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## Rogoff: Technology and Inequality – parallels in chess

21.07.2011 – When a leading economic thinker happens to also be a strong chess grandmaster, his explanations of financial matters tend to draw allegories from the game he loves. Prof. Kenneth Rogoff periodically sets out his views in TV interviews and newspaper columns. Here is one from Project Syndicate that has appeared in many news sites. A while ago Ken sent warm birthday greetings to ChessBase.

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## Technology and Inequality

By Kenneth Rogoff

CAMBRIDGE – Until now, the relentless march of technology and globalization has played out hugely in favor of high-skilled labor, helping to fuel record-high levels of income and wealth inequality around the world. Will the endgame be renewed class warfare, with populist governments coming to power, stretching the limits of income redistribution, and asserting greater state control over economic life?

There is no doubt that income inequality is the single biggest threat to social stability around the world, whether it is in the United States, the European periphery, or China. Yet it is easy to forget that market forces, if allowed to play out, might eventually exert a stabilizing role. Simply put, the greater the premium for highly skilled workers, the greater the incentive to find ways to economize on employing their talents.



*World class economist and chess grandmaster: Kenneth Rogoff in discussion with George Osborne, Chancellor of the Exchequer (Finance Minister) of the United Kingdom, right, and Vishy Anand, World Chess Champion, left, at the London Chess Classic last December.*

The world of chess, with which I am closely familiar, starkly illustrates the way in which innovation in the coming decades may have a very different effect on relative wages than it did over the past three decades.

During the late eighteenth and early nineteenth centuries, a brilliantly inventive chess-playing “automaton” toured the world’s capitals. “The Turk” won games against the likes of Napoleon and Benjamin Franklin, while challenging many great minds to penetrate its secrets. Concealing a human player in a shifting compartment amid a maze of impressive-looking gadgetry, it took decades for outsiders to correctly guess how the Turk really worked.

Today, the scam has been turned on its head: chess-playing machines pretend to be chess-playing humans. Desktop-based chess programs have considerably surpassed the best human players over the past decade, and cheating has become a growing scourge. The French chess federation recently suspended three of its top players for conspiring to obtain computer assistance. (Interestingly, one of the main ways to uncover cheating is by using a computer program to detect whether a player’s moves consistently resemble the favored choices of various top computer programs.)



*Ken Rogoff chatting with John Nunn (middle) and Ken Thompson (right)*

Of course, there are many other examples of activities that were once thought exclusively the domain of intuitive humans, but that computers have come to dominate. Many teachers and schools now use computer programs to scan essays for plagiarism, an ancient transgression made all too easy by the Internet. Indeed, computer-grading of essays is a surging science, with some studies showing that computer evaluations are fairer, more consistent, and more informative than those of an average teacher, if not necessarily of an outstanding one.

Expert computer systems are also gaining traction in medicine, law, finance, and even entertainment. Given these developments, there is every reason to believe that technological innovation will lead ultimately to commoditization of many skills that now seem very precious and unique.



*Ken Rogoff interviewing Vishy Anand under the direction of his wife, TV producer Natasha*

My Harvard colleague Kenneth Froot and I once studied the relative price movements of a number of goods over a 700-year period. To our surprise, we found that the relative prices of grains, metals, and many other basic goods tended to revert to a central mean tendency over sufficiently long periods. We conjectured that even though random discoveries, weather events, and technologies might dramatically shift relative values for certain periods, the resulting price differentials would create incentives for innovators to concentrate more attention on goods whose prices had risen dramatically.

Of course, people are not goods, but the same principles apply. As skilled labor becomes increasingly expensive relative to unskilled labor, firms and businesses have a greater incentive to find ways to “cheat” by using substitutes for high-price inputs. The shift might take many decades, but it also might come much faster as artificial intelligence fuels the next wave of innovation.

Perhaps skilled workers will try to band together to get governments to pass laws and regulations making it more difficult for firms to make their jobs obsolete. But if the global trading system remains open to competition, skilled workers’ ability to forestall labor-saving technology indefinitely should prove little more successful than such attempts by unskilled workers in the past.





*Ken 'n Ken: Rogoff and Thompson at Google Headquarters in Mountain View, CA*

The next generation of technological advances could also promote greater income equality by leveling the playing field in education. Currently, educational resources – particularly tertiary educational resources (university) – in many poorer countries are severely limited relative to wealthy countries, and, so far, the Internet and computers have exacerbated the differences.

