AGRICULTURAL INPUT SUBSIDIES
The Recent Malawi Experience

EPHRAIM CHIRWA  ANDREW DORWARD
Origins

2005/6: FAC Growth and Social Protection theme

- Social protection (inter alia) from agriculture and agricultural growth
- Social protection independent of agricultural growth
- Social protection for (inter alia) agricultural growth
- Social protection through (inter alia) agriculture

2006/7 to present

- DFID Malawi funding for subsidy programme evaluation (early years with ODI & MSU)
  - Biennial household surveys, annual reporting & government/ partners engagement
- FAC funding
  - Complementary qualitative work
  - Policy engagement (civil society)
  - Paperback African edition, 200 copies

September 2014
Purpose

- To draw together
  - 6 years of detailed evaluation work (annual implementation reviews, biennial household surveys, 2 input market surveys, special studies) on the Malawi FISP
  - Long standing agricultural development research in Malawi & wider policy analysis

- In order to
  - update and develop theoretical understanding of agricultural input subsidies’ impacts
  - review specific lessons on design, implementation and impact in Malawi
  - review wider lessons on agricultural input subsidies
  - promote debate on strategic policy decisions in large-scale agricultural input subsidies

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Outline

1. Introduction

Part I: Background
2. Agricultural input subsidies: changing theory and practice
3. Recent African experience with input subsidies
4. Malawi: political, policy, livelihoods & market background

Part II: Implementation & Impacts of the Programme
5. FISP activities and achievements
6. Direct impacts of input subsidies
8. Economy-wide effects of input subsidies
9. Impacts on input market development
10. Benefit cost analysis, 2006/7 to 2010/11

Part III: Strategic issues
11. Targeting and access to input subsidies
12. Graduation
13. Conclusions
Features

- Theoretical and historical / empirical underpinnings on input subsidy implementation and impacts
- Malawi background: political, policy & livelihood histories
- Detailed, contextualised & comprehensive empirical work for 2005/6 to 2011/12 on
  - Evolving implementation activities and costs
  - Direct outputs
  - Direct & indirect & impacts
  - Issues – graduation (& targeting)
- Lessons for the FISP and for other countries
Conclusions

- Old and new thinking & practice all important in understanding important opportunities & pitfalls in different contexts
- Mixed but poorly evaluated & reported experience with new generation of subsidies in Africa; narrow objectives
- Critical importance of specific Malawi context: politics, policies, livelihoods & markets
- Importance but difficulties of recording, measuring estimating activities, outcomes, & direct indirect impacts
- Key issues
  - contextual design & implementation for productivity, targeting, rationing, market development, graduation & growth
  - complementary investments
  - cost control
  - politics & coordination

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Outstanding issues

- The extent, impacts & significance of population growth
- Changing regional maize markets
- Contested issues – yield impacts & benefit:cost analysis
- Food security, growth, and/or social protection?
- Ongoing 2012/13 and 2013/14 experience …..
National food security: consumption, production & surplus/deficit without subsidy

-1500
-1000
-500
0
500
1000
1500
2000
2500
3000
3500
4000

'000MT

Domestic surplus (deficit) before subsidy (MT)
Domestic surplus (deficit) with subsidy (MT)
Domestic surplus (deficit) without subsidy (MT)
Total consumption (MT)
Production with subsidy (MT)
Input subsidies’ theory & experience

- ‘Conventional input subsidy theory’
  - Temporarily promote learning of inputs’ benefits & use
  - Conditions for success ….
  - Concerns about leakages, permanence, burgeoning costs, inefficiency, crowding out of private sector

- Widely used with credit subsidies etc in the Asian Green Revolution & in Africa but little empirical study of their impacts

- Abandonment of input & credit subsidies & other state actions

- Continued attraction in Africa & resurgence from 2000,
  - Ideal ‘smart’ subsidies (targeted, rationed, market friendly, time bound, contextualised, efficient ….)?
  - Actual programmes seldom smart
  - Need to consider impacts on credit constraints, wider indirect impacts, targeting, graduation

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Subsidies’ wider economy impacts

- Input supply system
  - Input market development

- Effects on Macro economy
- Subsidy implementation

- Rural Household Impacts
  - Effects on recipients
    - Production & productivity
    - Income & food security
  - Effects on non-recipients
    - Production & productivity
    - Income & food security
  - Labour markets
  - Maize markets

- Prices
- Policies
- External conditions
  - Etc
Malawi: politics & policies

- 1964-1994: One party state, Dr Hastings Kamuzu Banda
  - Dualistic agricultural development: commercial estate tobacco (middle class patronage), smallholder progressive farmers fertiliser (price) & credit subsidies, broad food security (mass patronage) but severe child malnutrition & poverty. Donor support then liberalisation

- 1994-2004: Multi party democracy, Bakili Muluzi
  - Business development: agricultural liberalisation of tobacco, small universal/ targeted fertiliser subsidy, severe food shortages. Donor liberalisation & poverty reduction services

- 2004-2012: Multi party democracy, Bingu wa Mutharika
  - Large Agricultural / Farm input subsidy programme, ‘targeted’ 50% coverage critical in minority government & 2nd term election. Donor budget support.

