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Learning, as a wonder weapon of endogenous growth?

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MŰHELYTANULMÁNYOK

DISCUSSION PAPERS

MT-DP – 2017/27

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PÉTER MIHÁLYI

Discussion papers
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Institute of Economics, Centre for Economic and Regional Studies,
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Learning, as a wonder weapon of endogenous growth?

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Learning, as a wonder weapon of endogenous growth?

Péter Mihályi

Abstract

This extended book review of *Creating a Learning Society* by Joseph Stiglitz and Bruce Greenwald (2014) looks at the 700-page long scholarly work from a transition economy perspective. Using as a starting point Arrow's renowned concept of "learning by doing", the authors throw away the doctrines of free trade, liberalization of capital, as well as the liberalization of labour and currency markets (for short: the Washington consensus) by claiming that these policies impeded economy-wide learning. In the opinion of the present author, Stiglitz and his co-author are using the term "learning" in such a broad sense that it becomes almost meaningless as an explanatory factor in their endogenous growth concept thought out primarily for less developed (infant) economies.

Keywords: Infant industry, infant economy, learning, labour productivity, inertia, rivalry, Washington consensus

JEL numbers: E61, E71, F12, I26, I28

Lehet-e a tanulás egy endogén növekedési modell csodafegyvere?

Mihályi Péter

Összefoglaló

Ez a tanulmány tekinthető akár úgy is, mint egy speciális, a posztszocialista átmenet szemszögéből készült, hosszúra nyúlt könyvbírálat Joseph Stiglitz és Bruce Greenwald (SG) közel 700 oldalas könyvéről (*A tanuló társadalom megteremtése. A növekedés, a fejlődés és a társadalmi haladás kérdéseinek új megközelítése*. Angol és magyar nyelvű kiadás: 2014 és 2016). A két amerikai szerző, J. K. Arrow „termeléssel szerzett tudás” fogalmából kiindulva arra a következtetésre jutott, hogy a fejlődő, az élbolyhoz képesti lemaradás behozni kívánó országok számára a növekedés legfontosabb útja, módja és csatornája a tanulás, legfőbb akadálya pedig a szabad piacok fékező, bénító hatása. Elgondolásuk szerint a tanulás azért fontos, mert tovagyűrűző pozitív externáliákat generál. E tanulmány szerzőjének véleménye szerint SG olyan lazán és tágan használják a „tanulás” fogalmát, hogy az valójában túlságosan sok mindent, s így tulajdonképpen semmit sem jelent, amit modellszerűen értelmezni lehetne. Jelen tanulmány szerzőjének véleménye szerint a fejlődő országok sikereit nem a szabad piaci működés – konkrétan: a washingtoni konszenzus ajánlásai szerinti gazdaságpolitika – fékezi, hanem a prekapitalista társadalmak belső értékrendszere, illetve azok az intézmények, amelyek egy privilegizált hazai kisebbség érdekei szerint elnyomják a változásban érdekelt többséget.

Kulcsszavak: fejlődő iparágak, felzárkózó országok, tanulás, munkatermelékenység, tehetetlenség, versengés, washingtoni konszenzus

JEL-kódok: E61, E71, F12, I26, I28

I. INTRODUCTION

Personally, it makes me contented to see that thick theoretical books are now coming into fashion in economics once again. In the recent past, the first in the sequence was Daron Acemoglu and James A. Robinson's (2012) monograph - *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* – with 529 pages. Then came, with 703 pages, the blockbuster work of Piketty (2014). The joint work of Joseph E. Stiglitz and Bruce C. Greenwald (henceforth: S&G), the subject of the present paper, has a length of 660 pages. One can, of course, make ironical estimations about the percentage of buyers of these books who really read them from cover-to-cover, but the sheer size of these works open the possibility of a broad and deep discussion among those deeply committed specialists who did read this long book thoroughly. Social and economic issues are always multi-faceted. There is no such thing as a one-factor explanation. When complex and controversial issues, like inequality in the case of Piketty or the learning as *the* main driver of development in the case of S&G are analysed at this length, this opens the possibility of specialists to verify or to refute the authors' assertions from many angles (e.g. methodology, geographical validity, data reliability). Such a broad evaluation of new propositions is simply not feasible in the case of a journal article or a conference paper, where only one assertion or hypothesis is made ("One idea, one paper") and there is simply no place to discuss the earlier, rival theories except of those which were published in the same or similar journals during the last 3-4 years.

The book of S&G certainly meets these sophisticated requirements. Nearly all the 17 substantive chapters are enriched with appendices, in which they spell out the simply formulated take-home message of the given chapter by using a formal model. What is even more valuable (and rare), the last part of the book (Chapters 18-22 and the Afterword) the living giants of the economic profession, such as Phillippe Aghion, Robert Solow and Kenneth J. Arrow are expressing their opinion on the main tenets of the S&G hypothesis.

There is no doubt that S&G set for themselves an extraordinary ambitious task. In our reading, their aim was to come out with a landmark book and a persuading, unique policy doctrine at par with the *Communist Manifesto* (1844) of the young Marx and Engels, the *Non-communist Manifesto* of W.W. Rostow (1960), an economic history account of the modern world economy. As the full title of S&G's book indicates, the authors try to build a new conceptual model of growth, development and social progress.

Authoring a thick book like this comes with a trade-off. It takes a lot of time. As S&G explain the book's main idea was born at 2008 conference celebrating the work of K. J. Arrow in general and his "learning-by-doing" growth explanation in particular. Those were very different times from the present Trump-era for reasons we shall explain later. If the S&G book had been drafted today, it would have been a very different book in many ways.

II. THE STARTING POINT OF THE S&G HYPOTHESIS AND ITS CONSTRUCTION

The concept of "learning society" is known in the scholarly literature for almost 50 years.¹ Among the international organizations, it was first embraced by the OECD (2000), as a key to a nation's economic development. The idea was subsequently taken further by the UNESCO stating that that education should extend beyond formal learning (in schools, universities etc.) and continue until the end of life ("lifelong learning").

