tons--					
Wheat	809,640	97,399	15,373			922,412
Flour	70,383	3,324				73,707
Corn	83,627		501			84,128
Sorghum	791,954					791,954
Rice	44,162	21,426	34,675	44,200		144,463
Corn/soy	135,824	90	15,282	0	0	151,196
Wheat/soy	19,656	1,600				21,255
Cornmeal	143,367		1,082			144,449
Beans	27,442	770	4,753	0	0	32,966
Peas	136,146	0	11,076	0	0	147,222
Lentils	62,957	100.227	1,879	0	0	64,937
Vegetable oil	167,130	10,738	22,685	0	0	200,553
Other	1,145	71	6,114	0	1,895	9,226
Total	2,493,433	135,519	113,421	44,200	1,895	2,788,469

Source: MARAD compilation from KCCO, USDA data

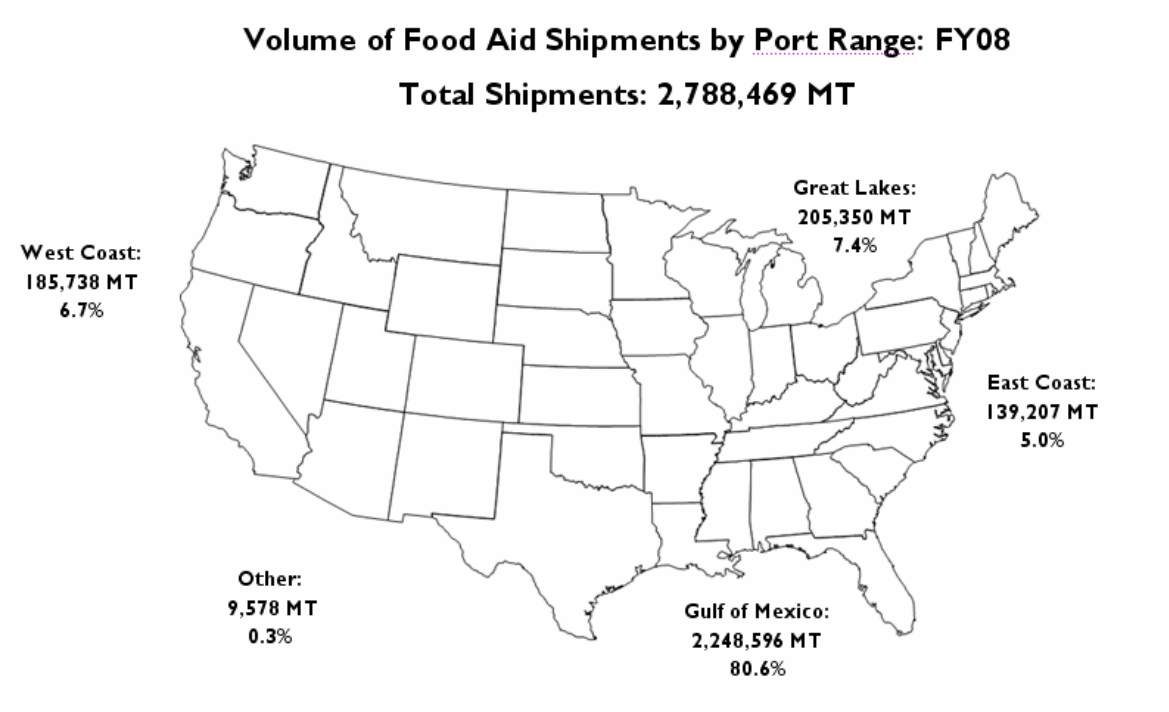
Food Assistance by Program & Commodity: FY09

Commodity	AID PL480 Title II	AID Food for Progress	USDA Food for Education	BEHT	Total
	----------metric tons----------				
Wheat	835,330	173,470	9,020	-	1,017,820
Flour	101,350	19,070	200	-	120,620
Corn	-	3,500	-	21,000	24,500
Sorghum	819,127	-	-	-	819,127
Rice	38,410	900	13,240	-	52,550
Corn/soy	132,660	3,600	20,140	-	156,400
Wheat/soy	22,510	1,000	0	-	23,510
Cornmeal	142,550	3,600	12,320	-	158,470
Beans	38,930	850	4,040	-	43,820
Peas	143,610	3,200	3,960	-	150,770
Lentils	38,870	-	310	-	39,180
Vegetable oil	125,130	21,000	6,910	-	153,040
Other	190	39,730	5,530	-	45,450
Total	2,438,667	269,920	75,670	21,000	2,805,257

Source: KCCO, USDA

2.2 Origins and destinations

The graphic below shows the volume of food aid commodities that was shipped in FY08 from each US port range, i.e. East Coast, West Coast, Gulf Coast and Great Lakes. The "other" category covers transshipments from one foreign port to another. Over 80 percent of the aid shipments went from Gulf Coast ports, mainly in Texas and Louisiana. The balance was about equally divided among the other port ranges.



Source: MARAD compilation of USAID and USDA data

The next table shows tonnage in FY08 by country of discharge of the cargo. For the most part these were the countries targeted for the food aid, but in many cases the commodities were shipped onwards to other countries. (The US government agencies involved have published the amounts of aid programmed for various countries but not the amounts of each commodity ultimately delivered.)

Of the 2.8 million tons of aid in FY08, 2.0 million tons were shipped to countries in Africa, and 0.5 million tons to countries in Asia. Djibouti, Kenya and Sudan were the largest delivery points that year, jointly receiving 1.45 million tons of food commodities. Assistance to other parts of the world was comparatively modest. Shipments to Djibouti were almost all for recipients in Ethiopia. Shipments to Kenya served a number of countries in central Africa, including Chad and Uganda, as well as Kenya itself.

