Assessing the Impact of Social Grants on Inequality: A South African Case Study

> Reinhard Schiel Murray Leibbrandt David Lam

Outline

- Introductory Comments
- Data
- Static Income Source Decompositions of Inequality
- Dynamic Income Source Decompositions of Inequality
- Dynamic Income Source Decompositions Using Simulations
- Concluding Points

Introduction



■ % Labour Market ■ % Remittances ■ % Capital ■ % Government ■ % Other

From: Leibbrandt and Woolard (2010)

Introduction



Introduction

1993

2008



Data

- Require:
 - Two time periods
 - Detailed information on income sources
- Project for Statistic on Living Standards and Development (PSLSD) conducted in 1993
- The National Income Dynamics Study (NIDS) first wave conducted in 2008

	1993	2008				
Household Income per Capit	Household Income per Capita					
Mean	329.271	442.052				
Gini	.666	.671				
Houehold Labour Income per Capita						
Mean	$19\bar{5}.065$	285.648				
Share	.592	.6146				
Correlation with Total Income	.581	.906				
Gini	.767	.794				
Old Age Pension Income per Capita						
Mean	17.218	13.114				
Share	.052	.030				
Correlation with Total Income	051	023				
Gini	.807	.816				
Other Government Transfer	Income per C	Capita				
Mean	3.543^{-1}	$^{-}28.71$				
Share	.011	.065				
Correlation with Total Income	015	128				
Gini	.955	.601				
Other Income Per Capita						
Mean	113.445	114.581				
Share	.345	.259				
Correlation with Total Income	.871	.721				
Gini	.83	.794				
$N_{unweighted}$	39067	28212				
$N_{weighted}$	42 781 962	43 812 042				
Notos: Own Calculations using NIDS and PSISD weighted						

Table 1: Descriptive Statistics of HH Income Componets

Notes: Own Calculations using NIDS and PSLSD weighted

Static Income Decomposition for Inequality

Lerman and Yitzhaki (1985) ; Stark et al. (1986) $G = \sum_{k=1}^{K} R_k G_k S_k$

$$\frac{\partial G}{\partial e} = S_k([R_k G_k - G]]$$

- G is the Gini Coefficient
- K is the distinct components or income sources
- R_k the gini correlation between income component k and total income
- G_k is the Gini for income source k
- S_k is the share of component k of total income

Static Income Decomposition for Inequality

Table 3: Static Decomposition of the Gini Index by Incomes Sources						
Source	Income Share	Gini Correlation	Gini Index	Absolute Contribution	Relative Contribution	Change
	(S_k)	(R_k)	(G_k)	$\left(S_k.R_k.G_k ight)$	$(\frac{S_k \cdot R_k \cdot G_k}{G})$	$rac{\partial G/\partial arphi}{G}$
			1993			
Labour	0.592	0.939	0.767	0.427	0.641	0.049
	(0.007)	(0.001)	(0.002)	(0.005)	(0.011)	
Old Age Pension	0.052	-0.008	0.807	-0.001	-0.001	-0.052
	(0.001)	(0.007)	(0.002)	(0.001)	(0.001)	
Other Gov Transfer	0.011	-0.091	0.955	-0.001	-0.001	-0.009
	(0.000)	(0.014)	(0.001)	(0.000)	(0.000)	
Other Income	0.345	0.832	0.830	0.238	0.357	0.012
	(0.007)	(0.007)	(0.005)	(0.008)	(0.011)	
Total	1.000	-	-	0.667	1.000	
	0.000	-	-	(0.004)	0.000	
2008						
Labour	0.646	0.956	0.794	0.491	0.731	0.085
	(0.007)	(0.002)	(0.004)	(0.007)	(0.010)	
Old Age Pension	0.030	0.066	0.816	0.002	0.002	-0.027
	(0.001)	(0.015)	(0.004)	(0.000)	(0.001)	
Other Gov Transfer	0.065	-0.014	0.601	-0.001	-0.001	-0.066
	(0.002)	(0.011)	(0.004)	(0.001)	(0.001)	
Other Income	0.259	0.871	0.794	0.179	0.267	0.007
	(0.007)	(0.007)	(0.006)	(0.007)	(0.010)	
Total	1.000	-	-	0.671	1.000	
	0.000	-	-	(0.011)	0.000	

Dynamic Income Decomposition for Inequality

Wan (2001)

$$\Delta G = \sum_{k=1}^{K} \Delta S_k C_{k,t} + \sum_{k=1}^{K} \Delta C_k, S_{k,t} + \sum_{k=1}^{K} \Delta C_k \Delta S_k$$

