Has Economic Growth in Australia Been Good for the Poor? and What Happens to the Socially Excluded?

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Abstract

We investigate whether Australia's strong economic growth between 2001 and 2008 can be deemed to be pro-poor according to different concepts of pro-poor growth. In doing so, we use evaluation methods consistent with the anonymity and non-anonymity welfare axioms recently proposed in the literature. We find that absolute and relative income gains at the top of the distribution were significantly larger than among the bottom positions. Consequently, growth in Australia from 2001 to 2008 can only be categorized as pro-poor according to the weakest definition of pro-poor growth. In addition, our results indicate that economic growth during this period was more pro-income poor than pro-socially excluded. Using counterfactual distribution analysis we find that the larger presence of long-term unemployed, disable people, and individuals with poor health and low English proficiency among the socially excluded clearly contributes to explain this result.

Key words: Growth, pro-poor, anonymity.

JEL Classification: D3, I32

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1 Conceptual framework

1.1 The concept of pro-poor growth

The question of how to characterize economic growth that can be considered beneficial for the poor is not a simple one and has generated an intense academic and policy debate. The final impact of growth on poverty is a function of two factors: the magnitude of growth, i.e., the amount of extra resources that are now available for society, and how these benefits are distributed between the poor and non-poor. At present, however, no consensus has been reached on how to integrate these two elements into an appropriate definition of pro-poor growth. In this analysis we make use of the two concepts of pro-poorness that have received the greatest attention in the literature, namely, the *relative* and the *poverty reducing* definitions. The first concept, proposed by Kakwani and Pernia (2000), identifies positive growth as pro-poor if the poor benefits proportionally more than the non-poor. When growth is negative, this definition requires that the loss of the poor is proportionally lower than that of the non-poor. Alternatively, the *poverty reducing* concept due to Ravallion and Chen (2003) classifies any growth pattern as pro-poor whenever it leads to a reduction in poverty.

Notice that besides its implications for poverty, the relative definition of pro-poorness also has implications in terms of inequality as it imposes a particular distribution of the benefits from growth across the population. Thus, relative pro-poor growth leads to a reduction in relative inequality between the poor and the non-poor as this type of growth will increase the share of total income accumulated by the poor. In contrast, the *poverty reducing* definition focuses only on the effect of growth on poverty and does not incorporate any value judgment on inequality. However, as Kakwani and Son (2008) show, this concept represents the weakest definition in the case of positive growth, but it becomes the strongest one when growth is negative as it requires a reduction a poverty when aggregate income declines.

1.2 Measures of pro-poor growth

Recently differences approaches and measures aimed to articulate the different concepts of pro-poorness have been proposed in the literature. These approaches can be categorized into two broad categories depending on whether the anonymity axiom is satisfied or not. This axiom, otherwise called the 'symmetry' axiom, is one of the core axioms in welfare economics and it is generally invoked in the measurement of income inequality and poverty. Essentially, it requires that social evaluations are based exclusively on information about the income variable excluding other people's attributes from the social choice problem. Pro-poor growth measures consistent with the anonymity axiom will evaluate the distributional change by looking only at the income changes that take place across the income distribution without considering any personal circumstances of the individuals that occupy the different positions in this distribution. However, in a recent article, Grimm (2007) suggests that this may be a restrictive approach to the measurement of pro-poor growth. In this case, the author argues, it makes sense to evaluate the growth pattern measuring the extent to which economic growth is beneficial for those who were *initially* most disadvantaged. Clearly, this implies to remove the anonymity axiom as it requires to incorporate information on the initial status of individuals into the analysis. Next we discuss the main features of these two approaches and the measures derived from them that we use in our empirical analysis.

