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POLICY PAPER

Winners and Losers on the Roller-Coaster: Ireland, 2003-2011

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Abstract: This paper applies the methodology of Ravallion and Chen in calculating growth incidence curves for Ireland over the 2003-2011 period, using measures of equivalised disposable income from the *Survey of Income and Living Conditions (SILC).* These curves provide an indication of growth at different percentiles of the distribution and may be used to address the issue of whether growth was pro-poor or not. The analysis suggests that growth was broadly pro-poor over the period as a whole and also over two sub-periods of 2003-2007 and 2008-2011, reflecting periods of boom and recession respectively. However, the results must be qualified by the fact that the income measure may not completely capture living standards as it deals incompletely with housing costs and state provided services.

I INTRODUCTION

Given the roller-coaster nature of Ireland's economic growth over the last ten years or so, it is not surprising that a number of analysts have chosen to examine distributional developments over the period. The analysis of the link between growth and inequality has a long tradition within economics, with perhaps the paper by Kuznets (1955) the most famous example. He noted that in the early stages of development economic growth was accompanied at

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first by rising inequality but subsequently accompanied by falling inequality. Hence the famous "inverted-U" hypothesis of Kuznets. Subsequent empirical work using more reliable data has cast some doubt over the original Kuznets hypothesis (for example, see Deiniger and Squire, 1996). More recently in the development economics literature there has been a vigorous debate concerning the correlation between economic growth and changes in inequality and poverty (see Dollar and Kray, 2002 and Ravallion, 2003).

Studies which have addressed the recent experience in Ireland include Callan *et al.* (2013), Madden (2013), and Whelan and Maître (2013), although it is arguable that recent Irish economic history does not constitute a "normal" phase of the business cycle, such have been the amplitude of the fluctuations. There have been other studies, but these are the three which have used the most recent data available. The three papers take slightly different perspectives on the issue: Callan *et al.,* look at measures of income distribution *per se*, Madden looks at health and income poverty, while Whelan and Maître look at various measures of economic vulnerability (which is a function of income poverty, material deprivation and economic stress). Despite the different approaches taken in the three papers, the results are fairly similar. Callan *et al.,* find that the Gini coefficient for disposable income fell between 2005 and 2009 and then rose again in 2010. However, what is probably most remarkable about developments in the Gini is its relative stability, generally varying between 0.31 and 0.32 except for 2009 when it dropped to 0.293. Madden finds essentially similar results with respect to income poverty, although the year-on-year variation is somewhat greater. For both fixed and purely relative poverty lines (whereby poverty can only change via a change in income distribution), poverty falls up to 2009 and then increases in 2010 and 2011 back up to levels seen before the onset of the Great Recession (there is some variation depending upon which particular poverty measure is used, with the headcount measure showing the least rise since 2009).

The Whelan and Maître analysis differs from the other two in that it takes a sociological perspective and examines the impact of the recession on vulnerability by class. Nevertheless, its conclusions are not inconsistent with Callan *et al.,* or Madden. Whelan and Maître suggest that the higher salaried groups, those dependent upon welfare and the agricultural sector have suffered least in terms of increased vulnerability, thus giving rise to a form of "middle class squeeze". This conclusion is consistent with a situation whereby overall indices of inequality and poverty would change relatively little, even though those around the "middle" of the income distribution experience reductions in living standards.

In this short paper, we attempt to contribute further to this debate by examining what are known as "growth incidence curves" (GICs) for Ireland for

the 2003-2011 period. These curves provide a simple graphical illustration of the extent to which economic growth (both positive and negative) has been concentrated on the upper, lower or middle part of the income distribution. We also calculate some simple indices which summarise the degree to which income growth has been "pro-poor". Given that Ireland's macroeconomic experience has been a roller-coaster of high growth followed by economic collapse, we analyse two sub-periods of 2003-2007 and 2008-2011 as well as looking at overall developments over the 2003-2011 period.

In the next section we outline the derivation of GICs and summary measures of pro-poor growth. We then outline our data and results before offering some discussion and conclusions.

II GROWTH INCIDENCE CURVES

Growth Incidence Curves (GICs) were first introduced by Ravallion and Chen (2003). Following their notation let F_t be the cumulative distribution function (CDF) of income, giving the proportion of the population with income less than y at date t. Inverting the CDF at the pth quantile gives the income of that quantile. Thus

$$y_t(p) = F_t^{-1}(p) = L_t'(p)\mu_t \text{ with } y_t'(p) > 0$$

where $L_t(p)$ is the Lorenz curve with slope $L_t'(p)$ and μ_t is the mean.

Now, comparing two dates t and $t–1$, the growth rate in income of the pth quantile is $g_t(p) = [y_t(p)/y_{t-1}(p)] - 1$. Thus when p varies from zero to one $g_t(p)$, traces out what Ravallion and Chen (2003) term the "growth incidence curve" (GIC). From the expression for $y_t(p)$ above it is clear that the GIC curve can also be expressed as

$$g_t(p) = \frac{L_t'(p)}{L_{t-1}'(p)}(\gamma_t + 1) - 1$$

where $\gamma_t = (\mu_t/\mu_{t-1}) - 1$ is the growth rate in mean income.

If $g_t(p)$ is a decreasing function of p for all p, then growth rates for poorer quantiles are greater than for richer quantiles and so inequality must be falling between period t and $t - 1$ for all inequality measures satisfying the Pigou-Dalton transfer principle.

