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The local economy impacts of social cash transfers

A comparative analysis of seven sub-Saharan countries

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For more information, please visit PtoP website: www.fao.org/economic/ptop

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Introduction

Africa has taken centre stage in the use of social cash transfer (SCT) programmes to combat extreme poverty and vulnerability. Between 2000 and 2009, over 120 cash transfer programmes were implemented in sub-Saharan Africa, by both governmental and non-governmental institutions (Garcia and Moore, 2012). These programmes increasingly form part of formal government social protection systems and range from small pilots to national, domestically financed large-scale initiatives. These programmes vary in detail but share the same basic approach: distributing cash transfers – usually unconditional – to individuals in ultra-poor households and, most often, to women. Income eligibility for SCTs is typically determined through proxy means testing and/or community-based wealth rankings. Some programmes have additional eligibility criteria, such as the presence of orphans and vulnerable children (OVC) and disabled adults in the household. Thus, beneficiary households are often both asset and labour poor.

The main goal of SCT programmes is usually to improve human health and welfare outcomes in poor and vulnerable households. However, SCTs may have productive as well as social impacts in beneficiary households. SCTs have the immediate impact of raising purchasing power in beneficiary households, and possibly loosening cash constraints on input purchases, financing productive investments in credit-constrained environments and reducing income risk. They may also affect production in non-beneficiary households through market spillovers. These spillovers are difficult to identify experimentally because they are second-order impacts diffused over a population that is large relative to the beneficiary population. Nevertheless the sum of these impacts may be large, resulting in significant SCT income multipliers. That is, a dollar transferred to a poor household may increase total income in the local economy by more than a dollar.

By treating beneficiaries, however, SCTs also treat the local economies of which they form a part. Beneficiaries' spending transmits the impacts of SCT programmes to non-beneficiaries, potentially creating production and income spillovers.

This article presents findings on the local economy impacts of seven African country SCT programmes evaluated as part of the UN Food and Agriculture Organization's (FAO) "From Protection to Production" (PtoP) project.[1] The countries are Ethiopia, Ghana, Kenya, Lesotho, Malawi, Zambia and Zimbabwe (Table 1). The PtoP project has facilitated expansion of the evaluations of SCT programmes to include productive and local-economy impacts.[2] Local economy-wide impact evaluation (or LEWIE; see Taylor and Filipski, 2014; Taylor *et al*., 2016) employs simulation methods to reveal the full impact of cash transfers on local economies, including spillovers they create to non-beneficiaries. It does this by linking agricultural household models together into a general-equilibrium model of the local economy, in most cases a treated village or village cluster.

[1] Descriptions and reports from each of the impact evaluations can be found at the Transfer Project (http://www.cpc.unc.edu/projects/transfer) and the PtoP (www.fao.org/economic/ptop) websites. The story of each of the impact evaluations is told in Davis *et al*. (2016).

[2] The results of evaluations of impacts in the beneficiary households are available on the PtoP website: www.fao.org/economic/ptop/publications/reports/ (accessed 24 March 2015).

Table 1 **Cash transfer programmes with LEWIE models**

Country	Programme	Year programme began	Implementing ministry	Target group
Ethiopia	Tigray Social Cash Transfer Programme Pilot (SCTPP)	2011	Tigray Bureau of Labour and Social Affairs	Labour-constrained, ultra-poor female, elderly, or disabled
Ghana	Livelihood Empowerment Against Poverty (LEAP)	2008	Ministry of Gender, Children and Social Protection	Extreme poor with elderly, disabled or OVC member
Kenya	Cash Transfers for Orphans and Vulnerable Children (CT-OVC)	2004	Ministry of Home Affairs, Department of Children's Services	Poor households with OVC
Lesotho	Child Grants Programme (CGP)	2009	Ministry of Social Development	Poor households with OVC
Malawi	Social Cash Transfer Programme (SCTP) – Expansion	2006	Ministry of Gender, Children and Social Welfare	Ultra-poor, labour-constrained
Zambia	Child Grant (CG) model of the Social Cash Transfer (SCT) programme	2010	Ministry of Community Development, Mother and Child Health	Household with a child under 5 years old in three poor districts
Zimbabwe	Harmonized Social Cash Transfer (HSCT)	2011	Ministry of Public Service, Labour and Social Welfare	Food poor and labour-constrained

Our LEWIE analysis finds evidence of significant spillovers, resulting in SCT income multipliers that are considerably greater than one in most cases. Nevertheless, there is wide variation in SCT multipliers across programmes, market settings, and household groups. Most spillovers accrue to non-beneficiary households. Integration with outside markets shifts impacts out of local economies, reducing local income multipliers. Local supply constraints may result in price inflation which creates a divergence of real from nominal income multipliers for beneficiaries as well as non-beneficiaries. The existence of income spillovers reveals that SCT programmes have local economy impacts beyond the treated households, which could yield large benefits for rural developments.

1. LEWIE in theory

A cash transfer generates spillovers if it affects households other than the intended recipients in any way, for example, by altering their incomes, production, consumption decisions, access to information, perceptions or even social interactions. LEWIE focuses exclusively on local economic spillovers generated when a SCT-recipient household spends its cash transfer. These spillovers result from general-equilibrium effects of SCTs in local economies. In economic systems prices transmit the influences of market shocks from one actor to another. Prices are central to LEWIE models because these models are a structural representation of how local economies work and how they adjust to exogenous income shocks, including SCTs.

If the local economy were perfectly integrated with outside markets (i.e. if all goods were tradable with the rest of the world), increased spending by recipient households would have no impact on prices or on local production. Recipients would purchase goods and services from suppliers outside the local economy at prevailing market prices. In this case, the SCT would not create spillovers. The SCT recipients' demand would not be large enough to affect prices in the larger economy so prices would not convey impacts to local producers who, in turn, would not increase production.

There are many reasons why goods in poor rural economies might not be tradable with the outside world. Foods may be too perishable or bulky to buy or sell in distant markets. Many services, from haircuts to prepared foods and construction, require close proximity of suppliers to consumers. Locally-supplied goods and factors may be imperfect substitutes for those obtainable through trade with outside markets (e.g. black versus white teff in Ethiopia or family versus hired labour in agricultural production). Goods that are obviously tradable have a non-tradable component. For example, the purchase of a bar of soap in a local grocery store will have a tradable (wholesale price plus transport cost to the village) and a non-tradable (a grocery mark-up from which wages and profits come and a possible within-village transport cost) component; witness the substantial variation in retail prices across space. Poor roads, communications and marketing infrastructure easily can turn what might be a tradable good – e.g. livestock or cassava – into a nontradable, produced to supply local demand, while severely limiting labour mobility.

The existence of non-tradable goods and services with locally-determined (endogenous) prices is a necessary condition for SCTs to generate spillovers affecting local prices and/or production. Unlike tradable goods, which have a fixed price determined outside the local economy, markets for non-tradable goods must clear locally (i.e. local supply must equal local demand). When beneficiary households spend a cash transfer on non-tradable goods the local purveyors of the goods are affected.

Spillovers create the potential for the local benefits of SCTs to exceed the amount of cash transferred to beneficiary households. SCT multipliers are the ratio of local income gains to transfers. A SCT multiplier that is greater than one implies positive programme spillovers.