1.2.1 Measures based on the anonymity axiom

Let $F_{t-1}(y)$ and $F_t(y)$ denote the initial and final cumulative distribution functions of income for the period under analysis, informing about the proportion of the population with income less than y at dates $t-1$ and t. Also we denote by γ_t the growth rate in the mean income. Any evaluation of pro-poorness consistent with the symmetry axiom is based exclusively on the information contained in these two functions. Within this approach, the most popular instrument for the measurement of pro-poor is the 'growth incidence curve' (GIC) proposed by Ravallion and Chen (2003). If we denote by $y_t(p) = F_t^{-1}(p)$ the p-th quantile of the income distribution, then the growth rate $g_t(p)$ of this quantile can be expressed as:

$$g_t(p) = \frac{y_t(p)}{y_{t-1}(p)} - 1.$$

The GIC shows the growth rates at different positions of the distribution ranging from the lowest quantile to $p_{\max}$. Importantly, this curve can be used to test whether the final distribution first-order stochastically dominates the initial distribution. Thus, when $g_t(p) > 0$ for all p one can conclude that growth was poverty reducing independently of the poverty line and the poverty measure used within a broad class (Atkinson 1987, Foster and Shorrocks 1988). Further, if $g_t(p)$ is positive and decreasing over all quantiles then growth can be classified as pro-poor according to the relative definition as relative inequality would fall for all indices consistent with the Lorenz criterion (Foster 1985). An important limitation of the GIC is that one cannot draw any conclusion on pro-poorness when these dominance conditions are not met. In this case, one has to rely on partial pro-poor growth measures derived for a particular poverty line and poverty measure. Ravallion and Chen (2003) propose to use as a measure of pro-poor growth the mean growth rate of the poor ($MGRP$) given by:

$$MGRP_t = \frac{1}{H_{t-1}} \int_0^{H_{t-1}} g_t(p)dp$$

where $H_{t-1} = F_{t-1}(z)$ is the head count index when the poverty line is set equal to z. As the authors show, this measure is proportional to (minus one times) the change in the Watts index of poverty. Thus, when $MGRP > 0$ it can be concluded that growth is poverty-reducing as the Watts index falls. Further, if $MGRP$ is greater than the growth rate in the overall mean, γ_t, then we can say growth was pro-poor in relative terms as the poor benefited from growth relatively more than those above the poverty line.

More recently, Kakwani and Son (2008) propose an alternative partial pro-poor growth measure based on the idea of a poverty equivalent growth rate ($PEGR$). This measure is defined for a general class of additively decomposable income-poverty measures which, for a given poverty line, z, can be written as

$$\theta = \int_0^z P(y,z)f(y)dy,$$

where $P(y,z)$ is an individual-poverty function homogeneous of degree zero in both arguments, and $f(y)$ is the density function of income. Importantly, this class includes the most common measures of poverty used in the literature including the Foster-Greer-Thorbecke family of indices proposed by Foster *et al.* (1984).[1] The $PEGR$ is proportional to the actual growth rate and, using the original notation of the authors, it is given by

$$PEGR = (\frac{\delta_t}{\eta_t})\gamma_t = \varphi_t \gamma_t,$$

[1] This family is given by $P(y,z) = (\frac{z-y}{z})^{\alpha}$, where α is the parameter of inequality aversion. When α is set equal to $0, 1,$ or 2, this expression leads to the head count measure, the poverty gap ratio and the severity of poverty index, respectively.

where $\delta_t = \frac{dLn(\theta_t)}{\gamma_t}$ is the growth elasticity of poverty, and $\eta_t = \frac{1}{\theta_t}\int\limits_0^{H_t} \frac{\partial P}{\partial y} y_t(p)dp$ is the neutral relative growth elasticity of poverty derived by Kakwani (1993), which indicates the percentage change in poverty caused by a 1 percent growth in the mean income of society when the all incomes grow at the same rate leaving relative inequality unchanged. Therefore, the $PEGR$ is the growth rate that would bring the actual reduction in poverty, $\delta_t\gamma_t$, provided that the growth process increases all incomes by the same proportion. Remarkably, for any additively decomposable poverty measure, the $PEGR$ is consistent with the direction of change in poverty so it can be used to infer whether growth is poverty-reducing or not: a positive (negative) value of $PEGR$ implies a decline (increase) in the level of poverty. Further, as Kakwani and Son (2008) show, when $\delta_t > \eta_t$ the change in relative inequality that comes with growth reduces total poverty. Consequently, growth is deemed to be pro-poor in a relative sense when $PEGR > \gamma_t$.