The particular GIC above provides evidence on what could be termed "relative" pro-poor growth i.e., did poorer quantiles experience higher relative growth rates than richer quantiles. It is also possible to examine another

version of a relative GIC curve where we normalise by the change in average income. This curve is $\frac{y_t(p)}{y_{t-1}(p)} - \frac{\mu_t}{\mu_{t-1}}$. Where this curve is greater than zero, it implies that this percentile have done better than average.

It is also possible to examine absolute GICs. In this case $g_t^a(p) = y_t(p) - y_{t-1}(p)$ and we examine the absolute growth for each quantile. If the GIC curve for absolute growth is always downward sloping then absolute inequality will be falling between period t and period $t - 1$.

In times of positive economic growth absolute pro-poor growth is more demanding than relative pro-poor growth (since by definition comparing two different values of p, the same relative growth rate implies a higher absolute growth rate for the higher p). Note that the reverse applies when growth is negative. This is important to bear in mind as the period under review here contains sub-periods of both positive and negative growth.

Pro-poor growth can be investigated visually via inspection of the GIC curves, but it can also be measured by a summary statistic. There are a number of such statistics (see the review by Kakwani and Son, 2008) and we present results for the *poverty equivalent growth rate* (PEGR). Poverty is typically measured by some aggregation of the numbers and/or incomes of those people below a given poverty line, z. Changes in poverty can thus arise from two sources. First of all, growth (we assume for illustration that growth is positive) will raise average incomes and thus would be expected to bring some individuals above a given poverty line, z. However, poverty may also change owing to changes in income distribution (i.e. inequality), which may increase or decrease the numbers below the poverty line (independent of growth). It is probable that in most cases growth will involve increases in average incomes and also changes in the distribution of income.

The summary pro-poor indices typically involve some attempt to distinguish between these two sources of change in poverty. More specifically the PEGR is the growth rate which would be required (assuming no change in relative inequality) to produce the same proportional change in poverty as actually observed. If the PEGR exceeds the actual growth rate, this implies that the growth which occurred was accompanied by a reduction in relative inequality (and is thus regarded as pro-poor). Specifically, the PEGR which we calculate is given by

$$PEGR = \gamma_t \frac{P_{t-1}(z, \alpha) - P_t(z, \alpha)}{P_{t-1}(z, \alpha) - P_{t-1}\left(z\left(\frac{\mu_{t-1}}{\mu_t}\right), \alpha\right)}$$

where P_t is measured poverty at time t and α is the distributional parameter from the Foster-Greer-Thorbeck P_α family of poverty measures (versions of

the PEGR for other poverty measures are also possible but as the P_α measures are probably the most well-known we choose to present this version).

Thus, the PEGR is the actual rate of growth multiplied by the actual observed change in poverty divided by the change in poverty which would have been observed had all incomes in period $t - 1$ simply been scaled up by the average rate of growth. It is also worth noting that the Kakwani and Pernia (2000) pro-poor index is given by $PEGR/\gamma_t$. Note also that this index provides a summary measure of relative pro-poor growth. Similar indices also exist for absolute pro-poor growth (see Kakwani and Son, 2008).

III DATA

Table 1 gives an account of how the main macroeconomic indicators evolved in Ireland over the 2003-2011 period (for a recent account of Ireland's boom and bust, see Whelan, 2013). Both GNP and GNP per head show falls approaching 10 per cent in 2009, and following a stabilisation in 2010, it fell again in 2011 (we use GNP as opposed to GDP as net factor flows in Ireland are unusually large and so GNP is regarded as a more accurate measure of "National Income"). The fall in consumption per head has not been quite so dramatic but the turnaround since 2008 is still stark (as explained below our micro data only became available in 2003, so we date our analysis from that year). Unemployment has also increased dramatically from 4.6 per cent at end-2003 to 14.6 per cent at end-2011.

The data from which we derive the GICs comes from nine consecutive cross-sectional surveys (2003-2011) which are the Irish part of the *European Union Survey of Income and Living Conditions* (EU-SILC).[1] This survey is the successor to the *European Community Household Panel Survey*. After allowing for missing observations for certain variables the sample sizes are between 13,000 and 14,000 for each year. However, in Ireland there was only six months data collection for 2003 (as opposed to twelve months collection for the other years) hence the sample size for 2003 is only about half of that for the other years (see Central Statistics Office (CSO), 2007).[2]

As our income measure we use equivalised income after social transfers, using the EU definition of income (details of this measure are included in the Appendix) and the modified OECD equivalence scale (1.0 for first adult, 0.5 for

[1] For details of the Irish part of EU-SILC see CSO (2007) and the documentation at http://www.cso.ie/eusilc/default.htm

[2] We also carried out the data for the 2004-2011 period and found that results were qualitatively very similar.