But this is not the point, where S&G starts the presentation of their hypothesis. They start their attempt to re-formulate the underlying mechanisms of economic development with the **rejection of the mainstream, neoclassical growth model**, the Cobb-Douglas production function, the famous $Y = A(K^\alpha L^{1-\alpha})$ equation, the Solow model and the Golden Rule of Edmund Phelps, because this family of models assume that technological change is an exogenous factor in the model. This criticism, as S&G readily acknowledges many times in the book, is not original. It is derived from Arrow (1962), where the concept of **learning by doing**, as *the endogenous driver* of labour productivity growth had been first introduced. In fact, the idea itself can be traced back to Adam Smith. It was the great Scottish philosopher who first realized that rise of labour productivity is primarily the consequence of the division of labour which in turn leads to "the increase of dexterity in every particular workman" as a by-product of rising volume of production. When a cobbler makes a boot, the hairdresser cuts a client's hair through practicing of his profession he himself becomes better and more productive all the time. This is all true, even if the cobbler or the hairdresser does not invent anything new, but simply applies and practices the knowhow invented and introduced by others. Thus rising productivity is achieved through practice, self-perfection and minor innovations without adding workers or investing significant amounts of capital.

According to S&G, information dissemination and absorption is much more important for social progress than information creation (p.490). And indeed, if we glance through the

¹ See e.g. Hutchins (1970), Schön (1973), Husén (1986) and Hughes – Tight (1995) among the English language works published before the millennium. More references can be found in Wikipedia (https://en.wikipedia.org/wiki/Learning_society), accessed on 30 August, 2017.

countries of the world, it is not difficult to observe that productivity differences within one country and/or within a single industry of the same country are quite considerable. Lewis (2004) empirical study based on the collective effort of the research staff of McKinsey Global Institute is full of such examples. At the end of the 1990s, labour productivity in the Japanese retail trade sector was not more than half of the comparable US figure, while the successful Japanese car manufacturing firms – like Toyota – surpassed in labour productivity their US competitors by a margin of 30 per cent. Labour productivity in housing construction varied even more.²

As a generalization of the learning-by doing theory, the S&G hypothesis is built on four new propositions:

- (i) growth has more to do with learning than with allocative efficiency;
- (ii) the presumption that all firms are efficient is false, the majority of firms are always operating below their efficiency frontiers, whether in the United States or elsewhere;
- (iii) this “knowledge gap” between the potential maximum and the actual average within a country or within a given industry is in itself a source of rent;
- (iv) if there are many knowledge gaps, countries can be trapped in a low-level equilibrium (low rate of productivity growth) even in the medium- or long-term.³

S&G return several times in the book to this fundamental criticism of the neoclassical mainstream. They underscore many times, quite correctly though in our opinion, that in the advanced economies, increasing return to scale prevail most of time (instead of the text-book assumption of constant return to scale), and therefore the neoclassical equilibrium concept loses its validity right from the outset.

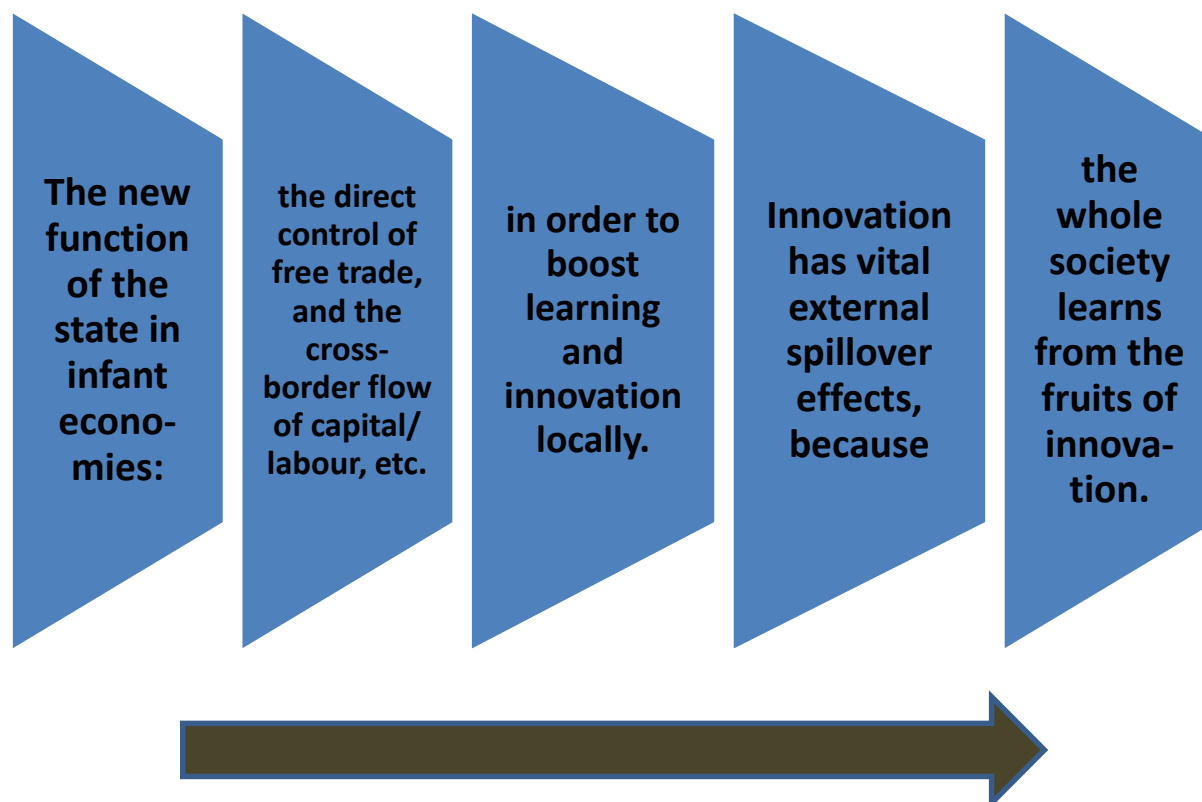
The thinking of S&G goes as follows (FIGURE 1).

