Introduction

Prof. Grzegorz W. Kołodko: It is our great privilege to host here with us Professor Edward Prescott, a great economist and a great man. This lecture at the Kozminski University will be the 21st of our series of distinguished lectures and this is the 5th presentation by a Nobel Prize winner in economics. Professor Prescott has come to us from the United States of America, where for a number for years he holds the position of advisor for the Federal Reserve Bank of Minneapolis in Minnesota, and at the same time he is a Professor of Economics at the WP Carey School of Business, Arizona State University. He was also a professor of economics at the Carnegie Mellon University, as well as the University of Chicago, the Northwestern University, and others. Professor Prescott received the Nobel Memorial Prize in Economics in 2004, sharing the award with Finn E. Kydland, "for their contributions to dynamic macroeconomics: the time consistency of economic policy and the driving forces behind business cycles". The Nobel lecture of Professor Prescott is available on the website of the Kozminski University. The lecture is entitled: *The Transformation of Macroeconomic Policy and Research* ("Journal of Political Economy" 114, 203–235, 2006).

In 1962, he received his bachelor's degree in Mathematics from Swarthmore College, where he was a member of the Delta

Upsilon fraternity. He then received a master's degree in Operations Research from Case Western Reserve University in 1963 and a Ph.D. in Economics at Carnegie Mellon University in 1967.

Today Professor Prescott will deliver a lecture on: *The Depressed US Economy and its Consequences for the Polish Economy*. After the lecture there will be a chance to ask him questions and discuss issues with Professor Edward Prescott.

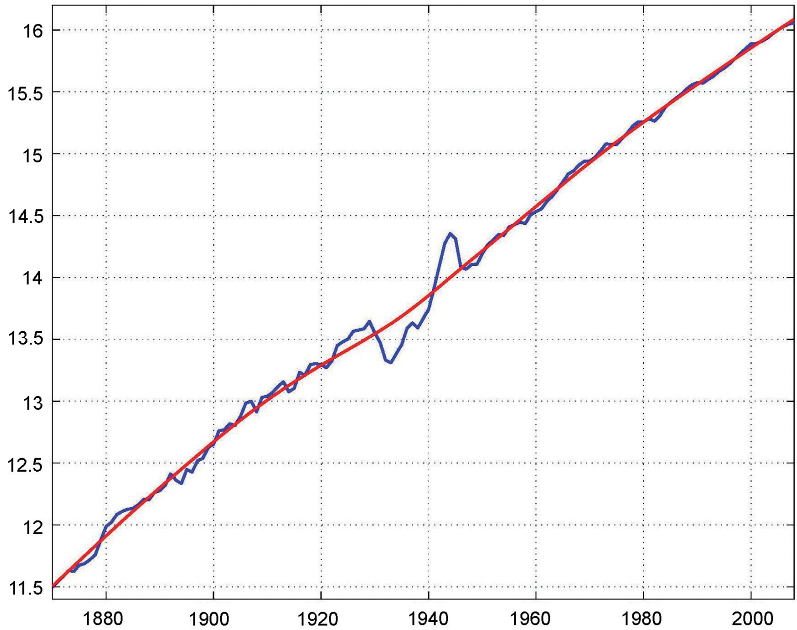
Professor Prescott, welcome to the Kozminski University, welcome to Poland. The floor is yours.

Prof. Edward C. Prescott: It is a pleasure to be here. I look forward to hearing your comments and questions. This is an exciting time in economics. It's unfortunate that some people are not working because of the bad economic conditions; the last two years have been hard for them, no doubt. But on the upside, when an economy gets depressed, a lot of bright young people go into economics and it is a real pleasure and joy for me to teach them and to work with them.

The history of U.S. economic growth and the current depression

Sometimes people are too short-term in their thinking. What is the picture of the last 150 years in the U.S.? A relatively constant growth rate. A couple of percent increase in *per capita* GDP annually – a trend line (see Figure 1). Between 1929 and 1933 GDP fell 40 percent relative to trend (see Figure 2). But, in the postwar period economic growth has been stable.

Figure 1. U.S. Real GDP, 1870-2008, Log Scale

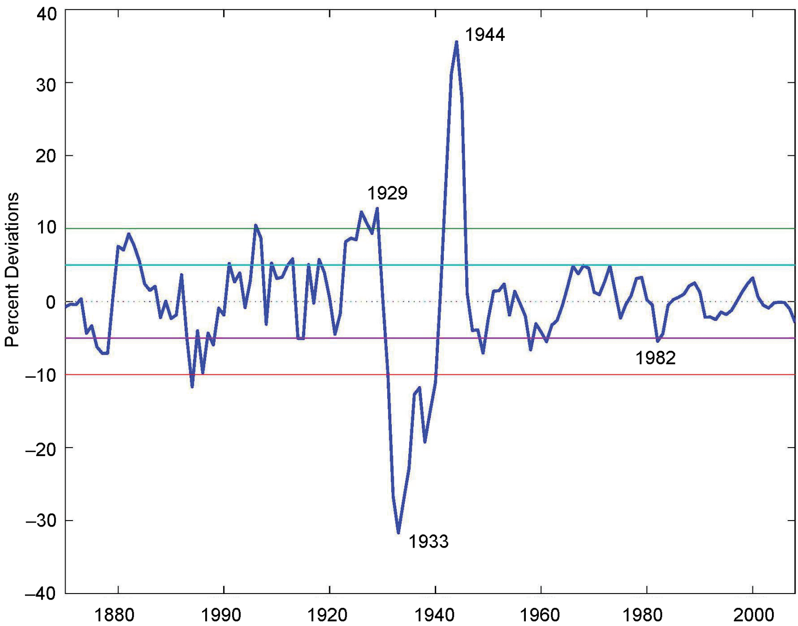


Source: Robert E. Lucas, Jr.

About ten years ago a group led by Lee Ohamian started studying the Great Depression (and many other depressions of the 20th century), using the tools of dynamic economic theory. There have been many depressions and they continue to occur. Fortunately, we now know so much more than we did ten years ago.

Currently, the U.S. economy is depressed about 8 percent – that depression occurred over the last 16 months. Figure 2 shows percentage deviations from trend. The straight line in the middle signifies a constant percentage growth – about 2 percent due to the living standards and 1 percent due to population. You can see the huge drop below trend from 1929 to 1933. You can also see that the economy has been pretty stable – generally within 5 percent of trend – in the postwar period. Hopefully the current economy won't get too bad.

