

The Timeliness and Cost-Effectiveness of the Local and Regional Procurement of Food Aid

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Abstract: Local and regional procurement (LRP) of food aid is often claimed to lead to quicker and more cost-effective response. We generate timeliness and cost-effectiveness estimates by comparing US-funded LRP activities in nine countries against in-kind, transoceanic food aid shipments from the US to the same countries during the same timeframe. Procuring food locally or distributing cash or vouchers results in a time savings of nearly fourteen weeks, a 62 percent gain. Cost-effectiveness varies significantly by commodity type. Procuring grains locally saved over 50 percent, on average, while local procurement of processed commodities was not always cost-effective.

Keywords: Emergency response, food assistance, foreign aid, humanitarian aid

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I. INTRODUCTION

With budgets tight, food prices high, and global food aid volumes at modern historical lows, policymakers face unprecedented pressure to make efficient use of scarce international food assistance budgets. Likewise, time is of the essence in emergency response, both for saving lives and livelihoods and for keeping costs under control. Advocates of local and regional procurement (LRP) of food aid and cash and vouchers often argue that sourcing food nearer to distribution sites is both faster and more cost-effective than traditional food aid sourced in and shipped from the donor country (“transoceanic food aid”).

Indeed, the assertion that LRP is both cheaper and faster was a crucial part of the argument in favor of LRP during Congressional authorization of the LRP pilot program (LRPPP), managed by the United States Department of Agriculture (USDA), in the United States (US)’ 2008 Farm Bill. The LRPPP was a major policy breakthrough in international food assistance as the US accounts for more than half of global food aid donations in any given year and had previously been the sole major donor that did not permit LRP under its food aid programs. Very soon after the Farm Bill’s passage, the US Agency for International Development (USAID) received supplemental appropriations with Congressional authorization to spend those funds on LRP under what has since become its Emergency Food Security Program (EFSP). These programs can also support the distribution of cash or vouchers to targeted food assistance beneficiaries as a form of decentralized LRP wherein recipients, rather than intermediating agencies, do the procurement through their local commercial food markets.¹ With the launch of the LRPPP and EFSP, in just three short years the US went from supporting effectively no LRP to being the world’s largest food aid LRP donor.

Some reasonable evidence exists to support the cost-effectiveness and timeliness claims of LRP advocates (Clay and Benson 1990; OECD 2005; WFP 2006, 2010; Coulter et al. 2007; Haggblade and Tschirley 2007; USGAO 2009; USDA 2009; Hanrahan 2010). But the data come largely from World

Food Programme (WFP) operations rather than from deliveries by the US-based nongovernmental organizations (NGOs) that have traditionally served as the primary delivery channel for US project and emergency food aid. Moreover, past timeliness and cost-effectiveness estimates have relied largely on comparisons with hypothetical shipments or with broad program averages that do not match by destination, source, delivery time period, and commodity very well. It therefore remained unclear whether US NGOs could truly improve on the timeliness and cost efficiency of transoceanic food aid deliveries if they could employ an LRP option for sourcing commodities. These new programs afford an unprecedented opportunity to carefully evaluate those key claims.

In this paper, we generate timeliness estimates by comparing US NGO LRP activities under the USDA LRP pilot program or USAID EFSP in nine countries against carefully matched in-kind, transoceanic US food aid shipments to the same countries during the same timeframe. All LRP transfers reached recipients faster than food aid from our matched transoceanic shipments. Our findings indicate that procuring food locally or distributing cash or vouchers results in a savings of nearly fourteen weeks, a 62% percent gain in timeliness. The amount of time saved varies by country. Not surprisingly, landlocked countries tend to receive transoceanic shipments more slowly than coastal countries, so the timeliness benefits of LRP vary spatially in intuitive ways.

As with the timeliness estimates, we estimate cost-effectiveness by comparing LRP activities against carefully matched in-kind, transoceanic US food aid shipments, now matching by commodity type as well. We find that cost-effectiveness varies markedly by country and commodity. Procuring unprocessed grains and some pulses locally seems to result in significant cost savings—procuring grains locally resulted in cost savings of over 50 percent, on average—while locally procuring processed commodities such as vegetable oil or corn soy blend (CSB) may or may not be cost-effective relative to transoceanic shipments.

The appropriateness of LRP relative to transoceanic food aid often depends on the objectives of the project. Our findings do not indicate that LRP is always superior to transoceanic food aid in cost-effectiveness terms, although it is always superior by timeliness criteria. However, where markets can adequately meet increased demand for food generated through LRP, LRP can often afford valuable cost and time savings, potentially allowing donors to reach more recipients and/or reach them faster. In an environment of growing demand and diminished resources for food aid, such gains make LRP a valuable part of the international food assistance toolkit.

II. LITERATURE REVIEW

Timeliness and cost efficacy are the two most commonly cited reasons for LRP as an alternative to transoceanic food aid. In 1996, the European Commission (EC) issued Council Regulation number 1292/96, which recognized that local purchases reduced transport costs and delivery times (Council Regulation, 1996; Coulter 2007). That policy change sparked a steady reallocation of food aid from the EC – including from individual member states – from transoceanic, in-kind contributions to LRP. Similarly, in a 1999 review of WFP’s procurement activities, WFP laid out three reasons for local procurement: cost efficacy, gains in timeliness, and purchase of locally appropriate foods. Over the subsequent decade, WFP moved to LRP for a large majority of its non-US-funded food assistance operations. Hanrahan (2010) reports that beginning with budget submissions for fiscal year 2006, the Bush administration argued that gains in timeliness and cost-effectiveness could be made with LRP compared to transoceanic food aid. Partly in response to a major OECD (2005) study, in 2005, Canada raised the cap on LRP in its food aid programs from 10 to 50 percent; then in 2008 it removed the ceiling entirely, permitting 100 percent LRP, citing, among other reasons, interest in improving efficiency of its food assistance (GAO 2009).

Donor and agency interest in and use of LRP—including cash and voucher transfers—has been spurred in part by evidence that tends to find that LRP outperforms transoceanic food aid and that cash

and vouchers are often faster, and may be cheaper, than transoceanic food aid and LRP food.

Unfortunately, comparisons among food assistance forms are often hampered by lack of comparable data. Ideally, comparisons among transoceanic food aid, LRP, vouchers, and cash instruments would utilize data generated from projects targeting similar people in similar locations at similar times for similar purposes, with the only parameter varying being the type of transfer. Such similarity is rarely if ever achieved, however, due to ethical, logistical and political constraints on the allocation of scarce food assistance, especially in emergency settings. Instead, analysts use the best available data to compute comparisons across different types of food assistance. A further difficulty is that because much of the funding for LRP and for transoceanic food aid is directed toward sub-Saharan Africa, many of the cost and time comparisons are findings for sub-Saharan Africa and may not generalize well to other regions, such as Latin America.