- Agriculture critical in wider political strategies; ‘maize and fertiliser politics’

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THAT'S MY PROMISE

DEVELOP AGRICULTURE TO GUARANTEE FOOD SECURITY

Dr Bingu wa Mutharika
A man of vision

VOTE UDF
VOTE UDF 18 MAY 2004
Malawi livelihoods & the low maize productivity trap

**Private Sector, Non-Farm**

**Roads**

**Maize Price & Trade Policy**

**Credit, Research, Extension, Cash & Oil Crops**

**Input Subsidy**

**Social Protection**

**Unstable Policies**

**Unstable Weather**

**Slow Private Sector Development**

**Poor Roads**

- **Low credit** → **Unstable maize prices** → **Consumer 'lock in' to low productivity maize**
- **Low producer investment** → **Low maize & agric productivity** → **Low & vulnerable real incomes** → **Low demand for non-agric goods & services**

**Malawi livelihoods & the low maize productivity trap**
Changing subsidy impacts on households & markets

**RURAL HOUSEHOLDS**

- **Poorer households**
  - Resale
  - Incremental use
  - Displacement use

- **Less-poor households**

**Y1**
- Increased real incomes
- Increased production

**Y2**
- Increased real incomes
- Reduced maize prices

**RURAL ECONOMY**

- **Y1 Increased wages**
- **Y2 Reduced maize prices**
- **Y2 Increased wages**

- Input service demand & investment
- Farm/ non farm demand & investment
Scale of fertiliser sales

Fertiliser sales ('000 MT)

- Actual tobacco fertiliser
- Actual maize fertiliser
- Fertiliser budgeted

Years: 2005/6 to 2012/13
Programme costs

US$ millions


- Total estimated other costs
- Other
- Transport Costs
- Net fertiliser
- Seeds – maize
- Seeds - flexi / legumes
What are the impacts of FISP?

- Incremental production
  - National food security
    - Maize prices
- Beneficiary production
  - Beneficiary food security (*hanging in*)
  - Beneficiary income growth (*stepping up*)
  - Beneficiary welfare, education, nutrition, health
- Cash injection
  - Ganyu wages
  - Maize prices
  - Non-beneficiary income growth & welfare (*stepping up*)
  - Diversification (*stepping out*)
- Knowledge
- Input supply system
- Resilience

**Maize exports**
**Population growth**
**Economic crises**
**Poor rainfall**
Incremental production

- Depends on
  - Incremental input use
    - Input disbursement
    - Leakage/ theft (0-30%)
    - Displacement (3, 15, 22%)
      - Targeting, prices
  - Incremental yields per unit input
    - Rainfall
    - Soils
    - Crop management
    - Crop variety

Information?

- ✓
- ?
- ?
- ?
- ?
- ?

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National food security: consumption, production & surplus/deficit with subsidy

- Domestic surplus (deficit) before subsidy (MT)
- Domestic surplus (deficit) with subsidy (MT)
- Total consumption (MT)
- Production with subsidy (MT)


'000MT
National food security: consumption, production & surplus/deficit without subsidy

- Domestic surplus (deficit) before subsidy (MT)
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- Total consumption (MT)
- Production with subsidy (MT)
Maize prices

Monthly Malawi domestic prices in Malawi Kwacha & in US$ equivalents
Direct & indirect impacts

- Nutrition?
- Health?
- Education?
- Maize prices?
- Ganyu (casual labour) wages?
- Poverty incidence?
- Economic growth?
Benefit cost ratios (2005/6-2012/13)

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Fiscal efficiency 2005/6 - 2012/13

with Growth Multiplier

BASE

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Conclusions

- FISP has been worthwhile
  - but benefits undermined by implementation & policy coordination weaknesses
- FISP faces major challenges
  - High costs, theft, low perceived benefits
- Returns & benefits could be dramatically improved
  - Timely deliveries
  - Higher farmer contributions
  - Complementary investments & policies
    - Roads, extension, research
    - Farm & non-farm diversification, maize prices, growth, graduation
- Targeting?
- Tighter controls
- Private sector development
Wider lessons

- Agricultural input subsidies can be successful
  - Address critical farm, livelihood & wider economy constraints to input use on staple crops
  - Good physical yield responses to subsidised inputs (soils, seeds, rainfall)
  - Efficient implementation
  - Coherent vision
  - Political commitment (a paradox?)

- Agricultural input subsidies can also be costly failures
  - Political attractiveness requires strong attention to their effectiveness & efficiency

- Locate overall responsibility within the Ministry of Finance or Economic Planning – while retaining operational responsibility within ministries of agriculture?
Thank you

http://www.soas.ac.uk/cedep/research/malawi-subsidies/

http://www.future-agricultures.org/blog/entry/agricultural-input-subsidies-the-recent-malawi-experience#.UuaP9xBFBpg

Much of the work reported here has been funded by UKaid from the Department for International Development; however the views expressed do not necessarily reflect the organisations’ official policies.
Information sources

- Implementation reports (predominantly Logistics Units weekly reports and annual report),
- Coupon access, redemption, crop management & other data from household survey, sample of 2000 households across 14 districts in the 3 regions
- Input supplier data from survey in 10 districts 446 outlets
- Focus group discussions, key informant interviews with different stakeholders (Ministry of Agriculture & local government staff, retailers, and different categories of rural people)
- ‘community survey’ with key informant groups in sampled villages
- Economy wide & maize crop simulation modelling
- Other reports
Brief history of FISP