² The book drew on extensive microeconomic studies of 13 countries over 12 years conducted by the Institute staff and invited world-class university professors, like Robert Solow himself. See also fn. 9.

³ For the first authentic formulation of the S&G hypothesis, see Greenwald – Stiglitz (2006).

FIGURE 1

The logic of the Stiglitz – Greenwald hypothesis



Source: Author's own presentation.

Why should the state assume “new” roles? According to S&G, the most important impediment of worldwide, lasting and equitable growth is that the globalized world economy has been continuously expanding the **gap between social and individual returns** everywhere. Knowledge is a public good and absent government intervention it is undersupplied by utility maximising firms and/or individuals.⁴ Unlimited free trade, the cross-border flow of capital and labour, the mechanism of freely floating exchange rates, the liberalization of financial markets⁵ and the harsh protection of intellectual property rights (essentially the entire list of the Washington consensus, Williamson, 1990, 2008) are *all* problematic, because in the less developed economies – i.e. practically in all countries, except

⁴ Although S&G fail to mention, there is nothing new in this proposition, either. Enhancing the Marshallian concept of externalities, Marshall's favourite disciple Arthur Pigou (1920) had stated exactly the same: „self-interest will not (...) tend to make the national dividend a maximum” (Part II, Chapter IX). In the original Arrow paper the same proposition is made, as well. The competitive solution is different from the societal optimum solution, because “learning means that an act of investment benefits future investors, but this benefit is not paid for by the market” (*op.cit.* p. 168).

⁵ Exposing their criticism over this issue, S&G are going quite far in the direction of populism, when they refer to „speculative businesses” and conclude that „in certain cases it is more efficient, if the state implements the allocation of capital investment itself” (*op.cit.* pp. 410-411).

the US – the overwhelming American productivity superiority prevents the local engineers, workers and business managers to learn and to innovate. Under such a regime to conduct research is bound to fail businesswise. But without continuous learning and innovation there is no opportunity to grow and develop. From the point of view of the developing countries – or using S&G’s terms: *infant industries* and *infant economies* – it is more promising to restrict competition and protect the entire home economy rather than entering into an open competition with the more advanced economies. This is the bottom line of the S&G hypothesis.

According to Stiglitz and Greenwald, infant economies have two good reasons to protect their own domestic markets and to support the national companies’ learning and research possibilities: (i) the countries and the domestic firms learn directly from the production process as the learning-by-doing theory suggests; (ii) the newly acquired knowledge always has significant, dynamic spill-over effects (or positive externalities). As an example of the spill-over effect S&G mention several examples, such as technological innovations in the manufacturing sector where a good idea of one firm can be applied later by other firms of another industry, or organizational innovations, such as the “just-in-time” stock management technique which can be applied across industries, once the necessary organizational skills and disciplines are learned by a relatively large pool of managers (p. 65).

In the real world, however, when we return to the previously mentioned example of the cobbler, the problem is that once it was found out how to produce good quality, inexpensive boots in the US, firms in other countries will never be able to compete with the industry-leader US cobbler. According to the S&G hypothesis, this is a major problem not because all other countries will find it more economic to import boots from the US, but because the infant economies will never learn how to make boots. Furthermore, once a boot factory in a developing country starts its operation despite the poor chances of success, there is a high likelihood that it will lose out in a free competition and goes bankrupt. Then the already acquired “new knowledge” will be wasted (p. 491) and the spill-over effects will cease to drive the other segments of the economy forward. According to S&G, their theory is valid historically as well. “the fact that some countries and firms have ‘learned how to learn’ helps explain why the last two centuries have seen such remarkable increases in standards of living, in comparison to the millennia that preceded them, which were marked by stagnation” (p. 373). In short: the secret of development is learning and learning to learn.⁶

⁶ The concept of “learning to learn” was originally developed in Stiglitz (1987).

III. CHALLENGING THE S&G HYPOTHESIS

This critique of the neoclassical growth model is not new. Many decades ago similar observation had been formulated by Nicholas Kaldor (1966) who in turn relied on Young (1928). In Kaldor's own words, Young's paper convinced him that "the main function of markets is to transmit impulses to economic change, and thereby *create* more resources through enlarging the scope for specialisation and the division of labour – rather than to secure an optimum allocation of a given quantum of resources" (Kaldor 1978, *italics* in the original), as the traditional school claimed in line with the Walrasian approach.⁷ In fact, as a student of Allyn Young, Kaldor had been entirely convinced from the 1930s onwards that increasing returns arising from, *inter alia*, the indivisibility of many types of physical capital was crucial only in the manufacturing sector. He believed that other sectors such as agriculture and the service sectors resembled more the textbooks' constant returns to scale model. Since then, however, the world has changed. The share of manufacturing in total output fell back in the advanced economies, while the possibilities to cut unit costs through the expansion of output became highly visible in other sectors of the economy. Therefore, without any reference to Kaldor's somewhat outdated assertion, in the S&G approach the terms like "industry" or "industrial policy" are used in a wider sense and meant to be applied not only in manufacturing as it was widely held in the first half of the 20th century, but in agriculture, in research and development and – most importantly –, in the service sector as well (pp. 22-23).

To whom the book's message is addressed? At this point, some of the readers of the present paper might start to protest and raise objections. First, they can object that it has been argued already for more than 200 years by scholars of the economic profession that free trade is not desirable for developing countries and new ("infant") industries. The most important example was the case of the United States of America. Alexander Hamilton, one of the founding fathers, who served his newly born country as Secretary of the Treasury between 1789 and 1795, became renowned as an opponent of free trade and as supporter of protectionism. It is also common knowledge that Hamilton's views influenced the German Friedrich List (1843) who became the main proponent of economic protectionism on the European continent a generation later. Second, speaking for protectionism and against free trade means something very different today than before President Trump appeared at the scene of international politics. Donald Trump as a presidential candidate and later as sworn-in president has been arguing for about two years that it is the US to which free trade is harmful, while the developing countries like China, Mexico or India free trade is unfairly

⁷ Mihalyi (2017).

advantageous. How come? How can be both statements – i.e. the S&G hypothesis and President Trump’s assertion – true simultaneously? Several prominent American trade specialists have already expressed their doubts about what President Trump asserts.⁸

The readers of the present paper might also pose a question by paraphrasing Hemingway’s famous novel, *For Whom the Bell Tolls*. What is the basis for S&G to classify China, Egypt or Hungary as infant economies? To whom the authors direct their policy recommendations? To the poorest countries of Africa, the 10 new Member States of the European Union, to Russia or China, to Greece or Italy, as the laggard countries in the EU? In the book, there is no answer to this critically important clarifying question. What is even more troublesome, the authors end the book by saying that industrial policies and government interventions in trade are desirable and they may even be a permanent part of economic policy in the most advanced countries and not just in the early part of the convergence period of an ambitious infant economy (p. 474).