LRP is positioned as a means to achieving cost and time savings relative to transoceanic food aid (Clay and Benson 1990; OECD 2005; WFP 2006, 2010; Coulter et al. 2007; Haggblade and Tschirley 2007; USGAO 2009; USDA 2009; Hanrahan 2010). A number of studies report on the time differences of LRP relative to transoceanic food aid deliveries, although the amount of time saved varies by region. Barrett and Maxwell (2005) report the median delivery time of USAID Title II emergency food aid to be almost five months, computed as the duration between the call forward date and the date the food aid arrives at the delivery port for shipments occurring in 1999 and 2000. Haggblade and Tschirley (2007) report that the WFP in Zambia found that procuring white maize locally or regionally required four to twelve weeks on average, as opposed to food aid shipments from the US, which required four to five months, resulting in a savings of between four to eight weeks. GAO (2009) also examined delivery times for WFP purchases relative to US food aid for ten sub-Saharan countries between 2004 and 2008. They measured delivery time for WFP's LRP activities as the number of days between the purchase order date and the date of possession. Local (regional) procurement took on average 35 (41) days, while international in-kind donations required, on average, 147 days to arrive.

GAO (2009) cites a Department of Transportation (DOT) study that finds that prepositioning can offer gains in timeliness relative to some LRP activities. An analysis by DOT found that US prepositioned food aid could have been faster than a 2008 regional procurement from South Africa to Somalia (GAO 2009, p. 23). Further, infrastructure limitations could delay delivery of regionally procured food aid. Therefore, prepositioned food aid may be a way for transoceanic shipments to be delivered faster than LRP. But gains in timeliness through food aid prepositioning come at a cost. Prepositioned food aid tends to be more expensive than other forms of assistance due to higher storage and freight costs. GAO (2007) reports that prepositioned food aid costs 25 to 40 percent more than transoceanic food aid due to additional loading, unloading, and waiting time at port, as well as storage charges. Thus, prepositioning may be a more expensive means than LRP, cash, or vouchers to improve on timeliness relative to traditional, transoceanic food aid.

Cash and vouchers are generally considered faster than either transoceanic food aid or LRP (Harvey 2005). However, there are few side-by-side timeliness comparisons between cash or vouchers and transoceanic food aid or LRP. Rather, cash and voucher timeliness comparisons tend to rely on information regarding average delivery times for transoceanic food aid, such as the five month median delivery time computed by Barrett and Maxwell (2005). The time savings associated with cash and vouchers depends on how administratively cumbersome or simple distributions are (Upton and Lentz 2011). In one example comparing cash to LRP, Adams and Winahu (2006) find that WFP's delivery of cash in post-tsunami Sri Lanka saved time relative to local procurement because food procurement systems were logistically complex and slow.

Many LRP—transoceanic comparisons are hampered either by a lack of actual LRP procurement costs or a lack of comparable transoceanic food aid costs, reflecting both difficulties in data collection and that it is rare for LRP and transoceanic deliveries to occur in the same country within the same time

period. In previous studies, LRP costs are computed as actual (or estimated) local commodity costs and may also include internal transport shipping and handling (ITSH) while transoceanic costs are computed as actual (or estimated) commodity costs and actual (or estimated) ocean freight. Some transoceanic costs also include actual (or estimated) ITSH. Yet, to date a lack of data has prevented analysts from comparing these two activities directly. Instead, analysts used one set of actual costs (LRP or transoceanic) and relied on cost estimates for the other mode.

OECD (2005) computes ratios of the reported actual cost of transoceanic food aid to the estimated alternative commercial costs of procuring food in a recipient markets, sometimes known in the literature as “alpha values.” The authors compare reported major donor food aid costs to estimated commercial costs for LRP purchases in various countries during 2002—2003. The commercial costs are the estimated import parity price for each country, generated by combining quoted US gulf port prices and freight costs. OECD (2005) estimated the overall inefficiency of food aid relative to estimated alternative commercial transactions as 27 percent, finding the greatest cost savings are associated with maize, wheat, and rice. The study’s authors acknowledge that using such an approach understates the actual savings that LRP could achieve (OECD 2005; Lentz and Barrett 2007).

Yet, local prices often differ from import parity prices. Lentz and Barrett (2007) refine OECD’s (2005) findings by using local commercial costs rather than commercial import costs and by using delivered food aid costs. They compute alpha values using data on actual USDA food aid commodity and ocean-shipping costs, which they compare to domestic commercial commodity market prices—but not the cost of actual food aid procurements—in Tanzania, Kenya, and Ethiopia. The authors find that the median food aid delivery was 21 percent more expensive than locally procuring the same commodity in the same calendar quarter (Lentz and Barrett 2007). Due to lack of available domestic price series for vegetable oil and other products, the analysis was limited to hard red wheat and yellow maize.

Tschirley and del Castillo (2007) compared WFP's actual local and regional procurement costs of maize in Zambia, Kenya, and Uganda to estimated costs of US-sourced transoceanic food aid. The authors estimate US food aid costs by including USDA commodity price series, US transport costs, and estimated ocean freight for the period 2001 through 2005. The authors report that local procurement cost 55 percent, 54 percent, and 77 percent of transoceanic food aid in Uganda, Zambia, and Kenya, respectively (and 57 percent on average across all three countries). In a second analysis, Tschirley and del Castillo (2007) examine the price paid by WFP relative to the prevailing local market price. In Uganda and Kenya, they find that WFP paid an approximately 10 percent premium relative to market prices, but find that WFP's purchases in Zambia were near or below market prices. Thus, Tschirley and del Castillo (2007) find that agencies may pay a small premium relative to local market prices and still enjoy significant cost savings relative to transoceanic food aid shipments.

WFP's procurement activities have expanded greatly since 2005. WFP's (2011) summary report of Purchase for Progress (P4P), a project designed to engage more smallholder producers and processors in LRP opportunities, shows that only slightly more than 2 percent of P4P purchases over the September 2008 – September 2011 period were at prices exceeding import parity. Among the five procurements that resulted in prices above IPP, three were purchases of pulses in Latin America (Honduras, Guatemala, and El Salvador) and two were purchases of processed foods in Kenya and Sierra Leone (WFP 2011). Between January 1, 2009, and September 30, 2011, P4P comprised only 13 percent of WFP's total local and regional procurements; almost all of the remainder is made through competitive-bidding processes that drop the smallholder development objective intrinsic to P4P.

