

Exclusive Interview

# LEADERS IN JAPAN

No. 6

Faculty of Economics at Princeton University

Prof. Nobuhiro Kiyotaki



## Modern Economics Provides Solutions for Macroeconomic Stability

By Keiichiro Kobayashi

For our leaders interview for the *Japan SPOTLIGHT* Jan./Feb. 2025 issue, we highlight Dr. Nobuhiro Kiyotaki, professor at the Faculty of Economics at Princeton University. He is one of the leading economists in the world, having studied and taught at some well-known universities in the United States and the United Kingdom. Our Editorial Committee member Dr. Keiichiro Kobayashi, another distinguished Japanese economist at Keio University, held the following discussion with him.

(Interviewed on Nov. 21, 2024)

### Differences in Research & Educational Environments at Japanese & US Universities

**Kobayashi:** You have been conducting research at universities in the US and the UK for a long time, and your contributions to economics are highly appreciated. You are also very familiar with Japanese universities. Based on your experience, what do you think of the differences in education and research between the US and the UK and Japan?

**Kiyotaki:** One of the outstanding features of American universities is that both professors and graduate students can concentrate on research and education. They do not have to spend much time on administrative work and other chores. Also, graduate students do not have to work part-time outside the university because they can support themselves by scholarship or teaching assistantships and research assistantships. In addition, most of them live on or near the campus, so it does not take much time for them to commute.

In the UK, not all graduate students can live in college accommodation, and in a city like London they may rent an apartment some distance away.

**Kobayashi:** In the UK and the US, the cost of living is

high, and I think it must be difficult for students.

**Kiyotaki:** Yes, for many undergraduate students. But for graduate students, they can live mainly on scholarships, or as research assistants or teaching assistants.

**Kobayashi:** Does the interaction between education and research work well?

**Kiyotaki:** Yes, it does. When you go to graduate school, you take classes, but research is the main focus. In Japan, most conversations among graduate students are about “Have you read this paper?” But in the US and the UK, mostly you hear “What are you researching now?”

**Kobayashi:** In Japan, graduate students, or even young faculty members, have to spend their time on education.

**Kiyotaki:** Even in the US, faculty and graduate students spend their time on education. If you are not prepared for class, you will receive a low assessment in the student teaching evaluations.

**Kobayashi:** That is an evaluation by the students. Do

## you find that your research is stimulated by preparing for classes?

**Kiyotaki:** Yes. Especially in graduate school, we have to teach at the cutting edge, talking about what kind of research we are currently doing and what issues are interesting for research. In that sense research and education are the same.

## Kobayashi: Is there anything in Japanese education that you think needs to be fixed?

**Kiyotaki:** It is true that there may be more class time in Japan. But in the US, even if the class time itself is not long, we often listen to student presentations or attend seminars. Seminars and student presentations usually fill up the entire lunch hour on many weekdays. Lunch-time seminars are an efficient use of time. Concerning Japanese professors, I get the impression that they are too busy with administrative work. They have less time for research and education. This really needs to be fixed.

## Why Trump Won

### Kobayashi: Looking at the US presidential election and other events, I feel that the division of society has become serious. First of all, why do you think Donald Trump won? Also, can we use economics to analyze this in any way, or to offer any prescriptions?

**Kiyotaki:** Yes, we can. First of all, concerning why Trump won, many people basically believe that the policies of the Joe Biden administration were failures. Inflation is around 3% at the moment, unemployment is low, and growth is fair, so it didn't look that bad. But about two years ago inflation was around 8%, and if you look at the past four years in total, price levels have risen by about 20%. In contrast, for most workers, wages have not increased by more than 10%, so that in real terms wages have fallen substantially for most people.