The presence of a non-tradable good, by definition, generates spillovers, but this alone is not sufficient to generate positive real (inflation-adjusted) SCT multipliers; there must be an accompanying supply response. Increases in local demand from SCTs exert upward pressure on

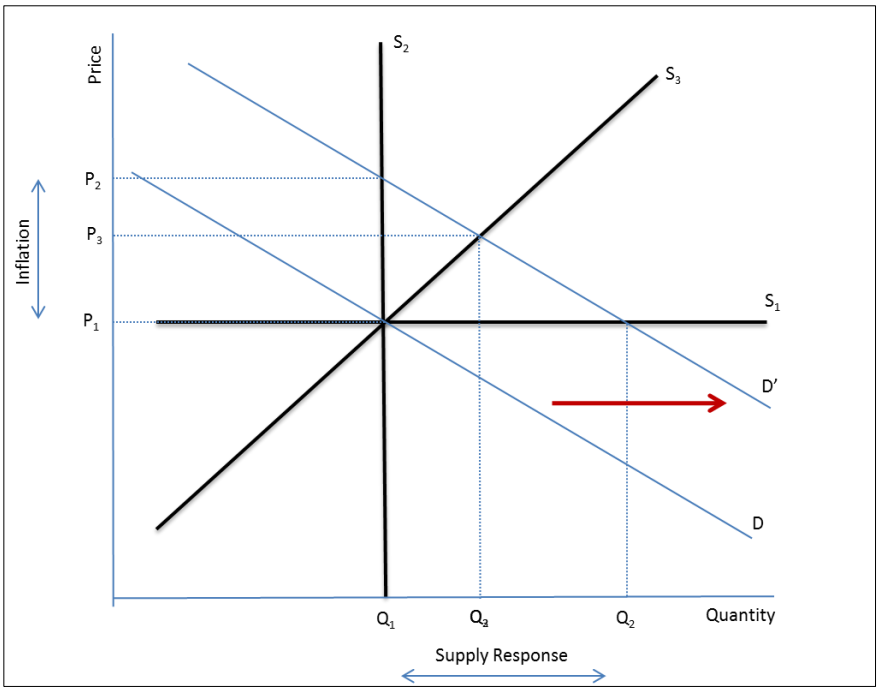
local prices. The result may be expansionary (production/supply increases), or inflationary (price increases) or a combination of the two. The expansionary response is what generates positive local real income multipliers. Inflation, on the other hand, erodes the real value of programme benefits. Whether and to what extent local prices actually increase depend on the elasticity of the local supply response. Real multipliers may be less than one if supply constraints result in substantial local price inflation.

Figure 1 illustrates how SCT spillovers can create multipliers and how the size of the multiplier depends on the local supply response (for an algebraic representation, see Filipski *et al.*, 2015). First consider the extreme case where local supply of a good is fixed at S_2. As the SCT shifts demand for the good from D to D', the price increases from P_1 to P_2, but there is no real expansionary effect on the economy. The quantity produced and consumed remains at Q_1. This is the worst possible outcome in terms of local economic growth because the full impact of the SCT programme is inflationary; higher prices transfer benefits of SCTs to the owners of factors of production while adversely affecting demanders of non-tradable consumer goods and inputs.

At the other extreme, a perfectly elastic supply response is represented by a flat supply curve, S_1. In this case, increased demand stimulates the local supply of the good, which increases from Q_1 to Q_2. The price does not change. Graphically, this scenario looks similar to the integrated markets case where price is fixed exogenously and no spillovers are generated. However, when the good is non-tradable, a perfectly elastic supply generates positive income spillovers for the households that own the factors of production, without raising consumption costs. This is the best possible outcome in terms of local multiplier creation because in this case the SCT is purely expansionary and not inflationary.

In between these two extremes lie many other possibilities in which the SCT creates both local economic expansion and inflation. Supply curve S_3 depicts one of these many possibilities. The increase in demand results in a production increase from Q_1 to Q_3 and in a price increase from P_1 to P_3. The expansionary versus inflationary impact depends on the slope of the supply curves for non-tradables.

Figure 1 **Illustration of possible impacts of SCT in a local market for a non-tradable good**



The good or service in question as well as the circumstances shaping the supply response are critical in determining how the SCT affects a local market. In the very short run it may be difficult for local producers to increase their output because crop and livestock production and investment in new activities take time, even under ideal conditions. Households are also likely to face constraints with respect to access to land, cash to purchase inputs or invest in new activities, technologies to raise productivity, capital and markets to acquire inputs in a timely fashion. Price inflation is not inevitable, however. In an economy with high levels of unemployment, a stimulus programme like cash transfers may increase the local labour demand without exerting significant upward pressure on wages. If land is abundant it will not impose constraints on local production. In a sector like retail, which sources most of its merchandise in outside markets, increased demand might not push up local prices noticeably. In practice, little evidence of systematic price increases has emerged from the impact evaluation studies. This may be due in part to researchers' failure to test for inflationary impacts. Qualitative fieldwork uncovers evidence of increased sales, especially around days when cash gets distributed. (Barca *et al*., 2015).

2. LEWIE in Practice

If we can simulate the local economy-wide impacts of SCTs, both nominal and real SCT multipliers can be calculated for total income, for individual household groups and for different production activities. LEWIE models are the basis for simulating the impacts of SCTs in the seven programmes we examine. Their use in programme impact evaluation parallels a broad shift from *in vivo* to *in silico* methods in the sciences (Taylor, 2015).

LEWIE models are structural general-equilibrium (GE) models that nest different groups of households within a local economy, where they interact in markets. Each household may participate in different income-generating activities and spend its income on goods and services inside and outside of the local economy. Theory and empirical findings inform the design of LEWIE, as with any simulation model. Data from baseline household surveys carried out as part of each country's impact evaluation reveal the production activities in which households participate, the technologies they employ, the markets in which they transact and household expenditure patterns. Targeted business surveys provide additional data to model production activities for which the household surveys may not yield a sufficient sample size for econometric estimation.

2.1. Model structure

Household groups, activities and factors form the backbone of the LEWIE model. We aggregated household groups, activities and factors based on their significance in the local economy and their importance to the stated goals of the SCT programmes.

Defining the household groups for LEWIE is straightforward – we follow the same criteria used to determine households' eligibility for SCTs. Our models include at least two households groups: eligible households, which receive the cash transfer, and non-eligible households, which are in the same (treated) communities but do not receive the transfer. In Kenya, we further disaggregated the ineligible households into two groups: those not satisfying the poverty criterion, and those satisfying the poverty criterion but not the requirement that orphans or vulnerable children are in the household.

The LEWIE model structure is centred on the principal economic activities in which these households participate, the households' income sources and the goods and services on which households spend their income. Households participate in productive activities (crop and livestock production, retail, service and other production activities), which produce commodities and services for sale within a given region and for sale (export) outside the region. The productive activities use a combination of factors, including hired and family labour, land, capital and purchased inputs (e.g. fertilizer) to produce their output. They may also purchase commodities to use as intermediate inputs. Examples of these include local crops for food processing, feed for livestock or imported goods for retail businesses. The activities, commodities and factors modelled in the SCT-LEWIEs are summarized in Appendix A.

As for expenditure, households can purchase any of the goods and services produced by local activities or supplied by markets outside the local economy (project-area "imports"). They can also give transfers to other households, or spend money on health care or savings. In addition to

income from productive activities and from selling labour or other factors, households may receive transfers from other households and from exogenous sources, including the SCT programme itself.

2.2. Zone of Influence

We designate a "Zone of Influence" (ZOI) as the geographic boundary of the local economy of interest for the local economy analysis. It is the area over which LEWIE simulates the SCT programme's impacts and across which we calculate the SCT multipliers. In the SCT-LEWIEs constructed for PtoP, the ZOI varies from a representative village (Ghana) to an entire district (Zimbabwe). The choice of ZOI definition is closely linked to the programme evaluation design, and more specifically, over how large an area we wish to document the impacts of the SCT intervention. For example, many of the SCT programmes were randomized at the village cluster (VC) level. In those cases it made sense to define the ZOI as a village cluster and estimate SCT multipliers for this economic space. Table 2 presents the geographic levels at which randomization occurred and the ZOI boundaries for each country evaluation.

In local GE analysis, goods and services fall in to two broad categories: tradable and non-tradable. The classification of goods as tradable or non-tradable depends on where prices are determined (we discuss the assumptions about market closure for specific items in the next section). The prices of tradables are determined in markets outside the ZOI – thus they are exogenous to the LEWIE. Assuming the ZOI is a price taker in larger (regional, national, or international) markets, the prices of tradables cannot change as a result of the SCT programme. By contrast, the prices of non-tradables are determined within the ZOI. These prices can be affected as SCTs impact the demand for goods and services supplied within the ZOI. Local markets and trading centres can play a role in transmitting programme impacts, and we included these markets within our ZOIs wherever possible.

The ZOI boundaries are important for LEWIE because any purchases of goods or services supplied by markets outside the ZOI represent leakages from the perspective of the local economy. That is, they shift impacts from within the ZOI to markets and households outside the ZOI. As with any kind of general-equilibrium (GE) analysis, there is no right or wrong way to define a ZOI. Aggregate general-equilibrium models exist for regions, countries and even groups of countries. In LEWIE, as in aggregate models, the larger the geographic area over which we cast our net, the more potential impacts we will capture. For example, expenditures in a nearby town do not create impacts in a village LEWIE, but they do in a district-level LEWIE that includes both village and town. On the other hand, the wider the net is cast, the smaller the ratio of treated to non-treated households and the less relevant the programme impacts relative to aggregate income in the economy.