GAO (2009) compared the per ton cost of procuring similar commodities (beans, corn soy blend (CSB), maize, maize meal, rice, sorghum/millet, vegetable oil, and wheat) for the same recipient countries and the same quarter locally by WFP and transoceanically through USAID. Local procurement costs included delivery duty unpaid (including transportation costs to the destination but not the import duty),

while the USAID procurement costs included commodity purchase, ocean shipping, and inland freight costs. The WFP regional procurement costs were free on board compared to USAID's commodity costs plus inland freight (GAO 2009, p. 18). GAO (2009) finds that WFP's local procurements resulted in an average savings of 34 percent in sub-Saharan Africa and 29 percent in Asia but no substantial cost savings in Latin America, as compared to USAID procurements. GAO (2009) does not present commodity-specific or location-specific cost-effectiveness findings for LRP, so the implicit policy guidance is only geographic and at continental scale.

The cost efficacy analyses of GAO (2009) and Tschirley and del Castillo (2007) are limited to procurement by WFP, arguably the agency with the most experience procuring food aid. For example, in 2010, WFP procured in developing countries over 2,618,000 metric tons of food valued at over \$975,000,000 (WFP 2010, p. 5). Whether other agencies with less procurement experience can garner similar cost savings has not yet been systematically determined, although Haggblade and Tschirley (2007) find that prices paid by other NGOs relative to WFP tend to be higher because of lower quantities procured, less frequent procurements and lack of regional procurement offices with specialized staff. So important questions remain as to the generalizability of prior cost-effectiveness findings to US NGO LRP operations.

The US is currently and historically the largest source of transoceanic food aid; therefore, cost comparisons often compare LRP to US-sourced food aid (Lentz and Barrett 2007, GAO 2009). Some of the cost savings associated with LRP relative to US transoceanic food aid are attributable to the high ocean freight costs incurred by US transoceanic food aid resulting from US agricultural cargo preference laws (Barrett and Maxwell 2005; Bageant et al. 2010). Bageant et al. (2010) estimate that US food aid agencies' compliance with cargo preference restrictions result in shipping costs 46 percent higher than competitive freight costs. These higher costs are one reason for higher total transoceanic costs relative to LRP costs. GAO (2009) notes that the lack of cost savings it found in WFP's LRP in Latin America is likely due to lower shipping costs from the US relative to shipping costs to sub-Saharan Africa from the

US.

Harvey (2005) reports that cost-effectiveness comparisons between cash and food aid or between vouchers and food aid are difficult, in part because the types of costs included vary. Gentilini (2007) and Meyer (2007) concur, noting that cash and voucher project costs depend on food costs, implementation costs, and distribution costs but also on accounting practices. Clearly, high and/or volatile food costs can drive down the relative efficiency of cash and vouchers, or can erode purchasing power of recipients when the transfers are not indexed to prices. However, overall cost-effectiveness is also shaped by distribution and administrative costs, which are heavily dependent on the approach taken by the agency. For example, distributing cash or vouchers electronically, such as through smart cards or cell phones redeemable at financial institutions or merchants, often drives up the fixed costs of distribution but can accelerate delivery and generate efficiency through very low marginal costs when amortized across several distributions or linked to other services, such as establishing savings accounts (Upton and Lentz 2011). In the comparisons we make below for cash and vouchers transfers, we therefore include commodity and ITSH costs as well as costs associated with voucher printing, while excluding administrative and distribution costs.

III. DATA AND METHOD FOR TIMELINESS ANALYSIS

As already discussed, past timeliness estimates have relied largely on comparisons with hypothetical shipments or with broad program averages that do not match by destination, time period and commodity closely. Our data allow us to compare LRP activities against carefully matched in-kind, transoceanic US food aid shipments. We compare event histories of LRP and transoceanic deliveries to the same country during the same time period so as to control for subtle differences due to timing (e.g., equivalent trafficability of roads, seasonal bunching of ocean freight contracting), imperfect matching of locations with different sea routes, differences in vessel type based on different cargo (e.g., using bulk

carriers versus liners), and endogenous choice of sourcing options (e.g., transoceanic shipments occurring when they can be done relatively speedily).

In order to make such matches, we were provided data from the four NGOs in the LRP Learning Alliance (Catholic Relief Services, Land O'Lakes, Mercy Corps, and World Vision) on their LRP, cash, and voucher projects and on all fiscal year (FY) 2011 transoceanic food aid shipment data from USAID and USDA. The nine countries involved are Bangladesh, Burkina Faso, Guatemala, Kenya, Kyrgyzstan, Mali, Niger, Uganda, and Zambia. For each country we included all emergency and nonemergency USDA and USAID-sponsored transoceanic shipments that occurred in that country up to six months before or after the expected final LRP purchase date as listed in their original grant proposals. For cash and vouchers, we used six months on either side of the expected final distribution date. The one exception is Zambia, which did not receive any USDA or USAID food aid shipments during the one-year window. Instead, we used US food aid shipments to its neighbouring country, Zimbabwe, as proxies for the missing Zambia shipments data.

Table 1 here

We then approached the operational agencies that received shipments matching those criteria. In addition to the LRP Learning Alliance members, ACDI-VOCA, Africare, CARE, Save the Children, Share de Guatemala, and the WFP graciously provided data on dates of port arrival, arrival at final warehouses prior to distribution, and ITSH costs. We treat different delivery dates to final distribution warehouses as distinct observations in these data, so that our accounting is based on deliveries rather than shipments. In the analysis that follows, we describe the set of comparisons that are available; we are not at liberty to release information on specific shipments provided to us directly by these agencies.

