



Oxford Policy Management

# Predicting the cost and impact of cash transfer programmes

## The power of microsimulation tools

Cash transfers to households are becoming an increasingly common policy instrument for reducing poverty in some countries of sub-Saharan Africa. This *Briefing Note* describes a simple ex-ante ‘microsimulation’ tool to determine whether launching a cash transfer programme will have an affordable impact on poverty.

### Background

Many of today’s cash transfer schemes operate as donor-funded pilot studies. A few such schemes are now integrated into national budgets, and their number is likely to increase as governments implement the International Labour Organisation’s (ILO) Recommendation no. 202 on the Introduction of National Floors for Social Protection.<sup>1</sup>

However, pilot schemes are not always modelled at the design stage to estimate their cost and impact on household poverty when run at scale, despite the availability of the basic ‘microsimulation’ tools required to make the calculations. Since the 1960s these tools have been widely used in developed economies to model the effects of social welfare reforms or tax reforms, and can also be applied to cash transfer schemes in low- and middle-income countries.<sup>2</sup>

The basic microsimulation tool described in this Briefing Note uses household survey data to predict the costs and poverty outcomes of cash transfer programmes under different scenarios before any programme is launched. It can also simulate how the benefit will be distributed among households with different consumption levels or different household composition. This contrasts with a tool that uses only macro-level data such as national population data, which cannot model the effect of the transfer at a household level.<sup>3</sup>

The tool can be elaborated and run within a few days in any country in which household survey data of a reasonable quality are available, using widely available statistical software such as Stata or SPSS together with a spreadsheet. More complex microsimulation tools can be employed to predict households’ behavioural response to receiving transfers, for example whether they have an effect on school enrolment or households’ propensity to save.<sup>4</sup>

### Key points

The following pages describe the four main steps and issues involved in using a basic microsimulation tool for cash transfer programmes. These four steps include:

- Decide the scenarios to be modelled;
- Obtain the micro- and macro-level data;
- Create variables in the household survey dataset that act as markers for each scenario;
- Model the effect of the programme using the household survey data.

1 Adopted by the ILO in June 2012.

2 Citro, C. and Hanushek, E. (1993), ‘Microsimulation models for social welfare programs: an evaluation’. Focus, Institute for Research on Poverty, December 1993, pp.13–21.

3 The steps are drawn from a microsimulation tool that OPM developed to simulate the potential impact and cost of introducing cash transfers in Côte d’Ivoire and Congo-Brazzaville.

4 See eg. Bourignon, F., Ferreira, F. and Leite, P. (2002), ‘Conditional cash transfers, schooling and child labor: micro-simulating Brazil’s *Bolsa Escola* program’, World Bank Economic Review 17:2, pp.229–254.

## Step 1: Decide the scenarios to be modelled

Thinking about the reasons for the cash transfer, you should first consider what the cash transfer might look like. Specifically, five key questions need to be answered:

1. **Who is the target beneficiary group?** Is the transfer intended to reach individuals of a particular age such as babies or the elderly, other categories of the population such as pregnant women or those with a disability, or households living below a certain poverty level? If it is to be targeted at poor households, how should they be identified? For example, households might be in the lowest consumption decile or quintile, or fall below the threshold of a proxy means test.
2. **What is the proposed value of the benefit?** This might be calculated, for example, as a percentage of the national poverty line or food poverty line. How often is the benefit to be paid, and what size is it? Is there to be a limit on the number of people in a household that can receive the benefit, and if so, how many? Would all eligible members of a household receive the same value, or is the amount to be tapered according to the number of beneficiaries in the household?
3. **Is the benefit likely to displace other sources of income?** If so, by how much? It might be assumed that a public works scheme, for instance, may have an opportunity cost for a household, because the beneficiary may spend time attending the programme at the expense of earning an informal wage on another job.
4. **How costly will the programme be to administer?** What percentage of the programme budget should be set aside for administration? Grosh (2008) observes that, ‘the administrative costs of well-executed cash or near cash programmes cluster in the range of 8 to 15 percent of total costs’. Does the country have the capacity to put in place a well executed system, or will it require additional long-term investment alongside the regular administrative cost? Is it simple to verify eligibility under the proposed scheme, or will it be necessary to design and administer a means test, or support improvements in the civil registration process?
5. **What is the intended take-up rate of the transfer?** Will it be rolled out gradually from one geographical location to another? Will take-up increase slowly as households begin to hear about the transfer? Or will there be a large campaign to enrol as many eligible households as possible right from the start?