Table 2 **Geographic levels of randomization and ZOI boundaries, by country**

Country	Randomization of treatment[a]	Representative unit of base model ZOI
Ethiopia	Non-experimental	Village (regional models)
Ghana	Non-experimental	Village
Kenya	Village Cluster level	Village Cluster (regional models)
Lesotho	Village Cluster (ED) level	Village Cluster
Malawi	Village Cluster level	Village Cluster
Zambia	Village Cluster (CWAC) level	Village Cluster
Zimbabwe	Non-experimental	District

[a] The term Village Cluster represents the different names for administrative units in the program countries: Electoral District (ED) in Lesotho; Community Welfare Assistance Committee (CWAC) in Zambia; Location in Kenya; and Village Cluster (VA) in Malawi.

2.3. Model assumptions

The SCT LEWIE models, like SCT experimental studies, evaluate impacts of cash transfers in the relatively short run. Since we do not simulate long-run programme impacts, our base LEWIE models assume that land and capital are fixed at their initial levels. (We test the sensitivity of findings to these assumptions later). Often, due to local land institutions or lack of access to investment capital, these inputs cannot be augmented through markets even in the long run.

Other goods and factors are marketable even in the short run. Assumptions about market closure – that is, where prices are determined – reflect how well households and businesses are integrated with local and regional markets. Households' and businesses' answers to survey questions about where they buy and sell different goods and services informed our assumptions about market closure. Goods with high transaction costs tend to be non-tradable, with prices determined inside the ZOI. As most of the SCT evaluations took place in poor, rural areas, we made similar assumptions about the tradability of most goods and factors.[3] Differences across countries reflect local market integration as well as sector composition (for example, in some countries non-agricultural production ("prod") is mostly crafts for export, but in others it is dominated by locally-consumed resource extraction, e.g. charcoal).[4] Table 3 summarizes these assumptions.

[3] The one exception is Abi Adi town in Ethiopia.

[4] Some ground truthing of these assumptions were included in the PtoP qualitative work (see Barca, *et al*., 2015), as well as at the presentation of LEWIE results at forums in each country.

Table 3 **Assumptions about tradability of goods and services in the seven LEWIE models**

Factor and commodity market closure assumptions		
	Local/ZOI markets	Integrated markets
*Commodities**		
Crops	ALL	
Livestock	ALL	
Retail	ALL	
Other Services	Ethiopia, Kenya, Lesotho, Ghana, Zambia, Malawi	Zimbabwe
Non-ag production	Ghana, Zambia, Malawi	Ethiopia, Kenya, Lesotho, Zimbabwe
Factors		
HL	ALL	
FL	ALL	
Purchased Inputs		ALL
Herd**	Ghana, Zambia	Malawi, Zimbabwe
Liquidity constraint in base model		
	On	*Off*
	Ethiopia, Malawi	Ghana, Kenya, Lesotho, Zambia, Zimbabwe

*We modelled additional markets in Malawi. Fish is local; maize is integrated.
** Herd was modelled as a fixed capital factor in Ethiopia, Kenya and Lesotho. Malawi included an integrated inventory factor.

It is useful to keep in mind the role of prices and the local supply response while thinking about the market assumptions underlying our LEWIE models. The role of prices in transmitting impacts is determined to an important extent by market closure assumptions. The LEWIE model assumes that there is an elastic labour supply in all countries (elasticity=100), reflecting the high-unemployment environments characterizing the programme areas and implying that, at the margin, labour availability does not inhibit the output-supply response much.

Households in poor economies often are cash-constrained and have difficulty purchasing inputs, such as fertilizer. This dampens the supply response to an increase in crop demand. In Ethiopia and Malawi, we explicitly model a liquidity constraint by limiting the amount of inputs households can purchase to what they purchase before the CT, as revealed by the household surveys.

2.4. Data

Household and business surveys have two main purposes for the construction of LEWIE models. First, they provide data to econometrically estimate parameters of interest and their standard errors. We estimate Cobb-Douglas production functions for each activity, assuming shared

technologies across all households (households have the same production function for a particular activity). We also estimate marginal budget shares for each household group, corresponding to a Stone-Geary utility function with no subsistence minima. The consumption items include all the commodities produced by local activities plus outside goods, transfers to other households and savings.

The survey data also provide initial values for all variables in the model, including production and input levels, household demands, the value of transfers, other exogenous income and labour market income received by each household group. The values of all of these variables differ – often substantially – across household groups. The data sources are summarized in Appendix B and a more detailed description of the LEWIE methodology, data and survey design process can be found in Taylor *et al*. (2016).

Estimates of parameters and their standard errors, along with the starting values for all variables, are entered onto EXCEL data input sheets (Appendix C) that interface with GAMS, where LEWIE model resides. LEWIE uses the initial values and estimated production and expenditure functions to create a base GE model of the project-area economy in which all actors' incomes equal their expenditures, and quantities supplied equal quantities demanded. The base model, in turn, is used to simulate the impacts of the SCT programmes. The LEWIE model generates a social accounting matrix (SAM) of the local economy as an intermediate output.

2.5. LEWIE multipliers

LEWIE multipliers are calculated by dividing the impact on the value of the outcome of interest (income, production, etc.) by the amount transferred to eligible poor households. Income multipliers take the total change in recipient and non-recipient household incomes and divide it by the amount transferred, which is the cost of the SCT programme. The interpretation of the multiplier is the amount of local income generated for each US dollar transferred to a recipient household. If this total income multiplier exceeds one, it means that the SCT creates positive spillovers in the local economy, such that US$1 transferred to poor households raises local income by more than US$1. LEWIE income multipliers can also be calculated for each household group by taking the group's income change divided by the total cost of the SCT programme. A LEWIE income multiplier that is greater than zero for non-beneficiary households is evidence of positive spillovers from treated to non-treated households. A LEWIE income multiplier that is greater than one for beneficiary households is evidence of positive feedback effects of these spillovers on programme-eligible households.

Production multipliers are calculated as the change in production value divided by the SCT programme cost. They represent the change in production per US$1 transferred to eligible households. Production multipliers greater than zero are evidence of productive spillovers of SCTs.

Unless local supply is perfectly elastic, the price of goods increases as a result of the increase in local demand stimulated by the SCT. In this case, real (inflation-adjusted) income may be a more accurate way to describe the SCT's impact than nominal (non-inflation-adjusted) income. We adjust for inflation by dividing the income change by a household-specific Laspeyres consumer price index (CPI) generated from price change within the simulation. Real income

multipliers generally are smaller than nominal multipliers for SCT programmes because income gains are partially offset by price inflation. The more elastic the local supply response, the more nominal and real multipliers tend to converge with one another.

2.6. Model validation

Validation is always a concern in GE (as with all simulation) modelling. Econometric estimation of production and expenditure function parameters generates standard errors along with parameter estimates. By drawing repeatedly from all of the parameter distributions and recreating a new base GE model from each draw, we construct confidence intervals (CIs) around the LEWIE multipliers obtained from our simulations following Taylor and Filipski, 2014. If the model's parameters were estimated imprecisely this will be reflected in wider CIs around income and production multipliers. Structural interactions within the model may magnify or dampen the effects of imprecise parameter estimates on simulated confidence bands.

This novel Monte Carlo method of constructing confidence intervals allows us to compare results from different modelling scenarios and test the robustness of multiplier estimates to model assumptions. We can use confidence intervals to test for the significance of SCT impacts, including the null hypothesis that spillover effects on production are zero and that income multipliers are unitary – that is, a US dollar transferred to a recipient household adds no more than a US dollar to the local economy. Similarly, we can use simulated CIs to compare real and nominal income multipliers.

In addition to testing the sensitivity of the LEWIE model results to parameter estimates, we can conduct robustness checks on the modelling assumptions we have made, including those on model closure, labour supply elasticities and liquidity constraints. Table 4 summarizes the tests we performed in each of the seven countries. The results of sensitivity experiments inform us in two main ways. First, they give insights into the importance of local production and market constraints in transmitting impacts and creating spillovers. For example, we tested the effect of a low labour elasticity instead of an elastic labour supply in Kenya and Lesotho and found that the multipliers were not significantly different than the baseline ones. Thus assumptions about labour supply do not play a large role in explaining programme impacts in these countries. Second, if there is uncertainty about appropriate modelling assumptions, sensitivity analysis combined with Monte Carlo simulations can produce "meta confidence intervals" reflecting both parameter and modelling uncertainties.