1.2.2 Measures derived without postulating the anonymity axiom

Pro-poor growth measures based on the anonymity axiom evaluate the growth pattern by comparing the cross-section distributions of income without taking into account individuals' mobility within these distributions. Consequently, this kind of measures cannot be used to infer the extent to which growth benefits the initially poor, where this is one of the main motivations for pro-poor growth analysis. To overcome this limitation, Grimm (2007) proposes a framework to derive a modified version of the pro-poor growth measures proposed by Ravallion and Chen (2003) without postulating the anonymity axiom. Assume that individuals can be followed over time such that the joint income distribution function $F(y_{t-1}, y_t)$ can be inferred for a fixed population. Assume also individuals can be ranked in ascending order according to some variable, Ω_{t-1}, reflecting their initial status at $t-1$.[2] Let $p(\Omega_{t-1})$ denote a variable informing about the absolute rank of individuals according to the indicator Ω_{t-1}. The income growth rate for the different positions within this rank can then be computed as

$$g_t(p(\Omega_{t-1})) = \frac{y_t(p(\Omega_{t-1}))}{y_{t-1}(p(\Omega_{t-1}))} - 1,$$

[2] Grimm's original formulation is in terms of the initial income of individuals. However, Ω_{t-1}, can refer to other welfare indicator such as consumption or wealth, but also any multidimensional measure combining information on more than one dimension.

where $y(p(\Omega_{t-1}))$ denotes the income of the individual located in the p-th position of the ranking based on the Ω_{t-1} variable. By letting p vary from the $p_{\min}$ to $p_{\max}$, $g_t(p(\Omega_{t-1}))$ traces out what Grimm (2007) denotes the 'individual growth incidence curve' ($IGIC$). Similarly to the GIC, this curve can be used to derive the mean growth rate of the initially poor ($MGRIP$) given by

$$MGRIP_t = \frac{1}{H_{t-1}} \int_0^{H_{t-1}} g_t(p(\Omega_{t-1}))dp,$$

where H_{t-1} indicates the percentage of individuals classified as initially poor according to variable Ω_{t-1}. [3] It is worth noting the differences between these measures and the measures based on the anonymity axiom. Thus, while the GIC reflects the quantile comparison of $F_{t-1}(y)$ and $F_t(y)$ without taking into account how growth affects the income of different individuals, the $IGIC$ uses information on $\{F(y_{t-1}, y_t), \Omega_{t-1}\}$ to describe transitions between $t-1$ and t by linking income growth to the initial conditions of individuals. For the partial measures, the $MGRP$ reflects the mean income growth of the *positions* below the poverty threshold without considering whether these positions are occupied by the same individuals or not. Instead, for a ranking of individuals $p(\Omega_{t-1})$, the $MGRIP$ focuses on the income change experimented by those characterized as initially poor according to Ω_{t-1}, omitting any information on those who were above the poverty threshold. Importantly, despite their focus on the initially conditions, pro-poor growth measures not based on the anonymity axiom can be used to assess the level of pro-poorness. Thus, Grimm (2007) defines growth as poverty reducing when the $IGIC$ is above 0 for all p as it benefits the initially poor no matter where one draws the poverty line. Differently to the case of anonymity, growth cannot be deemed to be relative pro-poor when $IGIC$ is positive and decreasing, as one cannot guarantee that relative inequality declines.[4] For a particular poverty threshold, Grimm (2007) defines a growth pattern as poverty reducing if $MGRIP > 0$, i.e., when the average income growth among the initially poor is

[3] This proportion would be determined by the particular poverty threshold. In the case of income, this corresponds to the income-poverty line, z. Equivalent thresholds can be defined for any variable Ω_{t-1} aimed to reflect the initial conditions of individuals.

[4] Notice this comes from the fact that the $IGIC$, independently of the variable Ω_{t-1} used to rank individuals in the initial period, does not use any information on the final rank of individuals at time t. Thus, it could be the case that income growth among the initially most disadvantaged is disproportionately larger compared to that of other groups, so that overall inequality increases.

positive. [5] Finally, this author characterizes growth as pro-poor in relative terms when growth benefits relatively more those who are initially poor, i.e., when $MGRP$ is larger than the growth rate in the overall mean, γ_t.

