Most of us would like to have a job that would support both physical well-being through providing enough income and psychological well-being reflected in high satisfaction with life. Unfortunately, not all jobs are like that. A sizeable part of the society considers their jobs as inappropriate for different reasons, starting from severe working conditions and ending with the acquired education and/or skills not being used in the job. This has a negative impact on their physical and psychological well-being. Another part of society is not employed at all, either seeking job or being inactive, which typically doesn't make one’s life comfortable.

Not only we as individuals are interested in the jobs we find appropriate for ourselves. Whether most of us are able to find them is also of relevance to firms and policy-makers. Firms are increasingly caring about the level of job satisfaction of their employees, because it affects the productivity of the latter and, ultimately, their decision to stay or quit the job. Policy-makers care about it, because poor quality of employment, meaning large rates of employee–job mismatch, unemployment or inactivity, increases their chances to fail re-elections and lose their jobs and, in extreme cases, leads to civil unrest.

Among the most important prerequisites of successful employment are knowledge and skills, which come from education and experience. Using the language of economists, the most efficient allocation of individuals across jobs is when the characteristics of the former match those required in the latter. Otherwise, the individual is mismatched by having more or less education and/or skills than the job requires. Research showed that working in a job where the acquired education or skills are not used has considerable negative effects on both physical well-being (e.g. lower salaries and slower career) and psychological well-being (e.g. higher risk of depression and lower job satisfaction).

On a macro level, this result brings attention to the coordination between the education market and the labour market. Lack of such coordination was repeatedly noted by many, including the World Economic Forum [296], which classified structural unemployment caused by education and skills mismatch as a global threat.

This coordination may be improved in three ways, depending on which of the two markets is viewed as more important and which as the source of the problem.
One way is to blame the education system that is preparing too few graduates in some fields of study and too many in others. Those who hold this view propose to restructure the education system so that it produces only the graduates demanded by employers [56, 128]. Another way is to blame the labour market, which is unable to take advantage of the existing supply of graduates. If this is the case, it is proposed to restructure the labour market so that the country benefits from the specialists it has [199]. Still another way is to take a broader view and understand the reasons of the existing imbalances, which might well exist because of misalignment of education and labour markets. Then these issues should be addressed and the links between the two markets should be improved [53]. This would lead to both markets working more closely together and being better adapted to current and future developments. Clearly, this third way appears to be the most beneficial.

This leads to the necessity of considering the labour market together with the education market as one system or labour–education market system (LEMS). Education-related decisions of individuals affect their labour-market options and outcomes, and labour-market outcomes of individuals affect education-related decisions of other individuals. This is the core of a typical LEMS model.

The idea that education and labour markets should be modelled together is, of course, not new, and economists have frequently embodied education characteristics of individuals into labour-market models. Usually, economists use mathematical modelling techniques and, hence, have to ignore the effects on individuals’ decisions from social networks for mathematical tractability. At the same time, there is a vast body of empirical evidence confirming that social networks are an important source of information for individuals and influence their decisions in both education and labour markets. Should we really ignore this important element in our models of LEMS? Certainly not in all cases.

Agent-based modelling allows to overcome not only the inability of social network modelling by standard mathematical economics techniques but also other shortcomings of standard economic modelling. This book is about using agent-based simulations to model LEMS with embedded social networks—more concretely, individual behaviour in LEMS where individual decisions are affected by social networks.

The book is written as a guide to using agent-based modelling for this purpose. It does not contain fully developed models—so if you’re interested in such examples, you’ll have to read the relevant articles, and this book references many of them. Rather, it contains a set of proposals on how different aspects of LEMS models should be constructed and an analysis of the approaches to their construction in the available literature. It also does not contain examples of programming code in a concrete agent-based modelling platform—programme listings that are included are written in pseudocode, so that you can easily implement them in your preferred platform. It is also not an encyclopaedia on individual behaviour (it would be much thicker if it were)—but it is a collection of facts and analyses that you should know about and consider while building your agent-based model of LEMS.

The book does not require you to be an expert in the field of agent-based modelling, education market, labour market or social networks (even if you are,
I hope you’ll still find the book useful). I also hope that it will be interesting to a wide readership, to both undergraduate students and experienced researchers.

There are three main chapters in the book. Chapter 1 discusses the facts we know about individual behaviour and the role of social networks in LEMS from empirical literature, also noting theoretical support, where relevant. Then Chap. 2 substantiates the need to apply agent-based modelling to studying LEMS, discussing the benefits and drawbacks of this modelling method, and provides a step-by-step guide to it. Finally, Chap. 3 analyses how three large blocks of LEMS—education market, labour market and social networks—can be constructed in an agent-based model, based on existing literature and the empirical results discussed in Chap. 1.

I wish you a pleasant reading.

Riga, Latvia

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