- 2004/5: Sachs & UN promotion of subsidy, delayed TIPS & fertilisers, ?poor rains? Food shortages and high prices
- 2005/6: Agricultural Input Subsidy Programme – no direct donor funding. Voucher based system for maize seed & maize & tobacco fertiliser
- 2006/7: donors began to get engaged, improved logistics systems, private sector seed & fertiliser sales, Imperial College / SOAS led evaluation (DFID)
- 2007/8: as above, new PS agriculture
- 2008/9: election year (May 2009), private sector excluded from fertiliser (but not seed) sales
- 2009/10 ff: post election, tobacco fertiliser cut, budget cuts & discipline, increasing legume seeds

Objectives:

to improve resource-poor smallholder farmers’ access to improved agricultural inputs in order to achieve their and national food self sufficiency goals. (some references to research)
FI SP Stated objectives

- to improve resource-poor smallholder farmers’ access to improved agricultural inputs ....
  
in order to
- achieve their and national food self-sufficiency
- raise these farmers’ incomes through increased food and cash crop production.

- Later years of the programme have given greater emphasis to concerns for vulnerable farm households
<table>
<thead>
<tr>
<th></th>
<th><strong>Kamuzu Banda</strong></th>
<th><strong>Muluzi</strong></th>
<th><strong>Mutharika</strong></th>
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</thead>
<tbody>
<tr>
<td><strong>Constitution</strong></td>
<td>One party state, ‘Life presidency’</td>
<td>Multi-party democracy, Presidential 2 term limit (5 year terms)</td>
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<tr>
<td><strong>Elite patronage</strong></td>
<td>Political/ technocratic/ estate ownership</td>
<td>Financial</td>
<td>Political &amp; financial</td>
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<tr>
<td></td>
<td>Weakening: small estate owners</td>
<td>‘democratisation of corruption’</td>
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<tr>
<td><strong>Middle class patronage</strong></td>
<td>Civil service, education</td>
<td>Professionals, businesses</td>
<td>Weak</td>
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<td></td>
<td>Weakening: small estate owners</td>
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<tr>
<td><strong>Masses patronage</strong></td>
<td>Fertiliser subsidy &amp; credit beneficiaries (less poor); food availability (poor)</td>
<td>Tobacco (less poor), Fertiliser subsidy</td>
<td>Fertiliser subsidy (FISP)</td>
</tr>
<tr>
<td></td>
<td>Rent utilization</td>
<td>Free for all</td>
<td>Non-developmental kleptocracy / free for all</td>
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<td><strong>Donor agricultural policies</strong></td>
<td>Integrated rural dev support</td>
<td>Liberalisation with U turns</td>
<td>Liberalisation, social protection (more diversity among donors)</td>
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<td>Budget support, governance, FISP support</td>
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## Malawi Social & economic indicators 1975 to 2005

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<tbody>
<tr>
<td><strong>Population</strong></td>
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<tr>
<td>Population, total (millions)</td>
<td>5.2</td>
<td>7.2</td>
<td>10.1</td>
<td>11.5</td>
<td>12.9</td>
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<tr>
<td>Rural population (% of total population)</td>
<td>92</td>
<td>90</td>
<td>87</td>
<td>85</td>
<td>88</td>
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<tr>
<td><strong>Welfare</strong></td>
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<td>Poverty incidence (rural)</td>
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<td>56</td>
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<tr>
<td><strong>Health</strong></td>
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<tr>
<td>Life expectancy at birth, total (years)</td>
<td>..</td>
<td>46</td>
<td>43</td>
<td>40</td>
<td>41</td>
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<tr>
<td>Mortality rate, under-5 (per 1,000)</td>
<td>304</td>
<td>245</td>
<td>193</td>
<td>155</td>
<td>125</td>
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<td><strong>Nutrition</strong></td>
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<td>Stunting (% children 6 to 59 months)</td>
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<td>49</td>
<td>43</td>
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<td><strong>Economy</strong></td>
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<tr>
<td>GNI per capita, Atlas method (current US$)</td>
<td>130</td>
<td>160</td>
<td>160</td>
<td>150</td>
<td>160</td>
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<td>GDP growth (annual %)</td>
<td>6.1</td>
<td>4.6</td>
<td>16.7</td>
<td>1.6</td>
<td>2.8</td>
</tr>
<tr>
<td>Inflation, consumer prices (annual %)</td>
<td>..</td>
<td>21.9</td>
<td>83.3</td>
<td>29.6</td>
<td>15.4</td>
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<tr>
<td>Agriculture, value added (% of GDP)</td>
<td>37</td>
<td>43</td>
<td>30</td>
<td>40</td>
<td>35</td>
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<tr>
<td>Industry, value added (% of GDP)</td>
<td>20</td>
<td>11</td>
<td>20</td>
<td>18</td>
<td>19</td>
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<tr>
<td>Services, etc., value added (% of GDP)</td>
<td>42</td>
<td>35</td>
<td>50</td>
<td>43</td>
<td>46</td>
</tr>
<tr>
<td>Trade</td>
<td></td>
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<tr>
<td>Imports of goods and services (% of GDP)</td>
<td>46</td>
<td>30</td>
<td>48</td>
<td>35</td>
<td>52</td>
</tr>
<tr>
<td>Food imports (% of merchandise imports)</td>
<td>9</td>
<td>8</td>
<td>14</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Agriculture</td>
<td></td>
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<tr>
<td>Fertilizer consumption ('000 metric tons)</td>
<td>22</td>
<td>65</td>
<td>196</td>
<td>167</td>
<td>292</td>
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<tr>
<td>Irrigated land (% of cropland)</td>
<td>0.93</td>
<td>0.97</td>
<td>1.50</td>
<td>2.46</td>
<td>..</td>
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<tr>
<td>Maize growers (% agricultural households)</td>
<td></td>
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<td>97</td>
</tr>
</tbody>
</table>