The next table covers FY09 and shows the actual countries where the food aid ended up. It is a longer list because it includes land-locked countries like the Central African Republic and Niger. During that year, 2.2 million tons of aid was shipped to African countries, almost 80 percent of the 2.8 million ton total, and 0.4 million tons went to Asia.

Food Assistance by Program and Ocean Freight Destination: FY08

Country	PL480 Title II	FFP	FFE	PL 480 Title I	Section 416	Grand Total
	----------metric tons----------					
Benin	9,243	1,404	78	-	-	10,725
Cameroon	36,674	-	-	-	-	36,674
Congo, Dem Republic	4,969	90	-	-	-	5,059
Cote d'Ivoire	834	-	-	-	-	834
Djibouti	603,878	-	-	-	-	603,878
Ghana	12,236	-	-	-	-	12,236
Guinea	5,029	-	7,310	-	-	12,339
Guinea Bissau	280	-	4,843	-	-	5,122
Kenya	477,151	-	19,329	-	-	496,480
Liberia	8,255	9,223	614	-	-	18,092
Libya	28,204	-	-	-	-	28,204
Madagascar	3,182	-	1,538	-	-	4,720
Mauritania	31,809	-	-	-	-	31,809
Mozambique	48,511	70,971	18,598	-	-	138,081
Republic of Congo	-	-	6,562	-	-	6,562
Senegal	6,374	-	3,446	-	-	9,820
Sierra Leone	3,461	-	-	-	-	3,461
South Africa	164,322	-	-	-	-	164,322
Sudan	347,510	-	-	-	-	347,510
Tanzania	67,902	-	511	-	-	68,413
Togo	19,082	4,203	2,133	-	-	25,419
Bangladesh	124,957	-	11,500	-	1,016	137,474
Cambodia	-	-	11,912	-	-	11,912
East Timor	1,548	-	-	-	-	1,548
India	32,019	-	-	-	-	32,019
Myanmar	2,156	-	-	-	-	2,156
North Korea	118,261	-	-	-	-	118,261
Pakistan	108,718	9,121	12,740	-	879	131,458
Philippines	-	-	-	44,200	-	44,200
Sri Lanka	47,804	551	-	-	-	48,355
Thailand	-	-	624	-	-	624
Jamaica	-	9,950	288	-	-	10,238
Haiti	75,705	-	-	-	-	75,705
Chile	271	-	-	-	-	271
Colombia	6,653	-	-	-	-	6,653
El Salvador	166	-	-	-	-	166
Guatemala	14,784	-	11,235	-	-	26,019
Honduras	15,391	-	-	-	-	15,391
Nicaragua	10,441	15,999	160	-	-	26,600
Peru	2,978	11,500	-	-	-	14,478
Georgia	-	928	-	-	-	928
Latvia	180	1,579	-	-	-	1,759
Israel	14,103	-	-	-	-	14,103
Syria	20,689	-	-	-	-	20,689
Jordan	17,130	-	-	-	-	17,130
Yemen	573	-	-	-	-	573
Africa	1,878,906	85,892	64,961	-	-	2,029,759
Asia	435,463	9,672	36,777	44,200	1,895	528,007
Carribbean	75,705	9,950	288	-	-	85,943
Latin America	50,683	27,499	11,394	-	-	89,577
Europe	180	2,507	-	-	-	2,687
Middle East	52,495	-	-	-	-	52,495
Grand Total	2,493,433	135,519	113,421	44,200	1,895	2,788,469

Source: MARAD compilation from KCCO, USDA data

Food Assistance by Program and Country of Final Destination: FY09

Country	PL 480 Title II	FFP	FFE	BEHT	Grand Total
	----------metric tons----------				
ALGERIA	6,470	-	-	-	6,470
BURKINA FASO	10,850	-	-	-	10,850
BURUNDI	24,620	7,250	-	-	31,870
CAMEROON	4,690	-	1,130	-	5,820
CHAD	105,370	-	4,380	-	109,750
CONGO, REP OF	-	-	2,370	-	2,370
CTRL AFRICAN RE	3,430	7,050	-	-	10,480
DEM RPBLC CONGO	88,046	-	-	-	88,046
DJIBOUTI	53,937	-	-	-	53,937
ETHIOPIA	584,998	12,500	5,050	-	602,548
GAMBIA	-	2,000	-	-	2,000
GHANA	4,990	-	-	-	4,990
GUINEA	1,400	-	3,810	-	5,210
IVORY COAST	4,980	-	-	-	4,980
KENYA	120,460	-	11,900	-	132,360
LIBERIA	4,860	2,360	-	-	7,220
MADAGASCAR	6,400	-	660	-	7,060
MALAWI	25,230	20,000	5,520	-	50,750
MALI	6,720	-	2,370	-	9,090
MAURITANIA	7,140	-	-	-	7,140
MOZAMBIQUE	45,560	35,600	7,750	-	88,910
NIGER	13,140	5,910	-	-	19,050
RWANDA	7,820	-	8,020	-	15,840
SENEGAL	3,600	1,420	140	-	5,160
SIERRA LEONE	9,460	-	1,260	-	10,720
SOMALIA	185,170	-	-	-	185,170
SUDAN	476,689	-	-	-	476,689
TANZANIA	9,169	-	-	-	9,169
UGANDA	48,387	15,000	5,680	-	69,067
ZAMBIA	1,710	-	-	-	1,710
ZIMBABWE	188,710	-	-	-	188,710
AFGHANISTAN	70,380	19,000	-	-	89,380
BANGLADESH	68,420	-	-	-	68,420
CAMBODIA	-	-	620	-	620
EAST TIMOR	-	3,610	-	-	3,610
INDIA	8,200	-	-	-	8,200
KYRGYZSTAN	-	-	500	-	500
LAOS	-	-	2,010	-	2,010
MONGOLIA	-	25,000	-	-	25,000
NEPAL	7,520	-	-	-	7,520
NORTH KOREA	-	-	-	21,000	21,000
PAKISTAN	59,537	50,000	2,700	-	112,237