Figure 2. U.S. GDP, Deviations from Trend, 1870–2008

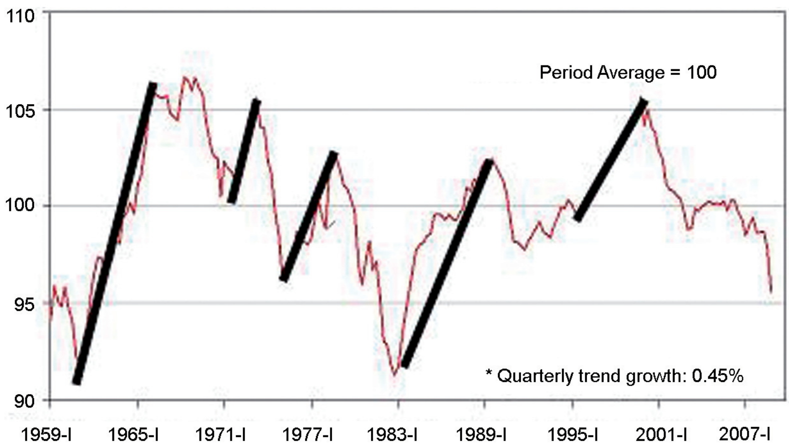


Source: Robert E. Lucas, Jr.

Looking at detrended GDP to emphasize the economy's booms and busts (Figure 3) we see first a technology-driven boom in the early 1960s, when new technologies – mainframe computers, jet airplanes – came along. The big expansion in the 1980s was of course because of the tax rate cut.

The boom in the 1990s is understated in Figure 3. As my colleague Ellen McGrattan and I found, that understatement is the result of a huge amount of investment that was not measured; intangible investment – R&D, starting up new businesses, training workers, advertising, making people aware of your product, all these things are expensed by businesses. Therefore, they are not *counted* as part of output, but they *are* output. *Measured* output is GDP; *true* output includes these intangible capital investments. So the boom in the 1990s was actually bigger by a few percent than Figure 3 indicates.

Figure 3. Expansions – Detrended GDP (red) per Person Aged 16–64, 1959–I to 2009–I



Source: Cociuba, Prescott, and Uberfeldt, U.S. Hours and Productivity Behavior Using CPS Hours Worked Data: 1957:III to 2009–III, November 2009. Minneapolis Federal Reserve Bank and Dallas Federal Reserve Bank Research Memorandum.

I say that the U.S. economy is depressed, which surprises some people. Most say we are "in a recession" and what they mean by that statement they will not say, probably because they do not have a definition of recession. There once was a commonly accepted definition of recession. This was before economists had a tested theory of business cycles, which are fluctuations of output and employment about trend. If output was contracting the economy was in a recession; if output was expanding the economy was in an expansion.

Then convoluted language was developed to talk about fluctuations in economies experiencing growth miracles. Periods when growth *rates* in Japan in the 1950s and 1960s were below average were referred to as a *growth* recession. Students of business cycles are shifting back to the language that an economy is in a depression if it is significantly below trend and in prosperity if it is significantly above trend. Being a student of business cycles, this is the language that I use.

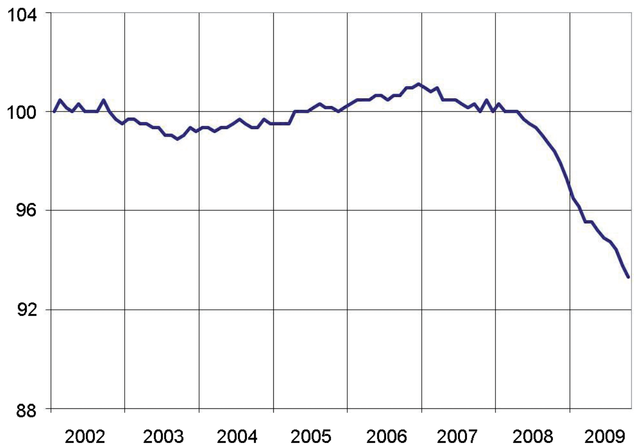
The newspapers report that the growth rate of the U.S. economy from the second to the third quarter of 2009 was 3.5 percent and that they economy had started to recover. Given this growth rate is only slightly above historical averages, the correct statement is that the economy stopped getting more depressed. In terms of level that is nearly a 0.9 percent change, which is a small number.

Insofar as this preliminary growth rate estimate stands up, it implies that the economy is not getting sicker, but not getting sicker is not the same as recovering. In fact this number was revised down a couple months later when more complete data was available – from 3.5 percent to 2.2 percent. Given that trend growth is higher than this number the economy became a little more depressed if the GDP number is used to measure the output of the economy.

But GDP measures only part of output and when the unmeasured part is included almost surely the economy became significantly more depressed between the second and third quarter of 2009. There were big declines in intangible investments. Businesses cut way back on hiring and making that big unmeasured investment in training new workers. They cut back R&D expenditures which are unmeasured investments that increase future production possibilities. This is why I say almost surely the economy became more depressed in the third quarter of the year than it was in the second quarter.

Looking at the fraction of the civilian population aged 16 and older who are employed (Figure 4) we see strong supporting evidence that the U.S. economy is depressed and becoming more so.

Figure 4. U.S. Employment-Population Ratio (Monthly, January 2002 value = 100)



Source: U.S. Department of Labor Bureau of Labor Statistics, Current Population Survey.

The employment-population ratio understates by how much market hours are depressed. Why? The fraction of workers that are part-time workers increased – so they are employed, but they are working fewer hours. Also the decline in employment was on average greater in occupations with longer workweeks.

What caused the current depression?

As you can see in Figures 1, 2 and 3, the economy had been humming along nicely since the early 1980s. The U.S., and Europe too, had about 26 years of healthy growth. Then, in the beginning or middle of 2008 the U.S. economy started becoming depressed.

Why?

It wasn't the Fed.

Before the current depression began, some people liked to credit Alan Greenspan and the Federal Reserve Bank for the economic boom in the early 1990s. But the Fed was not responsible for that boom. Nor is it responsible for the current depression. In fact, the Fed did what it should have given the situation in 2008 and 2009.

Dynamic stochastic general equilibrium models like the ones Finn Kydland and I worked on are often used by the Neo-Keynesians (they use the real business cycle methodology with interesting features such as sticky wages and constraints on changing prices). Those models all come up with the same answer: it is the real factors that matter, not what the Fed did. (Now, the Fed is important when it comes to inflation, but the Fed's policies do not determine real economic activity.)