We compare the time it takes from initiating procurement to bulk delivery to terminal warehouses prior to final distribution to recipients. In cases of transoceanic shipments that are monetized, we used the

delivery dates to the warehouse used before sale (generally near the port of entry²). For traditional food aid programs, the start date is the US government's release of an invitation for bids for commodity and ocean freight services for a USAID or USDA food aid program that procures commodity in and ships from the United States. For the LRP program, the initiation depends on the type of LRP activity. When commodities are procured competitively through a hard-tendering³ process, the delivery period is initiated the date the tender was released and continues until the product was delivered to terminal warehouses prior to final distribution to recipients. For local procurement not through hard tender (e.g., soft-tendering or semi-competitive contracting directly with preferred suppliers), we start counting from the date vendor contracting/certification began until the product was delivered to terminal warehouses prior to final distribution to recipients. For voucher programs, we start counting from the date vendor contracting/certification began until voucher distribution to recipients began. Note that this generates some upward bias in voucher delivery times relative to the other food assistance methods, for which we stop measuring delivery times at the final warehouse delivery, one step prior to final delivery to individual ration recipients. The one case where we do not use the invitation to bid for commodity for the transoceanic food aid shipments is in the one cash transfer project we include (in Kyrgyzstan). In cash projects, there is no obvious comparative initiation date comparable to a conventional invitation to bids from food aid suppliers. Therefore, we use the pre-authorization date for the LRP program and the award date for the transoceanic shipment and as the initiation dates. The end date is the distribution of cash to recipients; the end date for the transoceanic shipments to which the cash transfers is compared continues to be final warehouse delivery. We summarize these measurement issues in Table 1.

Ideally, we would be able to make distinct comparisons for emergency and non-emergency shipments. Unfortunately, however, we were not able to distinguish explicitly between emergency and non-emergency shipments in the transoceanic shipments used as comparisons to the LRP event histories. Therefore, we cannot assess timeliness gains for LRP emergency procurements against transoceanic

emergency shipments or for LRP nonemergency procurements against transoceanic nonemergency shipments.

IV. TIMELINESS FINDINGS

We find that food procured locally and distribution of cash and vouchers are significantly faster than transoceanic food aid deliveries for all nine countries. Several of the comparison transoceanic shipments had not yet arrived by the time of analysis, so we truncated these, estimating the arrival dates to be the latest confirmed date that the shipment had not yet arrived. Comparisons relying on these “truncated” dates necessarily underestimate transoceanic delivery times, understating the estimated timeliness gains due to LRP. In computing the mean difference for all deliveries, we use both actual and truncated deliveries.

Regardless of whether we compare against actual or truncated arrival dates, LRP yields considerable, and statistically significant, time savings relative to transoceanic deliveries. Relative to all transoceanic shipments, LRP was 13.8 weeks faster, a savings of 62 percent. Comparing just those LRP deliveries matched with arrived transoceanic shipments, we find a similar savings of 13 weeks, or 57 percent (Figure 1).⁴

Figure 1 here.

Geography and the type of transfer contribute to the amount of time saved. The mean time savings is greatest for projects in landlocked countries and off of major shipping routes. In landlocked countries, projects relying on LRP, cash, and vouchers rather than transoceanic shipments saved between 11 and 24 weeks. The greatest estimated time savings were associated with the Zambia LRP project. But, as noted previously, we had to match the Zambia LRP project with transoceanic food aid deliveries to Zimbabwe, which were offloaded in Beira Mozambique, a port commonly used for transoceanic deliveries to Zambia. Inland deliveries to Zimbabwe from Beira are typically quicker than to Zambia, so we doubt this substitution accounts for the considerable estimated timeliness gains there. In Burkina Faso,

the country project with the second largest number of weeks saved, we were able to match 24 LRP actions with 71 transoceanic actions, 64 of which had arrived by the time our analysis. We found that LRP saved, on average, 19.5 weeks compared to transoceanic food aid deliveries, a substantial, and statistically significant, gain in timeliness. Agencies with projects in the sample's remaining inland countries—Niger, Uganda, Mali, and Kyrgyzstan—also saved considerable time relative to transoceanic food aid deliveries, with all the differences statistically significantly different from zero at the one percent level.⁵

Even in coastal countries, LRP saved significant time. In Kenya, local procurement also saved over 11 weeks relative to transoceanic food aid. Not surprisingly, LRP in Bangladesh and Guatemala saved the least time. Yet, savings of slightly more than six weeks for Bangladesh and five and a half weeks for Guatemala are still statistically significant at the one percent and ten percent levels, respectively. Guatemala is quite near the US and these countries are both on major shipping routes, allowing food aid shipments to reach them faster.

Figure 2 here.

Turning to timeliness by type of transfer (Figure 2), we find that fairs and cash transfers tend to be fastest. Fairs are a special type of voucher programming intended to bring recipients and small producers and sellers together in the same location. Typically, an agency announces the date of a fair and what products will be redeemable by voucher recipients several weeks in advance. On the day of the fair, smallholder producers and petty traders gather in one location to sell their commodities to targeted recipients provided with vouchers that they redeem for commodities from the invited vendors. The agency then reimburses sellers for the value of the vouchers. LRP through soft tendering—i.e., targeted procurement from smaller producers, farmer organizations, or specific processors or traders—took slightly longer than hard tendering—i.e., standard open competitive bidding. This is likely due to the additional logistical requirements of identifying appropriate vendors and then explaining the tender

specifications, such as quality and safety standards, bagging requirements and contracting that are more familiar to larger traders who regularly deliver under hard tendering contracts (WFP 2011).

Aside from a few hard tendered procurements, all LRP, cash, fair, and voucher deliveries occurred faster than the median transoceanic delivery. Further, the median number of weeks for a transoceanic shipment was more than double that for cash distributions and procurement via hard tendering, soft tendering, and fairs. Some voucher projects were quite quick, with distributions occurring within ten weeks. For example, only six weeks elapsed between the date of vendor certification and first distribution in the Uganda project. More time elapsed in other voucher projects, such as in Burkina Faso. However, as discussed previously, our method of counting the time between vendor certification and voucher distribution likely underestimates the number of weeks saved. Agencies often contact vendors as early as possible to provide merchants with ample time to expand their supply in order to meet voucher recipients' added demand without fuelling local price increases. Vendors may not need the amount of time provided and therefore, our method cautiously estimates the time required to establish a voucher project.

Finally, a few important caveats remain. First, agencies using LRP may choose to slow down the delivery processes, particularly in the cases of processed products, which have a shorter shelf life. This means that the reported LRP delivery times may be intentionally longer than necessary. For example, the Bangladesh LRP project distributed fortified processed goods, and the NGO asked its processors to stagger production in order to minimize storage time. This appears as a delivery delay in the data but it was chosen so as to reduce storage costs and potential product spoilage.

Second, we only have matched transoceanic data for food aid delivered from the US. Deliveries of prepositioned food aid can cut down delivery times, especially to locations near prepositioning sites. However, as noted earlier, prepositioning is expensive.