Food Assistance by Program and Country of Final Destination: FY09, Continued

Country	PL 480 Title II	FFP	FFE	BEHT	Grand Total
	----------metric tons----------				
PHILIPPINES	1,480	18,730	-	-	20,210
SRI LANKA	37,240	-	-	-	37,240
TAJIKISTAN	2,500	6,870	-	-	9,370
DOMINICAN REPLC	-	1,250	-	-	1,250
HAITI	77,654		-	-	77,654
ARMENIA	-	6,000	-	-	6,000
GEORGIA	1,550		-	-	1,550
BOLIVIA	-	15,370	-	-	15,370
COLOMBIA	8,660		-	-	8,660
GUATEMALA	18,210	15,000	9,360	-	42,570
HONDURAS	1,420	-	-	-	1,420
NICARAGUA	-	-	440	-	440
WEST BANK GAZA	21,430	-	-	-	21,430
YEMEN	460	-	-	-	460
Africa	2,054,005	109,090	60,040	-	2,223,135
Asia	255,277	123,210	5,830	21,000	405,317
Caribbean	77,654	1,250	-	-	78,904
Europe	1,550	6,000	-	-	7,550
Latin America	28,290	30,370	9,800	-	68,460
Middle East	21,890	-	-	-	21,890
Grand Total	2,438,667	269,920	75,670	21,000	2,805,257

Source: KCCO, USDA

SECTION 3: DELIVERY OF US FOOD ASSISTANCE

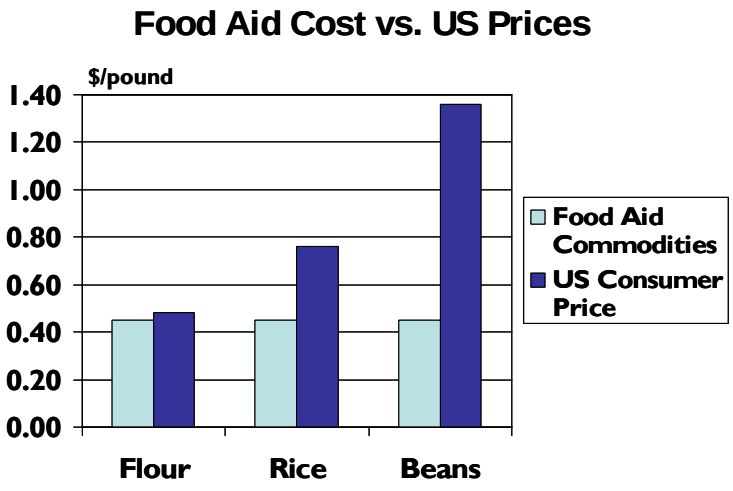
The United States has historically provided the bulk of its international food assistance in the form of US commodities and food products. In earlier decades when there were agricultural surpluses, some of the bulk commodities like grains were acquired as a by-product of price support programs. Today, these are for the most part purchased by USDA's Commodity Credit Corporation (CCC) on the US markets through tenders and competitive bidding. In some cases they are acquired by USDA in the heartland where they are grown or processed, but they are more often acquired at or near a port of export.

From the port of export they are transported by ship to a port in or near the country of destination. In some cases the contracted freight rate includes additional ground transportation to get the commodities to an inland city or a final destination in another country where they ultimately will be distributed or sold, which is called "inland transportation". In addition, WFP and PVOs responsible for the commodities after they are delivered incur considerable costs for internal transportation, storage and handling (ITSH costs) and for administration (Section 202e costs) that are covered by the relevant US assistance program. For emergencies, WFP program budgets show that the ITSH and administrative costs average about twice the cost of getting the US commodities to the foreign port and would be incurred regardless of the origin of the commodities – whether they were grown in a nearby region or shipped from an American farm.[2]

USAID's most recently published annual summary of US food aid covers the 2008 fiscal year and indicates that the total budget cost of getting the products to the ultimate recipients was $984 per metric ton, or about $0.45 per pound.[3] To put that in perspective, it is less than US consumers pay in grocery stores for basic foodstuffs despite the fact that food aid commodities are moved halfway around the world. According to the Bureau of Labor Statistics[4], the average retail prices paid per pound by US consumers in March 2010 were as follows:

- Flour – $0.48
- Rice – $0.76
- Beans – $1.36.

USDA estimates that the farm value of commodities represents only 19 cents out of every dollar that Americans spend on food.[5] In other words, 81 percent of the cost of food to US consumers is incurred after the basic food materials leave the farm.



[2] MARAD, KCCO and unpublished agency data on PL480 Title II.

[3] USAID, U.S. International Food Assistance Report 2008, April 2009.

[4] BLS Average Price Data at http://www.bls.gov/data/.

[5] ERS, USDA at http://www.ers.usda.gov/Briefing/FoodMarketingSystem/pricespreads.htm.

3.1 Transportation costs

The cost of ocean freight is just one of a number of factors affecting the cost of providing food aid. Rates in the freight market vary with shifts in demand, in the supply of vessels, in fuel costs, and in risks from war, piracy, etc. Rates also vary by ship type and size.