September 2014
**Input Use, Production, Food Security**

**Stakeholders**
- FARMERS
- MoAFS: HQ, LU, ADDs, DADOs, ASs, FAs
- DCs, TAs, VDCs, Police, CSOs
- Fertiliser importers, retailers
- Seed suppliers, retailers
- ADMARC: HQ, districts, markets
- SFFRFM: HQ, depots, markets
- Transporters
- Donors

**Planning & Budgeting**
- Secure coupon printing
- Coupon distribution to areas.
- Input purchase
- Input distribution (transport & storage)

**Payments & Control**
- Market opening
- Coupon issue
- Beneficiary identification
- Farmer registration

**Area Allocations**

**Coordination & Control**
- Coordination
- Payments & control

**Flip Span Project Implementation**
Completion of contracts & voucher processes

Month

- Fertiliser tenders
- Voucher allocations
- Transport tenders
- Voucher printing
- Voucher & lists to districts
- Seed supply contracts

Year


Completion of contracts & voucher processes as of September 2014
Depot receipts timing, % parastatal fertiliser sales
Uplifts timing, % total by month

Uplifts % total

- 2006/7
- 2007/8
- 2008/9
- 2009/10
- 2010/11
- 2011/12
- 2012/13

End Sept %  | End Oct %  | End Nov %  | End Dec %

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Outstanding invoice payments by season

- End Nov (MK bill)
- End Dec (MK bill)
- End Jan (MK bill)
- End Nov %
- End Dec %
- End Jan %

September 2014
- Initial tender call March 2012 opened in May
- Second call July 2012 awarded mid September
Fertiliser cost & price comparisons

2012/13 exchange rate: 365MK/US$
Farmer contributions have fallen since establishment of FISP from around 35% to 3% of fertiliser cost.
Programme costs

- **Challenges**
  - Very large scale of programme, national budget & fiscal macroeconomic impacts
  - Multiple stakeholders & political importance
  - Physical & financial budgeting & control
  - Controlling leakages
  - Determining appropriate farmer contributions
  - World prices for fertiliser costs
  - Forex demands for fertiliser
  - Speedy payments to reduce supplier costs
  - Tendering procedures – time, quality, price
Programme costs

- Changes implemented to date
  - Physical budget control
  - Financial budget control
  - Supplementary coupon control
  - Invoice payments …
  - Tender procedures …

- Further potential improvements
  - Increase farmer contributions
  - Reduce beneficiary numbers
  - Reduce subsidised inputs per beneficiary
  - Reduction in leakages
  - Improved targeting to reduce displacement

- FDG views
  - Mixed on reducing beneficiaries or subsidy/ beneficiary
Total fertiliser voucher redemptions (millions)
Incremental production

- Depends on
  - Incremental input use
    - Input disbursement
    - Leakage/ theft (0-30%)
    - Displacement (3, 15, 22%)
      - Targeting, prices
  - Incremental yields per unit input
    - Rainfall
    - Soils
    - Crop management
    - Crop variety

Information?

☑

?
Incremental maize production

- Difficult to obtain reliable information on smallholder yields and yield responses

Data sources

- Input response
  - On farm trials, 92 kgN/ha 5 bags fertiliser/ha
  - Hybrid: 13 to 22 kg/kg N, mean 17
- Survey analysis (IHS3)
- Yield measurement
- Crop simulation – *varies with crop management*

Crop management

- Survey analysis (AISS2, IHS3, AISS3)
Crop simulation

- New information from commissioned maize simulation study under smallholder conditions (Anthony Whitbread et al, Goettingen University)

- Realistic results
  - Average yields a little bit higher than IHS3 under similar management
  - Identifies critical yield factors
Illustrative N Response, hybrid without & with P

- Mz#_low/Weeding-well
- Mz#_low/Weeding-poor
- Mz#_mod/Weeding-well
- Mz#_mod/Weeding-poor
- Mz#_high/Weeding-well
- Mz#_high/Weeding-poor

(a) Grain yield (kg/ha) vs. Fertiliser N rate (kg/ha)

Chitala OP
Variety: Hybrid

(b) Grain yield (kg/ha) vs. Fertiliser N rate (kg/ha)

Chitala 10P
Variety: Hybrid

September 2014
Illustrative N Response, local without & with P

- Mz\_low/Weeding-well
- Mz\_low/Weeding-poor
- Mz\_mod/Weeding-well
- Mz\_mod/Weeding-poor
- Mz\_high/Weeding-well
- Mz\_high/Weeding-poor