Finally, we did not have access to data breaking down transoceanic shipments by emergency and non-emergency. In FY2010, 67 percent of Title II Food for Peace, Title I, and CCC-funded Food for Progress, McGovern Dole, and Bill Emerson Humanitarian Trust funds went to emergency food aid purchases (USDA/USAID 2010). Our sample includes a similar mixture of emergency and development (i.e., nonemergency) projects. Of the nine projects, five (Guatemala, Kenya, Kyrgyzstan, Niger, and Uganda) were emergency projects. Compared to a mix of emergency and non-emergency transoceanic shipments, the timeliness gains of procuring food locally for emergency response varied between five and a half weeks in Guatemala to seventeen weeks in Niger. Similar savings hold for nonemergency LRP. In Bangladesh, nonemergency LRP saved over six weeks compared to an (unknown) mix emergency and nonemergency transoceanic shipments while in Zambia, nonemergency LRP saved 24 weeks relative to a mixture of transoceanic shipments to Zimbabwe. If anything, the slightly greater share of emergency transoceanic shipments relative to LRP programs should bias downwards the estimated time savings from LRP, reinforcing our qualitative results.

V. DATA AND METHOD FOR COST COMPARISONS

We estimate cost-effectiveness by comparing LRP activities against matched in-kind, transoceanic US food aid shipments. We use the same criteria for the cost comparisons as in the timeliness comparisons above, except that we also now matched only with reasonably similar commodities. So as to control for other differences that might otherwise distort the comparison, we compare costs of LRP, vouchers, or cash, and transoceanic deliveries to the same country matched in time and by commodity. This matching helps to minimize differences due to factors such as changing commodity or freight prices, imperfect matching of locations with different sea routes, and endogenous choice of sourcing options (e.g., transoceanic shipments occurring when they are relatively cheap).

In generating cost-effectiveness estimates, we include the cost of the commodity, ocean freight, and ITSH for food aid shipments from the US. USDA and USAID provided commodity and ocean freight costs. The agencies identified earlier generously provided information on ITSH costs for those same shipments and confirmed the commodity and ocean freight costs reported by the relevant government agency. Where ITSH was reported as a single figure across multiple commodities in a shipment (or multiple shipments where one or more was stored at port temporarily), we allocated ITSH among commodities in proportion to cargo weight. If we had multiple transoceanic shipments of the same commodity, we weighted commodity costs, ocean freight, and ITSH costs by volume.

LRP costs include analogous costs of commodity delivered to final distribution warehouses, although ITSH costs are zero when suppliers delivered the commodity to terminal warehouses at the time of distribution.⁶ In cases of multiple local procurements of the same commodity, we likewise computed weighted average commodity and ITSH costs. When local prices were reported for locally procured products, we converted them to dollars per metric ton (MT) or dollars per liter (for vegetable oil) using the World Bank's Global Economic Monitor average monthly exchange rate for the month of procurement.⁷ In the case of commodity-denominated vouchers, we compared the commodity cost for the redeemed voucher to transoceanic costs. In the case of cash and cash vouchers, we identified a major staple product and, if necessary, converted the local cost to dollars using the average monthly exchange rate during the month of first distribution.⁸ We did not include voucher printing costs or cash distribution costs because these are costs associated with distribution and we do not have matched information on direct distribution costs for transoceanic food shipments. Further, an agency can choose an expensive method (e.g., via banking cards) or a cheaper method (e.g., paper vouchers). However, it is worth noting that voucher printing costs were relatively inexpensive. In Uganda, voucher printing cost about \$0.53 per recipient. In Burkina Faso, voucher printing cost about \$0.02 per metric ton of cowpeas.

VI. COST COMPARISON FINDINGS

Comparing matched total costs for matched LRP and transoceanic shipments, we find that the cost advantages of LRP vary markedly by commodity category. To illustrate this fundamental point, we present separate cost comparisons for processed products, pulses, and cereals.

We find that LRP, on average, is not more cost-effective than transoceanic shipments of processed products: vegetable oil and corn soy blend. On average, purchasing vegetable oil or CSB locally costs 26 percent more than transoceanic food aid. However, this varies by region and by the degree of processing and type of packaging (Table 2). In Guatemala, Incaparina, a locally produced CSB product, costs more than twice as much as CSB sourced from the US and delivered to a final distribution warehouse. Both transoceanic CSB and Incaparina are micronutrient fortified. However, Incaparina has slightly more micronutrients and is packaged in 450 gram retail bags, features that add to its cost, although they likely do not fully explain the estimated cost differential.⁹ Guatemala is coastal, near the US, and on a major shipping line, all of which contribute to lower shipping costs relative to transoceanic deliveries elsewhere. Furthermore, the scale and efficiency of US food processors relative to those in Guatemala likely also helps account for the cost advantages of US-sourced processed products relative to LRP of comparable commodities in Central America.

Procuring vegetable oil locally was also more expensive than transoceanic shipments in inland West Africa. Vegetable oil in Niger and Burkina Faso tends to originate in Cote d'Ivoire. Agencies operating in West Africa noted that the crisis following Cote d'Ivoire's November 2010 presidential election led to significant increases in transportation and commodity prices, which could account for the large price differential between transoceanic vegetable oil and vegetable oil procured regionally.¹⁰ Alternatively, CSB and vegetable oil procured in Kenya were cheaper than similar products delivered from the US. So it is not universally true that processed products are more expensive when sourced locally than shipped from the US, although it is true on average in our sample.

Table 2 here.

Turning to pulses and beans (Table 3), we find that on average, it is 25 percent less expensive to procure locally than transoceanic deliveries. In all instances except procurement of beans in Guatemala, it is cheaper to procure locally. As noted above, it is likely that Guatemala's proximity to the US and frequent container shipping to Guatemala drive down transoceanic costs relative to other locations. While¹¹ local procurement tends to reduce costs, the extent of savings depends on the pulses used for comparison. The types of pulses and beans that are available and commonly consumed vary greatly by region. For example, chickpeas procured in Bangladesh are between 8 and 24 percent less expensive than transoceanic lentils and split peas, respectively (Table 3). Moreover, in Kenya it is much more cost effective to procure yellow split peas locally than beans, with a statistically significant average cost savings of 34%.

Table 3 here.

In our sample, the greatest cost savings—53 percent, on average—come from local procurement of bulk cereals, which shows statistically significant cost savings for all comparisons with matched transoceanic shipments. As with pulses, the types of cereals used for comparison may drive some of this estimated price differential. For example, the US does not deliver millet, the price of which may be lower than its nearest substitutes, bulgur and sorghum. Nonetheless, as reported in Table 4, the weighted average savings for each match (between 45 and 62 percent) are so high that even after adjusting for cost differences due to differing commodity types, the overall savings would almost surely remain substantial.