2 Data Sources and Defintions

To evaluate the pro-poorness of growth in Australia, we use data included in first eight waves of the Household, Income and Labour Dynamics in Australia (HILDA) Survey. This is the first national representative household panel in Australia which, since 2001, annually collects information on income and other socioeconomic characteristics at both individual and household level.[6] Importantly for our analysis, this survey is particularly suitable for performing pro-poor growth analysis using the anonymous and non-anonymous approaches. Thus, HILDA involves annual interviewing of a representative panel of households and individuals included in the original sample in 2001. The initial sample is composed by 13,969 respondents from 7,682 households, of whom 9,354 were re-interviewed in Wave 8. They form the sample we use to study the link between the initial conditions and income changes experimented by individuals over the period 2001-2008. In addition, HILDA provides cross-sectional weights defined to ensure the representativeness of the sample in every wave. Thanks to this, cross-sectional information can be exploited to analyse the changes in the Australian income distribution that took place between the 2001 and 2008. To examine possible differences in the growth pattern within this period, besides the results for the 2001-2008 period, partial results for the 2001-2005 and 2005-2008 periods are also discussed.

The unit of analysis we use in this paper is the individual. We assume individuals' income is a function of the total income of the household they belong to. Concretely, each individual is assigned the equivalent household income, defined as total income per adult equivalent, where the number of equivalent persons is computed using the parametric specification proposed by Buhmann *et al.* (1988) given by

$$e = N^{\theta},$$

[5] In contrast to the original measure proposed by Ravallion and Chen (2003), no formal relationship between the $MGRP$ and the variation of a particular poverty measure has been provided in the literature.

[6] For a description of HILDA see Wooden and Watson (2007).

where N is the household size and θ is the measure of economics of scale within the household. Throughout the present analysis, a value for θ equal to 0.5 is assumed. Importantly, the main conclusions of the analysis are robust to the choice of this parameter. [7] The income variable we use in the analysis is household disposable income. This is defined as the sum of wages and salaries, business and investment income, private pensions, private transfers, and windfall income received by any household member. Further, our income variable includes the value of all public transfers provided by the Australian government, including pensions, parenting payments, scholarships, mobility and carer allowances, and other government benefits. Finally, the sum of these income components is reduced by personal income tax payments made by household members during the financial year. All income values are adjusted for inflation and are expressed in 2008 Australian dollars using the consumer price index provided by Australian Bureau of Statistics.

For the non-anonymous pro-poor growth analysis, we study the link between initial conditions and income growth using two measures of disadvantage, namely: initial income level and individuals' degree of social exclusion at the beginning of the period. In the case of social exclusion, we use the framework recently proposed in Scutella *et al.* (2009a, 2009b) to measure social exclusion in Australia. In contrast with the income indicator, the social exclusion measure recognizes the multidimensionality of disadvantage as it uses information on 21 indicators from seven different domains: material resources; employment; education and skills; health and disability; social; community; and personal safety. A summary measure of exclusion is derived from these indicators using a 'sum-score' method. This variable takes values in the interval $[0, 7]$, where 0 corresponds to the highest level of social exclusion. A complete description of the indicators and on how the social exclusion measure is constructed is presented in the Appendix.

3 Results

From 2001 to 2008, Australia witnessed huge and continuous economic growth. As Table 1 shows, mean and median income values grew more than 3.2 and 2.8 percent per year during this period. Growth was particularly high between 2001 and 2005 where average income rose more than 3.6 percent annually, whereas it slightly slowed down after 2005 with both mean and median values growing about 2.6 percent. Changes in the mean and the median cannot be used to assess whether the distributional change was pro-poor as

[7] Indeed, estimation results not presented here available upon request, suggest that the conclusions on the pro-poor growth pattern do not vary when alternative values of θ are considered.

Table 1. Annual income growth in Australia between 2001 and 2008

Period	Mean (%)	Median (%)
2001-2008	3.25	2.87
2001-2005	3.69	3.01
2005-2008	2.66	2.68