(b) Chitala OP
Variety: Local

(d) Chitala 10P
Variety: Local

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Simulated yield response

- Importance of
  - hybrid seed
  - early planting
  - good agronomy
  - potential for lower N rates
  - variable returns to N

- Good potential returns to N and impact
  - Nutrient responses with average smallholder management
    - Local 18 kg grain/kg N ( @37 kg N/ha)
    - Hybrid 22 kg grain/kg N ( @47 kg N/ha)
    - Hybrid without fertiliser + 600kg/ha
<table>
<thead>
<tr>
<th>Seed displacement</th>
<th>NUE</th>
<th>Fertiliser displacement &amp; leakage</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Reduced</td>
<td>Hybrid</td>
</tr>
<tr>
<td></td>
<td>-10%</td>
<td>22.1</td>
</tr>
<tr>
<td>40%</td>
<td>-20%</td>
<td>19.6</td>
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<tr>
<td></td>
<td>-30%</td>
<td>17.2</td>
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<td></td>
<td>-10%</td>
<td>22.1</td>
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<tr>
<td>50%</td>
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<td></td>
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<td>17.2</td>
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<td></td>
<td>-10%</td>
<td>22.1</td>
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<tr>
<td>60%</td>
<td>-20%</td>
<td>19.6</td>
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<tr>
<td></td>
<td>-30%</td>
<td>17.2</td>
</tr>
</tbody>
</table>

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Yield responses

- Data on actual yield responses
- Improving timing of coupon and input delivery & access
  - Tender processes
  - Fertiliser storage capacity
  - Delivery access to markets
  - Matching market supply & demand
  - Beneficiary identification & coupon distribution processes
  - More private sector involvement in fertiliser sales
  - Earlier & more transparent/participative coupon allocation & distribution
  - Eliminate annual farm family register
- Improving farmer crop management
  - Extension & farmer knowledge
  - Farmer resource (food/cash/labour) constraints
  - Increasing use of organic fertilisers, legume rotations, etc
National food security

- Value of saved imports from 2007/8 to 2013/14 market seasons between 33% and 43% of FISP programme costs depending on the use of domestic or SAFEX import prices for valuing maize imports.

- Analysis does not allow for
  - benefits of more local access to maize
  - dangers of reliance on often late imports
  - long term social, economic and health costs of periods of widespread food shortages and high prices.

- Analysis also ignores
  - wider economic benefits from FISP
  - seasonal regional export market challenges to FISPs role in supporting national food security (but this threatens national food security with or without FISP)
Maize markets & prices: Malawi

Monthly Malawi domestic prices in Malawi Kwacha & in US$ equivalents
Regional maize markets & prices

Current US$/kg

- Malawi
- SAFEX-0.1

Dates:
- 2000 Aug
- 2001 Apr
- 2001 Dec
- 2002 Aug
- 2003 Apr
- 2003 Dec
- 2004 Aug
- 2005 Apr
- 2005 Dec
- 2006 Aug
- 2007 Apr
- 2007 Dec
- 2008 Aug
- 2009 Apr
- 2009 Dec
- 2010 Aug
- 2011 Apr
- 2011 Dec
- 2012 Aug
- 2013 Apr
Regional maize markets & prices

Current US$/kg

- Malawi
- SAFEX
- SAFEX-0.1

Regional maize markets & prices

Current US$/kg

- Malawi
- Nampula
- Lusaka
- Tete

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Regional maize exports

- Early season regional maize exports pose a serious challenge
  - to national & household food security
  - to FISP food security benefits

- Options?
  - Export ban
  - Consistent ‘rules’
  - Better crop estimates
  - Encourage private sector storage
    - Options?
    - Relieve credit costs/ constraints
Cropping patterns (%)
Cropping patterns (ha)
Beneficiary welfare, education, nutrition, health

- Improved school attendance, diet, health mentioned in some FGDs
- Past studies: U5 health, school attendance
- Holden perceived health
- Rickert Gilbert satisfaction with life
- Ward TIPS reduced stunting
- Kamanga nutrition
Beneficiary income growth

- Maize (incremental production)
  - High value to cost ratios for subsidised inputs (70+ for fertiliser, 150 for hybrid seed)
  - Full maize pack MK55,000 to 75,000
  - One fertiliser coupon (without or with seed) MK20,000 to 25,000

- Focus group discussions
  - Mentioned income benefits & asset accumulation for better off hh with more land & more coupons (stepping up)
Input supply impacts: fertiliser procurement from private co. & parastatals

![Diagram showing fertiliser supply trends]

- Brought forward MTS
- Parastatal tenders MTS
- Private sector tenders MTS
- Private sector % new supplies


September 2014
Input supply system

Growth of Business: Number of Sales Outlets, 2010/11 - 2012/13

<table>
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<tr>
<th>Category</th>
<th>Percent</th>
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<td>Distributors</td>
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<td>Agro-Dealers</td>
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<tr>
<td>Other Suppliers</td>
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Legend:
- Blue: Expand
- Red: Contract
- Green: No Change
## Changes in Commercial Sales in past 5 agricultural seasons