It is possible to model a range of potential scenarios, or to adjust the scenarios after initial modelling and to observe what effect the changes have on outcomes. In Congo-Brazzaville, for example, OPM elaborated nine different scenarios. These were modelled as monthly benefits with a value calculated as a percentage of the food poverty line or the minimum wage. The nine scenarios included: universal and targeted child benefits, maternity and disability allowances, pensions for the elderly and for widows, and a public works programme.

## Step 2: Obtain the micro- and macro-level data

Once the scenario(s) have been set it is necessary to obtain the data for modelling the scenarios:

- At a micro level you need a national household survey dataset. This should contain consumption data, including regional deflators where necessary, and information that shows whether individuals or households are eligible for the transfer according to the chosen criteria, such as age, disability status and poverty level.
- At the macro level you need financial data, including figures for gross domestic product (GDP), total government budgets or expenditure, and expenditure on key sectors including social welfare, education and health, to benchmark the predicted cost of the cash transfer programme. To estimate the cost and the number of people eligible in any year other than that of the household survey, projections for population and inflation will also be needed.

## Step 3: Create variables in the household survey dataset that act as markers for each scenario

The next step is to create a set of variables that reflect each scenario:

- Dummy variables can be used to tag household members that are target beneficiaries, or that live in a household containing a beneficiary.

- Variables can be created to show the annual value of the benefit to each beneficiary, or the cumulative amount for the household. The real value of the transfer, taking into account regional inflation, is used to estimate the benefit to the recipient while the nominal value is used to estimate how much the provider spends on the programme. To understand the effect on household consumption the benefit should be deflated to the year of the household survey data. For example, if a government wishes to introduce a benefit in 2014 but the household survey was undertaken in 2008, the model will indicate the benefit's equivalent in 2008. Current prices should be retained to estimate the cost to the provider.
- Other variables can be added that indicate the estimated percentage reduction in a household's other consumption expenditure as a result of receiving the cash transfer (the substitution effect), and the percentage of additional cost in administering it. It is important to keep these adjustments separate in the dataset, because one affects the eventual value of the benefit to the household, while the other affects the cost to the provider.

**Benefit to household = Real value of transfer – substitution effect**

**Cost to provider = Nominal value of transfer + administration cost**

#### Step 4: Model the effect of the programme using the household survey data

By applying the scenarios to each household in the data – first adding the real value of the cash transfer for each household to its existing consumption, taking into account any opportunity cost, and then identifying the nominal cost to the provider of delivering the transfer to each household – the policymaker can estimate the effect of introducing the cash transfer on aspects including those described below. Macro-level projections can then be used to estimate how the programme coverage, poverty impact and cost varies in years other than that of the household survey. The underlying assumption is that the distribution of individuals across household types is constant over time, but the total number of individuals and households will vary. The population projections for the beneficiary group can be used to estimate future changes in the number of beneficiaries.

Estimates that can be calculated include:

- **Number of beneficiaries:** The model can estimate the number of direct beneficiaries, beneficiary households, or people living in beneficiary households, taking into account the take-up rate. It can also estimate the distribution of beneficiaries among households.
- **Change in consumption at household level:** An estimate of the change in mean per capita or per adult equivalent consumption can be measured either for beneficiary households only, or for all households. Inevitably the smaller the target population, the greater the discrepancy will be between these two measures. The policymaker will need to consider whether it is desirable to put in place a targeting approach that has a large effect on a small number of people, or a smaller effect on a large number of people.
- **Change in poverty at national level:** One way of measuring the predicted change in poverty at national level is to analyse the Foster-Greer-Thorbecke poverty measures before and after the transfer. This will produce before-and-after measures for the following indicators: P0 (the poverty headcount, or the proportion of the population that is below the given poverty line); P1 (the poverty gap, or the average amount by which the population is below the poverty line); and P2 (the poverty severity index, the square of the poverty gap).