Table 4 **Experiments and robustness checks**

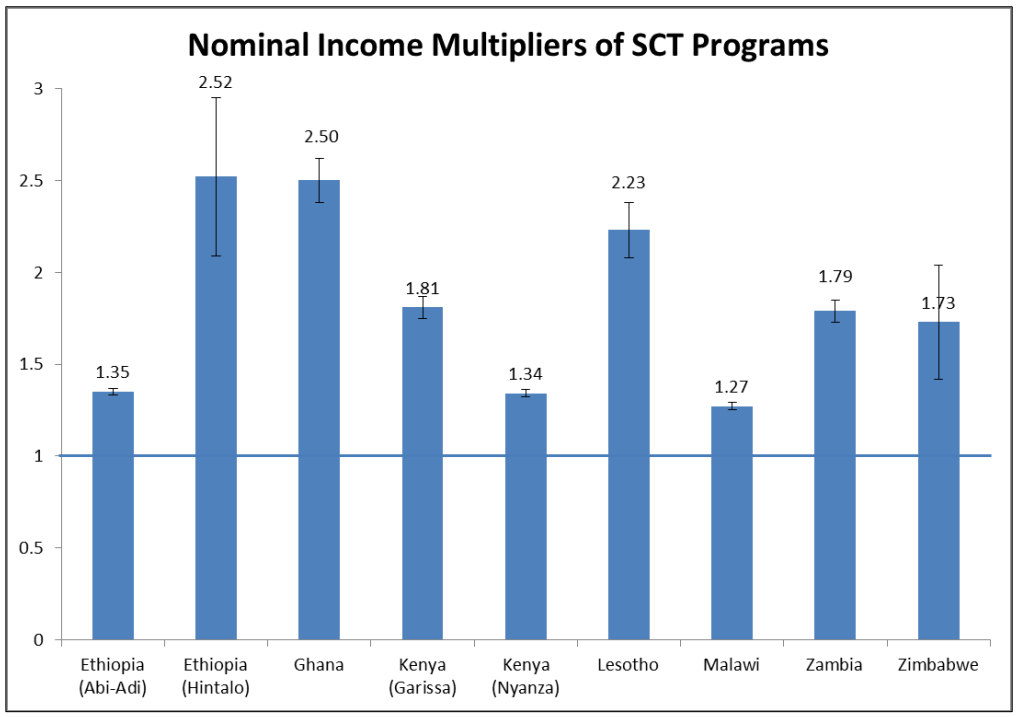
Factor supply	Elasticity of labour (Ken, Les), liquidity constraint on purchased factors (Ken, Les, Gha, Zam, Mal), injection of capital (Ken).
Market closure	Commodities tradeable in village or integrated markets (Gha, Mal), shared markets in scale-up (Zam).
Regions	Define regions with distinct economic characteristics (Ken, Eth).
Scale-up	Treat more villages in the region (Les, Zam), or more households in the village (Ken).
Populations	Model control region (Gha), population share of those eligible (Zam).

3. LEWIE findings

We find that all seven SCT programmes generate significant spillovers in the local economy. The nominal programme income multipliers range from 1.27 in Malawi to 2.52 in Ethiopia-Hintalo (Figure 2). All are significantly greater than 1.0; none of the confidence bands of the multipliers include 1; thus, each US dollar transferred to a poor household adds more than a US dollar to total income in the local economy. The income spillovers from SCTs equal the multiplier minus one – that is, they range from 0.27 to 1.52 per US dollar transferred to eligible households. This is the key result of our analysis.

The rest of this paper explores differences in multipliers across households and activities along with the factors shaping income and production multipliers across the seven SCT programmes.

Figure 2 **Nominal income multipliers with 95 percent confidence intervals for SCT programmes in seven African countries**



3.1. Income multipliers

What shapes differences in the magnitudes of multipliers across countries? The answer to this question is complex but also important if one goal of SCT programmes is to provide a stimulus for local economic growth. SCT multipliers illustrate the potential for cash injections to stimulate growth in the rural economy. Ideally, we would perform a formal meta-analysis of multipliers across project sites (Vogel, 1994); however, there is not a sufficient number of data points (sites) to do this. We take a more descriptive approach in what follows.

Differences in multiplier magnitudes are evident both across and within county boundaries. In Ethiopia, the SCT nominal multiplier ranges from 1.35 in Abi-Adi, an urban location, to 2.52 in

Hintalo, a relatively isolated rural one. Significantly, exactly the same data collection methods and teams were used to carry out the LEWIE studies at these two locales. The same is true for the Nyanza and Garissa regions in Kenya, for which the multiplier ranges from 1.31 to 1.84. The size of the confidence band also varies because of differences in precision in the estimation of expenditure and production functions across sites.

The magnitudes of SCT income multipliers are determined by a number of different factors. Multiplier magnitudes reflect the definition of the ZOI, the nature of local production activities and their supply response and the integration of the ZOI with outside markets. It is instructive to compare the multipliers within Kenya and Ethiopia. Programme income spillovers begin to accrue when a beneficiary household spends the cash. Table 5 shows eligible households' expenditure shares on local agricultural products, at shared ZOI markets, at local businesses and outside the ZOI[5]. They were estimated econometrically using data from the baseline surveys in each country. (Ineligible households show similar patterns, but generally with more spending in markets outside of the ZOI and less on local agriculture than eligible households).

Beneficiaries in the Nyanza region of Kenya spend 26 percent of their income outside the ZOI, while in the pastoral Garissa, region only 7 percent of beneficiary spending is outside the ZOI. The larger direct consumption leakage in Nyanza partially explains why the SCT multiplier is larger in Garissa than in Nyanza. This spending has no linkage to local production and thus cannot contribute to a local income multiplier.

Local (ZOI) versus exogenous spending by eligible households is only loosely linked to multiplier size, however, as other mitigating factors related to the local production response to increased demand determine the magnitude of the multiplier. For example, Hintalo and Adi-Abi, Ethiopia, both have very low shares of beneficiary spending outside of the ZOI (1.5 percent and 0.1 percent respectively), but different SCT total income multipliers.

[5] 'Local' spending includes purchases from store or households within a village or village cluster, depending on the ZOI definition in a given country. Shared ZOI markets are shared across villages (or village clusters), and include rotating markets and trading centers.

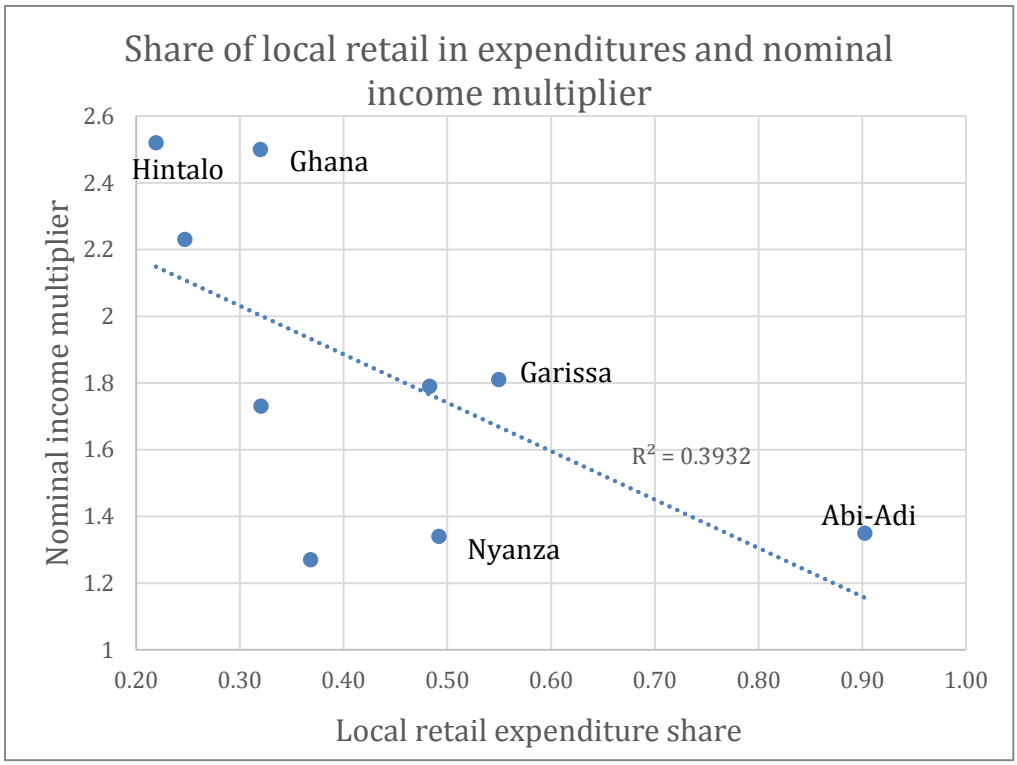
Table 5 Eligible household expenditure locations