In addition, immigration is another major issue. The number of immigrants who came to the US during the Biden administration was in the range of 2 to 3 million per year. The total number of immigrants in Japan now is about 3 million. So many people have been coming to the US in the last four years. If that many people come, no matter which countries they come from, there will be friction here and there. In that sense, when Trump asked "Are you worse off than you were four years ago?" people replied "Yes." Then he said, "I'll take care of it, vote for me." And many of them did. The fact that the price level went up by 20% with the Democrats in power, real wages are down for most people, and there are immigration frictions all over the place points to a failure of government policy. Real GDP growth is positive, but real wages are

down. Now it is finally coming back a little bit, but I think there are still more people who are worse off than four years ago.

### Kobayashi: Does the increase in GDP mean that profits have increased and are just concentrated in the hands of a few?

**Kiyotaki:** Yes. For the most successful people, income including profit distribution has increased significantly. However, for those in the middle class and below, most of them have seen their real wages falling. In that sense, more people are very dissatisfied with the Democrats' policies. So I think Trump won because the policies of the Democrats were bad.

### Kobayashi: Did the income redistribution policy not work?

**Kiyotaki:** The Democrats talk about some income redistribution, and Vice President Kamala Harris, for example, said they would exempt some education loans. However, education loan exemption has little to do with high school graduates. They don't have many education loans. Besides, there are many people who worked hard and paid back their loans in the past. Those people feel cheated and wonder why they have to pay for present college students and recent college graduates.

Also, Harris said that they would subsidize people who have never owned an apartment or house before and are buying for the first time. But such a policy would mainly increase the price of apartments, which is not a good thing. This is not an effective redistribution policy, even if it is intended for income redistribution.

### Kobayashi: Would it have to go as far as a large-scale drastic redistribution like in Europe to be effective?

**Kiyotaki:** No. In the case of European countries, social security is well established in the first place, and the tax systems are highly progressive. In addition, tax rates are higher for those who are middle class or above, and their take-home pay is usually reduced by about half. In the US, people don't like the idea of having their take-home pay being halved by tax. In this sense the US is different.

Then, during the Covid-19 pandemic, the US handed out various subsidies, and especially the last one was quite large. In some cases, the amount of money distributed was more than the monthly salary of the lowest-paid workers. It is fine to hand out some money when people are really in need, but it is not appropriate to hand out large amounts of money when people are not working. One reason for the current inflation is that the last stimulus package for recovery from the pandemic was too large.

### Kobayashi: Were those subsidies distributed to

## everyone and not just to those with low incomes?

**Kiyotaki:** They did not distribute subsidies to those in the top income bracket, of course, but to those in the middle range and below. They gave out so much money that people could eat without working. This was overdoing it. But in any case, if people don't work and receive more money than if they did work, they would not really be happy.

## **Kobayashi: It certainly feels demotivating.**

**Kiyotaki:** That's right. There were quite a few people who were upset, because they were paid only a limited amount when they worked hard, and now wondered why they were getting more than that when they were not working.

It is not a new phenomenon in US society that there has been a great difference between the rich and the poor. The lives of poor people in the US are like those in developing nations. Even just passing through a slum in a big US city, you see it is similar to a developing country. In that sense, the gap between rich and poor in the US is enormous.

I believe that it is education, not redistribution, which will reduce the gap between rich and poor the most. In particular, it is basic education. It may take time, but when children grow up, they will be able to get a decent job and have a chance to be successful. Improving basic education is the most reliable redistribution policy.

## **Kobayashi: Do you have any thoughts on the content and teaching methods of basic education?**

**Kiyotaki:** I am not very familiar with that field. But James J. Heckman of the University of Chicago and others say it is important even before school age. They say that eating alone is not good. They say that it is important for emotional development and communication for children to have someone to eat with, even if it is not a parent, when they are young. It fosters cognitive ability to work as a team. Cognitive ability and communication skills, after all, are also important in the workplace. That is important for development at a young age.

## **Kobayashi: It is not only money, but also the people who teach and the way they teach.**

**Kiyotaki:** Exactly. Also, during the administration of Barack Obama, they provided some money for daycare centers, and they are still doing so to some extent. But when they provide money for daycare centers, they lose people who take care of children informally in the neighborhood, because in order to receive the government subsidy, the daycare centers have to be formal. According to research by So Kubota, who is now at Tohoku University, subsidies have paradoxically reduced informal care of children, and made childcare

more expensive. This has in turn hindered women's entry into the workforce.