The cost of shipping US food aid is also affected by US laws that have long been in effect for the purpose of maintaining a domestic merchant marine, primarily for defense purposes. In times of war, the U.S. Navy needs an auxiliary to meet sealift needs and carry supplies to combat zones. In 1954, Congress passed the Cargo Preference Act which required that at least 50 percent of the tonnage of cargos generated by federal government programs be shipped in US flag vessels. However the law was not fully effective and in 1970 Congress gave the Department of Transportation (DOT) the authority to issue regulations that would allow tighter management of the program.

The 1985 Farm Bill raised the minimum to 75 percent in the case of certain agricultural export programs and required the DOT to pay most of the difference between the cost of using US flag ships and the estimated cost of using foreign flag ships. MARAD therefore collects data from both USAID and USDA and is currently the authoritative source on ocean freight costs.

In FY09, the cost for the donated commodities acquired by USDA was $955 million, measured generally at the port of export.[6] As discussed below in Section 4.3 of the description of our methodology, we estimate that 35 percent, or $334 million, of the commodity cost as measured at US ports reflects the cost of handling, processing and transporting the material beyond the farm level to the port of embarkation within the United States. Thus, the farm value of the crops and animal products is estimated at $621 million or 65 percent of $955 million.

The freight component of $451 million reported by USDA's Kansas City Commodity Office (KCCO) includes not just the ocean freight but also some bundled internal transportation costs in both the United States and the recipient country. As discussed above, for the most part, the CCC buys food aid commodities on a delivered-to-port-of-export basis. But in some instances, the commodity tenders are basis an inland transshipment point or processing facility and the shipper includes in his bid the cost of moving the material to the port. Similarly, if the ultimate delivery point is inland from the unload port, the costs for land transport within the recipient country have to be included in the bid. These costs are difficult to retrieve from the government data system after the fact. The KCCO data show internal US costs of $6.1 million and foreign costs for fumigation, bagging, and transportation of $34.8 million. That leaves $410 million as the ocean freight cost in FY09 (451 minus 6.1 minus 34.8).[7]

For PL 480 Title II, the total cost of ocean freight in FY09 was $336 million, or 14.5 percent of the funds appropriated for that fiscal year.[8] MARAD reimbursements to USAID will be approximately $90 million

[6] Promar International calculations from KCCO data.
[7] KCCO data set.
[8] Calculated from KCCO data set.

according to preliminary data, so the net ocean freight costs are estimated at $246 million or 10.6 percent of appropriations for Title II.[9]

In April 2007, the Government Accountability Office (GAO) estimated that for the Title II program "... approximately 65 percent of expenditures are for transportation to the U.S. port for export, ocean transportation, in-country delivery, associated cargo handling costs, and administration."[10] The GAO authors do not make clear whether they are referring to net or gross ocean transportation costs but we can assume it is the latter. Thus the 14.5 percent of appropriations cited above is broadly consistent with GAO's 65 percent. Earlier we noted that ITSH and management costs are double the ocean transportation costs. If one also factors in the transportation and processing costs within the United States, we estimate that the total is 45-50 percent of the 65 percent cited by GAO, leaving 15-20 percent for ocean transportation.

MARAD analyzes all of the transportation costs involved in the USAID and USDA programs in order to determine how much the Department of Transportation will reimburse the two agencies for certain additional costs involved in using US flag vessels rather than foreign flag vessels that typically have lower rates due to lower taxes and other operating costs. The reimbursements are determined by a complex formula that the Government Accountability Office says works reasonably well. At the time of this research, the most recent fiscal year for which data had been fully compiled was FY08. The table below summarizes by US and foreign flag the FY08 tonnage, total ocean freight cost, and average rate per metric ton.

Food Aid Shipments by Flag in FY08

	US	Foreign	Total
Metric tons	2,233,230	555,239	2,788,469
Ocean freight	$371,237,000	$85,727,000	$456,964,000
Average rate ($/mt)	$166	$154	$164

Source: USDA and USAID, verified by MARAD

In terms of tonnage, 80 percent went on US flag vessels that year. (The share was 86 percent in FY09.) Of the total ocean freight costs, 81 percent were incurred for US flag ships. The average rate of $166/ton for US flag vessels was 8 percent higher than the average foreign flag rate of $154. During 2007 and 2008, freight rates worldwide were unusually high due to booming commodity prices and the high volume of international trade relative to available shipping capacity before the current worldwide recession began.

[9] Promar International calculations from KCCO and MARAD data.

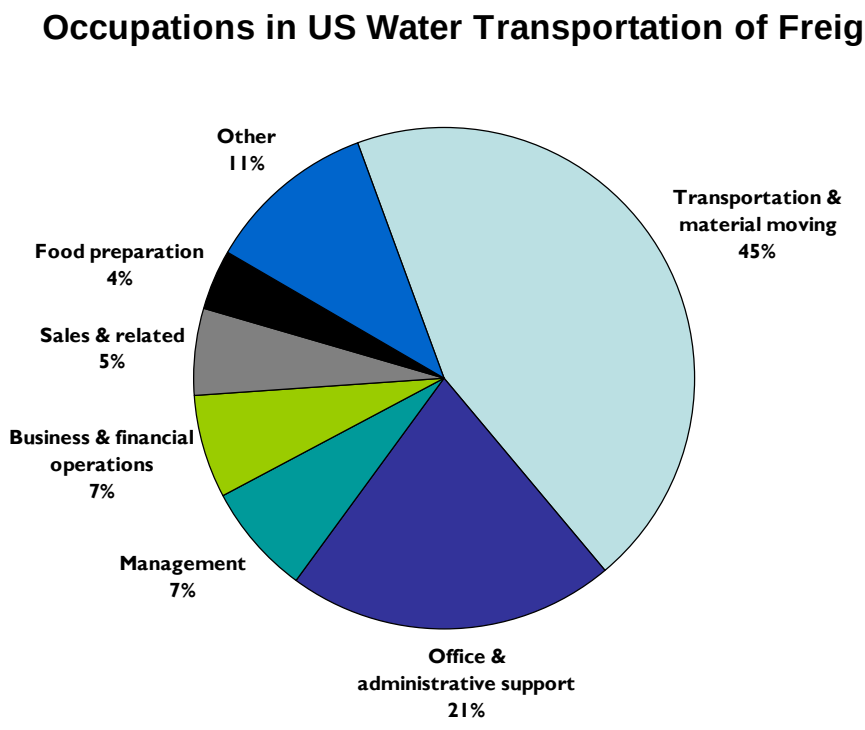
[10] GAO, "Various Challenges Impede the Efficiency and Effectiveness of Food Aid", GAO-07-560, April 2007, page 15.