	Shared ZOI markets	Local agriculture	Local business	Outside ZOI
Ethiopia (Abi-Adi)	0.5%	8.2%	91.1%	0.1%
Ethiopia (Hintalo)	76.7%	0.3%	22.3%	1.5%
Ghana	10.9%	20.1%	34.0%	35.0%
Kenya (Garissa)	0.8%	14.7%	77.4%	7.1%
Kenya (Nyanza)	9.9%	3.8%	60.2%	26.1%
Lesotho	22.0%	36.0%	28.9%	13.1%
Malawi	32.6%	18.7%	40.7%	8.0%
Zambia	7.5%	39.5%	49.5%	3.5%
Zimbabwe	3.7%	42.8%	39.9%	13.7%

Retail activities purchase many of the goods they sell in markets outside the ZOI at fixed prices. However mark-ups are sensitive to local supply and demand as well as to the costs of labour and other locally-supplied inputs. Thus retail activities have both a tradable and non-tradable component, and retail prices may change somewhat in response to changes in local demand. Since most of their merchandise is sourced outside the ZOI, retail activities tend to create a major leakage for the local economy, transmitting SCT impacts elsewhere. This is good news for production and incomes in other parts of the country, but we expect to see a negative relationship between retail spending and local SCT multipliers. Purchased inputs, locally-produced tradables (e.g. handicrafts) and, of course, household purchases outside the ZOI all involve tradable goods, whose prices are determined in outside markets.

Figure 3 plots SCT nominal income multipliers against the share of retail in total local expenditures. It is clear that there is a negative correlation between the two: the more their budget households spend on retail, the smaller the nominal income multiplier. The two Ethiopia sites define the extremes in this figure. Hintalo has a low retail share and large nominal SCT multiplier, and Abi-Adi has a retail share approaching 1.0 and a correspondingly low multiplier. Ghana has a slightly higher than expected multiplier (2.5) relative to its retail share (0.32). In Ghana, as in the other sites, local retail businesses have large purchases of goods outside the local economy relative to their value-added. However, other businesses rely heavily on locally-produced inputs (Table 6). Malawi and Nyanza, Kenya, have slightly lower multipliers than expected (1.27 and 1.34, respectively) given their retail shares (0.49 and 0.55). This is partly because crop markets are relatively well-integrated at those sites so local spending on crops does not have an appreciable effect on local crop production and incomes – the change in crop demand is met largely by outside markets, not by local production.

Figure 3 **The negative relationship between local retail expenditures and SCT multipliers**



Beneficiaries determine the first-round impacts of SCTs on the local economy. The cash they spend locally creates revenue for local suppliers of goods and services. Income spillovers are changes in payments to factors of production (labour and capitol). Second-round impacts of SCTs operate through production. Businesses that employ local factors and purchase inputs locally generate larger multipliers than activities that source their factors and other inputs from outside the local economy.

The first two columns of Table 6 report the value of intermediate inputs used for each US dollar of value added (payment to factors) in local businesses and other production activities. The last column shows the percentage of those intermediate inputs sourced from outside the ZOI. In Ethiopia, businesses in Abi-Adi clearly rely more heavily on markets outside the ZOI than businesses in the more remote Hintalo region. Businesses in Abi-Adi use more intermediate inputs to generate a dollar of value added than businesses in Hintalo. The intermediate input usage is even less intense in Hintalo when we consider other production activities. Hintalo sources more of its intermediate inputs locally than Abi-Adi.

In general, the regions with the largest multipliers have activities in which the value of purchased inputs is small relative to value added, as can be seen in Figure 4. However, because activity spending creates second-round impacts, it is generally not as critical as household spending in determining SCT multipliers. If beneficiaries do not spend income locally, second-round impacts will not materialize and multipliers will tend to be small regardless of how local businesses source their inputs.

Figure 4 **The inverse relationship between intermediate input shares and SCT income multipliers**

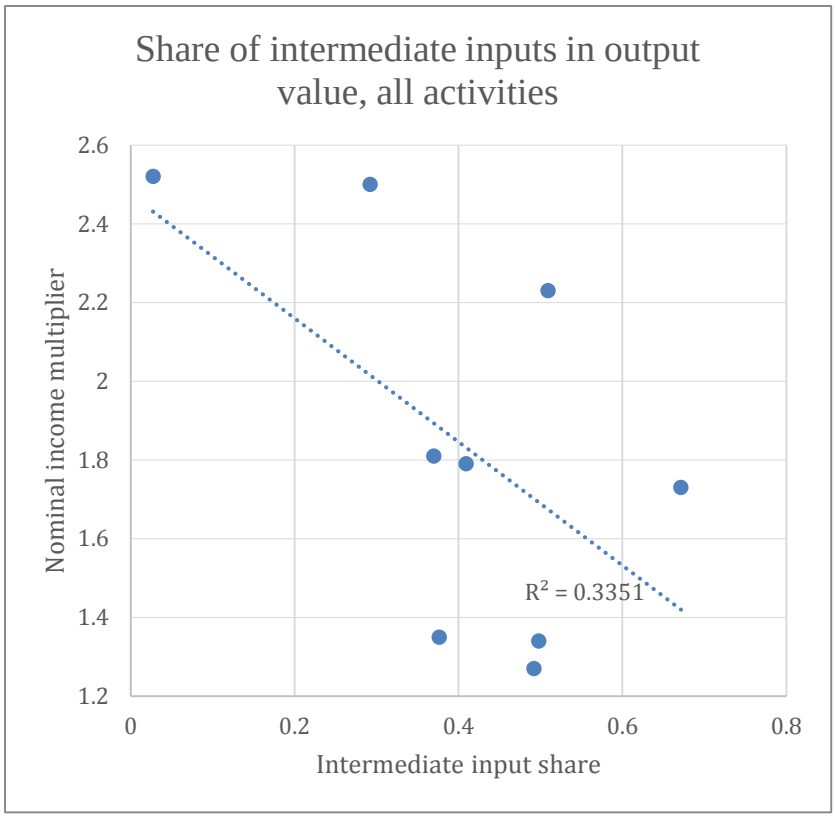


Table 6 **Ratios of input purchases to value added in local businesses, by source**

Study site	Ratio of intermediate input value to value added		Percent of intermediate inputs from outside ZOI
	All business	All activities	All activities
Ethiopia (Abi-Adi)	0.695	0.604	0.875
Ethiopia (Hintalo)	0.486	0.028	0.721
Ghana	1.118	0.413	0.549
Kenya (Garissa)	0.728	0.587	0.820
Kenya (Nyanza)	1.052	0.992	0.941
Lesotho	2.661	1.038	0.943
Malawi	1.614	0.969	0.272
Zambia	0.850	0.693	0.250
Zimbabwe	2.775	2.043	0.471

* Value-added weighted average of retail, production, and services.