## **Kobayashi: There is certainly a culture of babysitting in the US.**

**Kiyotaki:** Yes, there is some babysitting, but it is quite expensive and heterogeneous. So if you can take care of your own and the others' children together, that might be a better option. The loss of informal care is truly a loss. In short, you will have to use formal kindergartens and daycare centers, but the good ones are very expensive. Babysitters, too, are good if you have a good one, but some are not so good. There are a lot of variances.

## **Kobayashi: The same is true for nursing care and other services.**

**Kiyotaki:** Yes. It is not that easy, because it is not just a matter of handing out money. Also, if standards have to be met to a certain degree in the formal sector, there is the detrimental effect by which the informal sector will disappear. Thus, to a certain extent, we have to do things by trial and error, thinking about what kinds of things will work well for society. In short, if we think of taking care of small children or taking care of the elderly only in a market economy, it may not work.

## **Kobayashi: But it is also difficult to nurture the informal sector through policy. Because it is informal, the government cannot intervene.**

**Kiyotaki:** Yes, that's right. There will be good cases and bad cases as well. It may indeed be important not to intervene adversely.

## **Kobayashi: But in both the US and Japan, as market economies have developed, informal connections have been reduced.**

**Kiyotaki:** Yes. The informal sector will probably decrease. Young people, old people, and small children will probably get along better if they are all mixed up to some extent, rather than living separately.

## **Macro Policy**

**Kobayashi: I would like to ask you about macroeconomic policy, monetary policy and fiscal policy. In particular, how should we evaluate the past performance of unconventional monetary policy, which has been talked about in various places? Looking at the discussions of Paul Krugman at CUNY and Michael Woodford at Columbia University at that**

**time, I think they were saying they wanted to fix the temporary drop in demand by monetary policy, but could not do so with ordinary policy because interest rates had fallen to zero. So they wanted to use aggressive quantitative easing and unconventional policies such as announcements to fix the demand shortage. In Japan, since the 2000s, the discussion has turned to stimulating low growth with monetary policy in order to bring about high growth. Was that appropriate?**

**Kiyotaki:** There is certainly something a little strange about that. When “Abenomics” was launched, the economy was still in a deflationary trend, so the first priority was to stop deflation, and unconventional monetary policy was implemented on a large scale. I think such a policy was not wrong, because it contributed to stopping deflation. But it is a bit strange to think that growth will come simply by stopping deflation. Some of the followers of Abenomics say that, but I think they are wrong.

**Kobayashi: Growth required a different policy.**

**Kiyotaki:** Yes. Also, a large fraction of investments tends to be unprofitable, when the real interest rate is negative. Stimulating such unprofitable investments for a long time will not lead to sustainable growth.

**Kobayashi: If interest rates remain low for a prolonged period of time or are expected to remain low, will the growth rate decline?**

**Kiyotaki:** It can go down. For example, the price of real estate goes up when the long-term interest rate goes down. In comparison, the external funding horizon is not for that long. Most of the time, it’s for five or 10 years. With real estate, the horizon can be 30 years or even longer. Then, as a result of low long-term interest rates, the prices of real estate and other assets rise, but the ability to borrow, finance, and raise funds for factories, production facilities, or human capital does not keep pace with the rise in real estate and other assets.

For example, at the end of the 1980s and the beginning of the 1990s, real estate prices rose dramatically, and people thought the economy was booming for a while. But in reality they were just feeling as if they were getting richer because they were spending money on real estate and other things, when in fact they should have invested in production facilities and human capital.

Although real estate prices have been rising again recently in central Tokyo and other large cities, the ability of young people to buy houses or apartments has not kept pace with this increase. If young people cannot afford to buy houses or apartments, there is no way the boom will last long.