It wasn't the financial crisis.

It was not the financial crisis either that depressed the U.S. and world economies. In fact, the shortage of liquidity was handled quite well by the Fed.

People have been saying for almost two years that businesses couldn't borrow, couldn't get money from the banks. That's wrong. The total amount of borrowing – liabilities of the household sector, both directly (mortgages, credit cards) and indirectly in the business that households are partial or full owners of – actually went up in 2008. And the composition of that borrowing pretty much stayed the same. Table 1 shows this.

Table 1. Liabilities of Households and of Nonfinancial Businesses They Own

	End 2007	End 2008
Total Liabilities (billions $)	31,875	32,341
Composition Share		
Mortgages	44.9%	44.4%
Other Loans	18.0%	18.5%
Corporatc Bonds	11.2%	12.0%
Security Credit	1.0%	0.5%
Trade Payable	8.2%	8.5%
Other	16.8%	16.1%

Source: Federal Reserve Board Flow of Funds, Table B.100, B.101, and B.1023, September 2009 Release.

As an aside, everybody says that this is the biggest financial crisis since the Great Depression. But that is wrong; there wasn't a big financial crisis during the Great Depression. That Depression was well on its way before the banks started failing. Even the total amount of liabilities of banks that failed were modest – there were a many banks that failed, but they were all small, and most of those failures occurred either at the end of 1930 and beginning of 1931 or at the beginning of 1933. The failing at the beginning of 1933 happened because Franklin D. Roosevelt in December 1932 said the United States might go off the gold standard. This led people to run down to their bank and got their money because they expected the value of money to fall in terms of gold, which it did indeed happen when Roosevelt took the United States off the gold standard in March 1933.

Business cycles, immigration, and bad policies

So it wasn't the Fed, it wasn't the financial crisis – what did cause the depression? It was partly the result of business cycles – there was a mini technology boom that ended in late 2007 and there was a real estate bust that began in late 2007.

Both the current and the Great Depression started with a near complete cut-off of immigration. During the Great Depression, President Hoover thought that foreigners were taking Americans' jobs (he was an engineer; he thought in terms of physical systems and not in terms of economics). He bragged about sending all the Italians back to Italy (the U.S. had a large number of Italian immigrants at that time).

A dramatic decrease in immigration also contributed to the onset of the current depression. The U.S. shut off immigration in August 2007. Before that, the U.S. had a million people net immigrating each year. In 2008 only 100,000 more foreigners came to the United States than returned to their country of origin.

But the principal cause of both the Great Depression and this current depression is bad policies. The depression gave excuses for bad policies, or the expectations of bad policies. What you expect to be done in the future determines what you do now.

There is a famous study by Thomas Sarger on France in the 1920s. France was in bad fiscal shape. The people got together and agreed to reforms that resulted in fiscal health being restored. Good things started happening even before the reforms were instituted, because people believed that these agreed to reforms would be instituted, as they were. We see a similar case in Australia around 1980.

Do not think the economy is like a physical system. The economy has something called *people*. What they do depends upon what they think will happen. That is why economics is so much more interesting than the natural sciences. Economists deal with people.

As I said earlier, about 10 years ago we started studying the Great Depression, so we now know a lot about its causes. There is a volume edited by Timothy J. Kehoe and myself. You can get it cheaply on Amazon.com, because it was paid for by the Federal Reserve Bank of Minneapolis. Now we know that our perceptions of President Hoover were wrong. We used to think of him as a conservative guy, a market guy. In fact, he was not; he was a planner. He was an interventionist. He was not like the presidents that preceded him, Coolidge and Harding (whose policies fostered healthy economic growth).

In both the Great Depression and the current one stimulus plans – spending plans – were instituted. Hoover said that they were going to increase tax rates, and did. Just the expectations of these future tax increases depressed the economy well before these promised increases were implemented.

Ask any of the young people in any major department of economics and they will all agree that spending stimuli are not stimuli, but depressants. President Bush's tax rebate in the spring of 2008 was meant to be a stimulus, but it was a depressant. I had my undergraduates – they are honors students – using economic theory to predict that would happen as the result of the tax rebate. They correctly predicted that this tax rebate would depress the economy. Trying to argue that spending stimulates the economy is equivalent to arguing that cigarettes are good for your health – the scientific evidence proves that it is not.

Mr. Obama as a Senator consistently voted against free trade. He shifted a little bit as President in November 2009 after Asia and economists pressured him to be a bit more pro-globalization, pro-trade.

Both in the 1930s and now the White House started managing the economy. The market is a great mechanism. I recently started saying that the market mechanism is not without its problems, but it is so much better than anything else. This is the Winston

Churchill comment for democracy: it is a lousy system, but it is much better than any alternative.

So the depression was caused not by market failures but by failures of the central government. Established economic theory states that stimulus plans depress the economy. You do not spend your way to prosperity. I must compliment the Polish central government for not adopting bad policies.

In the late 1960s there was a revolution in macroeconomics led by Robert E. Lucas. Finn Kydland and I worked to develop the tools and methodologies for dynamic stochastic equilibrium models that interacted with the national accounts and other data – to teach us more about how policies and economic output actually interact.

We learned that one reason why bad policies depress the economy is that they destroy perceived profitable investment opportunities for businesses. If you are a business person and you expect higher tax rates in the future, what do you do? You distribute more profits to yourself now and invest less. You do not hire young people and train them – that is a big investment. That is exactly what the business journals recommended for businesses to do.

Despite what you might read in the newspaper, during the Great Depression businesses had the funds to invest. They had huge cash flows. You can do two things with that cash: reinvest or distribute it to the owners. What did businesses in the 1930s do with all their cash flows? They paid huge dividends, cut their investment and investment went negative.

Why? Because of a lack of perceived profitable investment opportunities. I would say that the reason for the current depression in the U.S. is the same, though on a lesser scale. Today the White House is much more constrained by informed public opinion – economic science has advanced a lot. We know so much more now than we did in 1929.

At the same time, U.S. banks are lending huge amounts to the Federal Reserve Banks. That is called "excess reserves." Banks get a very small return on this investment – 0.25 percent nominal (a negative real). Why do the banks lend to the Federal Reserve, rather than to businesses? I think is this because of a lack of profitable lending opportunities.

