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Volume Working Title: The Economic Consequences of Demographic Change in East Asia, NBER-EASE Volume 19

Volume Editor / Conference Organizer: Takatoshi Ito and Andrew Rose, editors

Volume Publisher: University of Chicago Press

Volume URL: [http://www.nber.org/books/ito\\_08-2](http://www.nber.org/books/ito_08-2)

Conference Date: June 19-21, 2008

Title: Comment on "The Effects of Demographic Change on Public Education in Japan"

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Date Received: September 12, 2008

URL: <http://www.nber.org/chapters/c8170>

Comments on “The Effects of Demographic Change on Public Education in Japan” by Fumio Ohtake and Shinpei Sano

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The authors of this paper present quite important and interesting empirical findings. The share of the elderly population negatively affects the level of public educational expenditure in the recent years in Japan, as was found in the US. I believe the economists in many advanced countries must take a good look at the results of this paper because they are similarly experiencing population-aging and also because high-quality education has been increasingly emphasized at the face of rapid technological progress and increased world market competition. To the extent that the causality is robust, we will have to work hard to find a way to deal with population-aging without sacrificing the quality of our education system.

That being said, we first need to confirm that such causality truly exists between the population share of the elderly and public expenditure on education, and also find out why such causality, if any, arises. The authors suggest several theories, but they are not quite successful in singling out the one behind the empirical findings. For example, the elderly may have become more selfish and short-sighted, but the changes in living arrangement expected to reflect such attitude change are found to have little explanatory power for the results. However, the effect on the educational expenditure serves only as an indirect test. A more direct test regarding the issue would investigate the effect of the elderly population on the public expenditure directly linked to the welfare of the elderly such as income transfer and health care.

One additional component to be considered regarding the hypothesis is private transfer within family. Living separately from their adult children does not necessarily mean that the elderly do not receive financial supports from their adult children. To the extent that public transfer and private transfer substitute each other, the elderly will be indifferent between higher and lower public transfers. Indeed, the substitution is almost one-to-one in a Korean data set I have an access to, and Japan may not be much different from Korea in that aspect. In any case, it would be interesting to see how much public transfers “crowd out” private transfers in Japan, and such information will be quite helpful for the readers to better understand the results presented in the paper.

The authors speculate in conclusion that the changes in the subsidy from central government may have caused the negative effects of the elderly population on the educational expenditure. I do not deny the possibility, but two inter-related questions

still remain. First, why would the effect of the changes in subsidy from central government show up in the relationship between the *elderly population* and the *educational expenditure*? I think it is possible that such changes affect the educational expenditure at local governments, but how are they related to the size of the elderly population? Second, what is the mechanism through which the changes in subsidy system affect the results? Little information is given in the paper regarding these two questions, and the readers will love to see some to better understand the paper. Further regarding the issue, the authors may wish to pay more attention for the 2000~2005 period during which the central government's subsidy fell a lot from the previously stable trend. If the period stands out in terms of the correlation between the elderly population and the educational expenditure, the authors' speculation can be more persuasive.

Now, I turn to the choice of variables in the regression. In particular, the authors need to pay more attention to the "OLD" and "KID" variables in the regression. As suggested by the authors, a greater share of school kids in population tends to reduce the per-student educational expenditure. But at the same time, a greater share of school kids implies a greater share of households with kids, whose parents may vote for a greater expenditure for education. These two effects offset each other, but the relative magnitudes of these effects may also depend on population-aging to the extent the aging arises from a lower fertility rate. In other words, a decline in fertility rate may reduce the share of school kids in population, but not so much the fraction of the households with school kids. As only the share of school kids (KID) is controlled for in the regression, the effects through the fraction of the households with school kids may show up in the coefficients on the elderly population. If so, the educational expenditure is not adversely affected by the increasing size of the elderly population. Instead, the educational expenditure is adversely affected by the declining size of the fraction of the households with kids, which is represented as an increase of the elderly population in the data.

Another complication arises in the regression as the increase in the share of the elderly given the share of kids partly reflects a smaller working-age population. To the extent that the smaller workforce means smaller tax revenue, the negative coefficients on the elderly population may simply represent the local government's ability to spend. The positive coefficient on the per-capita income is consistent with this alternative interpretation.

I wish to emphasize, again, that the empirical relationship documented in this paper is very important and deserves many economists' attention. I would like to thank the

authors for providing the interesting results and also encourage further works on the issue. Identifying the causality and the underlying hypothesis will make a great contribution to the literature.