Table 1: *Ireland, Key Economic Indicators, 2003-2011*

Year	*GNP Percentage Change*	*GNP Per Head Percentage Change*	*Consumption Per Head Percentage Change*	*Unemployment Rate (%) – End Year s.a.*
2003	4.9	3.2	1.6	4.6
2004	4.0	2.3	2.3	4.4
2005	5.0	3.5	4.8	4.3
2006	5.8	3.9	4.6	4.4
2007	4.2	0.8	2.9	4.7
2008	–1.8	–4.2	–2.5	8.5
2009	–8.1	–9.1	–6.4	12.8
2010	0.9	0.5	0.5	14.4
2011	–2.5	–2.9	–2.9	14.6

Source: Central Statistics Office *National Income and Expenditure* and *Census 2006*, *Labour Force Survey*, *Quarterly National Household Survey*.

subsequent adults and 0.3 for children aged less than 14). In Table 2 we provide summary statistics for mean equivalised income and for the 25th, 50th and 75th percentiles. Equivalised income is presented in 2010 prices. In order to remove the influence of outliers we trimmed the data of the top and bottom 0.5 per cent (by non-equivalised income). In general outliers can present a problem for analysis with mean based statistics. The analysis here is based instead upon percentiles and so, if we trim the data of, say, the top and bottom 1 per cent, then what was previously percentile p becomes percentile $p - 1$ (below the median) and becomes $p + 1$ (above the median). For the analysis of most of the distribution thus, symmetrical trimming of the data should have no effect on the results. However, in terms of the figures presented below, particularly those for absolute changes, without this trimming the graphs would be very difficult to decipher as the range of values on the y axis would be very wide. No results are qualitatively affected by the trimming and results and graphs for non-trimmed data are available upon request.

Table 2 shows that mean equivalised income rose continuously from 2003 to 2007. It was essentially constant between 2007 and 2009 but then dropped quite sharply in 2010 and 2011.

It is interesting to note that while the high-water mark for mean income was 2007, for the 25th percentile and the median, it was 2009. Looking at the latest available figures (2011), disposable income for the 25th percentile is now back at something between 2006 and 2007 levels, whereas average and 75th percentile incomes are more or less at their 2004 levels. This suggests that experience across the income distribution has not been uniform. We now look at GIC curves to examine this in more detail.

Table 2: *Summary Equivalised Disposable Income (€, 2010 prices)*

	Equivalised Y (mean)	*Equivalised Y (p = 0.25)*	*Equivalised Y (p = 0.50)*	*Equivalised Y (p = 0.75)*
2003 (N=8020)	211.96	127.56	189.75	263.78
2004 (N=14292)	218.55	128.07	196.94	276.27
2005 (N=15725)	224.26	133.23	201.57	281.53
2006 (N=14921)	232.06	136.57	202.99	289.47
2007 (N=10778)	250.71	149.29	216.86	316.49
2008 (N=10013)	245.88	150.40	216.99	305.75
2009 (N=9800)	248.46	156.60	222.03	310.65
2010 (N=8704)	233.07	143.98	204.23	284.95
2011 (N=8116)	220.54	139.03	192.99	274.46

Source: Central Statistics Office, *Survey of Income and Living Conditions* (SILC), 2003-2011.

IV ANALYSIS USING GIC CURVES

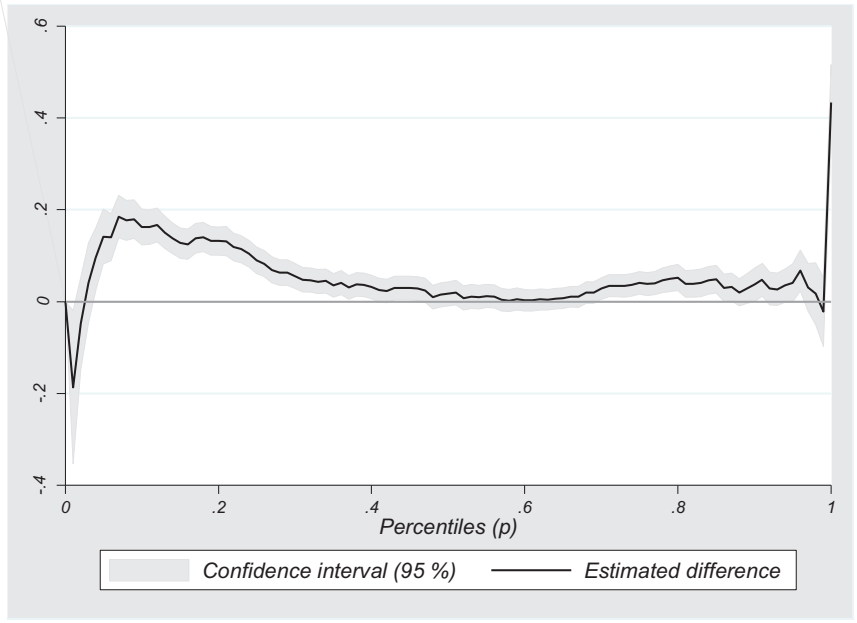
4.1 *2003-2011 Period*

We first examine the complete 2003-2011 period. The first GIC curve we show is $g_t(p) = [y_t(p)/y_{t-1}(p)] - 1$. It is useful to spell out clearly how these graphs should be interpreted. For example, in Figure 1, those areas where the graph is above the horizontal axis indicates percentiles which have seen growth, and the further above the horizontal axis, the greater has been the (relative) growth. The other key feature to observe is the slope of the curve as we move from left to right. This indicates how proportional growth is changing as we move along the income distribution. Thus a downward slope (as p increases) indicates that proportional growth in disposable income was greater for lower income groups or "relatively pro-poor". Of course there is no requirement that the GIC curve be monotonically rising or falling. It is perfectly possible to observe a curve with a number of turning points, and thus it is important to note the detail in the curves.[3] In the case of those curves which are drawn "relative to the mean" (Figures 2, 5 and 8) then as long as the curve for percentile p is above the horizontal axis, then percentile p has done better than average.

Figure 1 suggests that (apart from very low values of p which may reflect measurement error), poorer households fared better. After about the 40th percentile the curve is pretty flat, and indeed up till about the 70th percentile

[3] We experimented with curves showing the *slope* of the GIC curve but felt, on balance, that they did not represent an improvement on the original GIC curve in terms of clarity. These curves are available on request from the author.