There is another far-reaching point of ambiguity. If we look from close, the true content of dynamic externalities generated by the learning process, we run into logical contradictions. Still sticking to the already used cobble example, if a newly established boot factory goes bankrupt by facing too strong competition from abroad, there is still a possibility of preserving the fruits of learning. The engineers and the workers who lose their jobs might find similar employment opportunities in other firms, the freely acquired knowledge of the cobbler’s suppliers can also keep this knowledge.

Honestly speaking, the S&G hypothesis is not convincing at all and the solicited commentators of the volume (Aghion, Solow and Arrow himself) did not hide very much their own reservations, either. Stiglitz and Greenwald pretend as if they did not know

1. ... that the essence of the capitalist system is rivalry. There are always winners and losers in a competitive environment (Lavoine, 1985). Only in the world of Utopia can we think of countries displaying the same level of economic development and the closure of the knowledge gap.
2. ... that market competition is the strongest driver of innovation, even if there are well-known situations when limited competition is actually hampering innovation (e.g. the rise of monopolies).
3. ... the variation of productivity among firms operating on the same market is not caused by a failure in learning. This is the result of better management⁹, the power of the increasing

⁸ Nordhaus (2017), Dairuch et al. (2016).

⁹ This point was actually raised in the contribution of Robert Solow in Chapter 21. He directly referred to the empirical findings of Lewis (2004) in which he was one of the main research contributors. The key finding of the research was that the lower quality of management had not

return to scale and the natural monopoly situations arising from it. In other cases, better performance and higher productivity is simply a matter of luck. It doesn't make much sense to say that Facebook is successful because its managers "learned how to learn", while Nokia is less competitive because its business leaders were bad "pupils".

4. ... the 75 thousand employees who lose their jobs on every working day in the American economy are not bad "learners" either. They get fired because the structure of the economy is constantly changing. Certain industries created new jobs for decades (e.g. retail trade, publishing, etc.), but after some fundamental shifts in technology, the very same industries started to shed labour.¹⁰

5. ... that rent-seeking and corruption are more important snags in the developing countries than in the advanced ones. Therefore, centrally determined industrial policies carry with them an intrinsic risk. If governments assume the power to select the winners, the industries and firms which "merit" protection, the risk of state capturing might arise, and in this way industrial policies become the hotbed of corruption.¹¹

Several contradictions arise from the fact that two authors of the *Learning Society* are Americans; therefore the book was chiefly addressed to the American readership. Quite understandably, they tried to phrase their ideas in a way which is understandable and attractive for Americans. It is a widely held opinion that the American educational system is disgracefully feeble, therefore emphasising the importance of learning is a popular proposition for every segment of the American society. The upper middle class and the middle class are happy to read about this, because these elites are convinced that they merited their relatively privileged social position through successful education (Reeves, 2017). The lower level classes also like to read of the importance of education, because they expect from the government to spend more on the education of their children.

As we purported already, much of what S&G call learning is partly or entirely something else. There are at least five different meanings of "learning" in the book.

a. Often the term's true meaning in the given context is *adjustment* (p. 375). Firms always try to adjust to the changing market conditions. Sometimes successfully, other times unsuccessfully. Behind the failure the retrospective analysis usually identifies managerial mistakes, ill-judgement or slow reaction.

much to do with learning, knowledge or competence. The cross-country comparisons showed that it was caused „by the weakness of competitive pressure, and the most important obstacle to competitive pressure was formal or informal protection. Firms and industries exposed to competition from best practice were driven toward best practice” (*op.cit.* pp 501-502).

¹⁰ Krugman (2016).

¹¹ This argument, which is probably trivial for readers in the post-communist countries, was mentioned in the contribution of Phillippe Aghion (p. 496). Together with Ivan Szelényi, the present author came to similar conclusions in Mihalyi – Szelényi (2017).

b. Industrialization in the lagging, catching-up countries is usually based on *emulation*. Competitiveness at the level of firms – apart from the cutting-edge players – must mean the adoption of the best existing technologies. This was the quintessence of the successful industrialization of the Soviet Union in the middle of the 20th century and later in Japan and South Korea.

c. Few growth specialists or economic historians would question the importance of acquiring *basic cognitive skills*, like reading, writing, arithmetic, etc. There is a huge literature asserting that economic development is correlated with formal education (schooling), especially with the advancement of primary education.

d. Since Max Weber's analysis of the Protestant values, there has been a broad agreement that *non-cognitive* (cultural or soft) *skills* are also indispensable for growth. Sometimes these skills are part and parcel of the local, traditional culture (e.g. Protestant ethic, Confucianism), in other cases these skills need to be "imported" and disseminated by the educational system, religious organizations, the media, etc. The dissemination of English as a foreign language and the Anglo-Saxon cultural values are good recent example in Eastern Europe. The modernization of Russia under Peter the Great (1682-1696) and Japan during the Meiji period (1868-1912) worked with similar policy tools. Such implantations are almost impossible to carry out effectively without some kind of government commitment, although today much of it happens through the unstoppable use of the internet and mobile phone applications, even if the incumbent governments don't like it or try to stop it.