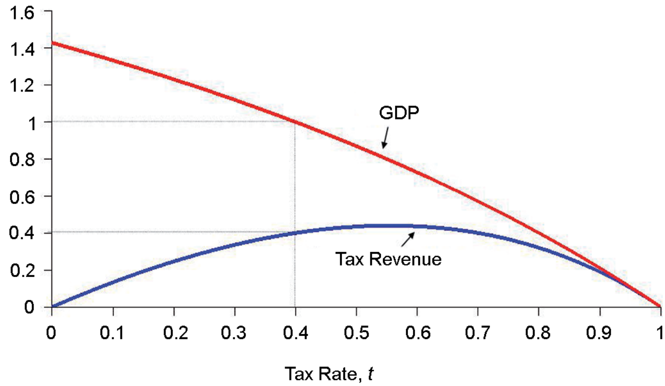
What would make the economy boom?

So bad policies caused the depression; what would make the economy boom? Cut marginal effective tax rates. People will work more. Businesses will invest more. Output and personal consumption will increase (supply creates its own demand). Do not erect barriers to the use of better production processes. Do not subsidize inefficiency and lose a decade of growth, like Japan did in the 1990s (when things went great in Western Europe and in North America).

Doing the opposite – raising tax rates rather than cutting them – will have the opposite effect; despite what the U.S. government might have us believe, increasing tax rates will not increase tax revenues.

You probably heard of something called the Laffer Curve. It shows the relationship between marginal tax rates and tax revenue and demonstrates that at some point, increasing the marginal tax rate will not increase tax revenue. If the tax rate is 100 percent, you do not get any revenue and nothing is produced. If the tax rate is 0 percent output is high but tax revenues are obviously 0. At some point, tax revenue actually falls when the tax rate is increased.

Figure 5. GDP and Tax Revenue *per capita*



Source: Edward C. Prescott class exercise: ECN 413.

In the U.S., Australia, and Japan the marginal tax rate is around 40 percent. So if an American works more and produces $100 worth of output, he gets to consume $60 worth of output either now or in the future. In Western Europe the marginal tax rate is around 60 percent; Poland is somewhere in between, probably around 50 percent. The UK is somewhere in between as well.

While the effects of tax rates on output are important, welfare matters, too. Japan, for example, has a higher GDP *per capita* than Western Europe, yet welfare is lower. The Japanese do not get as much leisure ("non-market") time, which has productive use. With a 50 percent tax rate, the value of non-market time is about half the value of the goods that you could produce with that time in the market sector. In Europe, for example, GDP is about 70 percent of the GDP of the U.S. Yet in terms of welfare, the lifetime consumption equivalence in Europe is about 85 percent that of the U.S. – because the Europeans take more non-market leisure time than Americans do.

We use the marginal rate of substitution degree in consumption and leisure as a proxy for the after-tax real wage rate. This relates current variables to each other. Of course, there are other factors in addition to the tax rate that affect labor supply. But the marginal tax rate is a big factor.

In order to calculate the number of hours of work per person aged 16-64 (my approximate for working-age population), you just sum up all the market hours and divide that by the population size. There is about 100 hours of non-sleeping time a week that a person has to allocate to the market and non-market. If you are sick and don't go to work, even if you get paid, it does not count as market hours. Neither do holidays, paid or not. It is about whether you work or not.

By the way, I am quite surprised by how many hours Polish workers work a year: 1969 – these are OECD numbers – United States is 1792, Netherland is under 1400 (see Table 2). So the Poles are hardworking people. Why is the number of hours worked in Poland higher? Because Poles retire early. (Though I have learned today that some changes have been made to gradually increase the average retirement age here.)

Table 2. Full Time Workers' Hours per year

OECD Average	1766
Germany	1432
Netherlands	1389
United States	1792
Poland	**1969**

Source: OECD.

Tax rates affect people's decisions about how to allocate their 100 weekly hours of market and non-market time. And that affects GDP. Simply put, *per capita* GDP is higher in the U.S. than Western Europe because tax rates are lower and people work more hours.

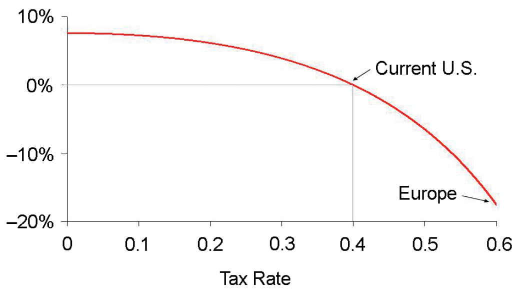
Figure 6 makes clear that welfare is like a parabola; loss goes up by the square, roughly. "Europe" in Figure 6 refers to Germany, France, Italy and Spain. Notice that if you increase the marginal tax rate above 40 percent, GDP goes down – so you end up with a bigger share of a smaller pie. Tax revenues actually change very little.

Clearly, those people who think you can finance economic growth through higher taxes are wrong. What does the CBO (Congressional Budget Office) do? They are ordered by the Congress to ignore science and say that people do not respond to incentives and assume that people will work the same amount if the tax rates change – clearly they will not.

So policy matters. The Japanese take about as much non-market time as the Americans, but they are not as productive as the

Western Europeans and the North Americans are. Why? Mercantilist policies. The Japanese are smart, hardworking people; it's the system. If you were to move Japan to the coast of Europe and they would join the EU, they would suddenly become a lot richer – GDP would be the same as in the U.S.

Figure 6. Welfare Gains and Losses



Source: Edward C. Prescott, *Prosperity and Depressions*, "American Economic Review" 92, 1–15, May 2002.

The lesson? Macro theory works. Economics has become a hard science. The dynamic equilibrium growth model, extended to include the allocation of time for market and non-market productive activities tracked actual economic growth just beautifully.

Until it didn't. In the 1990s, Ellen McGrattan and I saw a big deviation in the relationship between economic output and hours worked – people were working more than our models said they should. Did they get a contagious case of "harworkingness"? The answer, it turned out, was intangible capital investment.

Business students were dropping out of business schools. Why? To set up businesses, to become entrepreneurs, and to get rich. Normally booms are driven by 67 percent labor (hours of work) and 33 percent productivity (output per hour). Yet in the 1990s boom hours worked was 125 percent – this is for GDP. And -25 percent for productivity.