Figure 1: *Relative GIC Curve, Disposable Income, 2003-2011*



it is not statistically significantly different from zero. From the 70th percentile onwards the proportional rise over the period is barely statistically significant.

Figure 2 provides essentially the same information, but scaled so that values above zero indicate percentiles doing better than average and values below zero indicate percentiles doing worse than average. It shows that the lower percentiles do best (relative to the mean), the middle percentiles (especially around about the 60th percentile) do slightly worse and the upper percentiles fare about the same as the mean.

Finally, Figure 3 provides the absolute change. Note the vertical axis here is now in cents. Also, for this graph only, in order to make it easier to eyeball, we have further trimmed the very top of the 2011 distribution as there were some very large absolute changes at the very top. Figure 3 shows that no percentile suffered an absolute loss, as the curve never goes below zero, although it is not statistically significantly different from zero for some percentiles (around about the 60th). Percentiles 10 through 20 and then again beyond the 80th percentile (though confidence intervals are wider up here) experienced the greatest absolute increases.

In summary it seems fair to say that growth over the 2003-2011 period in general favoured those in the lower part of the income distribution, with those in the middle (especially around about the 60th percentile) faring worst. However, as Tables 1 and 2 showed, this period comprised two distinct sub-

Figure 2: *GIC Curve Relative to Mean Change in Disposable Income, 2003-2011*

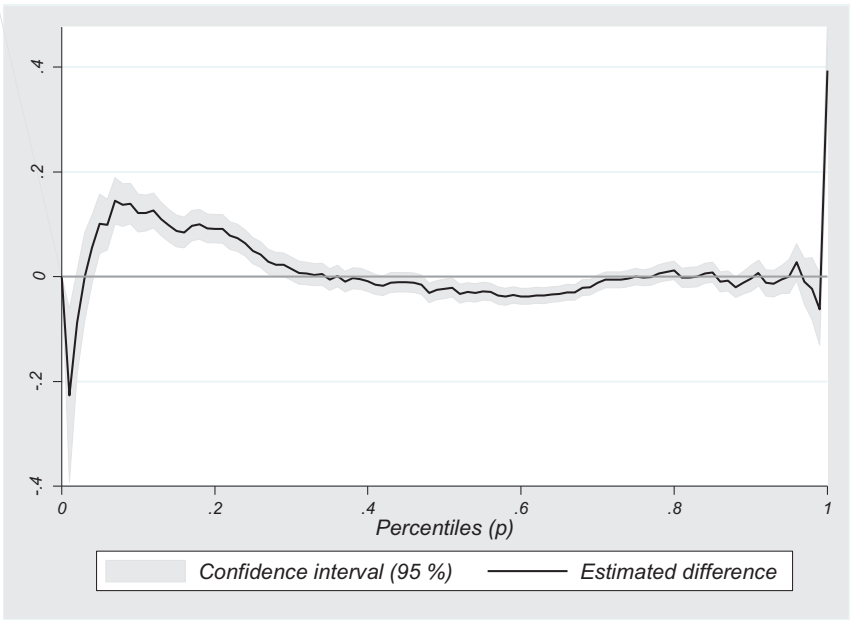
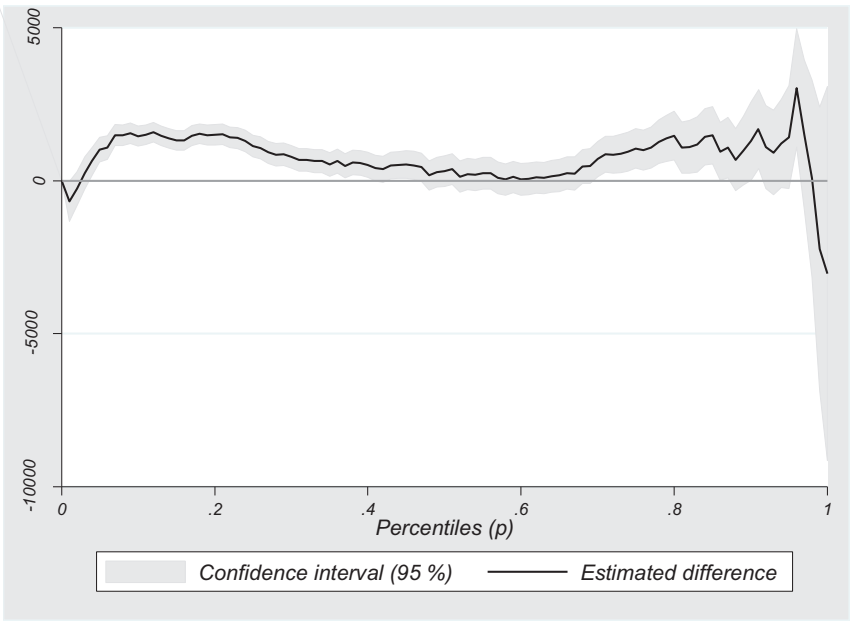


Figure 3: *Absolute GIC Curve, 2003-2011*



periods, one of high growth and the other of deep recession. We now examine these periods in turn.

4.2 *2003-2007 Period*

Figures 4 and 5 show the relative GIC curves, Figure 5 showing it relative to the change in mean income. Lower percentiles (up to about the 25th percentile) show the greatest relative gain. The group between about percentile 25 and percentile 70 shows a slight relative loss and then the percentiles higher than 70 appear to have gains that are approximately equal to the mean gain.