Table 4 here.

Where the key issue in timeliness gains from LRP appears to be geography—is the country land-locked? Is it far from the US?—the main issue driving cost savings appears to be commodity type. Shipping bulky cereals from the US is extremely expensive relative to the underlying commodity value. A ratio of weighted average commodity costs over weighted average ocean freight costs for processed products is about five for processed products, while the same ratio is about two for cereals (Table 5). In

other words, a much larger portion of total transoceanic costs for cereals is spent on ocean freight charges that are unnecessary with LRP. Cereals that are relatively cheap to produce in the US lose their efficiency advantage because their cost per metric ton prices more than doubles due to high ocean and ITSH expenses. By contrast, those very similar non-product costs are much less significant for processed products, enabling US-sourced commodities to remain cost competitive with LRP.

Furthermore, compliance with Agricultural Cargo Preferences (ACP) drives up ocean freight costs for transoceanic shipments. Under ACP, 75 percent of US food aid must be shipped on US flagged vessels. Due to lack of competition and arcane bidding practices, these vessels tend to be more expensive than foreign flagged carriers. Bageant et al (2010) compute that in 2006, USAID compliance with ACP increased food aid cargo costs by 46%, a premium of roughly \$104 million dollars. Decreasing cereal ocean freight costs by 32 percent (i.e., the reciprocal of the 46 percent premium) reduces shipping costs to \$155.95, resulting in an overall savings of about 9 percent for bulk cereals.

Table 5 here.

The evidence clearly indicates that locally procuring bulky commodities such as cereals and many pulses generates significant cost savings for NGOs. Cost savings associated with locally procured processed products are more difficult to achieve and appear to depend on the efficiency and competitiveness of local processors.

VII. POLICY IMPLICATIONS AND CONCLUSION

Not all food assistance responses are equally suitable in all situations (Barrett and Maxwell 2005, Barrett et al. 2009). The specific goals for a given food assistance activity matter in determining the best form in which to provide assistance: in-kind food aid shipped from the US, locally or regionally procured food aid, vouchers, or cash transfers. For example, an agency or donor may be willing to trade off cost efficiency for speed or in order to support local producers or processors. Other contextual factors matter as well, such as the specific location of the activity, the commodities involved and whether LRP is even

appropriate/feasible in the current and expected market conditions. But the evidence available prior to the 2008 changes to US food aid policy—based on analysis of WFP data and hypothetical transactions—was that LRP could be a valuable addition to the international food assistance toolbox, especially with respect to cost savings and timeliness gains.

When LRP is appropriate, the evidence reported in this paper, from US NGOs' initial forays into LRP and cash or voucher distribution using US government resources, clearly shows that cash and fairs are delivered faster than vouchers and locally procured food, which, in turn, are statistically significantly faster than transoceanic food. There are important regional differences. While still faster than transoceanic food aid, LRP in coastal countries on major shipping routes saves relatively less time compared to LRP in landlocked countries. LRP is most valuable in reaching landlocked populations far from the US for whom rapid delivery of commodities is crucial, such as following a rapid onset disaster (e.g., earthquake or flooding).

Within our sample, it is universally less expensive to procure cereals locally than to rely on transoceanic shipments of US food aid. In most cases, pulses are likewise less expensive to procure locally. More highly processed products, such as vegetable oil and CSB, are on average more expensive to procure locally. Yet, this varies by country. Places with well-developed local processing and / or competitive markets may be able to compete on cost with processed food aid from the US. LRP cost advantages can nonetheless be impeded by several factors. First, trade barriers can impede regional procurement, although none were encountered in the projects we studied, all of which were local procurements within the country in which food distribution took place. Second, price volatility can increase uncertainty as to the ultimate cost of local procurement, including the value of cash-denominated vouchers and cash. The period we studied, FY2011, was a time of rapidly rising food prices on global and local markets. In some cases, this squeezed NGOs that had budgeted initially at the lower prices that

prevailed when projects were proposed. Third, drought, conflict, and erratic weather patterns can disrupt local supply, again driving up prices for local purchases (WFP 2011).

Finally, the LRP Learning Alliance procurements tended to be small relative to local marketshed volumes. Scale-up may drive up prices and/or delay delivery, particularly where markets are thin (Barrett et al. 2009). Although no such price increases seem to have occurred in response to the LRP activities we studied (Garg et al. 2012), if LRP were to drive procurement market prices higher, it could undermine any cost savings from LRP as well as potentially harm other consumers who rely on markets for own-consumption (Barrett and Maxwell 2005; Hanrahan 2010). By contrast, in places where well-developed markets can readily meet increased demand due to LRP projects without driving prices higher, larger procurements may enable agencies to bargain for lower prices, driving down costs and increasing the efficiency advantages due to LRP.

LRP is a new instrument in the US international food assistance toolbox. These initial findings from NGO LRP activities under the USDA local and regional procurement pilot program and the USAID Emergency Food Security Program offer strong evidence in support of proponents' earlier claims to the US Congress that LRP would bring cost savings and timeliness gains. The evidence does not, however, indicate that LRP is always and everywhere superior to transoceanic food aid in cost-effectiveness terms, although in these data it is always superior by timeliness criteria. Agencies need to analyse carefully the setting in which they propose to distribute food assistance and identify their priority objectives—timeliness, cost-effectiveness, or something else—in order to choose the most appropriate response instrument. But in an environment of growing demand and diminished resources for international food assistance, LRP indeed appears an extremely valuable policy instrument to put at aid agencies' disposal.

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¹We consider cash transfers and vouchers as “decentralized LRP” for our cost effectiveness and timeliness comparisons against transoceanic food aid only. Cash transfers and vouchers differ from agency procured food in a number of fundamental ways. See Harvey (2007), Harvey et al. (2010) and Upton and Lentz (2012) for more details on how cash, vouchers, LRP and transoceanic food aid compare regarding welfare impacts, preferences, market impacts, nutritional impacts, food safety and quality, security concerns, ease of administering distributions, intrahousehold and gender-based effects.

² This necessarily generates some downward bias in delivery time estimates for transoceanic food aid relative to commodities delivered to inland warehouses for direct distribution. There are relatively few cases of monetized transoceanic shipments in the data, however, so we do not consider this a serious problem. If it were feasible to correct for this, it would only reinforce our qualitative results.