- ΔG is the change in the Gini Coefficient
- C_k is the the concentration index of component k
- S_k is the share of component k of total income
- Decomposes changes in the Gini into three unique terms: changes in income shares, changes in concentration index and interaction of these two

Table 4: Wan's Dynamic Decomposition of the Gini Index by Income Sources

	Structural Effect	Real Inequality Effect	Interactive Effect	Full Contribution
Labor	.024	.138	011	.152
Old Age Pension	-0.001	016	.005	011
Other Gov Transfer	016	003	023	043
Other	.075	.159	046	.189

Notes: Own Calculations using Wan (2001) approach on NIDS and PSLSD weighted

Dynamic Decomposition using Simulations

de Barros et al (2006)

$$y_i^{pc} = \sum_{k=1}^K y_{ik}^{pc}$$

$$y^{pc} = \sum_{i=1}^{n} y^{pc}_{i,G} + \sum_{i=1}^{n} y^{pc}_{i,NG}$$

$$\vartheta = \Psi(F(Y^{pc}(\sum_{i=1}^{n} y_{i,G}^{pc}, \sum_{i=1}^{n} y_{i,NG}^{pc})))$$

$$\hat{\vartheta} = \Phi(F(Y^{pc}(\sum_{i=1}^{n} y_{i,G}^{pc}, \sum_{i=1}^{n} y_{i,NG}^{\hat{p}c})))$$

$$y_i^{pc} = \frac{n_a}{n} \left[\frac{n_o}{n_a} \left(\frac{1}{n_o} \sum_{k=1}^K y_{i,G} \right) + \frac{1}{n_a} \sum_{k=1}^K y_{i,NG} \right]$$

 Table 5: Dynamic Decomposition using Simulations

	Gini	% Change
Labor	.011	1.7
Old Age Pension	.026	3.90
Other Gov Transfer	044	-6.6
Other	.008	1.2

Notes: Own Calculations using Barros et al. 2006 Data: NIDS and PSLSD weighted % Change calcuated by source's contribution over the 1993 Gini Coefficient

Dynamic Decomposition using Simulations

Table 6: HH Compositions and Targeting in Dynamic Decompositions using Simulations

	Gini	% Change
Household Composition		
Share of Adults in HH	.002	0.3
Share of Employed of Adults	023	-03.4
One over employed	.034	5.10
One over adults	.014	2.10
Labour		
Ranked by Total HH Income	012	-1.8
Ranked by Labour Income	008	-1.2
Old Age Pension		
Ranked by Total HH Income	.016	2.4
Ranked by Pension Income	.004	0.6
Other Gov Transfer		
Ranked by Total HH Income	035	-5.2
Ranked by Other Gov Trans Income	027	-4.0
Other		
Ranked by Total HH Income	.003	0.4
Ranked by Other Income	015	-2.2

Conclusion

- Each of these exercises is explicitly or (often) implicitly answering a different question.
- The dynamic decompositions would seem to have more to offer in looking at the impact of social grants on income inequality.
- Especially the decomposition that considers changing household composition and changing real income values and changing targeting.
- Still not getting traction on the with and without density

References

de Barros, R.P. & de Pesquisa Econômica Aplicada, I., 2006. Uma análise das principais causas da queda recente na desigualdade de renda brasileira, Econômica, Rio de Janeiro

Lustig, N., Lopez-Calva, L.F. & Oritz-Juarez, E., 2013. Deconstructing the Decline in Inequality in Latin America. *World Bank Policy Research*, pp.1–18.

Stark, Taylor and Yitzhaki. Remittances and Inequality. The Economic Journal, Vol. 96, No. 383 (Sep., 1986), pp. 722-740

Taylor, J.E. et al., 2005. Remittances, inequality and poverty: Evidence from rural Mexico. Agriculture and Resource Economics Working Papers

Yitzhaki, S. & Lerman, R.I., 1985. Income Inequality Effects by Income Source: A New Approach and Applications to the United States. *The Review of Economics and Statistics*, 67(1), pp.151–156.

Wan, G.H., 2001. Changes in regional inequality in rural China: decomposing the Gini index by income sources. *Australian Journal of Agricultural and Resource Economics*

Woolard, I and Leibbrandt, M (2013) "Social programs and Transfers: Are we learning?" Proceedings from 2010 Annual World Bank Conference on Development Economics, Global. Pp 363-84.