Older people, of course, will be fine because their previous holdings will go up in value. But if young people cannot come in, or new companies cannot come in, it will not lead to sustainable growth and may even be counterproductive. So lowering interest rates is not always a good idea, and raising them can have the opposite effect. This is especially the case where funding capacity is not keeping up with asset prices.

**Kobayashi: Under such circumstances, startup companies do not grow very well.**

**Kiyotaki:** Then you will lose the new engine of growth.

**Kobayashi: This may be a different mechanism, but Japanese businessmen often say that when interest rates are low, even low-profit businesses can pay back their debts as long as they are low-risk. So if they do not aim for very high profits, they should only engage in low-profit, low-risk businesses and pay back their debts as they see fit. Then it is sometimes said that in an environment of low interest rates, all businessmen who take the safe side will inevitably choose low-profit, low-risk businesses. Could that happen?**

**Kiyotaki:** I think it is possible. What is worse, there are some businesses that do not make much money, but they are still able to pay the interest for the time being without exiting the market. In this sense, some productive assets are retained in businesses which do not make much money.

**Kobayashi: In that situation, it is difficult to increase productivity.**

**Kiyotaki:** Yes. The productivity doesn’t go up. Also, I think that they don’t do many new things.

**Kobayashi: Then what should really be the next step for us?**

**Kiyotaki:** Once deflation is fixed, interest rates need to be raised. In the case of Japan, the inflation rate has been well over 2%.

**Kobayashi: We are maintaining close to 3%.**

**Kiyotaki:** It is not a good idea to leave interest rates still low at such a time, and it is better to keep the real interest rate at least at zero or higher.

**Kobayashi: By the way, in Japan, as in the US,**

**semiconductor companies are given financial subsidies in order to increase productivity, claiming that this is a growth strategy. But is this a good idea?**

**Kiyotaki:** I don't think it is a good idea. How will they take responsibility when they fail? If you invest taxpayers' money, which sometimes works out well and sometimes fails, you do not take full responsibility for the failure. If you do not invest with your own money but with the government's, you cannot say that you are taking your own risk. An investment that does not take its own risk is not a good investment.

**Kobayashi: Various countries are providing support for environmental improvement for businesses.**

**Kiyotaki:** Of course that is fine if there is externality. But it is not right that environmental improvement is done by a semi-private or semi-governmental organization without taking the responsibility. If there is a loss in such a project, the public will be on the hook.

**Kobayashi: Some people say that semiconductors are more like externalities or public goods.**

**Kiyotaki:** There are various choices for semiconductors, such as what kind of semiconductors to build and which semiconductors are promising. These choices change from moment to moment. If the government is involved, it is impossible to respond to such changes. There is a possibility that we will end up producing semiconductors that are outdated. Therefore, when making an investment, you should take the risk on your own. Relying on the government subsidy leads to moral hazard, because it is unclear where the responsibility lies in the event of a failure.

**Kobayashi: I understand. Related to this is the reality that Japanese entrepreneurs are not willing to take such semiconductor risks themselves.**

**Kiyotaki:** Some Japanese companies are very energetic and some are not. The ones that are somewhat vigorous are doing things properly on their own. I don't think they are very dependent on the government.

**Kobayashi: In general, it is said that Japanese managers are taking fewer risks than in the past.**

**Kiyotaki:** That may be so. However, I believe that proper companies take risks. If they are doing well, they usually keep quiet.

**Kobayashi: Yes, that's right.**

**Kiyotaki:** Companies in Tokyo are still very close to the government. In contrast, companies in Chubu and Kansai keep a distance from the central government, so they usually have the policy of doing things on their own without relying on the government. After all, entrepreneurs have to do things on their own. As in our research, relying on others is no good.