It is difficult to understand for the non-American readers of the book, why the authors didn't even try to tackle the question of American technological supremacy head on. Admittedly, the US has been the most advanced and most productive economy for about century, and its advantage has only increased since the onset of the international financial crisis of 2008 *vis-à-vis* Western Europe. But how can be the US economy so effective in spite of its allegedly poor quality of its educational system? The answer is straightforward. In the American value system, the capacity to trade has never played such an important role as in other times or other places, like in the ancient Athens, the northern states of Europe in the Middle Ages (the so-called Hanseatic cities) or in the Middle East. Perhaps this is the explanation of the fact that the "skills to trade" are not mentioned at all in this book. But America as a whole, a country of immigrants does have an infinite wealth of trading skills incorporated in Asian and Latin American immigrants' businesses. The ten millions working in the trade and service sector don't need to learn in school how to trade. They bring this knowledge from home.

It is equally inconceivable how come that the two authors did not take into consideration that the asymmetric limitation of free trade and or the administrative manipulation of the

exchange rate are not real options for the infant economies. They don't have enough power. It is very difficult to speak openly like this: "We would like to export freely, but we restrict the imports. We keep the value of our currency low, but you should allow your currency to freely fluctuate." Using double standards can be one element in the tool box of a powerful country. As many examples of the 20th century showed, the US could make pressure on other countries to open their market for US goods, while the US markets remained closed for the partner country. But this is not a viable strategy for converging countries, except for the very large ones like China or India.¹²

While the authors correctly pointed out more than one times in the book that certain conservative societies are purposely built on the strategy of no-change (p. 96). But they fail to draw the conclusion from this, namely that in such cases what is missing is not "learning" or "the capacity to learn", but those specific values which are required to catch-up with the more advanced countries. In more difficult cases, the majority of people in such conservative countries are honestly and deeply convinced that it is in their country's interest to defend the "old" values.

Finally, an author from a post-socialist economy can only regret that S&G do not even mention the bitter experiences of the large and small former socialist countries, such as the Soviet Union or Hungary, and the military dictatorships in Latin America which in many ways were similar to the planned economies. Dozens of such countries pursued protectionist policies for decades in the 20th century. But their overall growth performance was dismal. These countries failed to catch-up with their international competitors, as long as they pursued such policies.

At the personal level this is understandable. Professor Stiglitz and Greenwald do not have personal experience with such regimes, they don't have the gut feelings how centralized, autocratic regimes function. But the academic literature provides ample of evidences. Outside of the United States there are very few good examples proving that state-initiated trade restriction and state-sponsored industrial research – which is an important part of the "learning society" model - lead to expected results, to sustainable increase of competitiveness. Perhaps, the case of Japan and South Korea can be cited as suitable examples. If, in the case

¹² Robert Solow pointed out this contradiction, and – in an extremely polite way - made a devastating counter- argument. It is true that for an infant economy it is of vital importance to direct its products toward export markets in order to exploit the advantages arising from scale economies. Exporting is also very important to maintain and improve the quality of its products and services under the pressure of the high requirements of the foreign buyers. At the same time, however, it follows from the S&G hypothesis that the infant country should protect its own domestic markets from foreign competitors. One can imagine tolerance for the protection of an infant industry here and another there; but an overarching protection for an *entire* infant economy would be a harder sell (*op. cit.* p.501).

of China, state-supported industrial research brings significant returns to the country, which is quite unlikely, this is probably due to huge size of its economy.¹³

IV. A BETTER THEORY OF “LEARNING BY DOING”

Even among Hungarian economists of the young generation, there are only few who read and remember the works of Ferenc Jánosy (1914-1997), a Hungarian economist of great originality.¹⁴ This is a pity, because much of the quintessence of the S&G book sounds very similar to Jánosy’s thoughts developed during the 1960s. In our opinion Jánosy put forward a more convincing endogenous growth theory than the S&G concept.

First of all, he interpreted learning as a **qualitative change** rather than a quantitative process: “man’s individual knowledge today is not necessarily greater than yesterday’s, but mainly of a different kind” (Jánosy, 1971. p. 205). This is very much different from Arrow’s starting point (“knowledge is growing in time”¹⁵) which has been taken over uncritically by S&G. If learning means a qualitative change, there is no such thing as a “knowledge gap” that separates infant economies from the more developed countries (as S&G claimed on p. 481). Every child who grew up on the enchanting Indian stories of James F. Cooper or Karl May knows that the life of Native Americans required all sorts of knowledge (horse-riding, hunting, making fire, shooting of arrows, etc.) which were necessary to survive in that environment. Their knowledge, of course, was immeasurably different from the knowledge of modern American farmers growing wheat in the State of Iowa, or a banker working on Wall Street.

The concept of “learning by doing” had been identified by Jánosy independently from Arrow, and perhaps his own metaphor (*learning from the machine*) was more illuminating than that of Arrow. As Jánosy wrote “cutting can only be learned at a lathe, crushing at a milling machine, and driving at the wheel of the car. (...) This transfer of knowledge through the means of production is of particular interest (...) because this is precisely what causes the misleading impression that perfection of machinery is the primary factor of economic development” (op. cit. p. 209). Due to this important link, there is no real substitution

¹³ According to latest available data, China’s R&D in 2013 was equal to the money United States spent in 2005 (Veuglers, 2017).

¹⁴ Ferenc Jánosy grew up in Germany, worked and studied engineering in the Soviet Union between 1933-46, before he returned to his native Hungary. German was his first language therefore everything he wrote in German was subsequently translated into Hungarian. His most important book, *The End of the Economic Miracle. Appearance and Reality in Economic Development*, was simultaneously published in German and Hungarian in 1966. The English translation, used in the present paper, came out in 1971.