3.2. Real versus nominal SCT multipliers

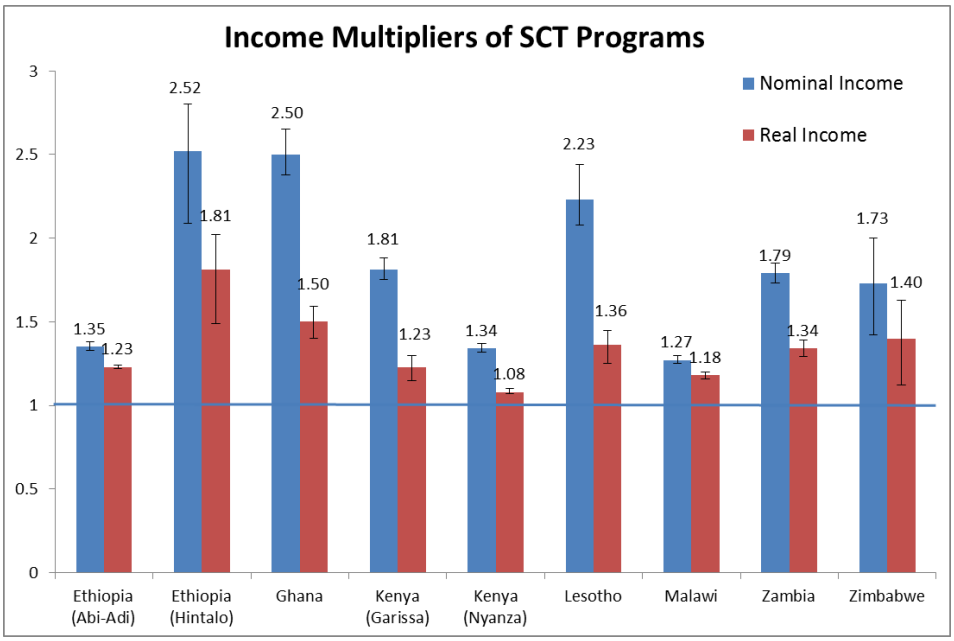
According to microeconomic theory, prices transmit the impacts of SCTs through the economy. If changes in local demand result in price increases, a given rise in nominal income will not translate into the same increase in welfare because consumption costs will rise. Real income multipliers take into account price changes by dividing nominal income by a local consumer price index before and after the transfer. The changes in prices are determined within the model; they depend on how much demand increases (or decreases) for a given commodity and the elasticity of the supply response. Household groups may experience different rates of inflation because they do not consume the same bundle of goods.

Figure 5 compares real and nominal income multipliers from SCTs in each of the seven countries. In all cases, the real income multipliers are smaller than the nominal income multipliers. This is because as SCTs increase local demand producers move up the supply curve (see Figure 1) and this puts upward pressure on the local price. Prices of tradables are set outside the ZOI, so they do not change; however, prices of non-tradables are determined locally and rise unless supply is perfectly elastic. As prices change, so does the local CPI, and nominal and real income multipliers diverge.

The gap between nominal and real multipliers varies widely from one study site to another. In some countries, such as Malawi, the nominal and real multipliers are similar in magnitude. The nominal income multiplier is only 8 percent higher than the real multiplier in Malawi (1.27 versus 1.18). In others, in particular Lesotho and Ghana, the real multiplier is much smaller than the nominal one. The nominal multiplier is 64 percent higher in Lesotho (2.23:1.26) and 67 percent higher in Ghana (2.50:1.50). Gaps also vary within countries. In Ethiopia, the gap between nominal and real multiplier is relatively small for Abi-Adi (10 percent: 1.35:1.23) but large for Hintalo (39 percent: 2.52:1.81). In Kenya it is larger for Garissa (47 percent: 1.81:1.23) than Nyanza (24 percent 1.34:1.08).

The main driver of the difference between the real and nominal multipliers is the elasticity of supply of local goods. In economies that are able to easily increase the supply of a good, prices change little and the nominal and real multipliers are relatively similar in magnitude.

Figure 5 **Real and nominal SCT income multipliers with 90% confidence bounds**



Greater integration with markets outside the ZOI lessens the potential for price inflation because increases in local demand are met by purchasing goods outside the local economy at fixed prices. This leads to similar real and nominal multipliers. However, outside market integration also increases leakages, which reduce the multiplier as cash leaves the local economy through trade.

Isolation from markets (and large expenditures on non-tradable goods) can generate large nominal income multipliers, by "trapping" cash inside the local economy. However, if the local supply response is inelastic, market isolation also creates the potential for price inflation. The more flexible the local supply response, the smaller the gap between nominal and real multipliers in isolated economies.

Market integration or isolation is reflected in market closure in GE models (Table 3). Prices of crops, livestock and services are determined locally because most basic food and service demands are met by local production activities. Almost all local labour demand is met through locally-supplied hired or family labour; hired-worker and family wages are thus determined in the local economy.

3.3. Production multipliers

SCT multipliers are created by productive spillovers in local economies. Production multipliers reveal which sectors are stimulated by the SCT. They provide insights into why some SCT multipliers are higher than others.

Figure 6 shows the total production multiplier for each country as well as the decomposition by production activity. Retail production has the largest sector multiplier in every SCT-LEWIE. This is to be expected because the largest share of expenditure by beneficiaries is on retail.

Crop production also benefits significantly from SCT programmes at all sites except Abi-Adi in Ethiopia, Nyanza in Kenya and in Malawi. The absence of agricultural stimulus is expected in Abi-Adi, an urban site. In Malawi, maize is an important local production activity; however, maize markets are integrated to such an extent that maize prices are unresponsive to local supply and demand. This essentially eliminates a stimulus to maize production, as do severe liquidity constraints on crop activities. Nyanza, Kenya, is similar to the Malawi sites in that its agricultural production is highly integrated with outside markets.

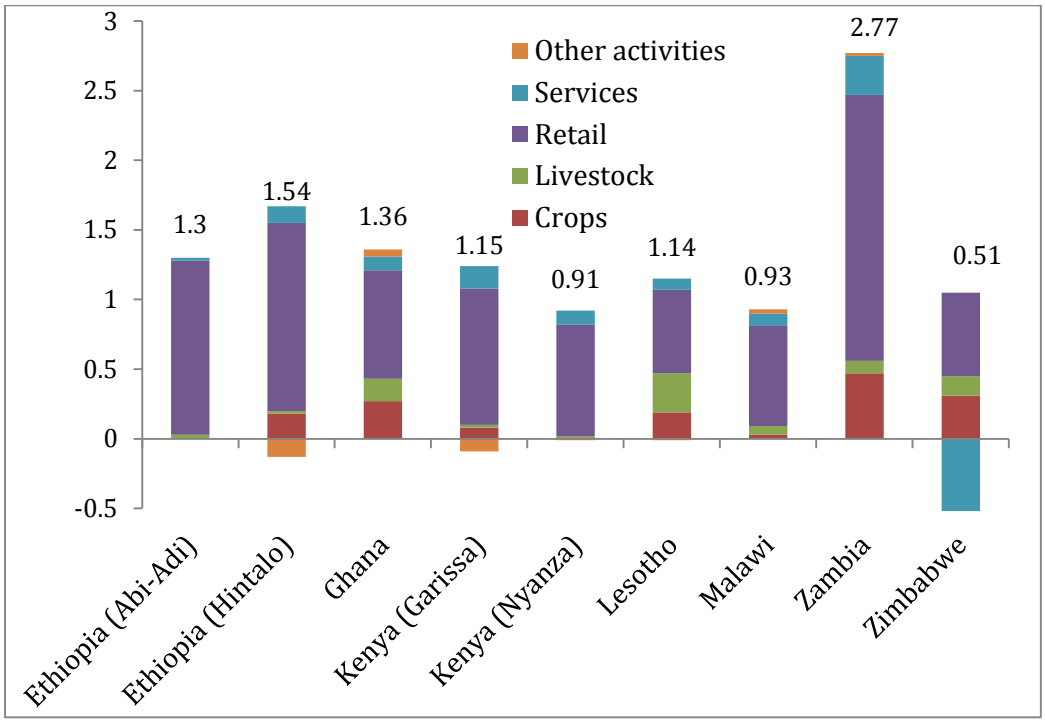
The crop production multiplier tends to be disproportionately large in areas where local crops constitute a significant consumption share and their price is influenced by local supply and demand. This is particularly the case in Zambia, Zimbabwe and Ghana, and, to a somewhat lesser extent, in Hintalo, Ethiopia and in Lesotho. The livestock multiplier, predictably, is largest in Lesotho, but it is also noteworthy in Ghana and Zimbabwe. The services multiplier is most notable in Zambia.

