

IARIW-ESCoE Conference

“Measuring Intangible Assets and Their Contribution to Growth”

Quantifying Human Capital in the Absence of Cardinal Measure: Exploring Gender Based Provincial Differences in Canadian Human Resources

Gordon Anderson, University of Toronto, anderson@chass.utoronto.ca

The per capita stock of human capital is integral to the growth and development potential of a society but, as a composite of an agents embodied human capital and their experiences, its inherently latent nature hampers quantification and comparison of human capital distributions across different groups of agents. What is initially required is a translation function which converts the combined effects of embodied human capital and experience into a measure of human capital. Unfortunately, many of the factors that influence human capital acquisition are categorical in nature, for example levels and types of schooling, the environments and lifecycle phases within which experience is acquired etc. In these contexts, as elsewhere, attachment of numerical scales to ordered categorical variables have facilitated analysis, but recently this approach has given cause for concern (see Bond and Lang 2019). The problem is that categories represent intervals of an unknown and not necessarily constant length along some continuous distribution and the cumulative distribution functions of different groups implied by the categories will invariably cross so that some monotonic transformations of the translation function would reverse the ordering.

Essentially the scale dependency of most summary statistics can result in a lack coherence when comparisons based upon alternative, equally valid scaling assumptions are made. Furthermore, simple summary statistics will not always reflect all of the information necessary for an appropriate comparison (see Carneiro, Hansen and Heckman 2004). In this paper, by extending techniques for multilaterally ordering and ranking a continuously measured variable (Anderson et. al 2020) to multivariate categorical environments, scale independent multidimensional techniques for making inferences about the respective levels of, and differences between, per capita embodied human capital and experience within groups are proposed. Motivated by concerns regarding interprovincial trends in economic growth and inequality in Canada, their effectiveness is exemplified in comparisons of Human Capital Distributions across Canadian Provinces in the 21st century. Results so far indicate that, while gender specific joint distributions of embodied human capital and experience are converging across Canadian provinces, the genders are themselves diverging with females becoming “more experienced and wiser” relative to their male counterparts.

References.

Anderson G.J. Post T and Y-J Whang (2020) Somewhere Between Utopia and Dystopia: Choosing From Multiple Incomparable Prospects” *Journal of Business and Economic Statistics.* 38 502-515

Bond T.N. and K. Lang (2019) "The Sad Truth about Happiness Scales," *Journal of Political Economy* 127, no. 4: 1629-1640.

Carneiro, P., Hansen, K.T., Heckman, J.J. (2003). "Lawrence R. Klein Lecture. Estimating Distributions of Treatment Effects with an Application to the Returns to Schooling and Measurement of the Effects of Uncertainty on College Choice." *International Economic Review*, 44, 361-422.

"