³ “Hard tendering” involves releasing a call for bids and selecting the lowest cost bid that meets other procurement specifications. By contrast, some LRP activities use a semi-competitive “soft tendering” procurement process that limits bids to a targeted population of eligible producers or traders. Soft tendering typically aims to couple smallholder or agribusiness development objectives with timeliness and/or cost-effectiveness objectives.

⁴ The actual transoceanic deliveries compared to their matched LRP activities arrived less slowly, on average, than the truncated transoceanic deliveries did. This accounts for the difference between the number of weeks saved relying on LRP relative to all transoceanic activities and the weeks saved relying on actual deliveries only.

⁵ We computed Student t-tests for all the timeliness comparisons by country with the exception of Kyrgyzstan, for which there was just a single distribution date. For that one case, we used a z-test to determine whether the number of weeks required for the single cash distribution differed from the pooled seven matched transoceanic distributions.

⁶ We omit agency administrative costs since those are difficult to allocate across specific shipments and because of accounting differences for such costs among the agencies whose delivery data we compare.

⁷ We use the daily exchange rate for West African countries (Burkina Faso, Mali, and Niger) using the CFA (Communauté financière d'Afrique) franc.

⁸ Our findings for cash and vouchers are limited to products consumed by the target population for which there was a suitable transoceanic match, which limited our voucher and cash comparisons to transoceanic shipments of cereals,

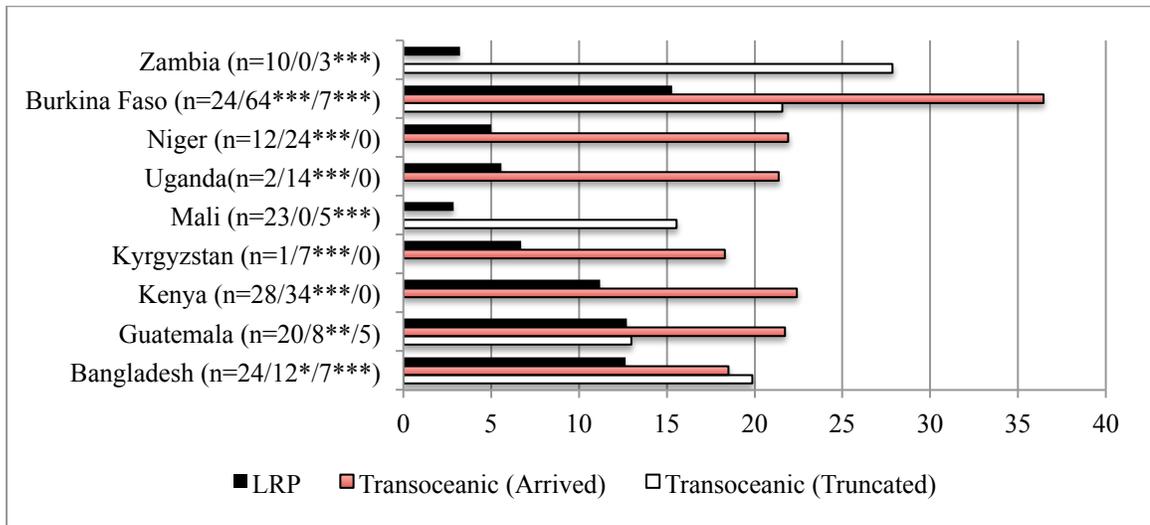
pulses, and vegetable oil. For example, we excluded costs associated with the Niger project distribution of vouchers for salt because we did not have transoceanic shipments of salt to compare against.

⁹ Harou et al. (2012) discusses this comparison further, finding that recipients preferred Incaparina relative to CSB.

¹⁰ While the transoceanic average of the Burkina Faso vegetable oil comparison is statistically significant, we don't find a statistical significant difference in Niger due to a small transoceanic sample size (n=2) which includes one very small, but very expensive, shipment.

Table 1: Start and end dates for LRP and comparable transoceanic projects, by LRP activity type

LRP Activity	LRP Start Date	LRP End Date	Transoceanic Start Date	Transoceanic End Date
Hard (Competitive) Tender	Date of tender	Date of commodity receipt at distribution point warehouse(s) or final distribution sites (e.g., schools for school feeding). For each date of tender, if there were multiple delivery dates, we take the average date.	Invitation to bid	Date of commodity receipt at final warehouse(s)
Soft (Noncompetitive or developmental) Tender	Date of vendor certification or contracting	Date of commodity receipt at distribution point warehouse(s) or final distribution sites (e.g., schools for school feeding). For each date of vendor contracting, if there were multiple delivery dates, we take the average date.	Invitation to bid	Date of commodity receipt at final warehouse(s)
Vouchers	Date of vendor certification or contracting	Distribution to recipients	Invitation to bid	Date of commodity receipt at final warehouse(s)
Fairs	Date fair was announced to vendors	Date of fair	Invitation to bid	Date of commodity receipt at final warehouse(s)
Cash	Pre-authorization letter (prior to award date)	Distribution to recipients	Invitation to bid	Date of commodity receipt at final warehouse(s)



The number of observations for LRP, delivered transoceanic shipments, and truncated transoceanic shipments are shown in parentheses, in that order. ***, **, and * indicate statistically significant differences from LRP delivery times at the 1, 5, and 10 percent levels, respectively.

Figure 1: Delivery lags by LRP, arrived transoceanic shipments, and truncated transoceanic shipments (weeks)

