

**Session 3: Demographics, Non-Working Time, Inequality and Growth/Inégalité,  
croissance, démographie et loisirs**

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**“Age Structure, Income Distribution and Economic Growth”**

Age structure is a great variable to have as an explanatory variable in any empirical study that you have. It is very easy to measure: most people know how old they are, at least to the nearest decade. It is available over long periods of time and for many countries. It is (pretty much) an exogenous variable or at minimum, it is predetermined relative to most dependent variables you might have. And, as a bonus, it is one of the few variables that we can confidently forecast for decades ahead. So in many ways just about the best x-variable to have in a regression. Furthermore, it is relatively easy to think up stories about why the age structure might matter in a whole host of situations. A simple example is crime. It seems compelling to me that the increase and subsequent decrease in crime rates in the western world over the last 30 years is related to the proportion of young people in the population. Now, one could say the same things about variables such as gender, for instance. This is also quite exogenous. However, the proportion of men and women in the population does not vary much, either over time or across countries. With age structure this is not true: there are significant differences, both across time (think of the baby boom) and across space. This gives a researcher plenty of variation with which one can go off and explain things. This is especially useful in studying inequality and growth, because this is an area where it is really quite hard to come up with good explanatory variables. I therefore want to commend the authors right away for using age as a way to look at the problem of what determines inequality, growth and the linkages between them.

So onto the paper. The authors begin by outlining four different stories about how inequality might affect growth. What is interesting about these stories is that in each one of these stories if you accept the channel inequality and growth, you also have to admit an important role for age structure. Take story about crime for instance. The idea here is that inequality leads to more social unrest, more crime and thus lower productivity. So inequality is bad for growth. But if you believe that this crime channel is very important then you also have to believe that age structure is very important because a world with more young men around is a world with more crime. So if you think crime harms growth then you have to agree that a higher proportion of young men is bad for growth as well, because more young men means more crime. So to reiterate, although each of the four stories is a story about income inequality and growth, but they can also be made into stories about how age structure directly affects growth.

The other piece of the puzzle is whether age structure might affect inequality, thus providing an *indirect* effect of age structure on growth, one that would work through inequality in addition to the direct effects mentioned above. Here the authors argue for two possible channels. First, an older workforce is a better paid workforce. So far so good. Then they go on to say that ‘countries which invest more in education and workplace training will tend to the wages of workers and thereby equalize distributions of income’. Well that all depends on whose wages are raised. If countries invest disproportionately in university education then this would, then this could actually raise inequality by raising the wages of an elite group of better educated workers. Another possibility is the raised by David Green and Paul Beaudry in a recent paper. A society that invests heavily in educating the top part of your skill distribution, can hurt lower paid workers by diverting physical capital away from low skilled workers towards high skilled workers. This happens because a greater supply of skilled workers will reduce the cost of high skilled labour, thereby providing a greater incentive for capitalists to match their physical capital with the high-skilled labour rather than low-skilled labour. Thus the authors need to be a little bit careful in thinking about how investment in

human capital affects inequality. We are accustomed to thinking of human capital investment as being an unalloyed good, but it doesn't necessarily reduce inequality. In the final analysis I think the authors are being a little bit too clever because at the end of the day it seems to me fairly obvious that if you have more young people you are probably going to have more inequality. Young people are disproportionately represented in the lower tail of the income distribution so it is probably mechanically true that if you have more young people in your society you're going to have more income inequality.

I am now going to move to talk about the data. The authors have a sample of OECD countries over the period 1960 to 1990. Although one could criticize the authors for restricting themselves to OECD countries, I actually agree with this choice. I think there's more to be gained from looking at economies that are not too different. I am not at all convinced that the growth experiences of Chad and Pakistan are relevant to Canada or other western countries. I am however somewhat less happy about the exclusion of the 1990s. The problem with excluding the 1990s is that it leaves aside the recent experiences of two countries in which inequality and growth have both risen together: the U.K. and the U.S. It is all very well to have 29 countries on a scatter diagram and to argue that most of the dots support a negative relation between inequality and growth, but if one of the dots that does not fit the line is the U.S., then this is more than just an outlier: it is something you have really got to understand and to be able to explain. It is no good having Luxembourg and Iceland behaving nicely if the U.S. is a big counter-example to your story.