¹⁵ See Arrow’s clear statement in the first paragraph of his 1962 paper (op.cit. p. 155).

between capital (C) and labour (L). Both of them are needed – simultaneously at a given point of historical time and in more or less fixed proportions.¹⁶

In several of his writings, Jánosy discussed the ways and means how these fixed proportions were often purposely distorted by government policies. One important example is, when state-controlled industrialization leads to loss making investments and then the government tries to impose limits on other market participants to protect the newly created factories. This may make sense, concludes Jánosy similarly to S&G, if and when the loss-making investment helps significantly the formation of the working force in the enterprise concerned. The example of the Soviet industrialization drive in the 1930s proves that such policies are sustainable for quite a time. But there are two uncomfortable by-products of policies based on the presumption that allocative efficiency doesn't count. Firstly, to maintain such a system, the state needs a large and brutal state apparatus, because these loss-making investments are financed at the detriment of consumption. With the benefit of hindsight, it is very likely that the development of Russia would have been faster than it was, if the market system had maintained all along the 70 years of socialist planning. Secondly, the forced investment drive – at least in Soviet or Chinese cases - led to a slow growth of consumption, which in turn slowed down the “learning” of the labour force. Widespread knowledge of driving supposes private ownership of passenger cars, clean working hands, the existence of bathrooms at home, the general knowledge of foreign languages cannot be imagined without mass tourism, etc .

Jánosy, who spent many years in the Hungarian Planning Office, warned his contemporary socialist planners not to try to accelerate economic growth through radically increased research and development (R&D) expenditures, either. Although it is not easy to comprehend at first hearing, innovation, the output of research does not generate welfare directly. Innovation is merely a “recipe” which shows how the structure of production needs to be modified in order to increase the productivity of labour (*op. cit.* p. 117). Whether the conditions of implementing the necessary restructuring of production are present or not in a given country and a given industry, that depends on the quality of the labour force at large, and not of the quality of the researchers. It doesn't help if the R&D activity runs much ahead of the quality of the labour force. If this happens, it leads to massive societal waste, only.

As it was shown above, the broader meaning of learning in the S&G concept included emulation, the copying of technologies of the more advanced countries. There is nothing wrong with this. Although in theory, the possibility of a revolutionary innovation being born in an infant economy cannot be excluded, nevertheless the experience of the past two

¹⁶ This is very different from Arrow's original approach, where the cumulative production of capital goods is used as a proxy for workers' experience – i.e. for learning.

centuries showed that *all* pioneering innovations came from the most advanced countries like Britain, Germany and the US. In his most recent book, János Kornai (2014) compiled a list of 111 innovations of great significance and proved that indeed only the most advanced countries are capable to convert inventions to innovation and organize the large-scale manufacturing of the new product in a commercially viable way (*op. cit.* pp. 5-18). There are few exceptions to this rule. The inventor of the ball pen lived in Argentina, Nescafe is a Swiss product, the software behind Skype was developed in Estonia, but none of these innovations had a major macroeconomic impact on the countries where these exceptional technological attainments were achieved.

Before anybody falls in love with the “Learning Society” hypothesis, it is worth recalling the warning of Jánosy (1969) who introduced the concept of “**quasi-development**”. This is directly linked to emulation or copying. As he argued 50 years ago, when a country tries to accelerate economic growth in general and the development of manufacturing industry with protectionist trade policies and the artificial manipulation of the exchange rate etc., there is a danger that the emulation will be successful only in statistical sense. The volume of production will increase, but the quality of goods coming off from the conveyor belts of the newly created factories will be hopelessly inferior to the products of the advanced market economies. Many socialist countries have gone through this bitter experience. Perhaps the most telling illustration to this scheme is the fate of the Soviet Lada passenger cars produced during the 1970s and 1980s, originally copied after a 1966 model of the Italian car manufacturer, FIAT. Millions of such cars were manufactured, but they were outmoded from Day One onwards, and the factory made financial losses on the Western exports of these cars.

It follows from Jánosy’s development concept that economic growth cannot be accelerated by the forced expansion of schooling, either. Let us illustrate his point with the help of the latest statistical data.¹⁷ The Polish – German comparison is telling. According to standardised OECD data, the share of persons in the labour force with a tertiary education degree is exactly the same in both countries (28%), while the difference in productivity¹⁸ is more than 2.1 times higher in Germany. We can take another, even more shocking example. In the 25-64 age group, 54% of the Russian workers had some kind of tertiary education, which is much higher than the corresponding American, Japanese or Israeli figures (all between 45-50%), let alone the comparable Danish figure (37%). In terms of productivity, however, the American level is 2.5 times higher than in Russia. Similar differences can be

¹⁷ Jánosy’s assertion born in the 1960s (that the dynamics of schooling does not help to explain the known facts about the rise of productivity across countries), has been later confirmed by many econometric studies. See e.g. Pritchett (2006).

¹⁸ Measured as output per hour worked in international US dollars (converted to 2016 price level with updated 2011 PPPs).

identified when the least educated population is compared. The share of Hungarians in the labour force with no more than 8 years spent in school is just 1%, while in Portugal this indicator stands at 32%. On the basis of this strikingly large difference, one would assume that the Hungarian economy must display higher productivity levels. But the contrary is the case: output per hours worked is 10% higher in Portugal than in Hungary.¹⁹

As another Hungarian economist – Polonyi (2010) – already noted this “over-education” is not a unique Hungarian phenomenon. It holds for all the post-socialist countries that the population’s educational level is higher than in market economy countries with similar level of economic development. Quite clearly, this over-education drive was – to a very great extent – driven by the absence of tuition-fees during the decades of socialism. As Holló (1974) and Jánosy (1975) who worked together showed, the extensive growth strategy in general and in the educational sector in particular leads to quasi-development and over-education, or simply waste – if we allow for ourselves to use such a brutal term.

Resistance to change/learning. At this point it is worthwhile to return to one of the shortcomings of the S&G hypothesis already mentioned above, namely that it does not pay sufficient attention to the natural inertia of societies and the conscious resistance to change. By using such a value-loaded, entirely positive term like “learning”, Stiglitz and Greenwald create a misleading sentiment in their readers: catching-up is easy. Jánosy, however, showed with a very simple argumentation that economic progress is not easy at all, because people for good reasons from their own perspective resist. “For if no great resistance would stand in the way of diffusion of new achievements and of greater labour productivity, there would be no people left who carry drinking water home in earthen vessels on their heads from the well, no nomad tents, and even no steam locomotives, the last specimens of which would already stand in museums next to waterwheels and hand looms” (*op. cit.* p.135). Very often religious norms are the main obstacle, like the Islam sharia-law according to which girls should not be allowed to go to school.²⁰ The traditional forms of Hinduism have similar negative impact on women’s education and employment.