Source: Author's calculation using HILDA data

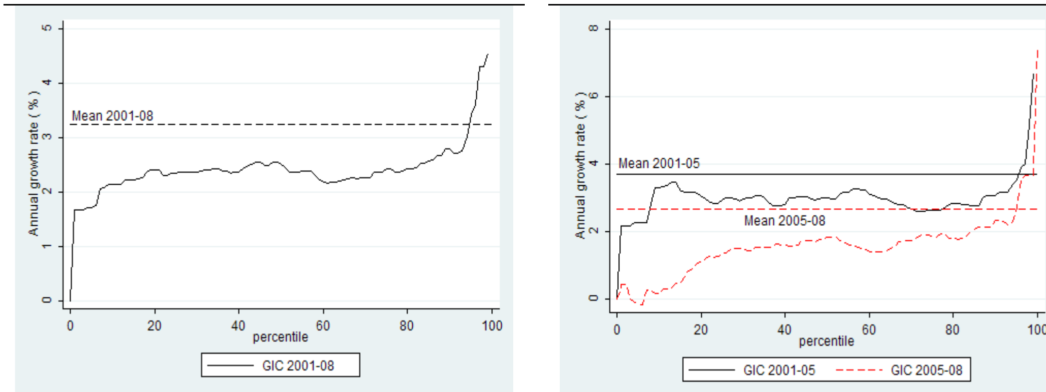
they are completely uninformative about the changes that took place in the different parts of the distribution. Figure 1 presents our estimates of the Australia's GICs consistent with the anonymity axiom for the 2001-2008 and the sub-periods 2001-2005 and 2005-2008.[8] Our results suggest that the distribution in 2008 first order dominates the initial income distribution. Thus, the curve for 2001-2008 lies above zero in the whole domain which implies that growth was positive over the whole distribution. Therefore, for a broad class of poverty measures and any poverty the line, we can conclude that growth in Australia was pro-poor according to the poverty reducing definition. The 2001-2008 GIC is non-monotonic, which means that no general conclusions can be drawn for alternative pro-poor growth concepts. In this case we need to rely on partial results derived using particular combinations of poverty lines and poverty measures. Still, the curves in Figure 1 suggest that economic growth in Australia was particularly beneficial for those located at the top of the distribution. Indeed, for all the three GICs estimated, we find that the only positions that grew more than the mean where those above the 90th percentile, which implies that the gains from growth were highly concentrated at the top.

Table 2 shows the estimates of the partial pro-poor growth measures which postulate anonymity for a range of poverty lines. Poverty thresholds are defined using different percentiles of the initial distribution so that the proportion of initially poor is known. In the case of the PEGR proposed by Kakwani and Son (2008), this was calculated for three of the most common poverty measures within the Foster-Greer-Thorbecke class of poverty measures, namely: the head count index, the poverty gap ratio, and the severity of poverty. Consistently with the results from the GICs , we find that for all the combinations of thresholds and measures the estimates are positive, which means that growth increased income of the bottom positions leading to a reduction of poverty. Remarkably, however, estimates in Table 2 suggest that the growth pattern in Australia has not been either

[8] These and all the other estimates of pro-poor growth measures presented in this section were computed using the Distributive Analysis Stata Package developed by Abdelkrim and Duclos (2007).

Figure 1. Growth incidence curves for Australia, 2001-2008

a) 2001-2008 b) 2001-2005 and 2005-2008



Source: Author's calculation using HILDA data. Note: Curves are smoothed using a 3-spam non-linear smoother.

relative or absolute pro-poor. This comes from the fact the values of the MGRP and the PEGR are lower than the actual growth rate of the mean income for most of the cases considered. We can conclude therefore that overall, Australia's strong economic growth between from 2001 to 2008 benefited the non-poor proportionally and absolutely more than poor. The difference between the income gains experimented by the bottom and top positions of the distribution was particularly large during the 2005-2008 period, where the values of MGRP and the PEGR are in general below 1 percent, quite far from the 2.6 percent growth in the mean.

An important feature of the anonymous approach is that pro-poor growth assessments are independent of the extent to which economic growth benefits those who are initially disadvantaged. Thus, evaluation methods based on the cross-sectional comparison of marginal distributions such as the GIC, MGRP or the PEG do not provide any information on the relative and absolute gains experimented by those characterized as poor at the beginning of the period. To obtain some insight on this issue we must turn to non-anonymous pro-poor growth measures. Figure 2 presents the estimates of the IGICs for Australia for 2001-2008 and 2001-2005 based on the HILDA panel. For each period, both the absolute and the relative versions of the curve are presented. Notice the only difference