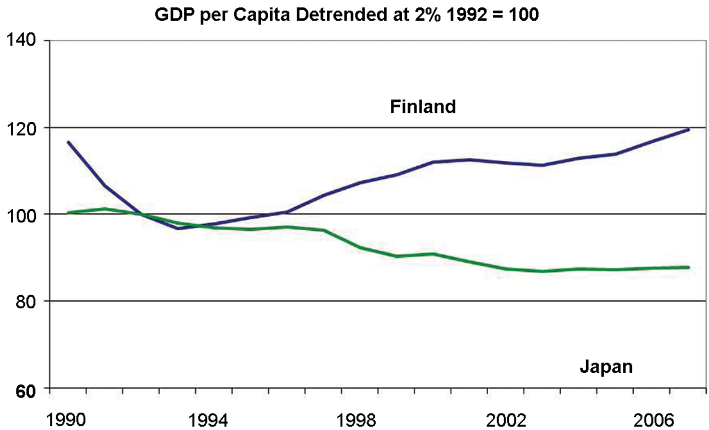
Ellen and I figured out how to deduce the size of that unmeasured investment: by assuming that business people are pretty smart, that they invest on margin in tangible capital (the things you capitalize) and in intangible capital (R&D, advertising, starting new businesses, training workers), so that the after-tax returns are equated. The boom in the1990s was a bigger boom than the statistics indicated – everybody knew that. The cabdriver in LA knew that, because everybody was throwing him $20 tips. Today, people aren't tipping the cabbie $20 – and they're not investing in intangible capital, either.

Outlook for the world's economic future

So just as bad policies led to the depression (in 1929 and today), good policies (like reductions in the marginal tax rate that foster investment) could restart the economic engine. And, certainly, how countries respond is not predetermined.

There have been many other financial crises in history – afterwards, sometimes good things happen, and sometimes they don't. Finland had a crisis caused by the collapse of the Soviet Union, their principal trading partner. Finland reformed its system – the banks all went bankrupt, then recovered and did quite well. Japan had a financial crisis in 1992 but they did not do well. They had zombie banks. They subsidized inefficiency. They followed Larry Summers' recommendation of spending to "stimulate" the economy. They lost a decade of growth.

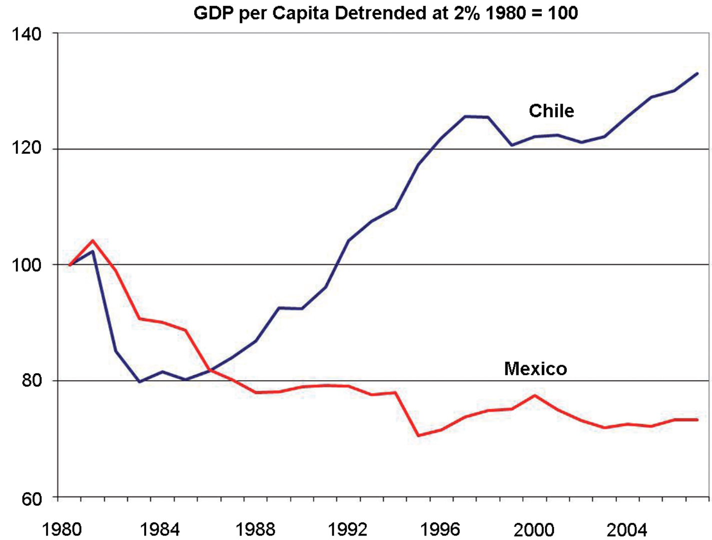
Figure 7. Japan and Finland's Experiences Very Different after Financial Crises



Source: GGDC (PPP-EKS).

And there is the dramatic example of differences between Mexico and Chile, which had very similar financial crises in 1981. They were both big debtors in dollar terms. And the interest rate on the dollar went way up in that period, to 15 or 16 percent (before that, the real interest rate was negative). The price of their principal commodity export (copper in Chile and oil in Mexico) fell. Chile responded by reforming, setting up a sound financial system that channeled savings to productive investments. The result? Chile had a growth miracle. Mexico didn't reform and lost a decade and a half of growth. Though in time I think Mexico will start doing better. They are setting up better economic and political institutions and that takes time.

Figure 8. Mexico and Chile's Experiences Very Different after Financial Crises



Source: GGDC (GK-PPP).

Yet I am not optimistic about the U.S. And prospects for economic recovery in the Southern part of Europe (Spain and Italy, for example) do not look so good either. It seems like Spain and the U.S. are following similar policies, which do not bode well for economic recovery.

However, other countries are already coming out of the depression. Poland continued to grow steadily throughout the 2008-2009 period (see Table 3). Australia was the other OECD country that did as well. And countries like China, India, Singapore and Brazil have already resumed healthy growth. In my forecast, Europe will too.

Table 3. Poland's Growth in GDP *per capita*

2008 Q1	6.6%
2008 Q2	6.5%
2008 Q3	5.5%
2008 Q4	3.3%
2009 Q1	1.1%
2009 Q2	1.3%

Source: Poland's Economic Statistics Agency.

Growth will be particularly high in Central Europe – it is catching up economically. It won't be long before Central Europe will have the same living standards as Western Europe (an extreme statement, I know; I will explain). By "Central Europe" I mean the eight European countries that joined the EU in 2004.

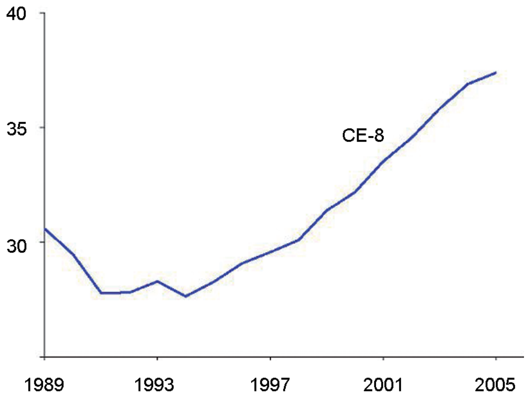
Figure 9 shows *per capita* GDP of that region relative to the U.S. (these are purchasing power parity numbers). Over the last fifteen years Central Europe has done a lot of catching up (steady growth has slowed down a bit recently, but it will come back). GDP in the EU-15 is currently at 70 percent of the U.S.; in another 15 or 20 years, the new members are going to be at that same level.

So Poland is doing well. It is good to see that some are doing well. And it is not at the expense of others. The Polish people deserve credit for this.

In terms of development, why did Poland do better than East Germany? East Germany got half the GDP subsidies from West

Germany. They also got constraints; they had to pay very high wages to keep the unions in West Germany happy. I think East Germany would have done better if it became a separate country. For example, Slovakia (which was a poor province of Czechoslovakia) has narrowed the gap with the Czech Republic. Slovakia did not get any subsidies.