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## Input supply system

### Reasons for Changes in Commercial Sales in past seasons

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<td>Higher farmer income, can procure more supplies</td>
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<tr>
<td>Able to obtain credit from suppliers</td>
<td>2.4</td>
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<tr>
<td>Subsidy programme has created more business</td>
<td>53.7</td>
<td>40.0</td>
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<tr>
<td>Farmers had more money to purchase</td>
<td>14.6</td>
<td>14.6</td>
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<td>Improved farm produce prices</td>
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<td><strong>Reasons for Decrease</strong></td>
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<tr>
<td>Lack of credit/cash to purchase supplies</td>
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<td>3.1</td>
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<td>Subsidy programme has discouraged sale</td>
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<td>High input prices</td>
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<td>Farmers have no money for purchases</td>
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<td>Unable to participate in the subsidy programme</td>
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Numbers of farm families?

Farm families (millions)

- North
- Centre
- South

2005 2006 2007 2008 2009 2010 2011 2012

September 2014
Numbers of farm families?

Annual growth rate

- North
- Centre
- South

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<td>2011-12</td>
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September 2014
# Leakages

<table>
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<th>Fertiliser</th>
<th>Maize seed</th>
<th>Legume seed</th>
<th>Fertiliser coupons</th>
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<tbody>
<tr>
<td></td>
<td></td>
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<td>2010/11</td>
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### Estimate as % redemptions/ sales, NSO hh

<table>
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<tr>
<th>Region</th>
<th>Fertiliser</th>
<th>Maize seed</th>
<th>Legume seed</th>
<th>Fertiliser coupons</th>
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</thead>
<tbody>
<tr>
<td>North</td>
<td>77%</td>
<td>77%</td>
<td>82%</td>
<td>105%</td>
</tr>
<tr>
<td>Centre</td>
<td>58%</td>
<td>52%</td>
<td>29%</td>
<td>74%</td>
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<tr>
<td>South</td>
<td>65%</td>
<td>83%</td>
<td>68%</td>
<td>88%</td>
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<tr>
<td>Total</td>
<td>63%</td>
<td>68%</td>
<td>52%</td>
<td>86%</td>
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### Estimate as % redemptions/ sales, MoAFS ff

<table>
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<tr>
<th>Region</th>
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<th>Maize seed</th>
<th>Legume seed</th>
<th>Fertiliser coupons</th>
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</thead>
<tbody>
<tr>
<td>North</td>
<td>126%</td>
<td>126%</td>
<td>134%</td>
<td>171%</td>
</tr>
<tr>
<td>Centre</td>
<td>99%</td>
<td>89%</td>
<td>49%</td>
<td>132%</td>
</tr>
<tr>
<td>South</td>
<td>103%</td>
<td>132%</td>
<td>109%</td>
<td>132%</td>
</tr>
<tr>
<td>Total</td>
<td>104%</td>
<td>113%</td>
<td>87%</td>
<td>139%</td>
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</table>
Diversion?

- Transport losses?
  - No of companies commissioned
    - 2008/09: 23
    - 2009/10: 26
    - 2010/11: 25
    - 2011/12: 23
    - 2012/13: 43
  - Logistics Unit reported 608MTS lost (0.4%) & MK108 mill (0.2%)
  - Logistics Unit also reported 4,902MT stock balance expected (3.2% of voucher redemptions)
- Tampered vouchers: 13,083 (0.4%)
Leakages & displacement

- FGD proposals
  - More participation
  - Sealed coupon packages opened at village meetings?
  - Marked fertiliser bags?
  - More/less involvement of VHs, FAs?
  - Elected committees?
  - Mixed views on universal but smaller ration versus targeting the poor

Scores:
4 = very good; 3 = good;
2 = not good not bad; 1 = bad;
0 = very bad
Leakages & displacement

- Challenges
  - High value of inputs & of subsidy
  - Fake coupons
  - Supplementary coupons & diversion
  - Transport losses
  - Adulteration of inputs (eg sand in fertiliser)
  - Late deliveries, stockouts & queues
  - Seed claims
  - Local level diversion (TAs, Agric. staff, market staff)
  - Coupon sales, input sales, vendors
Leakages & displacement

- Changes implemented to reduce leakages & displacement
  - No supplementary coupons
  - Better coupon security
  - Transport monitoring
  - Open meetings
  - Public beneficiary lists
  - Better market systems (eg rotation, committees)
  - Police & ACB involvement
Leakages & displacement

- Further changes?
  - Sort out the number of farm families & rural households
  - Transporter vetting & monitoring
  - E vouchers
  - Raise farmer contributions
  - Universal allocation but smaller amount per beneficiary
  - Further & earlier transparency/ information & participation
    - Genuine participatory allocations
    - Fuller & earlier information on numbers
    - Fuller implementation of public lists
Targeting

- Stated targeting criteria
  - resource poor Malawians owning land
  - explicit emphasis on more vulnerable households
    - child or female headed households,
    - people living with HIV/AIDS,
    - vulnerable people and their guardians or carers,
## Targeting