Onto the variables. The authors use a Gini coefficient as their measure of inequality. The reason they do this, I am sure, is because it is all that they have. This is a shame because the Gini isn't necessarily the best way of measuring inequality for each of the stories that they tell. For instance, take the story about social conflict. This seems to me to be a story about the extremes of the income distribution. You have an impoverished underclass gazing longingly at the luxurious lifestyle of the rich. In this case what you would ideally want a

measure that is more sensitive to the extremes, whereas, as we all know, the Gini coefficient is much more sensitive to what is going on around the middle of the income distribution. On the other hand the credit market imperfections or differential access to education story is very one much one about the lower tail of the income distribution: some people come from poor families and so they can not afford to go to university. This is not really a story about income distribution, this is a story about relative poverty. How well off the middle quartile is relative to the top quintile is largely irrelevant if both kinds of families are well able to send their children to university. It is financial resources of the bottom quintile that really matters. In this case what one would really want is a measure of relative poverty such as how well off the bottom quintile is for instance. This criticism gets to a basic problem with cross-country data. It is much harder than with time series data to get variables defined the way you would really want. If we were looking at income distribution within a country we would be able to use equivalence scales, which are just income distribution measures adjusted according to differences in household size. This would be quite important if for example the returns to scale in a family differ importantly by age, and remember, this is very much a paper about age structure. I also wonder about some of these education variables that go into these cross-country growth studies. As somebody who has experienced the education system of two different countries I am not at all sure that one year of education in one country has just the same impact as a year of education in another.

Another thing I am not clear about is whether the authors should be looking at pre- or post-tax inequality. This is a very important for policy. It is very easy for governments to change post-tax inequality: all that I required is changes in tax rates. It is a lot harder to deal with pre-tax inequality. One can easily think of a model in which increasing the progressivity of the tax system raises *pre-tax* income inequality as firms try to undo the impact on incentives of increases in top marginal rates. And this is an important consideration with the stories about inequality that the authors tell. The envy story—the social conflict story—is, I think, a story about after tax inequality. It is about how many possessions you have. The

monitoring story—the idea that it is better to be working with people of like human capital—is probably more a story about pre-tax incomes, which better measure the relative productivities of different people in the economy.

The authors find that inequality reduces long-run growth and that age structure affects inequality. However, I am not convinced that they find much evidence that age structure effects growth directly, as the relationships that they estimate do not seem statistically significant. This leads to a bit of a puzzle because they find that age structure affects inequality, and that inequality affects growth, but that there is no direct channel. I suspect that the authors are a little bit puzzled too, but they do appear to be thinking about it. One comment I always like to make is, and it is not original with me, is that the authors need to think a little bit more about economic significance, not just statistical significance. It is not clear from the paper how big the growth effects are of inequality. They may be economically trivial or they may not be: it is not clear from the paper.

Perhaps the most important thing for the authors is to sort out which of their stories about inequality, age structure and growth fits their data best. Information about how long this process takes—how long the lags are—may be quite useful here. The social strife story is one in which you would expect the lags to be quite short: a country which has a very unequal distribution of income at time  $T$ , should have higher crime and therefore lower growth at time  $T$ . It should not be a process something that takes 10 or 20 years to have an effect. On the other hand, the differential access to schooling story, the idea that poor families can not educate their children, is a process that has an impact over much longer time period. So I think the authors could probably use information about the lag structure of their model to try and tease out the differences between their different stories.

I shall conclude by saying that I really liked this paper, because it made me think about some linkages between inequality and growth that I had not thought about. I think what the

authors need to do now is to think about ways of allowing the data to separate out the different hypotheses that they are trying to test.