3.2 Employment in water transportation

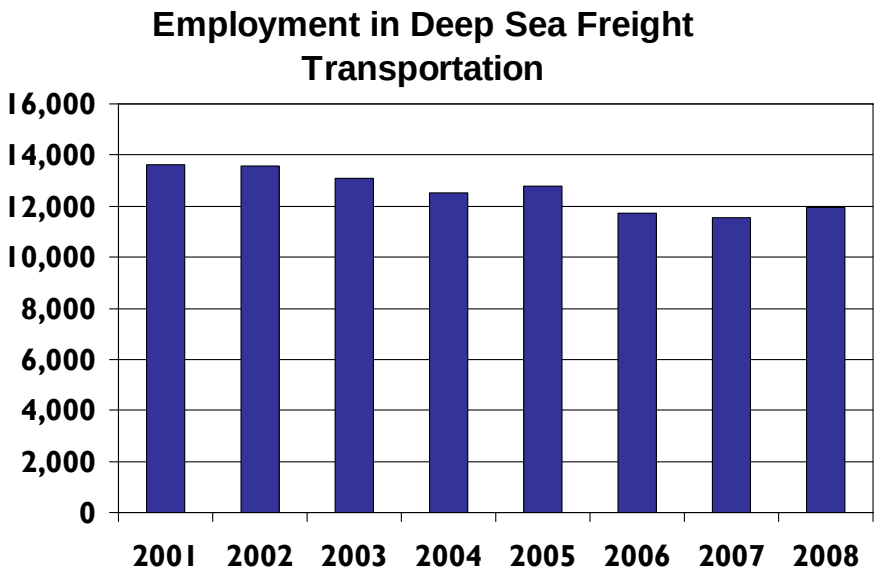
The Bureau of Labor Statistics collects a great deal of information about employment and wages in different industries through its quarterly employment surveys. The North American Industry Classification System (NAICS) code for "deep sea, coastal, and Great Lakes freight transportation" is NAICS 483100. At that level, BLS breaks out the different occupations involved in the industry.

The pie chart below shows the percentage breakdown of the 37,990 people employed in the industry. The largest portion is the 45 percent that are in transportation and material moving occupations. This includes the captains, mates, engineers, sailors and others. The next largest are the office and administrative support staff that account for 21 percent of the total. Management, business and financial operations, sales occupations and food preparation are each in the 4-7 percent range. The remaining 11 percent is comprised of a variety of occupations ranging from computer science, to maintenance, to engineering.

The ocean freight segment of that industry (NAICS 483111) has a similar range of occupations but a breakdown at that subsector level is not reported by BLS. Total employment in the segment in 2008, the last full year covered by the BLS data, was 11,943. The employment trend in the segment has been down at the rate of about 2 percent per year, as illustrated in the bar chart below. For the first half of 2009, employment declined slightly due to the recession and was estimated by BLS at 11,500.



Source: Bureau of Labor Statistics



Source: Bureau of Labor Statistics

SECTION 4: ANALYSIS OF ECONOMIC IMPACTS

4.1 Overview of Methodology

To estimate the impact of handling, processing and transporting food aid on the overall economy of any given geographic area, it is necessary to quantify the relationship between those sectors and each of the other major components of the area's economy. So-called input-output (I-O) models are commonly used for this purpose. Given the great amount of detailed information that is required to build and maintain a national I-O model, there are comparatively few of them in operation. One of the most elaborate of these models is the Regional Industrial Multiplier System (RIMS II) operated by the Bureau of Economic Analysis (BEA) in the US Department of Commerce. This is the primary model used in this analysis.

In order to estimate the domestic economic impacts of international food aid we can divide the economic activity into three segments:

- production of the crops or animal products at the farm level,
- handling, processing and transporting those commodities to ports,
- and shipping the commodities across the ocean to the recipient countries.

A second model that we use is the export multiplier model developed by USDA's Economic Research Service (ERS). It enables one to divide the export value at the port into the farm value, transportation costs, and handling and processing.

4.2 RIMS II multipliers

RIMS II is based on a benchmark I-O table developed by BEA in 1997 and it is updated annually, most recently for 2006. It is described at https://www.bea.gov/regional/rims/. It is comprised of approximately 500 industries. The model traces the interactions among these industries so that the effect of a given level of output in one industry on all other industries can be measured. These measures take the form of multipliers or factors that can be applied to output measured in dollars. They indicate the total economic activity in the state or region associated with a dollar of sales in any particular industry. In addition to measuring the value of output, multipliers are also derived for measuring impacts on earnings of households and on employment. The employment multiplier is the number of total jobs in the state or region associated with one million dollars of sales in that industry.

