Alicia von Schenk



I Contact Information

Place and Date of Birth:	Heidelberg, Germany | 26 September 1995
Address:	Goethe University Frankfurt
	Department of Management and Microeconomics
	Theodor-W.-Adorno-Platz 4
	60323 Frankfurt am Main
Phone:	+49 (69) 798-34828
email:	vonSchenk@econ.uni-frankfurt.de

II Research Interests in AI

The idea that firms may outperform competitors by better exploiting their organizational capital, i.e. the accumulation of knowledge, has been formally modeled early on in terms of 'dynamic adjustment costs' (Prescott and Visscher, JPE 1980). With the progress of self-learning artificially intelligent (AI) systems, organizations face new possibilities of allocating and collecting firm-specific knowledge. In light of my current research projects sharing the topic of individuals' knowledge acquisition and the impact on team or firm performance, I aim at contributing to organizational theory by setting up a microeconomic model on

How to Compose the Workforce of Tomorrow?
Artificial Intelligence and the Future of Knowledge

Based on the advance of AI systems in organizations, how should firms choose the composition of their workforce to ensure an efficient distribution of knowledge in consideration of the AI's current usefulness and capacities? I set up a formal model describing the employees' optimal knowledge acquisition and the dynamics of AI systems' application in a firm over the current and (overlapping) future generation of workforce. While AI is characterized by "immortality" – i.e. it persists across all generations – and improves with usage, humans are employed only for a limited number of periods, form judgments and are capable of generalizing and using intuition. In particular, human employees belong to a generation $g = 1, 2$ working for T periods. In the period of training $\tau_g = 1$, each individual i of generation g can invest in two types of knowledge, k_a (cheap, applied knowledge) and k_d (costly, deep understanding), at heterogeneous learning costs $c_\ell^i(k_a, k_d)$. From $\tau_g = 2$ onwards, productive work comprises engaging in two types of activities, m (mechanical) or h (human-specific), and wages are paid. The AI, possessing knowledge k_v which is a function of the cumulative production history in terms of mechanical work m, updates and improves at the end of each production period. Besides enabling the transfer of knowledge between generations and creating a positive externality for coworkers, the AI lowers production costs $c_p(m, h|k_a, k_d, k_v)$. The organization hence needs to dynamically adjust its workforce in $g = 2$ with regard to the profit-maximizing measure on the set of learning capabilities (implying a distribution of knowledge among the employees). Finally, the model introduces the possibility of a system failure, suddenly reducing the AI's knowledge by a random shock between 0 and 1 with point mass at zero. This risk has to be incorporated in the decision upon the optimal composition of workforce.

Curriculum Vitae

Alicia von Schenk | 26 September 1995

Education

Goethe University Frankfurt

September 2018	**Master of Science** in **Quantitative Economics**, **grade: 1.3 (very good)** *Thesis: "When Giving a Hand Comes at a Cost: A Theoretical Perspective on Parenting"* Prize for the **second best Master in Quantitative Economics** in the Academic Year 2017/2018
October 2016	Admission to the **Ph.D. Program in Economics** at the Graduate School of Economics, Finance, and Management (GSEFM) **Scholarship of the GSEFM** for financial funding of Ph.D. studies (€12,000) Courses in i.a. Microeconomics, Macroeconomics, Econometrics (1st year) and Computational Statistics, Machine Learning, Experimental Economics, Advanced Game Theory, Digital Economics (2nd year)
August 2016	**Master of Science** in **Mathematics**, **grade: 1.4 (very good)** *Thesis: "Recursive Valuation of American Put Options Based on the Geske-Johnson Approach"* Courses i.a. in Formal Logic, Optimization, Numerical Financial Mathematics, Markov Chains
March 2016	**Bachelor of Science** in **Economics**, **grade: 1.4 (very good)** *Thesis: "Large Games with Application on the Refugee Situation and the Existence of Equilibria"*
July 2014	**Bachelor of Science** in **Mathematics**, **grade: 2.2 (good)** *Thesis: "Manipulation of Elections: A Quantitative Proof of the Gibbard-Satterthwaite Theorem"* Scholarships: **"Deutschlandstipendium"**, **"Studienstiftung des deutschen Volkes"** Start of Bachelor studies in Mathematics at the **Ruprecht-Karls-University Heidelberg**
April 2013	Admission to double degree studies in both Bachelor programs, Mathematics and Economics

Kurfürst Friedrich Gymnasium, Heidelberg

June 2011	Completion of the **Abitur** with the **grade 1.0** (875 of 900 points) at the **age of 15** Receipt of several school awards, i.a. the **Ferry Porsche Prize** for outstanding achievements in mathematics/physics and the **prize of the German Mathematical Society**

Work and Teaching Experience (Selection)

Current	**Goethe University Frankfurt**, Germany Research Assistant
October 2017	Prof. Dr. Ferdinand von Siemens, Chair of Applied Microeconomics
April 2019	Prof. Dr. Matthias Blonski, Chair of Microeconomics
	Teaching Assistant Organizational Economics, Fundamentals of Microeconomics [M.Sc. Economics] Microeconomics 1, Decision Making in Markets and Organizations, Informatics [B.Sc. Economics] Introduction to Numerical Analysis [B.Sc. Mathematics]

Work in Progress (Selection)

- How to Compose the Workforce of Tomorrow? Artificial Intelligence and the Future of Knowledge
- The Neglected Costs of Helping: An Experiment on the Motives Underlying Harmful Support (with Victor Klockmann)
- Experimental Evidence on Knowledge Hierarchies and the Efficient Division of Labor Within Organizations (with Ferdinand von Siemens and Victor Klockmann)
- A Model of Persistent Effects from Behavioral Interventions (with Victor Klockmann)
- The Logarithmic Tracing Procedure and a Homotopy Method for Computing and Selecting Markov Perfect Equilibria of Dynamic Stochastic Games (with Steffen Eibelshäuser, Victor Klockmann, and David Poensgen)

Academic Visits, Conferences and Summer Schools (Selection)

March 2019	**Research visit** (Host: Prof. Dr. Randolph Sloof); **University of Amsterdam** (NL) Presentation at the CREED lunch seminar
September 2018	4th Lecture on The Economics of Organizations and Human Resources; University of Hamburg (D)
June 2018	9th International Conference of the French Economic Association of Experimental Economics; IAE Nice, University of Nice Sophia Antipolis (F)
March 2018	Ph.D. course on "Computational Statistics"; University of St. Gallen (CH)
August 2012	International Summer School of Mathematics for Young Students (ISSMYS); ENS Lyon (F)

III Academic References

Prof. Dr. Ferdinand von Siemens [Supervisor]
Dept. of Management and Microeconomics
Goethe-Universität Frankfurt
Frankfurt a.M., Germany
vonsiemens@econ.uni-frankfurt.de
+49 (69) 798 34824

Prof. Guido Friebel, Ph.D.
Dept. of Management and Microeconomics
Goethe-Universität Frankfurt
Frankfurt a.M., Germany
gfriebel@wiwi.uni-frankfurt.de
+49 (69) 798 34826

Prof. Dr. Matthias Blonski
Dept. of Management and Microeconomics
Goethe-Universität Frankfurt
Frankfurt a.M., Germany
blonski@wiwi.uni-frankfurt.de
+49 (69) 798 34815

Kindly note that, due to our highly complementary research profile and interests, I would be very pleased to be granted the possibility of attending the workshop – in case of acceptance – together with my fellow Ph.D. candidate Victor Klockmann.