



Cultural change, risk-taking behavior and implications for economic development[☆]



Mariko J. Klasing

Faculty of Economics and Business, Department of Global Economics and Management, University of Groningen, P.O. Box 800, 9700 AV Groningen, The Netherlands

ARTICLE INFO

Article history:

Received 6 July 2012

Received in revised form 30 April 2014

Accepted 5 June 2014

Available online 24 June 2014

Keywords:

Endogenous growth

Earnings risk

Risk aversion

Cultural transmission

ABSTRACT

This research studies the dynamic interplay between the evolution of risk attitudes and the process of economic development. This is achieved by integrating an endogenous growth model with a cultural transmission mechanism that captures how parents shape the risk attitudes of their children in response to economic incentives. The model predicts that in an economy in which the material benefits associated with risky entrepreneurial activity are high, agents will over time develop more risk tolerant attitudes, which in turn will speed up the rate of economic growth. It is shown that policy interventions aiming at supporting entrepreneurial activity can play an important role for overcoming the forces of risk aversion and promoting long-run economic growth. Furthermore, the paper highlights how by inducing cultural change, such policy interventions may quantitatively have larger effects than what would be predicted by more standard models of endogenous growth.

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1. Introduction

Endogenous growth theory has emphasized the crucial role of entrepreneurs and innovators in generating new technological improvements that ultimately drive economic growth. The production and marketing of new technologies is a complex process, though, that entails substantial risks. This implies that the outcome of this process may be strongly influenced by the prevailing attitudes toward risk in the economy. Nevertheless, the existing endogenous growth literature has largely ignored the role that individual risk attitudes can play in this process. Instead, the literature has typically assumed that entrepreneurial activity is either not risky to begin with, such as in Romer (1990), or that potential entrepreneurs are all risk-neutral, such as in Aghion and Howitt (1992).

Empirical evidence, however, clearly indicates that there is substantial variation in risk attitudes both across countries and within countries

(Guiso and Paiella, 2008; Harrison et al., 2007). In addition, it has been documented that risk attitudes influence the occupational choices that people make (Bonin et al., 2007) and that less risk-averse individuals are significantly more likely to become self-employed compared to otherwise identical more risk-averse individuals (Caliendo et al., 2009; Cramer et al., 2002; Van Praag and Cramer, 2001). Furthermore, it has been shown that risk attitudes are highly persistent and transmitted intergenerationally from parents to children (Dohmen et al., 2012).

With this evidence in mind, the present paper presents the first systematic attempt to integrate heterogeneity in risk attitudes in the context of an otherwise standard endogenous growth model and to analyze its implications for the course of economic development. The analysis incorporates several key elements emphasized in the literature: (i) the link between entrepreneurial activity and risk; (ii) the relationship between individual risk attitudes and the decision to become an entrepreneur; and (iii) the fact that risk attitudes are endogenous and culturally transmitted across generations.

To link economic growth with entrepreneurial activity, risk taking, and endogenously changing risk attitudes, the present model combines an endogenous growth model with a cultural transmission mechanism. The production structure of the model economy is closely related to the setup proposed by Romer (1990), where growth is driven by horizontal innovations generated by entrepreneurs who engage in research and development (R&D) activities. Yet, the model differs from Romer in that the innovation process is assumed to be subject to uncertainty. The presence of risk allows for risk attitudes to play a crucial role in the growth process.

[☆] Parts of the results included in this paper were previously circulated under a working paper titled "Culturally Risk Averse? A Model of Economic Growth with Endogenous Culture." I am grateful to the editor of the journal, David Weil, two anonymous referees, Simon Evenett, Reto Foellmi, Manfred Gaertner, Oded Galor, Peter Howitt, Takuma Kumieda, Ross Levine, Petros Milionis, Fabrizio Zilibotti and seminar participants at various universities and conferences for their comments and suggestions. Financial support by the Swiss National Science Foundation (grant PBSC1-115475) and also the hospitality of the Economics Department at Brown University are gratefully acknowledged.

E-mail address: m.j.klasing@rug.nl.

The model economy is populated by overlapping generations of agents who differ in terms of their risk attitudes and have to choose between working in the economy's final-good sector and becoming entrepreneurs. As entrepreneurial activity is risky, only agents with a sufficiently low level of risk aversion will decide to become entrepreneurs. This way, the overall level of entrepreneurial activity and consequently the rate of growth of the economy will depend on the representation of agents with low risk aversion in the population, creating a link between the distribution of risk attitudes in the economy and its rate of growth.

To endogenize the distribution of risk attitudes and analyze its interaction with the economic environment, a cultural transmission mechanism in the spirit of *Bisin and Verdier (2001)* is integrated into the model. According to this mechanism, parents try to socialize, namely influence the risk attitudes of their children, because they care about the material conditions their children will be facing as adults. These material conditions reflect the wages their children will be earning as adults and therefore are contingent on the children's occupational choices, which in turn are influenced by their risk attitudes. This implies that parents' incentives to make their children more or less risk averse depend on the material benefits associated with risk taking, which creates a link between the economic environment and the future distribution of risk attitudes in the economy.

The integration of the above described cultural transmission mechanism into the growth model allows for the joint determination of risk attitudes and the economy's growth rate. Earnings in different sectors affect parental socialization decisions and the latter influence the occupational choices made by the next generation. I show that this two-way interaction between the distribution of risk attitudes and the rate of growth in the economy will over time give rise to a unique equilibrium with balanced growth and a non-degenerate distribution of risk attitudes. The uniqueness of the equilibrium implies that even if an economy starts off with a very small number of individuals characterized by low risk aversion and thus a very small number of entrepreneurs, over time, these attitudes will become more prevalent. As a result, in the long run, the economy will converge to the same balanced growth path as an economy that started off with a larger number of individuals with low risk aversion.