Figure 9. Central European (CE-8) Countries' GDP as Percent of U.S. GDP



Source: GGCD dataset

Argentina has a huge endowment of land, but they still integrated producing industrial and high-tech goods. And it is good to see what they are trying to do there with some success, which is good for economic development (like the high-tech park, for example).

Japan had a growth miracle, and so did South Korea, Taiwan, Hong Kong and Singapore. A lot of countries are narrowing the gap. So the average income of the people in the world relative to the income in the richest countries – industrial leaders – has gone way up. It started going up in about 1970. Before that, the difference between the average and the world leaders was increasing. Some countries started this modern economic growth earlier. These countries traded industrial goods. Note that I'm not talking about oil, from which some small countries have gotten rich, which is more like a curse than a help.

Latin America, on the other hand, is not catching up. If we go back to 1900, GDP in Latin America was about 25 percent of GDP of the industrial leader; and it's about 25 percent still today. Why the failure to catch up? With some minor exceptions (like Chile), Latin America is not economically integrated

Why do some countries catch up and others don't?

The rise of the U.S. is a good example of the power of economic integration. After the Civil War, U.S. GDP was only about 80 percent of GDP in the UK, but by the late 1920s it was 123 percent (see Table 4). Why did this happen? The U.S. became economically integrated.

Table 4. U.S. GDP *per capita* as Percent of UK GDP *per capita*

GDP *per capita*; US relative to UK	
1868	79
1888	85
1908	103
1928	123

Source: Maddison.

Economic integration between U.S. states was made possible by dramatically lower transportation costs (which fell by a factor of 10 in the 19^{th} century). (Interesting aside: In the beginning of the 19^{th} century it was too expensive to ship grain from the Midwest to the East. So what did they do? They made it into whiskey, which has a lot more valuable unit weight and could be more easily shipped. What did the people who were digging the Erie Canal get? Their rations were a pint of whiskey a day. The Americans were a bunch of drunks. When the cost of transportation came down, the alcoholic consumption came way down too.)

Also, the states of the U.S. had great economic autonomy. The used to say the United States "are" – they did not say the United States "is." The Federal government could only rely on direct taxes, excise taxes, and tariffs (a high excise tax on alcohol was probably another reason why the consumption of alcohol fell). But the Supreme Court ruled that the states could not interfere with the interstate movement of people and goods, so there was free trade. It is interesting to see what happened: economic integration led to huge growth.

Initially, the European Union was thought to do the same for Europe as free trade and competition fostered economic growth. The six original EU members – Italy, France, Germany and the Benelux countries – were about 53 percent as productive as the U.S. for the first half of the 20^{th} century. After signing the Treaty of Rome in 1957, over the next 25 or 30 years, they caught up to the U.S. in terms of productivity.

The late joiners to the EU – Denmark, Ireland and the UK – and even later ones that joined 1995 (Austria, Finland and Sweden) were at the same level as the original EU countries until the Treaty of Rome, but lost a lot of ground relative to the original members, until they too joined (see Table 5).

Table 5. 1995 EU Joiners (Austria, Finland & Sweden) and Switzerland Lose Ground

	Relative
Year	to Oridinal EU
1900	103
1913	99
1938	103
1957	106
1973	96
1983	85
1993	81

Source: GGDC dataset.

In 1950 there were only 14 countries with GDP equal to 50 percent or more of the leading country. In 2005 there were 30. I think Poland will join this club in around 2018. Countries like the Czech Republic, Slovakia and Cyprus will do it sooner, as will Chile. As economic integration progresses, economic growth booms and we all become richer.

Why economic integration fosters growth

So economic integration is the means by which countries catch up economically to industrial leaders (the UK in the late 1800s and the U.S. today). But what is it about economic integration that fosters growth?

One factor is technology – the lever to richness. But you need access to the technology and you need to use it. It is easy to produce in inefficient ways. People are very good at being inefficient. Openness gives access to technology and lowers the barriers to its use. Poland started developing its share of technology capital and the rest of the world will get access to that, which is good for the rest of the world and good for Poland.

Openness means that some industries have constraints in their low productivity. The threat of foreign competition is often sufficient to make that industry productive. Based on a number of studies in cooperation with the McKenzie Institute it was found that industries come up to world level if they are exposed to foreign competition.

Why did the original EU countries catch up? The EU countries became economically integrated because of the threat of competition – for example, in Spain from French companies or German companies. So Spanish companies became more efficient. Furthermore, if you get more productive, in the Polish industry, for example, you face an elastic demand with exports. That means the amount of your sales goes up by a bigger percentage than the increase in your productivity and employment goes up. Unions like changes that increase employment. (If on the other hand, demand is inelastic, and more production and lower price reduce employment, then you are going to get a lot of resistance.)

There is also the dramatic example of the Minnesota iron ore industry. In 1982 President Reagan opened up the U.S. mining industry to competition from Brazilian mines. What did Minnesota do? They changed work practices at the mines. The same equipment, the same work, but they almost doubled productivity overnight. They cut the employment of skilled machinists in half. What happened to those people? They went down to the twin cities, Minneapolis and St. Paul, and got better-paid jobs. They were productive and talented people.

Openness fosters change – it cannot be forced; you cannot just change barriers or the work rules of the ones working in given industries. They tried to change the medical industry in the U.S. What happened? The medical establishment got the states to change the rules and protect them. But what we really need is more competition and fewer barriers.

And that may be happening – some countries are starting to develop medical tourism (Indonesia, Malaysia, and Mexico, for example). In India, you can get a bypass heart operation at about one-fifth of the U.S. cost, with a free airplane ticket and tourist tour included. Complication rates are a lot lower there, too. Maybe they have the less difficult cases. But to sustain a good system you have to have vested interest groups who want to sustain it. When you are in an organization like the EU, if you do not play by the rules, other people will retaliate against you. So the equilibrium is that people play by the rules and stay open.

Another reason that economic integration makes integrated countries richer is diffusion of knowledge. When you have multinationals all around, you learn from them and they learn from you. It is a mutual benefit. I was over in Korea with the Samsung people, who are big in electronics and in finance (which makes up 17 percent of the Korean economy). I asked them, "What about your multinationals?" They said "We have a place in Helsinki and in Austin, Texas." You know what is in Helsinki? Nokia. They had to be near that leader in electronics. What is down in Austin, Texas, besides the research university? Dell computers. Multinationals are of key importance in the diffusion of knowledge.