Given the complexity of tracing these effects throughout the economy, some simplification in methodology is required to keep the task manageable. The first simplifying step in constructing RIMS II was to collapse the nearly 1,200 industries identified in the Census Bureau's North American Industry Classification System to a smaller number of industries. (NAICS replaced the old Standard Industrial Classification system). As a result, **"grain farming"** includes not just grain but peas, beans, and lentils. Grain elevation, storage and merchandising and some processing activities can be subsumed under **"wholesale trade"** and others under **"retail trade". "Truck transportation"** and **"rail transportation"** cover movement of freight, but **"water transportation"** is a single industry encompassing both inland and ocean shipments, and transportation of both freight and passengers. So these are the six industries in the RIMS II system that are relevant to our calculation of the domestic economic impacts of food aid.

A second important step in estimating multipliers is in defining the geographic region of interest. The RIMS II model permits the region of inquiry to be as small as an individual county or as large as a regional aggregation of several states, as long as all the parts are contiguous. The choice of region can have an important effect on the outcome, depending on whether the associated industries are located within the region. As a general rule, the more broadly the region is defined the greater the likelihood that associated industries are represented within the region and the larger the multipliers.

4.3 ERS export margins and RIMS II multipliers

The ERS agricultural trade multipliers are based on the RIMS II model. The ERS system calculates multipliers at both the producer and port levels. In aggregate, the ERS website estimates that "the almost $115 billion of agricultural exports in 2007 produced a total domestic economic output of $273 billion and 920,000 jobs." (The site address is http://www.ers.usda.gov/data/trademultiplier/.)

The online model contains ERS estimates of the margins beyond the farm or processor level. Thus the export value at the port is divided into a producer portion, a transportation portion, and what ERS calls the "wholesale/retail margin". What the latter term covers in practice is everything that happens between the farm and the port other than transportation. That includes grain elevation and storage, processing, bagging, inspection, etc. The table below provides a sampling of these percentage breakdowns. There are no breakdowns for products like corn/soy blend, or peas, beans and lentils. Moreover, the producer level is not defined consistently. In some cases it is the farmer, while in others it is the processor. When it is the processor, one is not capturing the transportation and handling of the crop from farm to processor.

Composition of Export Value at Ports

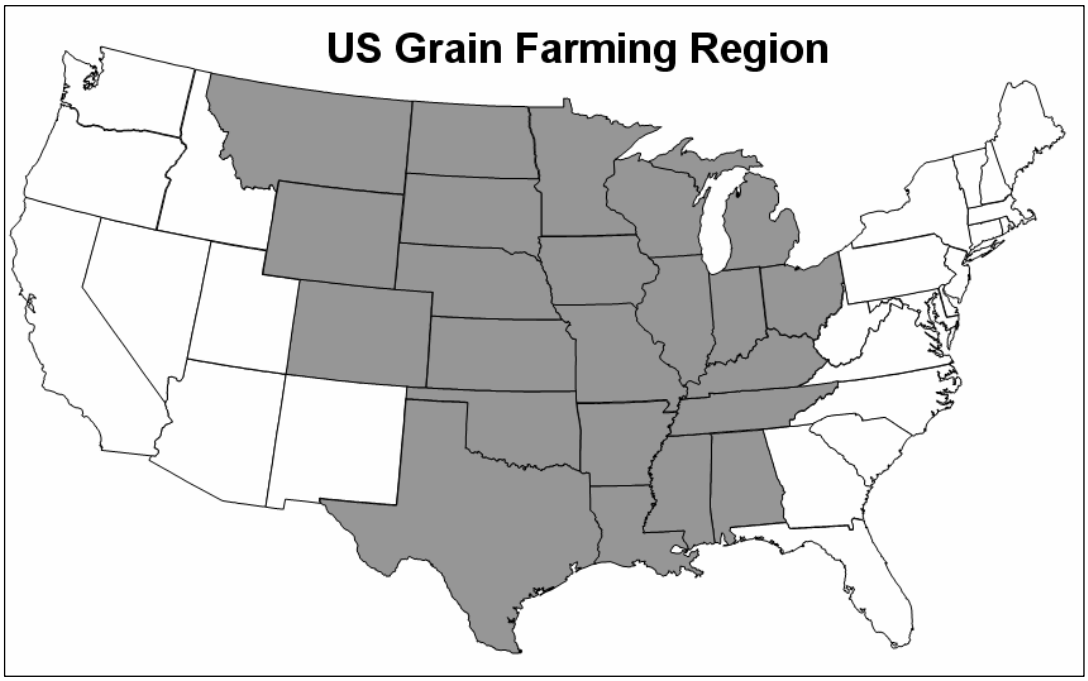
Crop	Producer	Transport	Wholesale/ Retail	Total
		percent		
Wheat	62	16	22	100
Corn	64	15	21	100
Rice	62	16	22	100
Other grains	64	15	21	100
Soybean processing	72	12	16	100
Fats & oils refining	88	7	5	100
Flour milling & malt	85	6	9	100

Source: Economic Research Service, USDA

Since most of the tonnage and value of US food aid is comprised of basic grains like wheat, sorghum and rice, and blends of grain and soy protein, we estimate that on average the farm value represents 65 percent of the export value of food aid commodities, internal transportation 15 percent, and other activities 20 percent. Consequently, we can divide the $955 million in FY09 export value as follows:

- $621 million for farm value
- $143 million for transportation
- $191 million for wholesale and retail margin (grain elevation, processing, etc.).

We have defined what we have called the Grain Farming Region, mapped below, which encompasses those states producing most of the grain, pulses, vegetable oil, etc. that goes into exported food aid.