Figure 4: *Relative GIC Curve, Disposable Income, 2003-2007*

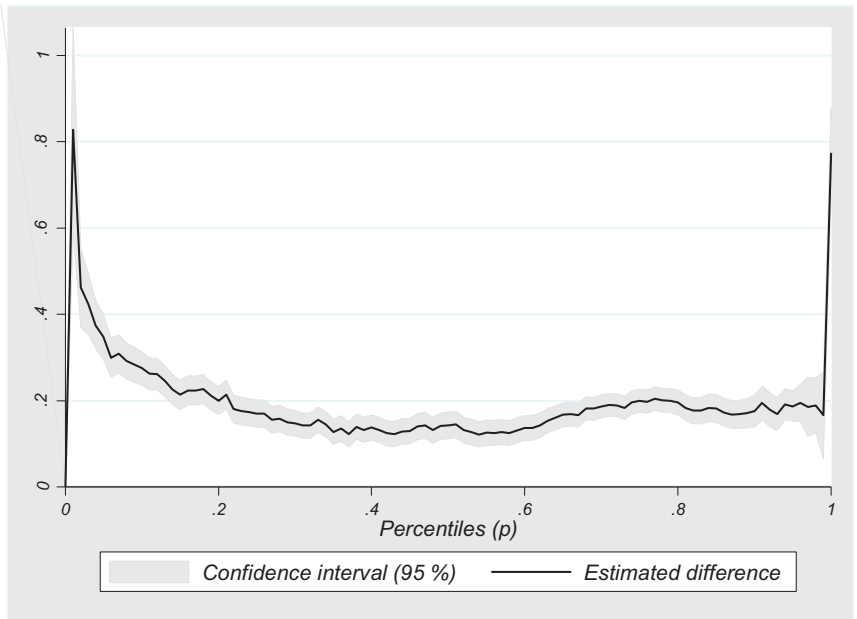


Figure 6 translates this into absolute gains (once again with the trimming at the very top of the distribution). Absolute gains are fairly constant up to about the 60th percentile (implying of course relative gains for lower percentiles). They then start to increase fairly steadily with a levelling off at the 80th percentile followed by another rise at the 90th.

4.3 *2007-2011 Period*

This period is different from the two we have examined already in that it encompasses a period of negative growth. Thus absolute pro-poor "growth" (i.e. less contraction) is more likely to be observed.

Figure 5: *GIC Curve Relative to Mean Change in Disposable Income, 2003-2007*

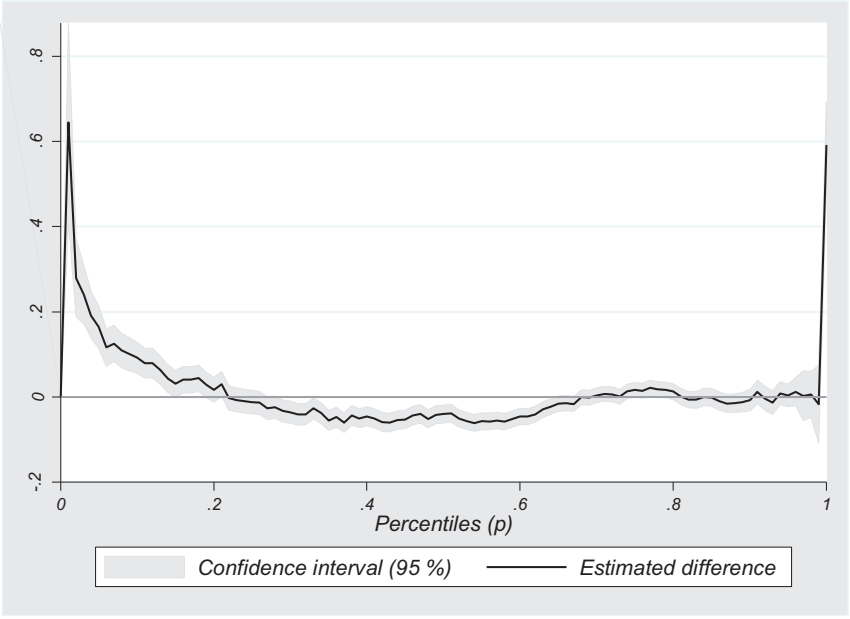
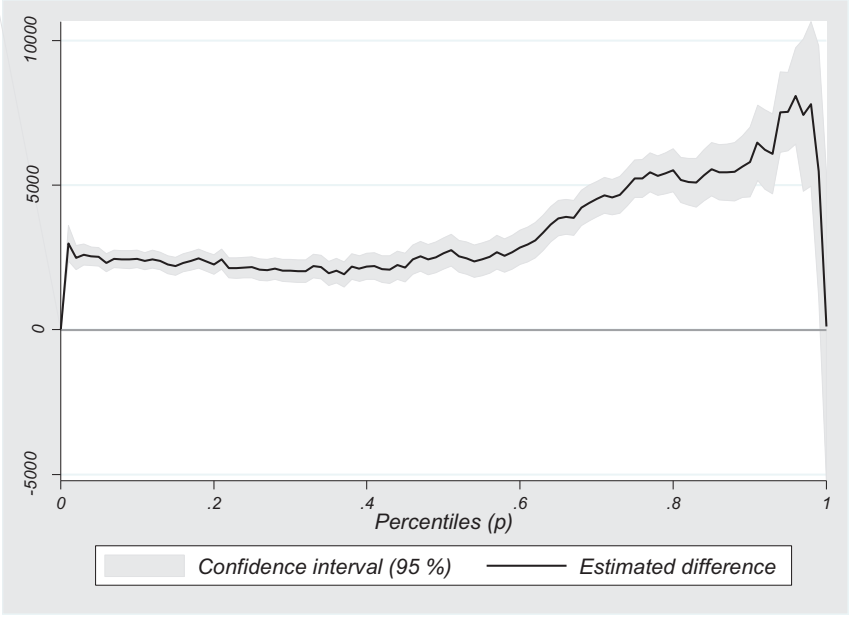