Multipliers for the "other production" activity (prod) are very small or negative in all countries. This is partially because households spend a small share of their income on these goods. In Ethiopia, Kenya and Lesotho, other production is an integrated market, meaning that its price does not change as a result of the SCT. In those cases the sector shrinks as households reallocate factors in favour of producing non-tradables, whose prices rise as a result of the SCT program. In Zimbabwe, both services and other production are integrated markets, and both of those sectors contract as a result of the SCT. This finding is analogous to the Dutch disease phenomenon, in which an economy's non-tradable sectors expand but its tradable sectors contract when a new source of external income appears.[6] In Zimbabwe, services are tradable in local markets, which lie outside the village focus of the LEWIE model there. This explains the negative impact there.

These findings offer insights into the multiplier effects of SCTs presented in Figure 3. In Ghana, even though households spend a large share of their income on retail goods, the production multiplier per cedi spent locally is relatively large. The opposite is true for Malawi, which has among the lowest production multipliers among all of the sites shown in the figures.

[6] Historically in the Netherlands, the new source of income was from the discovery of North Sea oil. In the present case, it is the SCT. See Ebrahim-zadeh, C. 2003. Ebrahim-zadeh notes: "Although the [Dutch] disease is generally associated with a natural resource discovery, it can occur from any development that results in a large inflow of foreign currency, including a sharp surge in natural resource prices, foreign assistance, and foreign direct investment." In the classic Dutch disease, an inflow of foreign currency increases the exchange rate, making the production of tradables uncompetitive with the outside world. In the case of SCTs, upward pressure on local prices increases the real (that is, price-adjusted) exchange rate, even though the project area shares the same currency as the rest of the country.

Figure 6 **Production multipliers disaggregated by activity for SCT programmes**



3.4. Distribution of spillovers across households

The multiplier effect of SCTs on household incomes reflects both the receipt of transfers by eligible households as well as income spillovers. Although the non-beneficiary households do not receive the SCT they nonetheless benefit indirectly, from income spillovers linked to local production.

Figure 7 shows the nominal income spillovers to beneficiary and non-beneficiary households for each programme. Income spillovers vary widely across households. Differences in income spillovers across households primarily reflect factor endowments, including labour as well as access to assets used in local production activities. For each US dollar transferred, the eligible households receive the transfer plus a spillover ranging from a negligible amount to 0.29 cents/dollar transferred. The spillover income captured by ineligible households is much larger, ranging from 0.26 to 1.50 per US dollar transferred. It is significantly greater than zero in all cases, and it sometimes exceeds the amount transferred to eligible households. (This is the case whenever the spillover exceeds 1.00 in the figure.) These findings reflect non-beneficiary households' relatively greater access to productive assets. They highlight that SCT programmes create benefits to households that do not receive the cash. Real-income spillovers follow similar patterns.

Figure 7 **Distribution of spillover of nominal income multipliers among households**

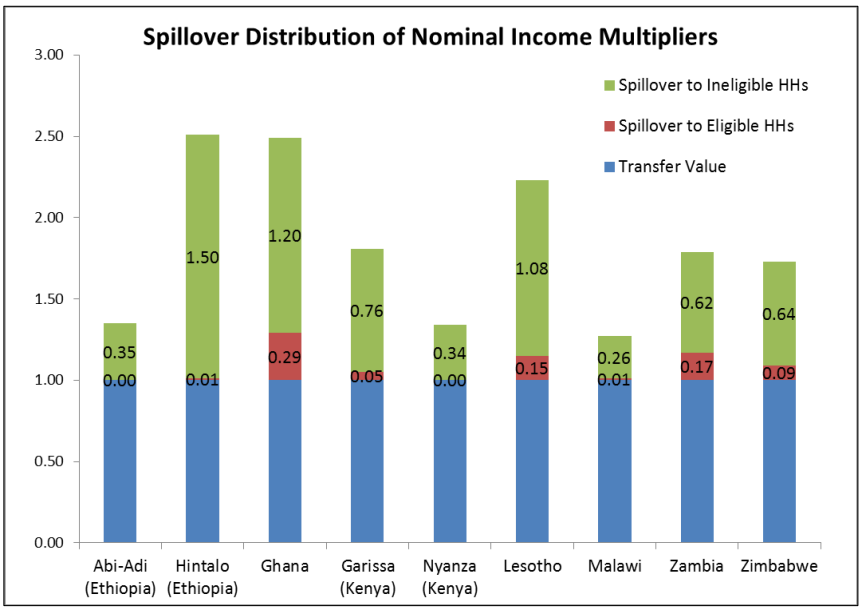
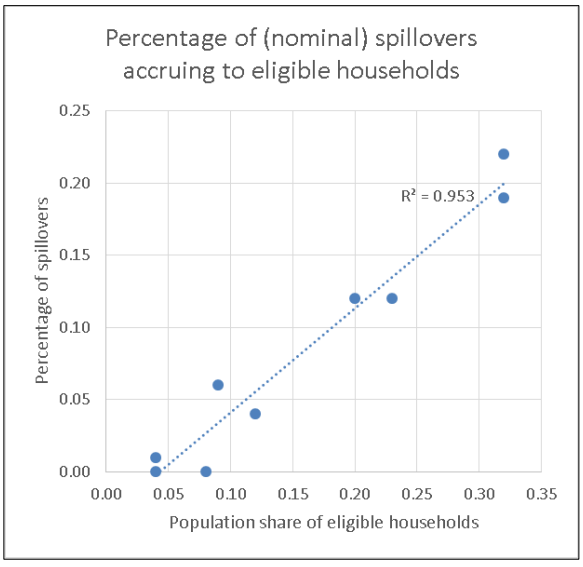


Figure 8 shows eligible households' share of the local population and the percentage of the total nominal spillover income they capture. Where there are relatively more eligible households, they capture proportionately more of the spillover income. In every case, the percentage of spillovers going to eligible households is less, however, than those households' share of the ZOI population. This reflects the eligibility criteria of the SCT programmes: eligible households are targeted because they are poorer and have less access to productive assets (including labour and land). Eligible and ineligible households' engagement in agriculture and business activities also determines their share of SCT spillovers.

Figure 8 **The share of spillovers going to eligible households increases with eligible households' share of local population**



4. Conclusion

Social cash transfers create income spillovers within local economies. Our LEWIE simulations from seven different SCT programmes in Africa reveal that each US dollar transferred to poor eligible households generates an additional 0.27 to 1.52 of local income. In other words, the total income multipliers from SCTs range from 1.27 to 2.52. Most of the spillover goes to households that are not eligible for transfers because they do not meet the poverty or other eligibility criteria of the programmes and are positioned to respond to increased demand for local products. The SCT programmes primarily target poor regions, in which the average income of ineligible households is greater than beneficiary households but still relatively low. Average PPP-adjusted baseline incomes of ineligible households range from US$300 (Ethiopia, Hintalo) to US$1,865 (Kenya, Nyanza). Our findings reveal that ineligible households as a group are indirect beneficiaries of SCT programmes, even though they do not receive a cash transfer.

SCTs can play an important role in social protection by smoothing consumption in the poorest and most vulnerable households. The presence of income spillovers in both eligible and ineligible households demonstrates that SCTs can play a second role, as an economic stimulant. Prices transmit impacts of SCTs through local economies. As local demands for goods and services increase, an elastic supply response will result in local economic expansion, while an unresponsive or inelastic supply may lead to price inflation that erodes the benefits to eligible households and real-income spillovers to non-beneficiaries. An important lesson from LEWIE is that complementary interventions aimed at lessening constraints on local production could increase SCT multipliers and decrease the potential for inflationary impacts.

The more integrated a local economy is with outside markets, the smaller the potential inflationary impact of SCT programmes will be, because increases in local demand are met by outside markets instead of putting upward pressure on local prices. If prices are set in markets outside the local economy, they cannot convey impacts to local producers, spillovers do not materialize and SCT multipliers on the local economy tend to be lower. We can see this clearly at the most integrated study sites, where most income is spent in retail establishments which sell goods from outside markets. There, nominal and real SCT multipliers do not diverge greatly, but both are lower than in places which are more isolated from outside markets.

Thanks to the spillovers they create, SCTs can play an important role in rural development strategy. In most poor rural areas that are the target of SCT programs, the local economy is imperfectly integrated with outside markets, and this isolation gives rise to a potential for large multipliers, especially if there is a robust local supply response. Although integration with outside markets leads to lower program multipliers, it can benefit households in other ways, for example, by providing them with consumption goods at low cost.