**Kobayashi: Let me move on to the next topic. In relation to finances, it is also often said, especially since 2016 when interest rates were low and long-term interest rates were zero, that all young politicians who became politicians during the Abenomics era feel that issuing government bonds is the norm and they don't care about reducing the national debt.**

**Kiyotaki:** That is certainly the downside of unconventional monetary policy. Once the Bank of Japan (BOJ) buys, refinancing of Japanese government bonds will not fail in terms of funding. That said, if the BOJ is allowed to buy as much as it can, there will come a point where even the BOJ will not be able to continue to buy at low interest rates. That is when inflation rises gradually. When inflation rises, the BOJ should no longer continue to buy government bonds to keep interest rates low. That would be a bad policy. At that time, Japan ended up with no cash flow problems, and it is still the inflation tax that seems to have kept the government bond to GDP ratio from rising at a noticeable rate. In short, if inflation occurs while interest rates remain close to zero, the real value of government bonds is falling, and the real value of the postal savings or bank deposits that buy them is also falling.

The cost of inflation is paid invisibly by depositors, such as those who have a Japan Post Bank account. That is tax. It is not good to continue inflation tax, because it is invisible. In Japan, more than half of the people have most financial assets in the form of deposits. To apply tax on them by inflation is a very regressive practice.

Inflation happens slowly, so you don't notice it quickly. But if inflation continues at, say, 3% for three years, it will go to 9% or more. If interest rates were zero during that period, the real value of deposits and other similar assets would have fallen by more than 9% in real terms.

**Kobayashi: Inflation makes life difficult for the younger generation, doesn't it?**

**Kiyotaki:** Some people's salaries may not have risen 10% even though prices have risen 10%, and even pensions have not risen 10%. It means they have decreased in real terms, and their deposits have also decreased by 10%. The same thing as in the US is happening in Japan, although not so extreme. Real wages are going down, real deposits are going down, and real pensions are going down. Life is becoming more difficult than before. Therefore, it is not



good for the BOJ to continue this and interest rates must be raised.

But if we start raising interest rates, we will now be placing a heavy burden on the public finances. Furthermore, since interest rates are charged on excess reserves held by the BOJ, it will no longer be possible to reduce the interest rate on the BOJ's purchases. Unless the public finances are restored at some point, it will not be possible to continue expansionary monetary policy at this point.

**Kobayashi: The BOJ would like to raise interest rates in the future, but the government cannot continue its policy unless the fiscal situation is also made sound.**

**Kiyotaki:** We need to have fiscal balance improved, but the BOJ is responsible for controlling inflation on its own.

**Kobayashi: I think the BOJ should tell the government to do more to restore fiscal soundness.**

**Kiyotaki:** From the BOJ's standpoint, it cannot strongly tell the government to restore fiscal soundness. What it can say, however, is that as far as inflation is concerned, the BOJ is responsible for controlling it. To that end, there is no choice but to raise interest rates, even if it has some negative impact on public finances. That is the extent of what it can say. However, the BOJ cannot tell the government to raise taxes or cut spending.

**Kobayashi: Former BOJ Governor Haruhiko Kuroda actually said so.**

**Kiyotaki:** He originally came from the Ministry of Finance, so he would have told them to do something about it. But it is still elected Diet members who decide taxes and finances. It cannot be chosen by government officials. The Diet has budgetary authority, so it has to go through the Diet.

**Kobayashi: What is the current status of the BOJ's independence, or rather the way it deals with the government?**

**Kiyotaki:** Currently, the BOJ is somewhat reserved. It is concerned that if it raises interest rates too much, it would make the budget deficit unsustainable.

**Kobayashi: How does the relationship between the central bank and the government compare between the US and Japan? Are there any differences?**

**Kiyotaki:** In Japan, the BOJ has only recently become independent.

**Kobayashi: It was 1997.**

**Kiyotaki:** The US had something called the Accord a little earlier, around the time of the Korean War, and inflation occurred around that time. They said they would ensure the independence of monetary policy in order to control inflation, and they managed to raise their reputation slowly and gradually over time. The trigger to achieve it, after all, was probably with Paul Volcker from 1979. At that time, he said, "We will do whatever to keep inflation down, even if it has various side effects."