Figure 6: *Absolute GIC Curve, 2003-2007*



Figures 7 and 8 show that, with the exception of the lowest decile, the lower percentiles fared relatively better over the recession period. What is also noticeable from Figure 8 is that from about percentile 20 to percentile 60 did at least as well as the mean (albeit bearing in mind that mean income fell). It was the lowest decile, followed by the group between the 60th and 80th percentile that fared relatively the worst, although in fairness much of the relative GIC curves are fairly flat, indicating that the experience across a considerable part of the distribution was fairly uniform (in relative terms at least).

Figure 9 gives the situation in absolute terms. Apart from the very lowest centiles, absolute losses were pretty similar up to about the 25th percentile. Then the curve starts to slope downwards, indicating larger absolute losses for the higher percentiles, though the rate of decline is fairly modest.

We can now summarise these results: the 2003-2011 period can be fairly neatly divided into a period of high growth, followed by a period of deep recession. For the first of these sub-periods it was the relatively less well-off who fared the best while the group whose income increased the least was the middle group, from about the 25th to the 65th percentile. For the recessionary period, the lowest decile fared poorly, but subsequent deciles up to about the 60th did slightly better than average. From about percentile 60 onwards the experience was close to the mean, though the top decile also seems to have fared relatively poorly. Taking the period as a whole, apart from the very lowest centiles, it was certainly a good one for lower percentiles, up to about the 35th percentile. The middle group, from about percentile 35 to 65 fared relatively less well, and the higher percentiles about average.

How do these figures compare with the results in the three papers referenced earlier on? The results are certainly consistent with the Callan *et al.,* and Madden paper, which is hardly surprising as the same data and broadly speaking the same variables are analysed. In particular the findings of Callan *et al.*, that the bottom and top deciles fared worst over the 2008-2011 period and that both deciles lost out relative to the average is echoed in Figures 7 and 8. Taking the longer view, however, in general economic developments over the 2003-2011 period have favoured the less well-off, certainly in a relative sense and even in an absolute sense in the recessionary period. The fact that the overall Gini coefficient has not fallen by as much as might be expected (given that lower income percentiles have fared well) is explained by the fact that higher income groups appear to have done slightly better than middle income groups. This is borne out by the change in the Atkinson (5) measure of inequality which places greater weight on incomes in the lower part of the distribution – between 2003 and 2011 this index falls from 0.928 to 0.833 (detailed results available on request from the author). The

