

Report on the PhD Dissertation  
“ Essays on Human Capital, Inequality and Technological  
Change”  
by Daniil Kashkarov

This doctoral dissertation has three chapters. The first two chapters are concerned with the individual responses to Routine-Biased Technical Change (RBTC) in terms of human capital accumulation and occupational choices. The last chapter brings up insights from theories on adaptation to changing environments in biology and ecology, to the problem of adaptation of workers to technical change.

My overall assessment is that this dissertation is ambitious. It tries to make progress on different fronts, combining models and data. After revisions, the chapters have the potential to become published papers in respected journals, In my view, it clearly passes the bar for a public defense.

I have general comments, and some comments in detail on the first two chapters, with an eye on eventual publication. I list these comments below.

1. A general comment on all chapters is that the writing is at times dry, with sections or subsections that are long, with long paragraphs. Exhibit A on this is section 2 of the first chapter ('Data and Micro Evidence'), or section 3 of the second chapter ('RBTC and Career Paths'). It becomes hard for a reader to capture the key ideas in each of these chapters, and results may lose importance in the eye of the potential journal referee. I would recommend to split up the material by adding subsections, or by the use of headings that highlight the theme of different paragraphs. On this vein, the use of the *subparagraph* feature of Latex is very convenient.
2. The first chapter puts forward key questions, that are appealing and of broad importance. I have a few comments that should be addressed in future versions. To start, the model should ideally be presented in a more systematic manner, describing preferences, technology and technology in a better way.

I like the formulation of two generic occupations (abstract and routine), that endogenous human capital formation occurs for only one (abstract), and the modeling of initial conditions as a triple of learning ability, initial human capital in the abstract occupation, and the level of the ability in the routine occupation (which evolves exogenously over the life cycle). This is nice and insightful, with potential in accounting for patterns in the data.

An issue here is about occupational switches. Why switching across occupations happens at no cost? One would imagine a cost in terms of foregone earnings, for instance, as other authors have modeled in previous work. Likewise, one could conjecture that human capital formation depends on the occupation the agent currently is. That is, human capital formation could conceivably occur faster if the agent is working in the abstract occupation. Right now, human capital formation takes place regardless of the individual's occupation.

3. The model should be formulated more carefully. The law of motion of human capital should be explicitly part of the individual's problem in equation 1.1.
4. The use of the 'flat spot' approach to identify changes in prices is nice but needs to be developed more systematically in the analysis. First, what age groups are considered? Second, how aggregate growth in wages is taken into account? Or is it ignored? Third, note that one could follow, a priori, the approach in Huggett et al (2011) and infer all prices *and* price shocks from the 'flat-spot' approach.

Incidentally, the replacement of means by medians is not without problems. Note that if wages are log-normally distributed, as it is implied by the assumptions, the use of medians can be problematic. Recall that if  $\ln(x)$  is normally distributed,

$$\text{mean}(\log(x)) = \log(\text{median}(x)).$$

Overall, it would be a good idea to list the steps followed to infer prices from one year to the next, and how to recover the price sequence for a potential reader. Similarly, it would be nice to compare results when means are used instead of medians.

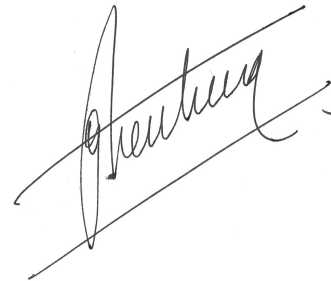
5. Overall, the message from chapters 1 and 2 need to be sharper. What is the quantitative punchline in chapter 1? Are changes in prices, in the presence of human capital formation, critical to account for what?
6. Chapter 2 develops an environment in which individuals live for three periods, and differ at the start of their lives in terms of human capital, and can choose among four occupations. Human capital grows exogenously according to the current occupation. Individuals receive job offers within a period, and at most can receive four offers in the period.

A comment here pertains, again, on the writing and presentation of the environment. The presentation should be cleaner and straightforward. It takes more than two and half pages to learn about the nature of uncertainty in the environment. I was guessing while reading, and this should not happen.

7. Again, what is the quantitative punchline of the second chapter? One could be, as in pp. 81 of the dissertation, on the implications for the number of workers in the NRC occupation when probabilities from the past are used. An alternative one is about welfare implications of the 'bottleneck' problem. What are the welfare implications for the distribution of welfare gains associated to a counterfactual path of probabilities  $p_{R,C}$ ?

I hope the comments are useful.

Gustavo Ventura

A handwritten signature in black ink, appearing to read 'Gustavo Ventura', is written over two parallel diagonal lines that serve as a signature line.