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Appendix A: Accounts in the SCT-LEWIE models

Activities[a]	
crop	Crops
live	Livestock
ret	Retail
ser	Services
prod	Other production activities
Commodities	
crop	Crops
live	Livestock
ret	Retail
ser	Services
prod	Other locally-produced goods
outside	Produced outside the area
Factors[c]	
HL	Hired labour
FL	Family labour
Land	Land
K	Capital/physical assets
Purch	Purchased input
Herd[b]	Herd (livestock)
a: Malawi included maize and fish activities and commodities.	
b: In Ethiopia, Kenya, and Lesotho, Herd was represented by K.	
c: Malawi included two types of hired labour (HL and GL: Ganyu Labour) as well as gendered labour accounts for each labuor type..	
Malawi LEWIE also included an inventory factor (INV).	

Appendix B: Data sources for the SCT-LEWIE models

Country	Business enterprise surveys (BES)	Eligible hhs (expenditures and incomes)	Ineligible hhs (expenditures and incomes)	Locations and sources of economic transactions
Ethiopia	Baseline	Baseline	Baseline	Baseline
Ghana	Follow-up	Baseline	ISSER (2010) (rural households)	Follow-up, locations collected for eligible households only, trading partners from Zambia
Kenya	Follow-up 2 (2011)	Follow-up 1 (2009)	2005 KIHBS	Follow-up 2, collected for eligible households only
Lesotho	Baseline	Baseline	Baseline	Baseline
Malawi	Baseline	Baseline	Baseline	Baseline
Zambia	Follow-up	Baseline	LSMS (2010) (rural households)	Follow-up, collected for eligible households only
Zimbabwe	Baseline	Baseline	Baseline	Baseline

Appendix C: Data input sheet for retail activity

Panel I **Variable descriptions**

Variable	Type of parameter
INTD	Intermediate Inputs for Activity (Value)
FD	Factor Demand (Value)
beta	coefficient from Cobb-Douglas production function
se	standard error from Cobb-Douglas production function
acobb	shift parameter from Cobb-Douglas production function
acobbse	standard error on shift parameter from Cobb-Douglas production function
alpha	coefficient from expenditure function
alphase	standard error from expenditure function
cmin	consumption minimum
Commodity	Activity/Commodity modeled (see Appendix A for definitions)
Commodity2	Commodity used as intermediate input
Factor	Factor used in activity (see Appendix A for definitions)

Panel II **Input sheets for Ethiopia and Kenya**

				Ethiopia Abi-Adi		Ethiopia Hintalo		Kenya Garissa			Kenya Nyanza		
Variable	**Commodity**	**Commodity2**	**Factor**	HH	HH	HH	HH	HH	HH	HH	HH	HH	HH
				A	B	A	B	A	B	C	A	B	C
INTD	ret	crop											
INTD	ret	live											
INTD	ret	ret		32468	3605793	21600	1747373	812	71	7489	11330	24883	70241
INTD	ret	ser		8977	997022	0	0	401	35	3700	2485	5458	15407
INTD	ret	prod		17161	1905826	316	25590	138	12	1276	568	1249	3524
INTD	ret	outside		514320	57119278	83187	6729654	6485	564	59781	72913	160139	452047
FD	ret		FL	153511	17048629	44054	3563890	4775	1580	54265	22230	54668	246508
FD	ret		HL	223373	24807315	127955	10351233	1720	569	19547	8007	19692	88794
FD	ret		K	93012	10329673	19863	1606848	1937	641	22014	9018	22177	100001
beta	ret		FL	0.327	0.327	0.230	0.230	0.566	0.566	0.566	0.566	0.566	0.566
beta	ret		HL	0.475	0.475	0.667	0.667	0.204	0.204	0.204	0.204	0.204	0.204
beta	ret		K	0.198	0.198	0.104	0.104	0.230	0.230	0.230	0.230	0.230	0.230
se	ret		FL	0.117	0.117	0.195	0.195	0.209	0.209	0.209	0.209	0.209	0.209
se	ret		HL	0.116	0.116	0.151	0.151	0.038	0.038	0.038	0.038	0.038	0.038
se	ret		K	0.084	0.084	0.110	0.110	0.000	0.000	0.000			
acobb	ret			6.075	6.075	7.536	7.536	10.608	10.608	10.608	10.608	10.608	10.608
acobbse	ret			0.774	0.774	1.203	1.203	0.258	0.258	0.258	0.258	0.258	0.258
alpha	ret			0.903	0.958	0.219	0.014	0.550	0.695	0.841	0.492	0.631	0.365
alphase	ret			0.012	0.006	0.013	0.003	0.028	0.042	0.014	0.013	0.015	0.034
cmin	ret			0	0	0	0	0	0	0	0	0	0

Panel III **Input sheets for Ghana, Lesotho, Zambia, and Zimbabwe**

				Ghana		Lesotho		Zambia		Zimbabwe	
Variable	**Commodity**	**Commodity2**	**Factor**	HH	HH	HH	HH	HH	HH	HH	HH
				A	B	A	B	A	B	A	B
INTD	ret	crop		0.22	0.30			55304	214235		
INTD	ret	live		0.02	0.02			346415	1341935		
INTD	ret	ret		1.30	1.78	90459	34572	3884191	15046491	28.1	445.5
INTD	ret	ser		11.55	15.88	96655	36940	998696	3868724	18.1	286.3
INTD	ret	prod		2.41	3.31			3687	14284	0.7	10.5
INTD	ret	outside		158.96	218.51	13794361	5271984	2283235	8844741	53.9	855.2
FD	ret		FL	74.52	84.25	378122	144512	5704649	22098538	68.1	237.7
FD	ret		HL	13.08	56.24	507632	194009	6071	23518	24.4	85.3
FD	ret		K	82.25	92.99	2235980	854556	8147689	31562330	103.1	359.6
beta	ret		FL	0.361	0.361	0.121	0.121	0.627	0.627	0.325	0.325
beta	ret		HL	0.241	0.241	0.163	0.163	0.001	0.001	0.117	0.117
beta	ret		K	0.398	0.398	0.716	0.716	0.449	0.449	0.491	0.491
se	ret		FL	0.277	0.277	0.309	0.309			0.410	0.410
se	ret		HL	0.070	0.070	0.038	0.038			0.153	0.153
se	ret		K					0.068	0.068	0.146	0.146
acobb	ret			7.675	7.675	9.195	9.195	0.070	0.070	2.174	2.174
acobbse	ret			0.287	0.287	0.284	0.284	1.793	1.794	1.983	1.983
alpha	ret			0.320	0.165	0.247	0.269	0.483	0.538	0.072	0.088
alphase	ret			0.007	0.013	0.010	0.010	0.008	0.083	0.003	0.005
cmin	ret			0	0	0	0	0	0	0	0

Panel IV **Input sheet for Malawi**

				Malawi	
Variable	**Commodity**	**Commodity2**	**Factor**	HH	HH
				A	B
INTD	ret	zoi		698	36019
INTD	ret	outside		454	23418
INTD	ret	crop		4	227
INTD	ret	maize		1	63
INTD	ret	live		101	5191
INTD	ret	fish		0	26
INTD	ret	ser		84	4334
INTD	ret	ret		85	4364
FD	ret		FLF	100	2470
FD	ret		FLM	780	19326
FD	ret		HLF	2	55
FD	ret		HLM	3	69
FD	ret		K	72	2431
FD	ret		INV	374	9262
beta	ret		FLF	0.040	0.040
beta	ret		FLM	0.313	0.313
beta	ret		HLF	0.001	0.001
beta	ret		HLM	0.001	0.001
beta	ret		K	0.084	0.084
beta	ret		INV	0.150	0.150
se	ret		FLF	0.072	0.072
se	ret		FLM	0.079	0.079
se	ret		HLF		
se	ret		HLM		
se	ret		K	0.029	0.029
se	ret		INV	0.047	0.047
acobb	ret			8.560	8.560
acobbse	ret			0.449	0.449
alpha	ret			0.368	0.401
alphase	ret			0.012	0.013
cmin	ret			0	0

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The From Protection to Production (PtoP) programme, jointly implemented by FAO and UNICEF, is contributing to the generation of solid evidence on the impact of cash transfer programmes in Sub-Saharan Africa.

PtoP seeks to understand the potential effects of such programmes on food security, nutrition, as well as their contribution to rural livelihoods and economic growth at household and community levels in Ethiopia, Ghana, Kenya, Malawi, Lesotho, Zambia and Zimbabwe.

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