But then, you have to protect the property rights of foreign multinationals. In World War I, the U.S. took over some of the German companies. They also took over the British companies in the media, and the U.S. was UK's ally in that war. It was not until 1976 that the rules were changed and the President could not just, for national defense reasons, seize titles to firms. They could still seize for the use, but they could not get the title, which means that they were probably going to go back.

Direct investment in other countries helps foreign firms overcome barriers to adopting better technology. When the Japanese imposed voluntary quotas, Toyota responded by locating a plant in Kentucky. Kentucky is where the hillbillies live; it's not the industrial heartland of the United States. But the senators from Kentucky wanted that plant there and they used politics to block Washington from blocking it. Kentucky wanted these high-paying jobs. They liked the construction. A lot of supplier firms were created.

Toyota had to do the same thing later to break into the EU. The company set up operation in Wales. Again, not the industrial heartland of Europe. Europe had free trade in cars, but the cars had to be inspected. And they had to include the port of Marseilles. And they could inspect one car per day. There were almost no Japanese cars in France, for example. Yet in Norway, over half the cars were from Japan.

The fascinating fact is that the U.S. seems to be getting a great return on its foreign direct investment – accounting profits are 9.5 percent. For foreigners who invest in the U.S. accounting profits are 3.2 percent. And it has been this way for a number of years. One reason is that the U.S. has a lot of technology capital. And the input on this capital is included in the accounting return, but it is not in the denominator – it is intangible capital. The second reason that the return on U.S. foreign direct investment is so high is that with openness you can benefit from the use of technology abroad. If there are lower barriers (more openness), there is more production.

What about the conclusion? I think Poland will catch up with Western Europe in about 15 years. I fear that the U.S. will lose a decade of growth, mimicking Japan in the 1990s. There has been a regime change in the U.S. Maybe it is temporary, maybe the American people will actually change.

But even if America does lose this decade of growth, it will not have a big effect upon Poland. How well Poland does depends upon the Polish people. And I think Poland will do well. Thank you very much.

Prof. Andrzej K. Koźmiński: Thank you very much Professor Prescott for this most exciting explanation of the phenomenon of economic growth I have ever heard. And there is a very optimistic lesson to be learned from it. For Poland, no subsidies means better competitiveness and better growth. And I hope this applies to this institution as well. This was a wonderful presentation. It was a great honor for us to host you. Thank you for kindly accepting the membership of our International Advisory Board. That is also a great honor for us. Thank you.

Questions

Prof. Ryszard Michalski: I am from the Institute for Economic Research in Warsaw. Professor, thank you very much for your exciting lecture. I would like to raise a couple of issues. First of all, you quite consequently use the term “depression” when describing what is going on now and in the 1930s. Obviously, that is not common. In research here in Poland we talk about “slowing down”. Could you explain why you are using the word “depression”? Moreover, you quite openly underestimate the significance of the financial sphere. I am a special agent in finances and that is why I am a little bit worried. The financial sphere is much bigger than the real market (10–12 times bigger). The rate of returns in the financial sphere is much higher than in the real sphere (production sphere) since the beginning of the 1980s. Nowadays, we observe attempts to keep down the bonuses and salaries in banks, insurance companies and so on and there is a fierce opposition. So I wondered, maybe, after all, the financial sphere of national economies and world economies does matter. I would like your comment on this issue. With reference to Poland, thank you for your optimism. It is true that stimulus policies were ineffective; nevertheless we have made use of some other stimulant schemes. For example, the fact that Western governments developed some stimuli helped the industry enormously in exports. Moreover, stimulus plans of our Western partners caused that financial institutions have not withdrawn from Poland. So foreign investors decided to stay here. I would like to know what information sources you have used for Poland?

Prof. Edward C. Prescott: If you are high in the business cycle you are in a boom; if you are low, you are depressed. I focus on levels. The word recession is misused. Recession means contraction, at a derivative. You can be in a boom and in a recession, like in 2000 or 1991, where the economy just comes back down. So I am trying to get people to think in terms of levels, not derivatives. I am making a conscious effort to move people in terms of language.

I have been doing a lot of work in the financial area recently. In the past, I have had one paper that was fairly well cited, *The Equity Premium: A Puzzle*, in cooperation with Rajnish Mehra. The reason we did this on financial intermediation is because there is a huge amount of borrowing between households to get intermediated – 3.5 percent GDP of private capital has to be financed. In the U.S. currently private capital is half financed by owners' equity and half by borrowing. The average difference between the borrowing and lending rates is slightly bigger than 2 percent, and that is compound, which indicates to me that the financial system is getting more efficient. We want a system where people can borrow at a low rate and lend at a high rate.

The system is set up to serve the people, yet the current system has a lot of regulatory rent, and people are gambling and doing crazy things that I would not permit. I would not permit financial institutions to borrow a lot and lend a lot and get too big to fail and get subsidized by the tax payers. I like sharing arrangements. The stock market is a sharing arrangement. Many of the defined contribution pension plans are really shared. TIA was the first one, set up in 1970. They promise a low return, and you expect to get a much higher one, and if they get higher than that, you share it. If you get lower, but still above that bottom line, then you get less.

The two biggest stock market collapses occurred between 2000 and 2009. GDP value was lost in a relative short period of time. The stock market fluctuates, but there is a strong regression to fundamental values – the value of productive assets corrected for the tax system. The problem with this shared arrangement stock market was that people suffered a capital loss, but they recovered. There was no big financial crisis. A lot of people want to impose big costs on the young people when things go bad. The young people should not be forced to help the older people. People should share.

Prof. Alojzy Nowak, Warsaw University: I only wanted to make one short comment and ask three questions. Thank you very much for your excellent presentation. It was a very important and very challenging presentation. Your presentation consisted of very many hypotheses. Some of them have already been proved, but I think that some still must be proved. We hosted another Nobel Prize winner, Joseph Stiglitz, some months ago here and when he was asked about the reasons for the crisis, he indicated different reasons. He was talking about market information asymmetry, about deregulation, about securitization and other production and financial instruments. You did not mention any of those. You do not see the influences of those elements on the financial crisis? Additionally, Paul Volcker usually uses the same categories or factors for the financial crisis within the USA. Question number 2. You quoted Professor Lucas, and many years ago Professor Lucas announced that the Keynesian or Neo-Keynesian economy died. In the last few months we have been observing GDP growth in many places, also in the USA, but in Europe in particular. We are happy that you have spoken such nice words about Poland, but unfortunately we have competitors and the GDP growth is observed in other places. We also know that governments and central banks (the U.S. government and the European Commission) made a huge intervention, around a year ago. Will someone, maybe you, maybe another person, announce the rebirth of the Keynesian economy? And question number 3. It is said that we think, at least I think, that the economic cycle was broken recently due to the intervention of the governments and the central banks. Do you think that is true? And in case it is true, do you think that the results of stopping the crisis put the financial economic crisis in the broken cycle with influence in different ways on the economy in comparison to the last ten or fifteen crises?

