Application to NBER tutorial and meeting on the Economics of Digitization

Sofia Hernnäs

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Name in passport	Anna Sofia Kristina Hernnaes
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Dear member of the selection committee,

My name is Sofia Hernnäs, and I would be thrilled to participate in the NBER Digitization tutorial in March next year, as I believe I am well situated to gain and to contribute to the tutorial. My background of graduate studies at the LSE demonstrates I will be fit to take on coursework and absorb complex problems and models. My current research on automation and its effect on labour markets would contribute to a wider perspective on digitisation issues, which obviously constitute a major part of modern automation. Additionally, as I am in the intense upstart phase of a project, as well as developing new ideas in this research area, I believe I would greatly benefit from and bring a lot of energy to the tutorial. And lastly, I believe I would contribute to a social and collaborative atmosphere. I am always happy to meet new fellow PhD students or faculty, to have a chat, learn and develop ideas together.

I am looking forward to hearing back from you.

Best regards,

Sofia

Graduate studies

I hold an MSc in Economics and Philosophy from London School of Economics, where I finished with merit in 2016. At LSE, I took macroeconomics (taught by professors Alwyn Young and Wouter den Haan) covering growth theory, business cycle theory and dynamic optimisation in continuous and discrete time. I also took econometrics (taught by professors Vassilis Hajivassiliou, Mark Schankerman and Danny Quah), which included theoretical treatment of panel and time series methods, as well as e.g. asymptotic theory. This MSc built on a BSc Hons in Economics, where I finished top of my class at Newcastle University, UK.

My first year at Uppsala University's PhD Economics programme was spent on course work in the four core modules maths, micro, macro and econometrics. Thereafter, I have taken two field courses: Quantitative macroeconomic methods (given by professors Kathrin Schlafmann and Kurt Mitman at IIES and Stockholm University) and Labour market macroeconomics (given by professors Johanna Wallenius and Per Krusell at Stockholm School of Economics, Stockholm University and IIES).

The former gave a solid foundation in numerical work in Matlab. We learned how to numerically solve and calibrate partial and general equilibrium models with incomplete markets. Extensions of these models, including with heterogeneous agents, were discussed.

The latter was aimed at deepening understanding of frameworks used and current research topics in labour market macroeconomics, including labour supply and human capital accumulation.

At the moment, I am auditing the course in Labour economics given by professors Parag Pathak, Daron Acemoglu, David Autor and Simon Jäger here at MIT.

I am thus well versed in graduate level theory in macroeconomics, econometrics and microeconomics. I have worked extensively in Stata and in Matlab.

Research interest and ongoing work

I am interested in the effects of automation on the labour market.

I am currently working on a project called "Individual consequences of occupational decline" together with Per-Anders Edin, Tiernan Evans, Georg Graetz and Guy Michaels. We investigate the long-term effects on individual workers' employment, wages and mobility following decline in the demand for the workers' occupations.

Here, I have further developed my skills in Stata, my ability to work with large datasets (administrative Swedish micro data), understand, adapt and implement research design and analyse results. I have presented this project at Uppsala University, at the Nordic Summer Institute in Labour Economics in Helsinki and at MIT.

I am also interested in the task content of occupations. How do labour

replacing technologies affect the task content of occupations? How do workers react and how are they affected when the task content of occupations change? How does sorting and re-sorting work when occupations are not fixed categories, but can move around in the task space?

I am therefore currently developing a project where I investigate these issues. In this project, I plan on contributing to our theoretical understanding on how automation affects workers through the task content of their occupations. This seems relevant since several authors have highlighted that skills are bundled – a worker cannot unbundle her skills and apply them in different occupations – and thus task returns vary across occupations (Autor & Handel 2013; Heckman & Scheinkman 1987). If task returns are a function of task content, and if automation affects task content, then workers comparative advantage (and thus occupational choice) and earnings will be affected. However, it does not seem clear *a priori* how earnings or mobility should be affected. My aim is to theoretically understand this phenomenon, and to empirically investigate whether the change in the task content over the last decades[1] has contributed to worker mobility. To this end, I am currently developing a theoretical model, as well as working with task data from e.g. Atalay et al. (2018).

References

Atalay, E., Phongthiengtham, P., Sotelo, S. & Tannenbaum, D. (2018), 'The evolving U.S. occupational structure'.

Autor, D. H. & Handel, M. J. (2013), 'Putting tasks to the test: Human capital, job tasks, and wages', *Journal of Labor Economics* **31**(S1), S59–S96.

Gathmann, C. & Schönberg, U. (2010), 'How general is human capital? A task-based approach', *Journal of Labor Economics* **28**(1), 1–49.

Heckman, J. & Scheinkman, J. (1987), 'The importance of bundling in a Gorman-Lancaster model of earnings', *The Review of Economic Studies* **54**(2), 243–255.

[1] See for instance Gathmann & Schönberg (2010) and Atalay et al. (2018).