When simulating the effect of a cash transfer programme on national poverty, especially in sub-Saharan Africa, it may be useful to measure its effect on the poverty gap, P1, not the poverty headcount, P0. Cash transfers are often intended for the ultra-poor, the most destitute individuals whose consumption is the absolute lowest in a society. This is particularly the case in countries where a very large proportion of the population falls below the poverty line but where scarce resources mean that transfers cannot be generously distributed to all of them. If a transfer is destined for, say, the poorest 10% of individuals, in a country where 50% of the population is below the poverty line, it is unlikely to have any effect on the poverty headcount (P0): the beneficiaries will remain poor, but will be less poor than they were before. Indeed, it might be considered inequitable to try to lift that target group entirely out of poverty if they were to leapfrog in wealth terms over the 40% of the population that were slightly better off originally. In such cases the poverty gap measure, P1, will give a better idea of the poverty impact of the transfer because it will show the relative poverty reduction of the poor households.

- **Affordability:** To estimate the likely cost of the transfer to the provider once scaled up, the nominal costs of the transfer and any associated administrative costs can be weighted to the size of the overall population. This can then be easily compared with key macro-level data such as the size of the government's budget for social protection, its national budget, or levels of GDP, to give an idea of affordability.

## Conclusion

Using a basic simulation tool policymakers can determine whether a cash transfer programme is likely to be an effective or affordable part of social protection. When combined with other tools such as a political economy analysis or an assessment of institutional capacity to deliver the programme, this approach can provide an even more powerful early indication of the programme's potential success before significant resources are committed.

## Further reading (for examples of the model in use)

- Hodges, A., Notten, G., O'Brien, C. and Tiberti, L. (forthcoming), 'Are cash transfers a realistic policy tool for poverty reduction in Sub-Saharan Africa? Evidence from Congo-Brazzaville and Côte d'Ivoire', *Global Social Policy*.
- Hodges, A., O'Brien, C. and Ganga, L. (2012), 'Strengthening social protection for families and children in the Republic of Congo'. *UNICEF Social and Economic Policy Working Paper*. Available at: [http://www.unicef.org/socialpolicy/index\\_66151.html](http://www.unicef.org/socialpolicy/index_66151.html)
- The study for UNICEF Cote d'Ivoire in Hodges, A. et al. (2012), 'Une première analyse du rôle, de l'impact, des coûts et de la faisabilité de diverses options de programmes de transferts sociaux monétaires' (in French). Available at [http://www.opml.co.uk/sites/opml/files/Cote d'Ivoire Cash Transfer Feasibility Study\\_Fr.pdf](http://www.opml.co.uk/sites/opml/files/Cote%20d'Ivoire%20Cash%20Transfer%20Feasibility%20Study_Fr.pdf)

### About the author

**Clare O'Brien** is a senior consultant and project manager in social protection. She provides technical assistance to the design, implementation and evaluation of social protection programmes, with a regional focus on sub-Saharan Africa and central Asia. Clare has recently carried out microsimulations of the potential costs and impact of cash transfer programmes in Côte d'Ivoire and Congo-Brazzaville on behalf of UNICEF as part of OPM's support to the development of social protection policies in those countries.

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Oxford Policy Management (OPM) is one of the world's leading international policy development and management consultancies. We enable strategic decision-makers in the public and private sectors to identify and implement sustainable solutions for reducing social and economic disadvantage in low- and middle-income countries. Supported by more than 140 specialists on three continents, we have offices in the UK, Bangladesh, India, Indonesia, Nepal, Pakistan and South Africa. For further information, visit [www.opml.co.uk](http://www.opml.co.uk)

### Contact us

If you would like to discuss OPM's social protection expertise, or any other development issue, please contact your nearest OPM office.

#### Africa

Ruth Faragher  
OPM Pretoria  
Email: [ruth.faragher@opml.co.uk](mailto:ruth.faragher@opml.co.uk)

#### Asia

Aparna John  
OPM New Delhi  
Email: [aparna.john@opml.co.uk](mailto:aparna.john@opml.co.uk)

#### Asia (continued)

Abdur Rauf Khan  
OPM Islamabad  
Email: [rauf.khan@opml.co.uk](mailto:rauf.khan@opml.co.uk)

Smita Notosusanto  
OPML Jakarta  
Email: [smita.notosusanto@opml.co.uk](mailto:smita.notosusanto@opml.co.uk)

Asheq Rahman  
OPM Dhaka  
Email: [asheq.rahman@opml.co.uk](mailto:asheq.rahman@opml.co.uk)

#### Asia (continued)

Suresh Tiwari  
OPM Kathmandu  
Email: [suresh.tiwari@opml.co.uk](mailto:suresh.tiwari@opml.co.uk)

#### Europe

Simon Hunt  
OPM Oxford  
Email: [simon.hunt@opml.co.uk](mailto:simon.hunt@opml.co.uk)