Source: Region defined by Promar International

The RIMS II multipliers for the transportation and wholesale/retail sectors in this region obtained from BEA are shown in the following table. We have calculated averages for wholesale and retail, and for the three transportation sectors. Most grain moves to export points by barge or rail, but the initial movement from the farm is by truck. There is no actual data on the percentage breakdown of these internal transportation costs for the mix of commodities with which we are dealing, so we gave them equal weights.

Multipliers for Grain Farming Region

	Final Demand Multipliers		
	Output (dollars)	**Earnings (dollars)**	**Employment (jobs)**
Wholesale trade	2.4122	0.7238	17.3538
Retail trade	2.5751	0.7888	28.2111
Average	2.4632	0.7563	22.7825
Rail transportation	2.5503	0.6926	15.3753
Water transportation	2.8267	0.6795	16.1546
Truck transportation	2.7866	0.7648	20.6257
Average	2.7212	0.7123	17.3852

Source: Bureau of Economic Analysis, Department of Commerce

For the ocean transportation part of the analysis, we have defined a 28-state Maritime Region encompassing the key ports on the Gulf, Atlantic and Pacific coasts and the Great Lakes. The region is

illustrated in the map below. (Since the components of a RIMS II region must be contiguous, we have included Arizona and New Mexico to link the Pacific coast states to the others. This does not significantly affect the impact calculations.)

Source: Region defined by Promar International

The table below presents the RIMS-II multipliers for water transportation for our Maritime Region, along with their definitions. These include both the "final demand" and "direct effect" multipliers provided by the BEA model.

Multipliers for the Water Transportation Industry in the "Maritime Region"			
Type	**Multiplier**		**Definition**
Final Demand	**Output** (dollars)	**3.1239**	Dollar change in output in all industries for each dollar of output in water transportation
Final Demand	**Earnings** (dollars)	**0.7748**	Dollar change in earnings of households in all industries for each dollar of output in water transportation
Final Demand	**Employment** (jobs)	**17.5672**	Change in number of jobs in all industries for each million dollars of output in water transportation
Final Demand	**Value added** (dollars)	**1.4287**	Dollar change in value added in all industries for each dollar of output in water transportation
Direct Effect	**Earnings** (dollars)	**5.5467**	Dollar change in earnings of households employed by all industries for each dollar of earnings of households employed in water transportation
Direct Effect	**Employment** (jobs)	**8.5670**	Change in number of jobs in all industries for each additional job in water transportation

Source: Bureau of Economic Analysis, Department of Commerce

For most purposes we focus on the three final demand multipliers for output, earnings and employment. These include the induced effects of households spending their additional earnings. What these tell us is that for every additional dollar spent in the United States on international shipping of food aid in US vessels, a total of $3.09 dollars of economic activity and $0.76 of household income are created in the Maritime Region we defined. And for every million dollars, 17.3 jobs are created.

The direct effect multipliers tell us that for each additional dollar of earnings in water transportation in this region, more than five dollars of earnings are created in all other households. And each job in water transportation results in about 8.5 jobs in all other industries. Thus, the 11,500 US jobs in deep sea freight transportation result in more than 97,000 jobs in other parts of the US economy.

4.4 Calculation of impacts

The table below summarizes the economic impacts of processing and shipping food aid within the United States. The first section of the table allocates the $955 million of FY09 food aid among the farm level, transportation, and the wholesale/retail segment. Spending on transportation is estimated at $143 million and on wholesale/retail at $191 million. The multipliers for the Grain Region are applied to these two values to estimate the economic impacts, which are as follows:

- **$866,000,000 in output of all US industries**
- **$246,000,000 in earnings of households**
- **6,842 jobs.**

Economic Impacts of Domestic Transportation, Handling & Processing of Food Aid in FY09

Export value shares	**percent**	**$million**	
Producer	65	621	
Transportation	15	143	
Wholesale/Retail	20	191	
Total	100	955	
Multipliers	**Output**	**Earnings**	**Employment**
Transportation	2.7212	0.7123	17.3852
Wholesale/Retail	2.4932	0.7563	22.7825
Economic impacts	**$million**		**Jobs**
Transportation	390	102	2,490
Wholesale/Retail	476	144	4,351
Total	866	246	6,842

Source: Promar International

The next table calculates the impacts of ocean freight. As discussed above, the total ocean freight cost for food aid in FY09 was $451 million. Subtracting $35 million of inland destination costs leaves $416 million. Of that total, 86 percent or $358 million was in US-flag vessels. Using that latter amount and the final demand multipliers above, this translates into the following economic impacts:

- **$1,118,000,000 in output of all US industries**
- **$277,000,000 in earnings of households**
- **6,285 jobs.**

Economic Impacts of Ocean Shipment of Food Aid in FY09			
Ocean freight costs	**$million**		
Total	416		
US flag (86%)	358		
Multipliers	**Output**	**Earnings**	**Employment**
Water transportation	3.1239	0.7748	17.5672
Economic impacts	**$million**		**Jobs**
Transportation	1,118	277	6,285

Source: Promar International

Finally, the table below sums up the national impacts of what happens beyond the farm level, both domestic and through shipping in US-flag vessels. The total economic impacts are:

- **$1,984,000,000 in output of all US industries**
- **$524,000,000 in earnings of households**
- **13,127 jobs.**

Total Economic Impact of Shipment of Food Aid in FY09			
	Output	**Earnings**	**Employment**
	$million		**Jobs**
Domestic	866	246	6,842
Ocean	1,118	277	6,285
Total	1,984	524	13,127

Source: Promar International

We can also estimate the impacts at the state level. In the first section of the table on the next page, we allocate the economic impacts from domestic processing and transportation in proportion to USDA's estimates of state exports of grains, oilseeds and vegetable oil. In the middle section we allocate the economic impacts of ocean transportation in proportion to the value of freight by port of export as shown in the KCCO database for FY08. In the final section of the table we sum up the impacts on output, earnings and jobs. Texas, Illinois and Iowa are the top three states in terms of employment impacts, and this does not include the impacts of actually producing the commodities at the farm level.