¹⁹ The source of education and productivity data are https://stats.oecd.org/Index.aspx?DataSetCode=EAG_NEAC (downloaded on 30 August, 2017) and The Conference Board (2017), respectively. All data refer to 2015.

²⁰ A 2017 Pew Research Center survey in 39 countries asked Muslims whether they want sharia law, a legal code based on the Quran and other Islamic scripture, to be the official law of the land in their country. Responses on this question varied widely. Nearly all Muslims in Afghanistan (99%) and most in Iraq (91%) and Pakistan (84%) support sharia law as official law. But in other countries, especially in Eastern Europe and Central Asia – including Turkey (12%), Kazakhstan (10%) and Azerbaijan (8%) – relatively few favour the implementation of sharia law. The variation in Africa is also large: 86% in Niger, but only 37 in Tanzania. <http://www.pewresearch.org/fact-tank/2017/08/09/muslims-and-islam-key-findings-in-the-u-s-and-around-the-world/>, downloaded on 1 September 2017.

In other cases, as the authors of the third thick book, Acemoglu and Robinson convincingly demonstrated, the resistance comes from a small group of people or a minority group within the country controlling all political institutions and excluding others from decision-making, ownership rights, fair competition, etc.

Without any oversimplification, we can assert that the speed of economic development is determined by two countervailing forces: inertia on the one hand, and the ambition to emulate the more advanced countries on the other. The needs of consumers are to a large extent biologically determined. Everybody needs food, clothing medicine or communication. If and when this is possible, people would like to consume more from all this. The international price competition (or globalization) continuously modifies these needs within certain biological limits; therefore new forms of consumption appear all the time (e.g. cell phone, discount airlines). As long as the use of mobile telephones was expensive, they were unreachable for the masses of the developing countries. When prices started to fall, the very same consumers displayed massive demand for this type of service. It is also true, of course, that the emulation of consumer needs are to a certain extent the product of conscious marketing and the unpredictable shifts of fashion. The new trends emerging in the advanced countries exert influence on the less developed ones. This nature of the emulation effect can be more easily detected on certain markets like music, films or sports.

Convergence is difficult, because the pioneers learn, too. With the introduction of the “knowledge gap” concept, which is inherently static, the S&G hypothesis creates a deceitful image about the future chances of infant economies to catch-up with the most advanced countries. It is enough that well-meaning policy makers support learning and the spread of innovation in all possible ways. By contrast, Jánosy had a very simple illustration which shows that – beyond the problem of resistance, analysed already above – the horrendous difficulty to catch-up with the most advanced countries lies in the fact that the most productive economies can continue to improve their performance all the time, and there is no intrinsic impediment blocking them to keep on innovating.

In the Anglo-Saxon world, this phenomenon is known as the Red Queen Paradox, which is an often used metaphor in everyday life, in economics, in the theory of arms race, in evolutionary biology etc. The Red Queen is a fictional character in Lewis Carroll's fantasy novella, *Through the Looking-Glass*. Talking to the real-world hero of the book, Alice, the Red Queen described her empire as a system, in which "It takes all the running you can do, to keep in the same place." In narrow, economic terms this is the description of competition: if your competitors are moving ahead, you have to move faster, not to lose ground. In broader evolutionary terms (Valen 1973), the message is: "For an evolutionary system, continuing

development is needed just in order to maintain its fitness relative to the systems it is co-evolving with."

The following model directly taken over from Jánosy's book (*op. cit.* pp.128-131) illustrates the connection between the diffusion of innovations and the rise of productivity in time and space. Let us assume that six shipwrecked sailors – A, B, C, D, E and F – go ashore on a Monday and start to catch turtles as the only source of food on an uninhabited island. After one day of hard work, each of them returns with 10 turtles. Then sailor A racks his brain overnight and comes up with a trick, a kind of a turtle trap, with which he succeeds in doubling his catch on Tuesday. He catches 20 turtles instead of 10, while the other five sailors achieve only the yield of the previous day. Thereafter, the innovation begins to spread. On Wednesday the trap is already used by sailor B, and on Thursday by sailors A, B and C as well. On Friday, A succeeds in perfecting his method further, and thus catches 30 turtles, while B, C and D – still using Tuesday's innovation – continue to get 20 each, while E and F, still using their hands only – catch 10 each. The improved method find acceptance, too and is adopted by B on Saturday, while all the others remain content with Tuesday's innovation, except for the most backward among them, F, who still hunts turtles without any tool. The table below shows the yield of the six sailors for each sailor and each day.

TABLE 1

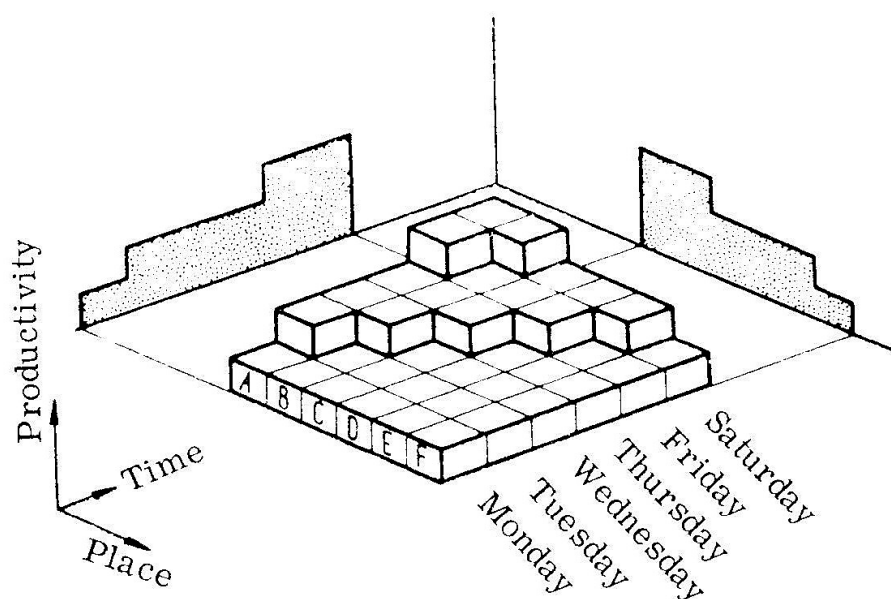
The spread of innovation among according to Jánosy's theory

Sailor	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
A	10	20	20	20	30	30
B	10	10	20	20	20	30
C	10	10	10	20	20	20
D	10	10	10	10	20	20
E	10	10	10	10	10	20
F	10	10	10	10	10	10

Source: Jánosy (1971) p. 129.