<table>
<thead>
<tr>
<th></th>
<th>Fertiliser</th>
<th>Maize seed</th>
<th>Legume seed</th>
<th>Fertiliser coupons</th>
</tr>
</thead>
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<tr>
<td><strong>Average coupons received per hh</strong></td>
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<td></td>
<td></td>
<td>2010/11</td>
</tr>
<tr>
<td>North</td>
<td>0.94</td>
<td>0.46</td>
<td>0.42</td>
<td>1.38</td>
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<tr>
<td>Centre</td>
<td>0.65</td>
<td>0.29</td>
<td>0.15</td>
<td>0.92</td>
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<tr>
<td>South</td>
<td>0.75</td>
<td>0.48</td>
<td>0.37</td>
<td>1.29</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>0.73</td>
<td>0.39</td>
<td>0.28</td>
<td>1.13</td>
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<table>
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<tr>
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<th>2010/11</th>
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<th>2006/7</th>
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<tbody>
<tr>
<td><strong>Zero</strong></td>
<td>48%</td>
<td>24%</td>
<td>28%</td>
<td>38%</td>
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<tr>
<td><strong>&gt;0 &amp;&lt;1</strong></td>
<td>0%</td>
<td>24%</td>
<td>35%</td>
<td>45%</td>
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<td>9%</td>
<td>31%</td>
<td>33%</td>
<td>49%</td>
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<tr>
<td><strong>Mean/recipient</strong></td>
<td>1.82</td>
<td>1.81</td>
<td>1.42</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Zero</strong></td>
<td>40%</td>
<td>31%</td>
<td>33%</td>
<td>46%</td>
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<tr>
<td><strong>Mean/recipient</strong></td>
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<td>1.49</td>
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<td>46%</td>
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<tr>
<td><strong>Mean/recipient</strong></td>
<td>1.21</td>
<td>1.44</td>
<td>1.52</td>
<td>1.7</td>
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*September 2014*
Area targeting: fertiliser vouchers redeemed per farm family

MoAFS farm families

NSO rural households

September 2014
Area targeting: beneficiaries per farm family by district

September 2014
## Targeting

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North - 48% 0% 9% 1.82
Centre - 40% 17% 31% 1.08
South - 38% 8% 37% 1.21
National - 40% 11% 31% 1.21
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<td>Maize for 4-7 months</td>
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<td>Poorest (Ovutikitsitsa)</td>
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<td>1.29</td>
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<td>1.22</td>
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<td>1.69</td>
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## Targeting

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<tr>
<td>National</td>
<td>40%</td>
<td>11%</td>
<td>31%</td>
<td>1.21</td>
<td>21%</td>
<td>1.44</td>
<td>33%</td>
<td>1.52</td>
<td>46%</td>
<td>1.7</td>
</tr>
<tr>
<td>Male headed</td>
<td>41%</td>
<td>11%</td>
<td>30%</td>
<td>1.22</td>
<td>20%</td>
<td>1.45</td>
<td>34%</td>
<td>1.55</td>
<td>43%</td>
<td>1.8</td>
</tr>
<tr>
<td>Female headed</td>
<td>37%</td>
<td>13%</td>
<td>35%</td>
<td>1.18</td>
<td>25%</td>
<td>1.41</td>
<td>32%</td>
<td>1.45</td>
<td>54%</td>
<td>1.6</td>
</tr>
<tr>
<td>Youth head</td>
<td>60%</td>
<td>12%</td>
<td>23%</td>
<td>0.93</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>na</td>
<td>n.a.</td>
</tr>
<tr>
<td>Working age head</td>
<td>42%</td>
<td>11%</td>
<td>31%</td>
<td>1.15</td>
<td>21%</td>
<td>1.43</td>
<td>35%</td>
<td>1.53</td>
<td>N.A.</td>
<td></td>
</tr>
<tr>
<td>Elderly head</td>
<td>27%</td>
<td>12%</td>
<td>34%</td>
<td>1.29</td>
<td>21%</td>
<td>1.53</td>
<td>28%</td>
<td>1.49</td>
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</table>
### Fertiliser Coupon numbers per hh

<table>
<thead>
<tr>
<th></th>
<th>Zero</th>
<th>&gt;0 &amp;&lt;1</th>
<th>1</th>
<th>More than 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Owned Area in ha</strong></td>
<td>0.90</td>
<td>0.88</td>
<td>0.94</td>
<td>1.16</td>
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<tr>
<td><strong>Value durable assets (‘000MK)</strong></td>
<td>34.4</td>
<td>23.2</td>
<td>25.8</td>
<td>55.2</td>
</tr>
<tr>
<td><strong>Value Livestock assets (‘000MK)</strong></td>
<td>53.1</td>
<td>26.8</td>
<td>45.7</td>
<td>178.0</td>
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<tr>
<td><strong>Total Value livestock &amp; durable assets (‘000MK)</strong></td>
<td>87.5</td>
<td>50.1</td>
<td>71.5</td>
<td>235.2</td>
</tr>
<tr>
<td><strong>Subjective score of hh food consumption over past 12 months</strong></td>
<td>1.4</td>
<td>1.4</td>
<td>1.5</td>
<td>1.6</td>
</tr>
<tr>
<td><strong>Subjective score on welfare</strong></td>
<td>2.2</td>
<td>2.2</td>
<td>2.2</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>Month after harvest that maize ran out</strong></td>
<td>6.9</td>
<td>7.3</td>
<td>7.2</td>
<td>7.5</td>
</tr>
</tbody>
</table>
Targeting - respondent views