Figure 7: *Relative GIC Curve, Disposable Income, 2007-2011*

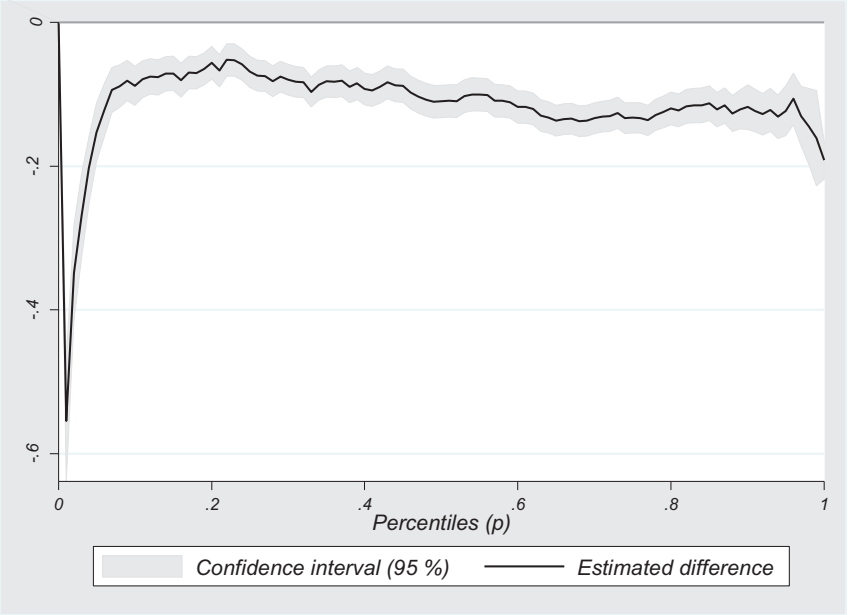


Figure 8: *GIC Curve Relative to Mean Change in Income, 2007-2011*

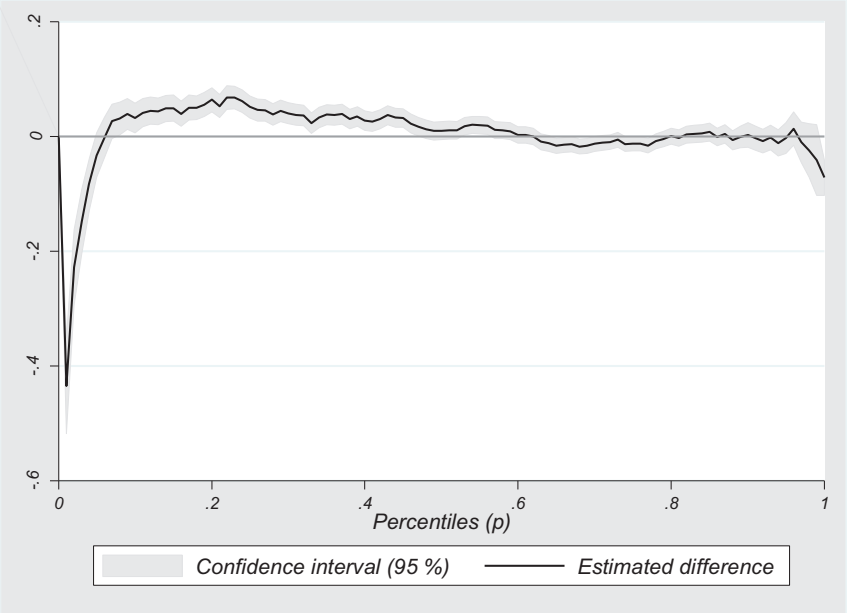
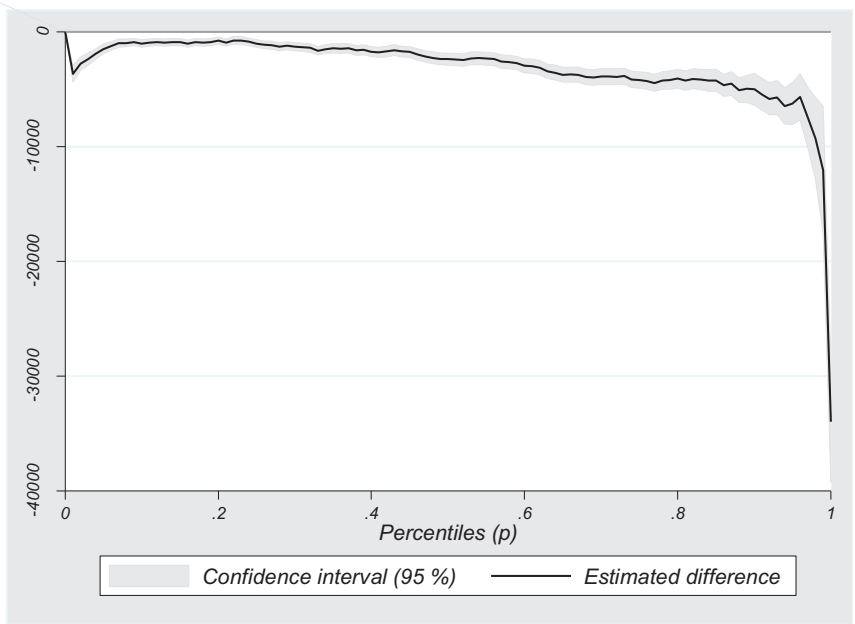


Figure 9: *Absolute GIC Curve, 2007-2011*



improvement in the relative position of the less-well off which we see here is also consistent with the earlier results of Madden, whereby poverty rates fell up to 2009, increased in 2010 and 2011 but still were below the levels of 2003 (and 2007).

The results here do not correspond quite so closely with Whelan and Maître. However, that may be explained by the fact that (a) Whelan and Maître examine economic vulnerability, which is a different (though not entirely unrelated) concept to what we examine here and (b) Whelan and Maître present their results by class as opposed to percentile in the income distribution. While there may well be correlations between class and income, reconciling results for the two approaches would represent a substantive task in its own right and would be a useful topic for future research.

V SUMMARY MEASURES OF PRO-POOR GROWTH

The results so far have been presented in simple, graphical terms and provide an appealing way of assessing the nature of growth across the income distribution. However, when comparing whether growth in one sub-period was

more pro-poor than the other, or whether growth was more pro-poor for one measure of living standards than another, then visual inspection can be difficult. In these instances it may be more useful to examine summary indices.

The summary index we use is the PEGR of Kakwani and Son (2008). In calculating this, we must choose a poverty line. For the case of the SILC data from 2003 to 2011 we choose 60 per cent of median equivalised income for the year with highest average income, 2007 (this corresponds to the definition of poverty line chosen by the EU in its Laeken indicators). We present results for the case of $\alpha = 0, 1, 2$.

Dealing first of all with the SILC data over the complete 2003-2011 period, we see that growth was pro-poor, in the sense that if growth had occurred without any change in inequality, we would have required over twice the amount of growth in order to bring about the same change in poverty. This is the case for when poverty is measured by a headcount measure. The gap between the PEGR and actual growth is not quite so pronounced for poverty measures which take account of the depth of poverty, while for poverty measures which also take account of the distribution of income amongst the poor, actual and PEGR were very similar.

What about the two sub-periods? For the first sub-period, where growth was high, we see once again that the PEGR exceeds actual growth, though not by as much as over the total period. Nevertheless, the evidence is here that growth was pro-poor over the period and interestingly, it was pro-poor for all values of $\alpha$and by about the same amount. For the second sub-period, the gap between actual growth and the PEGR is much smaller and for the case where $\alpha = 2$ actual growth exceeds the PEGR. This indicates that growth, or at least the contraction, was (very) mildly pro-poor over the 2008-2011 period, and that the very poorest of the poor lost out (in relative terms), a finding which is once again consistent with that of Callan *et al.* As mentioned above, it is worth bearing in mind that when growth is negative, then relative pro-poor growth (as opposed to absolute pro-poor growth) is quite demanding (the opposite is true when growth is positive).