Table 2. Partial pro-poor growth measures for Australia, 2001-2008

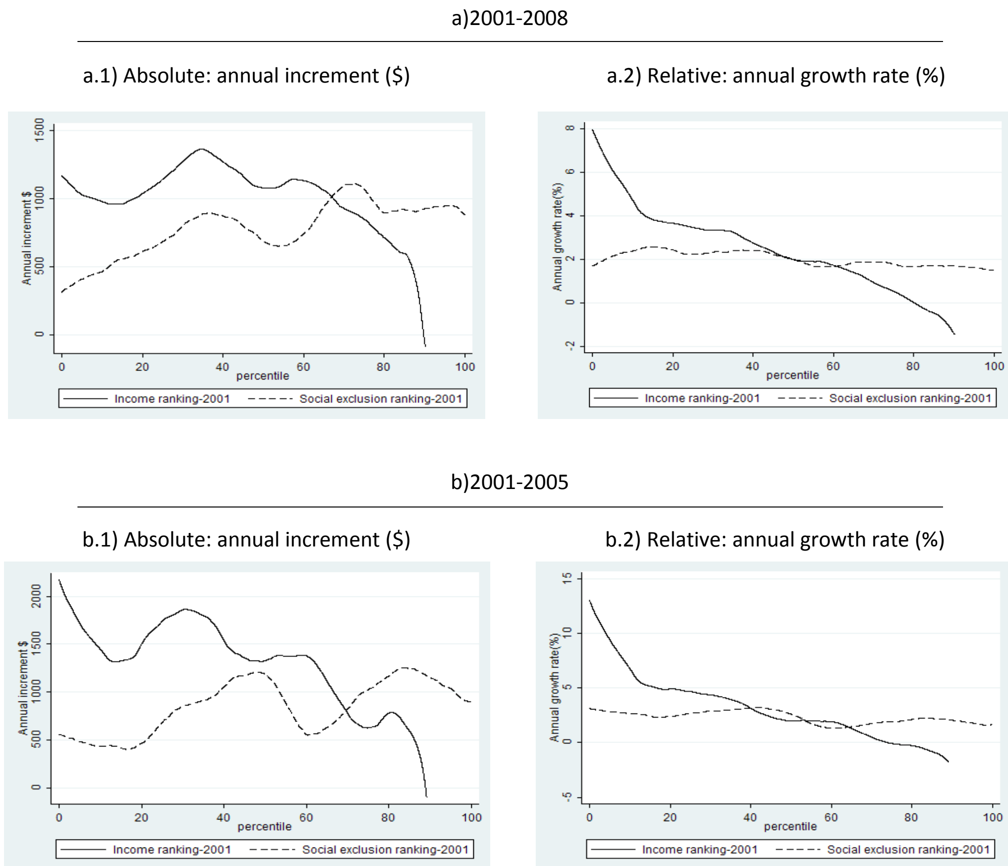
Poverty line= *p*th-percentile	Mean annual growth rate of the poor (MGRP)	Poverty equivalent growth rate (PEGR)		
		Head count ratio	Poverty gap ratio	Severity of poverty
	2001-2008 (annual growth in the mean=3.25)			
2.5	3.89	1.45	2.10	2.08
5	2.28	2.04	1.63	1.56
10	1.76	2.21	1.77	1.50
15	1.75	2.24	1.82	1.54
20	1.82	2.19	1.82	1.58
	2001-2005 (annual growth in the mean=3.69)			
2.5	6.79	2.77	3.13	3.31
5	3.72	2.47	2.07	2.22
10	2.81	2.38	2.20	1.99
15	2.76	3.33	2.34	1.96
20	2.87	3.23	2.43	2.00
	2005-2008 (annual growth in the mean=2.66)			
2.5	1.45	0.56	0.60	0.42
5	1.24	1.26	0.85	0.56
10	1.23	1.20	1.02	0.70
15	1.11	1.21	0.93	0.75
20	1.13	1.57	0.92	0.75

Note: All variables expressed in percentage. As discussed in Section 2, the PEGR is defined for a general class of additively decomposable poverty measures including the ones presented in this table. Robustness checks were conducted assuming alternative poverty indices within this class. These results, available upon request, yield equivalent conclusions about the growth pattern.