- Poor people, female headed hh, more productive farmers, households with orphans, better off farmers all roughly no difference in targeting
- VDC members a bit more likely to get coupons, civil servants & teachers less likely
- FGDs – mixed reports
Targeting: allocations, distribution & access

- Good targeting should promote:
  - Low diversion / losses
  - Low displacement
  - Effective input use
  - Reaching the poor & vulnerable
  - Low exclusion errors (the right people don’t get it)
  - Inclusion errors (the wrong people get it)

- Issues: processes & outcomes
  - Scale of programme & disbursements
  - Area targeting:
    - Regional & district distribution
  - Household targeting:
    - Beneficiary characteristics
    - Coupon access & redemption
Targeting

- Further changes?
  - E vouchers
  - Universal allocation but smaller amount per beneficiary
  - Further & earlier transparency / information & participation
    - Genuine participatory allocations
    - Fuller & earlier information on numbers

- FGD proposals
  - More participation
  - Sealed coupon packages opened at public village meetings?
  - Marked fertiliser bags?
  - More/ less involvement of VHs, FAs?
  - Elected committees?
Household targeting

- Challenges (see earlier slides)
  - Little evidence of targeting reaching the poor & vulnerable – but they are not excluded…?
  - Redistribution & sharing very important for the poor
  - Interactions with leakages
  - Allocation & access both important
  - ‘We are all poor’, growing population, static coupons
  - Very difficult to improve it
    - Participation & transparency?
    - External involvement?

- Changes implemented to improve area & hh targeting
  - See under leakages
  - Regional reallocations
  - Increased emphasis on poor & vulnerable
  - Actions to improve access (eg market systems)
  - Low farmer contributions?
2012/13 BCA Sensitivity analysis: leakage/displacement

NPV (US$) vs Fertiliser leakage/displacement

- NPV (US$)
- BCR
- Fiscal Efficiency

September 2014
2012/13 BCA Sensitivity analysis: fertiliser price

Fertiliser price US$/mtT

- NPV (US$)
- TOTAL FISCAL Costs
- BCR
- Fiscal Efficiency

US$mill

Fertiliser price US$/mtT

September 2014
2012/13 BCA Sensitivity analysis: farmer contributions

September 2014
2012/13 BCA Sensitivity analysis: yields

US$ mill

- NPV (US$)
- BCR
- Fiscal Efficiency

% of Simulation NUE

September 2014
Corrections to Jayne et al BCA (1)
(and correction effects)

- Methodological
  - Separate financial analysis for government & farmers
  - Calculation of Fiscal Efficiency (FE)
  - Algebraic calculation of combined diversion & displacement
    (very minor improvement in BCR)
    (minor improvement in FE)
  - Consistent treatment of diversion as transfers
    (major improvements in BCR & FE)
  - Inclusion of incremental farmer costs (eg harvest)
    (major deteriorations in BCR & FE)
  - Allowance for economy wide multipliers
    (improvements in BCR & FE)
Corrections to Jayne et al BCA (2) (and correction effects)

- **Data**
  - Displacement & diversion estimates for later years
    - more sharing,
    - no supplementary distribution,
    - no tobacco fertilisers,
    - better coupon security,
    - (better recovery of farmer contributions)
  - (little change to BCR)
  - (improvements in FE)
  - Higher yield response – 5 not 3.3 kg grain/kg fertiliser
  - (major improvement in BCR)
Corrections to Jayne et al. BCA (3)

<table>
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<tr>
<th></th>
<th>2005/6</th>
<th>2007/8</th>
<th>2009/10</th>
<th>All years</th>
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<tr>
<td><strong>Jayne et al.</strong></td>
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<tr>
<td>Econ BCR</td>
<td>0.63</td>
<td>1.57</td>
<td>0.64</td>
<td>0.76</td>
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<td><strong>Revised estimates addressing methodological issues</strong></td>
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<tr>
<td><em>Without multipliers</em></td>
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<tr>
<td>Econ BCR</td>
<td>0.67</td>
<td>1.66</td>
<td>0.70</td>
<td>0.90</td>
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<td><em>With multipliers</em></td>
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<tr>
<td>Econ BCR</td>
<td>0.71</td>
<td>1.81</td>
<td>0.78</td>
<td>0.98</td>
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<tr>
<td><strong>Revised estimates addressing methods &amp; 5kg maize/kg fert.</strong></td>
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</tr>
<tr>
<td><em>Without multipliers</em></td>
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<tr>
<td>Econ BCR</td>
<td>1.01</td>
<td>2.50</td>
<td>1.05</td>
<td>1.36</td>
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<tr>
<td>FE no farmer payments</td>
<td>0.01</td>
<td>1.44</td>
<td>0.04</td>
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<tr>
<td>FE inc farmer payments</td>
<td>0.01</td>
<td>1.89</td>
<td>0.05</td>
<td>0.35</td>
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<td><em>With multipliers</em></td>
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<tr>
<td>Econ BCR</td>
<td>1.07</td>
<td>2.72</td>
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<td>0.03</td>
<td>3.52</td>
<td>0.09</td>
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