Table 3: *Poverty Equivalent Growth Rates* ($\alpha = 0$)

	SILC 2003-2011	*SILC 2003-2007*	*SILC 2008-2011*
Growth (g)	0.041	0.183	–0.103
PEGR	0.121	0.221	–0.088
PEGR-g	0.081	0.039	0.015

Table 4: *Poverty Equivalent Growth Rates* (α= 1)

	SILC 2003-2011	*SILC 2003-2007*	*SILC 2008-2011*
Growth (g)	0.041	0.183	–0.103
PEGR	0.084	0.229	–0.099
PEGR-g	0.043	0.033	0.004

Table 5: *Poverty Equivalent Growth Rates* (α= 2)

	SILC 2003-2011	*SILC 2003-2007*	*SILC 2008-2011*
Growth (g)	0.041	0.183	–0.103
PEGR	0.049	0.229	–0.131
PEGR-g	0.009	0.034	–0.028

VI DISCUSSION AND CONCLUSION

This paper has used the GIC curves of Ravallion and Chen to provide a summary of the distribution of growth over the 2003-2011 period. The period is subdivided into two periods, 2003-2007 which captures the last years of Ireland's economic boom and 2008-2011 which captures Ireland's experience during the Great Recession. We also provided summary indices of pro-poor growth over the period. The evidence suggests that for the latter part of the boom and the Great Recession, growth in Ireland has overall been pro-poor, allowing for the fact that growth has been negative or flat since 2008, and also bearing in mind that the bottom decile have not done so well in the post 2008 period. These results are consistent with other work by Callan *et al.* (2013), Madden (2013) and Whelan and Maître (2013).

However, there are some caveats which we should enter with respect to the conclusions. The main caveat concerns the extent to which the income measure we use provides an adequate measure of living standards. There are a number of reasons why it might not. The first of these concerns the role of housing costs.

As has been well documented elsewhere (e.g. Whelan, 2013), much of Ireland's journey from boom to bust was tied up in a property bubble. During the latter stages of the bubble (around 2005-2006) house prices were already well above what could be regarded as equilibrium levels. Despite this, as the bubble was still in place, there was still the expectation amongst many that prices would continue to rise and hence people may have been tempted into buying on the basis that "they needed to get a foot on the property ladder". When incomes fell in the 2008-2011 period, some people will have been left

with high mortgage debt and it could be argued that disposable income may not accurately reflect their true household resources, since a disproportionate amount of income may have been required to service a debt on an asset which had been overpriced and whose value had fallen substantially.

Of course asset prices rise and fall all the time and typically adjustments are not made to disposable income figures to reflect this. It could also be argued that in many cases houses were purchased in order to make a quick capital gain (some people purchased multiple properties) and so there is no reason to adjust income figures to reflect a speculative investment. It is also the case that for people who "traded up" the more expensive house may well have been of higher quality and so the imputed rent they would have received as owner-occupiers would be higher. However, it also seems likely that many people purchased houses in this period as their first principal residence. The difficulty we face is that while SILC provides the most reliable indicator of disposable income, the figures it provides do not adjust for housing costs. There is a further complication in that even if we could incorporate housing costs we would still face the difficulty of distinguishing between people whose high housing costs reflect speculative purchases gone wrong and those for whom they constitute a "genuine" burden.[4] In some ways this is similar to trying to distinguish between the "can't-pay" and "won't-pay" groups when dealing with mortgage arrears.

The second caveat over our results also involves the extent to which our measure of income is a true measure of living standards. Part of the macro-economic adjustment which the economy has undergone during the Great Recession has involved reductions in various forms of social support and transfers. Where the support was provided in the form of cash transfers then it is captured in our income measure. However, in some cases the reduction support may have applied to a subsidised service or to a directly provided service e.g., restrictions in medical card availability, cuts to home help hours, cuts in the availability of special needs teachers etc. To the extent that such cuts may not apply uniformly across the income distribution, then they will affect the distribution of a broader measure of living standards, although they may not be reflected in changes in income.

It is also possible that non-monetary benefits for employees may have been cut e.g., employer provided health insurance or sports club membership. Once again, if these cuts are not uniform across the income distribution then there may be a discrepancy between developments in headline income and underlying living standards.

[4] In other versions of this work we applied the same methodology to the measure of disposable income in the *Household Budget Survey* and adjusted for housing costs. The qualitative results and shape of the graphs were similar to those for SILC. Results available from the author on request.

Overall, however, our results indicate that for the definition of disposable income that we *can* measure, as provided in SILC and after adjustment for household size and composition, growth in Ireland since 2003 has been broadly pro-poor.

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APPENDIX 1: DEFINITION OF INCOME IN SURVEY OF INCOME AND LIVING CONDITIONS

Definition of Income: The income measure we use from SILC is equivalised income after social transfers using the EU definition of income and the modified OECD equivalence scale. The EU definition of income consists of:

- Direct income (employee cash and non-cash income).
- Gross cash benefits or losses from self-employment.
- Other direct income (but not pensions from individual private plans, value of goods produced for own consumption, employer's social insurance contributions).
- All social transfers (e.g., unemployment benefits, housing allowances, sickness allowances etc.).

Tax on income and contributions to state and occupational pensions are deducted from this to give disposable income, which is then adjusted to equivalised income by applying the modified OECD scale (1.0 first adult, 0.5 other adults, 0.3 children aged less than 14). For details see Central Statistics Office (2007).