Source: Author's calculation using HILDA data.

between these two is that while the absolute curve plots the income increments enjoyed by individuals, the relative one displays the actual growth rates. Further, we study the link between initial conditions and income growth using two measures of disadvantage: individuals' initial income and their level of social exclusion before growth. Thus, for each graph, the solid and dashed lines depict the income variation enjoyed by individuals in the panel when these are ranked according to their levels of income and social exclusion in 2001, respectively. We find that the effect of Australia's economic growth on the income of those who were most disadvantaged in 2001 critically depends on the welfare measure

Figure 2. Individual growth incidence curves for Australia



Notes: i) Figures a) and b) show the annual income increment and growth rate for those individuals included in the panel when these are ranked according to their initial level of income or social exclusion. Thus, for instance, the solid line in Figure a.1) represents the annual increment experimented by individuals when these are ranked in an increasing order according to their income in 2001. Similarly, the dashed line in this figure shows the increment when individuals are ordered by their initial level of social exclusion, where values around 0 correspond to the most excluded and 100 represents the least excluded in 2001.

ii) To control for measurement error, we compare individuals' mean income values for 2001-2002 with mean values in 2007-2008 (Figure a)) and 2004-2005 (Figure b)). In the first case, the size of the sample is 8,726 whereas computations for the 2001-2005 period are obtained using a sample with 9,534 individuals. Results for the 2005-2008 are very similar and are omitted to save space.

iii) Curves are smoothed using a 3-spam non-linear smoother.

Source: Author's calculation using HILDA data.

considered. In the case of income, the negative slope of the IGICs suggests the existence income mobility, with those who were initially poor growing more than those who had high incomes in 2001 in both absolute and relative terms. In contrast, the results for social exclusion highlight a positive relationship between individuals' initial level of inclusion and the absolute gain from economic growth. Indeed, Figures a.1) and a.2) show that those individuals with the highest levels of social exclusion in 2001 were precisely the ones who obtain the smallest benefit from growth. The comparison of the IGICs for income and social exclusion, suggests that growth in Australia was more pro-income poor than pro-socially excluded. In fact, for both the absolute and relative cases, the curve for income lies above that of social exclusion for all the positions up to around the 60th percentile. This implies that growth was more beneficial for the income poor than for the most socially excluded in the absolute and relative senses. Table 3 shows the mean income growth rates experimented by the 2.5, 5, 10, 15 and 20 percent most disadvantaged in 2001 according to income and social exclusion. It is clear from this table that those who were initially income-poor particularly benefited from income growth. Thus, growth can be characterized as pro-income poor as the absolute and relative gains of low-income groups were well above the mean values for the population. Further, Australia's growth from 2001 to 2008 was clearly more pro-income poor than pro-socially excluded. For instance, for the bottom 10 percent, the mean growth rate among the income poorest was more than four times larger than among the most socially excluded (6 versus 1.3 percent). Importantly, this gap still exists when we exclude from the panel all those individuals whore were below 25 years of age in 2001. Consequently, the difference in the benefits from growth between the income poor and the social excluded is not explained by a larger presence of individuals at early stages of the income life-cycle among the initially income-poor.

Table 3. Anonymous partial pro-poor growth measures for Australia, 2001-2008

Threshold= *p*th-percentile of income or social exclusion in 2001	Mean annual growth rate of the initially poor (MGRIP)			
	All : ranked by initial		Age>25: ranked by initial	
	Income	Social exclusion	Income	Social exclusion
	2001-2008 (annual growth in the mean=3.25)			
2.5	11.31	1.05	10.67	1.51
5	8.73	1.57	7.95	1.47
10	6.01	1.37	5.32	1.20
15	5.10	1.96	4.42	1.64
20	4.33	1.97	3.79	1.64
	2001-2005 (annual growth in the mean=3.69)			
2.5	22.73	2.11	21.47	2.94
5	16.01	2.43	14.62	2.92
10	10.66	3.01	9.74	3.11
15	8.75	2.66	7.92	2.55
20	7.19	2.68	6.52	2.57

Note: i) All variables expressed in percentage. Mean growth rates computed for the *p%* initially most disadvantaged in terms of income or social exclusion.

ii) MGRIP values for the 2001-2008 and 2001-2008 periods are computed comparing individuals' mean income values for 2001-2002 with mean values in 2007-2008 and 2004-2005, respectively. In the first case, the size of the sample is 8,726 whereas computations for the 2001-2005 period are obtained using a sample with 9,534 individuals. Results for the 2005-2008 are very similar and are omitted to save space. When the analysis is restricted to those who were above 25 years of age in the initial period, the sample size for 2001-2008 reduces to 7,528 observations, whereas in the case of 2005-2008 it reduces to 8,172 individuals

Source: Author's calculation using HILDA data.

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