Impacts on State Economies of Shipping International Food Aid: FY09

State	Impacts of Internal Transportation					Impacts of Ocean Transportation					Total Impacts		
	Exports*	Share	Output	Earnings	Jobs	Freight**	Share	Output	Earnings	Jobs	Output	Earnings	Jobs
	$million	percent	$million	$million	number	$million	percent	$million	$million	number	$million	$million	number
Alabama	81.2	0.28%	2	1	19	1.5	0.34%	4	1	21	6	2	40
Arkansas	1,275.2	4.42%	38	11	303						38	11	303
Colorado	400.4	1.39%	12	3	95						12	3	95
Illinois	3,579.2	12.41%	107	31	849	37.3	8.35%	93	23	525	201	54	1,374
Indiana	1,855.1	6.43%	56	16	440						56	16	440
Iowa	3,671.5	12.73%	110	31	871						110	31	871
Kansas	2,366.6	8.21%	71	20	561						71	20	561
Kentucky	425.5	1.48%	13	4	101						13	4	101
Louisiana	412.3	1.43%	12	4	98	54.6	12.23%	137	34	768	149	37	866
Michigan	600.0	2.08%	18	5	142	8.4	1.88%	21	5	118	39	10	261
Minnesota	2,379.5	8.25%	71	20	565						71	20	565
Mississippi	464.0	1.61%	14	4	110						14	4	110
Missouri	1,387.6	4.81%	42	12	329						42	12	329
Montana	587.8	2.04%	18	5	139						18	5	139
Nebraska	2,404.3	8.34%	72	21	570						72	21	570
New York						1.5	0.34%	4	1	21	4	1	21
North Dakota	1,622.5	5.63%	49	14	385						49	14	385
Ohio	1,411.5	4.89%	42	12	335						42	12	335
Oklahoma	508.8	1.76%	15	4	121						15	4	121
Oregon						28.7	6.43%	72	18	404	72	18	404
South Carolina						0.9	0.20%	2	1	13	2	1	13
South Dakota	1,376.7	4.77%	41	12	327						41	12	327
Tennessee	332.2	1.15%	10	3	79						10	3	79
Texas	1,009.9	3.50%	30	9	240	272.2	60.95%	681	169	3,831	712	177	4,070
Virginia						37.6	8.42%	94	23	529	94	23	529
Washington						3.7	0.83%	9	2	52	9	2	52
Wisconsin	665.7	2.31%	20	6	158	0.2	0.04%	1	0	3	20	6	161
Wyoming	23.6	0.08%	1	0	6						1	0	6
Total	28,840.9	100.00%	866	246	6,842	446.6	100.00%	1,118	277	6,285	1,984	523	13,127

* Source: ERS, USDA; Average for grain, oilseeds, vegoil for FY 2004-08

** Source: KCCO, USDA; Total freight costs for FY 2009

4.5 Effects of foreign reflagging

In addition to the standard approach that economists use to calculate economic impacts, one needs to consider the actual practical effects of reducing total tonnage of preference cargos, which is what would happen if funding for PL 480 Title II were significantly reduced in favor of local or regional purchases.

Ships in the US merchant marine depend to varying degrees on preference cargos from the Department of Defense or for the food aid programs. Some vessels almost exclusively carry preference cargos while others do so much less frequently. But the vessel owners all rely to some degree on the government cargos. Industry sources indicate that preference cargos typically account for about half the tonnage carried by the fleet, and food aid accounts for about 30 percent of preference cargos. If preference tonnage is reduced, it adversely affects the economics of being a US-flag vessel. Owners would simply re-flag vessels in other nations until the ratio of preference cargos to regular cargos is back to a level that makes the economics work.

As an example, on the assumption that food aid cargos represent 15 percent of annual fleet tonnage, and food aid volume is eliminated, the size of the US fleet that could be supported by the preference cargos would shrink by 30 percent. As ships are re-flagged and head office operations shift to other countries, the many jobs associated with ocean freight would eventually disappear. Recalling the direct effect employment multiplier of 8.5670 other jobs for every water transportation job, we can estimate the actual impact. If 30 percent of the 11,500 jobs in the ocean freight portion of the water transportation industry disappeared, an additional 29,550 jobs in other parts of the economy would be lost for a total of about 33,000 jobs lost.

At a minimum, one can consider the smallest number of ships needed to transport food assistance cargos. During FY08, 2.2 million tons were moved on US-flag vessels.[11] Taking into account the destinations, transit time, and loading and unloading, a vessel can make about four round trips per year, so ships with aggregate deadweight capacity of 550,000 tons would have been required. That is in fact about 15 percent of the total capacity of 3.6 million tons for the 88 ships in the US ocean-going fleet at the end of 2008.[12] If one adds the capacities of the eight dry bulk carriers in the fleet plus one tanker and one container or general cargo ship, the total is about 540,000 tons. That 15 percent of the fleet is the least that one would lose through re-flagging. If 15 percent of the 11,500 jobs in the ocean freight portion of the water transportation industry disappeared, an additional 14,775 jobs in other parts of the economy would be lost for a total of about 16,500 jobs. Actual job losses would therefore be somewhere in this 16,500-33,000 range.

[11] MARAD data

[12] MARAD data