But it does not have to be that way. Surely, higher education will eventually be hit by the same kind of sweeping wave of technology that has flattened the automobile and media industries, among others. If the commoditization of education eventually extends to at least lower-level college courses, the impact on income inequality could be profound.

Many commentators seem to believe that the growing gap between rich and poor is an inevitable byproduct of increasing globalization and technology. In their view, governments will need to intervene radically in markets to restore social balance.

I disagree. Yes, we need genuinely progressive tax systems, respect for workers' rights, and generous aid policies on the part of rich countries. But the past is not necessarily prologue: given the remarkable flexibility of market forces, it would be foolish, if not dangerous, to infer rising inequality in relative incomes in the coming decades by extrapolating from recent trends.

*Kenneth Rogoff, an international chess grandmaster, is Professor of Economics and Public Policy at Harvard University, and was formerly chief economist at the IMF. The above article was reproduced with the kind permission of [Project Syndicate](#), a pre-eminent source of original op-ed commentaries. Project Syndicate provides incisive perspectives on our changing world by those who are shaping its politics, economics, science, and culture. Membership included 466 leading newspapers in 151 countries, and the articles are typically carried in fifty or sixty countries in 12-15 languages. It is definitely worthwhile putting it on your favourites list.*

## **Links**

- [For a podcast of this article](#)
- [Read more from Kenneth Rogoff at Project Syndicate](#)
- BBC: ['Default best for Greece' says leading US economist](#) (podcast and transcript)
- [Ken Rogoff on Nightly Business Report](#) (video, start at 3 min 50 sec)

## A Birthday Greeting from Ken Rogoff

[http://www.youtube.com/watch?v=cA8RpqMXGx0&feature=player\\_embedded](http://www.youtube.com/watch?v=cA8RpqMXGx0&feature=player_embedded)

Greetings, ChessBase, from Cambridge, Massachusetts. This is Ken Rogoff at Harvard University. I'm afraid I stopped playing chess before you were born! I played in the Interzonal in Biel in 1976, and didn't play much after that. I can only imagine the incredible things you have done – the database, beyond anything I could ever have conceived of; Fritz, the engine which is so strong. And then this wonderful web page that you produce that I admit to be slightly too addicted to – it is hard to do creative economics, as I try to do, being a researcher. Fortunately I have my children to see when I am paying too much attention to your web page and not enough to what I should be doing. It is remarkable what you've been able to do – the energy, the creativity, intensity, and I think this is a great moment to celebrate after twenty-five years. I feel privileged to be here: Happy Birthday and good luck for the next twenty-five years. Thank you.

## See also



### ChessBase is 25 – everything 25% off in our shop

19.05.2011 – It is difficult to determine the exact date when ChessBase was born. Was it when a science journalist and a future World Champion discussed computer databases? Or when a very talented programmer started to actually write one? We think it was when the two showed the prototype to the World Champion and decided, at his urging, to commercialise the product. [That was May 19, 1986.](#)



### Greetings from Pál Benkő for 25 years of ChessBase

20.05.2011 – "Congratulations to ChessBase on your [25th anniversary!](#) Your news page is the the first thing I look at every day when I go on the Internet. You do such wonderful work. Keep up your great service for the whole chess world." Heartening words from legendary great chess player, theorist, author and problem composer – who in addition sent six [anniversary puzzles for our readers.](#)



### ChessBase is 25: Birthday greetings from Anand

01.06.2011 – Our company was born on May 19, 1986, twenty-five years ago, and on May 19, 2011 one of our most loyal friends, World Champion Viswanathan Anand, logged into the Playchess server and sent us a ten-minute birthday greeting. It was quite moving to be reminded of the early days by one who was present at the time – and who has remained a close friend ever since. [Must-watch historical video.](#)



### Kasparov on 25 Years of ChessBase

08.06.2011 – He was there at the start – actually before that, when a chess database was just an idea in the minds of a few enthusiasts. And when he saw the first prototype Garry Kasparov immediately pushed for its completion. For the 25th anniversary of ChessBase he sent us a very moving statement, recorded in his study in Moscow, describing the birth of what he calls [the ChessBase generation.](#)