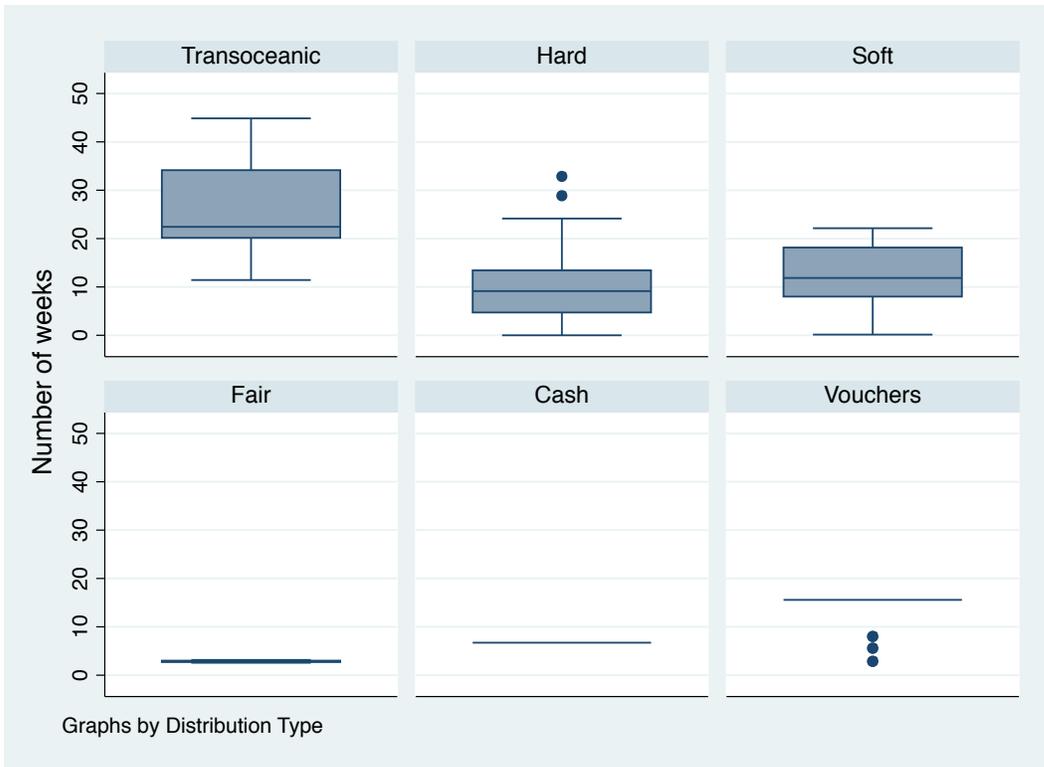


Figure 2: Boxplot of delivery times by distribution type

Table 2: Processed products costs for matched LRP and transoceanic shipments

Country	Commodity (LRP / Transoceanic)	LRP (\$/MT)	Transoceanic (\$/MT)	Total Savings
Burkina Faso	Veg Oil / Veg Oil	\$2,065.01	\$1,808.04	-14%**
Guatemala	Incaparina / CSB	\$1,919.03	\$867.23	-121%***
Kenya	CSB / CSB	\$800.01	\$985.02	19%***
	Veg Oil / Veg Oil	\$1,689.00	\$1,885.16	10%**
Niger	Veg Oil / Veg Oil	\$2,509.83	\$1,976.10	-27%

Notes: Total costs include commodity, ocean freight and ITSH.

*** and ** indicate statistically significant difference at the 1 and 5 percent levels, respectively. The number of LRP and transoceanic observations are: Burkina Faso (veg oil n=1, veg oil n=3); Guatemala (Incaparina n=9, CSB n=6); Kenya (CSB n=7, CSB n=2) and (veg oil n=4, veg oil n=5); Niger (veg oil n=2, veg oil n=2)

Table 3: Pulses costs for matched LRP and transoceanic shipments

Country	Commodity (LRP / TO)	LRP	Transoceanic	Total Savings
Bangladesh	Chickpea / Lentils	\$715.23	\$781.26	8%
	Chickpea / Split Peas	\$715.23	\$938.99	24%**
Burkina Faso	Cowpeas / Lentils	\$546.45	\$1,032.23	47%***
Guatemala	Beans / Beans	\$1,087.03	\$999.30	-9%
Kenya	Beans / Yellow Peas	\$711.94	\$1,078.53	34%***
Mali	Cowpeas / Split Peas	\$544.62	\$1,014.86	46%***
Niger	Cowpeas / Beans	\$524.95	\$1,460.20	64%***
Uganda	Beans / Yellow Peas	\$662.95	\$731.68	9%
Zambia	Beans / Beans	\$1,148.00	\$1,158.54	1%

Notes: We did not compute either t-tests or z-tests for the Uganda pulse comparisons because we had only one cost for LRP activities and one cost for transoceanic activity. Total costs include commodity, ocean freight and ITSH.

*** and ** indicate statistically significant difference at the 1 and 5 percent levels, respectively.

The number of LRP and transoceanic observations are: Bangladesh (chickpeas n=6, lentils n=4) and (chickpeas n=6, split peas n=6); Burkina Faso (cowpeas n=19, lentils n=10); Guatemala (beans n=6, beans n=6); Kenya (beans n=6, yellow peas n=24); Mali (cowpeas n=11, split peas n=1); Niger (cowpeas n=3, beans n=2); Uganda (beans n=1, yellow peas n=2); Zambia (beans n=3, beans n=1).

Table 4: Cereals costs for matched LRP and transoceanic shipments

Country	Commodity (LRP / TO)	LRP	Transoceanic	Total Savings
Burkina Faso	Millet / Bulgur	\$339.24	\$830.36	59%***
Kyrgyzstan	Wheat flour [^] / Wheat flour	\$470.04	\$989.10	52%***
Mali	Millet / Bulgur	\$300.57	\$781.36	62%***
Niger	Millet / Bulgur	\$391.17	\$844.78	54%***
	Millet / Sorghum	\$391.17	\$715.76	45%***
Uganda	Maize flour ^{^^} / Cornmeal	\$457.52	\$833.34	45%***

Notes: [^]Cash converted to wheat at prevailing market price in distribution zones

^{^^}Vouchers converted to beans and maize at prevailing market price in distribution zones

Total costs include commodity, ocean freight and ITS^H.

*** indicates statistical significance at the 1 percent level.

The number of LRP and transoceanic observations are: Burkina Faso (millet n=4, bulgur n=13); Kyrgyzstan (wheat flour n=1, wheat flour n=2); Mali (millet n=10, bulgur n=2); Niger (millet n=2, bulgur n=10) and (millet n=2, sorghum n=1); Uganda (maize flour n=1, cornmeal n=8).

Table 5: Weighted average costs per metric ton by commodity type

	Ocean	ITSH	Commodity	Total
Transoceanic				
Processed products	\$212.66	\$151.28	\$1,145.90	\$1,509.84
Pulses	\$221.61	\$141.32	\$705.93	\$1,068.85
Cereals	\$227.68	\$182.96	\$384.34	\$794.97
LRP^				
Processed products	NA			\$1,636.14
Pulses	NA			\$809.78
Cereals	NA			\$362.56

^Note: In our sample, many tenders for locally procured food combined commodity costs and ITSH costs. Therefore, we present combined commodity and ITSH costs. Further, we exclude LRP and transoceanic costs for Kyrgyzstan and Uganda because the LRP projects are cash and cash-voucher based and we do not know volumes redeemed under these transfers and therefore cannot weight these costs relative to other matches within the commodity types.