The presence of risk, however, has adverse effects on the economy's equilibrium growth rate. Compared to an otherwise similar economy where the earnings of entrepreneurs are not subject to risk, the growth rate of our model economy is shown to be lower. Furthermore, it is demonstrated that the introduction of a partial insurance scheme can mitigate, but not completely eliminate this problem. Yet, with an R&D subsidy it is possible for the economy to achieve the same growth rate as could be attained in the absence of risk.

Finally, I show that subsidies targeted at promoting entrepreneurial activity have a greater impact on growth if entrepreneurial activity is risky, people are risk-averse, and risk attitudes are endogenous, than in an economy where the earnings of entrepreneurs are not subject to risk. Even though in the presence of endogenous risk attitudes it may take longer for such policy measures to influence the economy, as their full effect may only become visible after many generations, the size of their effect will exceed the one predicted by a more standard endogenous growth model where entrepreneurs do not face any earnings risks. These findings suggest that risk attitudes play an important role for the mechanics of growth and that the predictions of endogenous growth theory depend crucially on the assumptions one makes regarding risk attitudes.

The present paper connects with various strands in the economics literature. First of all, it contributes to the endogenous growth literature, by explicitly integrating risk aversion in an otherwise standard growth model. There is a large literature going back to *Abel (1983)* and *Zeldes (1989)* that has emphasized how risk attitudes matter for consumption decisions under uncertainty. Also, the role of risk aversion for the decision to engage in entrepreneurial activity has been discussed in the

context of classical general equilibrium models, going back to the seminal work of *Kihlstrom and Laffont (1979)*. However, very few papers have investigated the implications of risk aversion for growth, which is at the core of the present study.

In the context of the growth literature, the role of risk aversion has only received some attention in the works of *Acemoglu and Zilibotti (1997)*, *Galor and Michalopoulos (2012)*, and *Doepke and Zilibotti (2014)*. Yet, all three papers differ from the present one in various respects. *Acemoglu and Zilibotti (1997)* focus on portfolio allocation choices and analyze how risk aversion influences the savings and investment choices that people make. However, the authors do not discuss entrepreneurial activity, which plays a key role in the present paper. *Galor and Michalopoulos (2012)* study a model with endogenous risk attitudes where the distribution of risk aversion in an economy has a direct effect on its rate of technological progress. However, the evolution of risk attitudes in Galor and Michalopoulos' model is based on differential fertility, while in the present paper the fertility channel has been deliberately muted and instead the transmission of risk attitudes is cultural and based on conscious parental socialization choices.¹ Finally, the model proposed by *Doepke and Zilibotti (2014)* is also an endogenous growth model where risk attitudes evolve based on conscious socialization choices of agents. However, Doepke and Zilibotti consider a dynastic optimization problem in which children follow the same occupation as their parents.² Accordingly, in their model, the evolution of risk attitudes is driven by changes in the preference parameter of given social classes, rather than by a diffusion of certain preferences in the population as a whole, as in the present paper.

Furthermore, the present paper can be considered as part of the growing literature on culture and economics, which has documented how various cultural attributes may influence economic outcomes. This literature has, for example, shown that cultural factors can explain variation in income levels (*Algan and Cahuc, 2010; Gorodnichenko and Roland, 2010*), institutions (*Klasing, 2013; Tabellini, 2010*), as well as fertility and female labor force participation (*Alesina and Giuliano, 2010; Fernandez and Fogli, 2009*).³

In the context of this literature, the present paper contributes primarily to the literature on cultural transmission, which follows the seminal work of (*Bisin and Verdier, 2001*).⁴ This literature, though, has analyzed the dynamics of cultural factors and economic outcomes primarily in partial equilibrium models that do not take into account how cultural change may subsequently alter the economic environment agents face. In contrast, the present paper analyzes the general equilibrium effects of cultural transmission, which, apart from the present study, have only been considered in the recent work of *Doepke and Zilibotti (2014)* as well as *Klasing and Milionis (2014)*.⁵

The remaining paper is organized as follows. *Section 2* outlines the building blocks of the model. *Sections 3 and 4* discuss the model

¹ In reality, probably both evolutionary forces, driven by differential fertility, and forces of cultural transmission through social learning from parents and peers matter for the evolution of cultural factors. However, the two channels likely operate at different time scales, with the evolutionary channel being more relevant in the long run and the cultural one being more relevant over shorter periods of time. In this vein, the present study can be thought of as complementary to that of Galor and Michalopoulos.

² The cultural transmission mechanism employed by Doepke and Zilibotti was first introduced in *Doepke and Zilibotti (2008)*. There, the authors discuss the role of patience and work ethic in understanding the rise and fall of different social classes in pre-modern England.

³ See *Guiso et al. (2006)* and *Fernandez (2010)* for an overview of this literature.

⁴ Models of cultural transmission have been, for example, used to understand the dynamics of corruption (*Hauk and Saez-Marti, 2002*), religious intermarriages (*Bisin et al., 2004*), trust (*Bidner and Francois, 2011*) and the interaction between work ethic and unemployment insurance (*Michau, 2013*).

⁵ The focus of *Klasing and Milionis (2014)* is on the link between patience and human capital accumulation.

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