In order to make the course of the first and the second innovation – increasing the daily catch from 10 to 20 and then from 20 to 30 – the data in the table are presented in graphic form (FIGURE 2), too. The figure is a representation, in a general sense, of productivity as a function of time and place.

Transmission of the best practice, as an illustration of the diffusion process in general



Source: Jánosy (1971) p. 129.

The three dimensional figure has the advantage of showing both the increase of productivity in the course of time (e.g. threefold for sailor A from Monday to Saturday) and the growing variation of productivity for each day of the week (non-existent on Monday, quite significant on Saturday). These two cross sections of time and sailors are shown as projected silhouettes. The third projection, an aerial view shows the diffusion process itself – i.e. how fast the steps of productivity created by the inventions of sailor A were diffused. The measure of diffusion at a given time is the number of sailors (workers, as we shall call them later) who have already adopted the innovation. In this example the speed of diffusion is one worker per day. Let us now leap from the six sailors to the entire population of the globe, and from the “developments” of one week to developments of several centuries; but we stay in the one-product (turtles-only) world. Let each sailor correspond to a country, his labour productivity to the average productivity in that country, and the week on the uninhabited island to world economic history over the past 200 years. The increase in productivity of one country forms a cross section through time – this is the per capita growth of national income (or GDP). On

the left hand side of Figure 1, the projected silhouette corresponds to the GDP growth of country A, while on the right-hand side we see (without projection) that in country F there was no GDP growth at all through the past 200 years. The other projected silhouette shows the productivity of the six sailors on Saturday, or (in the generalized mode) all countries of the world in order of their stage of development after the transmission of the innovations. Country A is the most developed and country F is the least advanced one. If we extend our time horizon, we can easily get the same result: only country A innovates and the rest grow as fast as they can emulate the leading edge technology.

V. AT PRESENT TRADE PROTECTIONISM IS NOT LIKELY TO BE EMBRACED

Piketty's voluminous book was a totally unexpected and unparalleled commercial success. As of end-2015, more than 2.1 million copies were sold (Goldhammer, 2017 p. 18.). For many reasons the book Stiglitz and Greenwood is unlikely to get close to this achievement. Among the reasons, I presume, the protectionist trade rhetoric of President Trump is by far the most important. Any idea, which so closely remembers to Trump's ideology, is bound to be rejected by the academic circles in the United States and the prestigious European university departments, as well. It is widely known that there was a historical precedent, when a protectionist legislation had been enacted by the US Congress and signed to law by a president, but the consensus view today is that the so-called Smoot-Hawley Tariff Act of 1930 was – even according to Arrow – “a very destructive policy” (p. 508).

The full, official title of the Act was already expressive: “An Act to provide revenue, to regulate commerce with foreign countries, to encourage the industries of the United States, to protect American labour, and for other purposes.” When it was still debated in Congress, a petition was signed by 1,028 economists in the US asking President Hoover to veto the legislation. The legendary automobile executive Henry Ford spent an evening at the White House trying to convince Hoover to veto the bill, calling it “an economic stupidity.” J. P. Morgan's chief executive Thomas W. Lamont said he “almost went down on [his] knees to beg Herbert Hoover to veto the asinine Hawley-Smoot tariff.” Initially, Hoover himself opposed the bill and called it “vicious, extortionate, and obnoxious”, but eventually he yielded to influence from his own party and signed the bill. The new tariff imposed an effective tax rate of 60% on more than 3,200 products and materials imported into the United States, quadrupling previous tariff rates on individual items, and thus raised the average tariff rate to 19.2%. As it was feared, Canada and other countries raised their own tariffs in retaliation after the bill had become law. Unemployment was at 8% in 1930 when the Smoot–Hawley

tariff was passed, but the new law failed to lower it. The rate jumped to 16% in 1931, and 25% in 1932–33.²¹

Against the backdrop of such a history and the noisy trade protectionism of President Trump during the first year of his presidency, everything that had been proposed by Stiglitz and Greenwald in 2014 sounds totally differently today. While the book's main idea that learning can be a wonder weapon in the hand of enlightened, good-willing policy makers will continue to attract many supporters, the present academic environment will remain unsupportive to the policy proposals emanating from S&G's interpretation of the "learning by doing" metaphor. As long as President Trump is advocating trade restrictions, S&G's suggestions pointing into the same direction will be hardly heard.

VI. CONCLUSION

This extended book review of *Creating a Learning Society* by Joseph Stiglitz and Bruce Greenwald (2014) made an attempt to show that the term "learning" in used in the book in such a broad sense that it became almost meaningless as the main driver of economic convergence. The second major shortcoming of S&G is that they left in obscurity to whom their policy advices are addressed: to the very poor, infant economies, the unsuccessful countries or to every country which aspires to catch up with the world's leading economy, the United States. By using such a value-loaded, entirely positive term like "learning", Stiglitz and Greenwald have created a misleading sentiment in their readers: catching-up is easy. The present paper, relying on the growth theory of a hardly known Hungarian economist, Ferenc Jánosy shows that convergence is not easy at all, because people for good reasons from their own perspective resist to changes. Furthermore, catching up is always difficult, because if your competitors are moving ahead, you have to move faster, just for not to lose ground.

²¹ The cited facts and figures are from Wikipedia (https://en.wikipedia.org/wiki/Smoot%E2%80%93Hawley_Tariff_Act), downloaded on 30 August, 2017.

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