Prof. Edward C. Prescott: Joseph Stiglitz and I have both done considerable research on private information, as I call it. Stiglitz focused on adverse selection insurance. I deal with the same environment, but I focus on mutual insurance companies, where equilibrium exists and is efficient. I have extended classical general equilibrium with valuation equilibrium to include private information. And there the invisible hand works.

According to Joe private information does not work. When I look at it, I see market mechanisms where people get together and form mutual organizations. If they can do that and make themselves be better off, then it seems to work and to be efficient.

I consider myself to be the student of Bob Lucas, because he knew me from being a statistician. (Being an economist is more fun.) Lucas argues that financial factors are big factors. But nobody seems to be able to show it and neither can people construct explicit models. Keynes was a great politician and he did a lot of good things for England in terms of preserving democracy, but he was not logically consistent. What were his policies? The economy needs a visible hand. What visible hand? John Maynard Keynes' visible hand. I know, I can see, I can tell.

I have much more admiration for the American Keynesians. They develop explicit macro-econometric models, where they try to empirically determine the laws of the economy. If you try to exploit the Philips Curve, it will fail. They tried to exploit it in the 1970s – it was a spectacular failure.

According to Lucas, the existence of policy in laws of motion is inconsistent with the dynamic economic theory. But we can evaluate rules and say, if the rules will be followed and people think they will be followed, this is what will happen. Policy is a game, a complicated dynamic game. So you want to create a stable set of rules and if you want to change them, there is a lot of public discussion. People come to an agreement as to what will be better and then they institute the new alternative.

But we have to be careful here; there have been some great economic experiments that turned into spectacular failures. Centralized planning is one of the victims of that. Lucas said that these grand social experiments are best admired at a distance. So you should be pretty sure that some alternative ways will work better, before you shift to them. And that is why we need better theory. Better theory is being developed. There is a lot to be done in economics. That is why it is such an exciting field.

Prof. Tadeusz Tyszka, Kozminski University: I am very enthusiastic about your conclusions. Everybody in this room is. I also support your general view. However, I have some methodological problems. When presenting your view, you mentioned several theses, which are psychological. Like for example, that cutting tax rates should result in the willingness of people to work more. This is a psychological thesis. You give some macro-level support for this. However, in psychology, and I am a psychologist, from time to time we try to test this type of theses on individuals and often the results are inconsistent with your macro-level data. Concerning this issue of cutting taxes, there were some (artificial) experiments, but generally they did not support this claim. Maybe you do not care about this psychological aspect. However, this inconsistency is interesting. How would you comment this?

Prof. Edward C. Prescott: Behavioral economics is a conflicting term. There is the behavioral science, there is the economic science and there is the cosmic science. People do not behave in the way that businesses wanted them to do. There are lots of institutions developed to make people behave more rationally.

People may look irrational in their forecasting, but in actuality be quite rational. Take farmers, for example, they are quite rational. Consider forecasting the weather in Florida, for example. The weather forecast influences the future market in the orange juice contracts. People can lose a lot of money depending on whether or not the weather forecasts are off by half a degree as a half degree can have major consequences for how much of the citrus crop is destroyed by a freeze.

The world is really a complex place. The behavioral finance people criticize *Eugene* Fama's efficient market hypothesis. But they offer no alternative to that theory. Unless I have better information, I know I am not going to be able to make a lot of money by trading in financial market. And I do not try. It is true that when Fama got older, he started studying the market, looking for efficient market deviations. He found some and made a lot of money. Some people doing that type of activity are needed for the markets to be efficient. If nobody did it, markets would not be efficient.

John Mulenga: My question is very simple. The lecture was great and very informative, thank you. You mentioned something about the financial crisis not being part of the depression, but policies. So my question is, how do you separate a financial crisis from policy makers? And secondly, you consistently used "integration" as a key word, as well as catching up with the West. Don't you think that it is actually integration that saved Poland from the financial crisis? The fact that Poland is not overly integrated with the other major countries in terms of financial institutions? Because all the countries that are majorly integrated were actually part of the financial crisis. You also mention similarities between the current depression and the Great Depression. You call it depression, even though we normally use the word recession. Are you saying that we have not learned anything from the Great Depression to limit this current depression?

Prof. Edward C. Prescott: Firstly on the Great Depression. The financial system was stable beginning mid-1933. But the Great Depression lasted through that entire decade. I saw the economy was in depression until the end of the 1930s because employment was depressed by over 20 percent relative to the 1929 level correcting for population growth. The problem of the prolonged Great Depression was due to a bad policy regime, and not due to a financial crisis.

In 1939 there was a policy regime change. FDR abandoned the cartelization policy and antitrust policy was reintroduced. He declared the New Deal was Dead. Once America moved from pro-redistribution to pro-production policy regime economy rapidly recovered from the decade-long depression. In 1939 and 1940, before any significant increase in military spending, there was substantial growth in productivity and employment and by the end of 1940 the U.S. economy had returned to trend, almost a year before the U.S. entered World War II.

People keep trying to develop a theory of how monetary and financial factors could lead to a depression and have failed in this quest. They introduce features such as sticky prices and credit chain into otherwise standard macro models. The predictions of these models are counter factual. The magnitude and nature of the fluctuations induced by monetary and financial factors are far from those observed. These models find that real and not monetary factors are what led to and prolonged the Great Depression.

The big cost of these financial crises is they provide an excuse for bad policy. Our payment and credit system works pretty well, but of course it can be improved. I think we should adopt a 100 percent reserve system with interest paid on these reserves for any insured deposits. Most household lending is financed by mutual savings organizations and not by commercial banks that have deposits that people use for transaction purposes. With a shift to a 100 percent reserve system, the people at banks that decide who to lend to and monitor these borrowers would do the same thing but for mutual lending organizations. The lenders are the ones that should bear the risk.

By the way, I would like to emphasize how honored I am to be on the International Board of this Institution. Thank you for this opportunity to be with you.