**Kobayashi: There have been major side effects, such as the ballooning of accumulated debt in Latin America.**

**Kiyotaki:** Yes. Latin America suffered badly, but in a way double-digit inflation was controlled by Volker's monetary tightening. In that sense it was an important achievement. Since then, central banks have been considered responsible for inflation by all, and that is good. However, inflation went to about 8% during the recovery process from the pandemic about three years ago, because the Fed was slow to raise interest rates. Then public finances have become more expansionary than expected, which became another reason for inflation. The monetary policy authorities thought the oil price increase was temporary, and they waited for a while without raising interest rates. After a while they saw that it was not temporary, and they panicked and raised interest rates from 0% to 5% in a flash. But it was probably too late in terms of timing.

A central bank must speak out about the harmful effects of inflation. Inflation must be controlled. It is very regressive to impose an inflation tax as a policy. It is not good for people who rely on their pensions and deposits to cover their living expenses.

**Kobayashi: Until now, too much emphasis has been placed on the negative effects of deflation, and we have always been told that inflation is a good thing.**

**Kiyotaki:** I think it is better to have a little inflation at a time of deflation, but deflation is bad and inflation is also bad. Inflation between 1% and 2% would be best.

**Kobayashi: That has already been achieved now and is about to be exceeded, so monetary policy has to be a little more inflationary suppressive.**

**Kiyotaki:** Yes. Since inflation has already exceeded the permitted level of around 2% in terms of CPI, subsidies for gasoline and electricity to curb inflation are still a bad idea. It may look to consumers as if inflation has gone down a little with this, but this could raise demand and thus price levels would eventually rise. This would result in failure to stop inflation.

**Kobayashi:** Incidentally, the BOJ and the government have a Japanese version of the Accord, signed just before the start of Abenomics in 2012, in which both committed to each of their policy goals, namely 2% inflation for the BOJ and implementing a growth strategy for the government. In fact, that is still in place today. The Accord says the BOJ will aim for 2% inflation and will conduct an accommodative monetary policy.

**Kiyotaki:** At that time, it was deflation, which was fine, but now that the inflation rate is over 2%, the opposite is true.

**Kobayashi:** It is the opposite. So would it be better for the BOJ to stop its low interest rate policy?

**Kiyotaki:** Yes. Since you are aiming at 2% as an inflationary target, you would have to tighten monetary policy when it exceeds 2%. The Accord tells us that we have to take it to tightening when inflation exceeds 2%.

## Fiscal Sustainability

**Kobayashi:** The next topic is fiscal sustainability. I want to ask your opinion on this issue. During the past 10 years of Abenomics, long-term interest rates have been zero, so interest payments have not increased.

**Kiyotaki:** Also, because of inflation these days, we are somehow managing to control public finances with an inflation tax, but that is not a very good policy. After all, one of the standard policies to deal with government debt is to cut spending. The alternatives are increasing tax revenue and inflation tax. In the case of Japan, spending on pensions, health insurance, and long-term care is getting bigger and bigger, and cutting it would be undesirable. What we can do is to extend the years of working. After all, the life expectancy of Japanese people is increasing.

**Kobayashi:** Healthy life expectancy is also increasing.

**Kiyotaki:** Yes, there are many elderly people who are in good health, so the most effective way to increase their income and decrease their expenses for pensions would be to extend their retirement age and extend the period they work. Extending the retirement age and the length of working years is the most effective way to increase fiscal revenue and decrease expenditures. The government can do both the spending cut and the revenue increase at once with this.

Of course, that probably won't be enough, so we will still have to raise the consumption tax. This is because, as more and more people retire, there will be many people who pay no income tax.

**Kobayashi:** So only those who are currently working will pay.

**Kiyotaki:** Yes. If the minimum taxable income is raised, the number of people who do not pay will increase rapidly. It is not that easy to get a small number of people to pay a large amount. People say that the rich should pay, but there are not that many rich people in Japan, and in some cases, if you impose more tax on those people excessively, they will go abroad. Thus, it is not easy to impose a high income tax. I think the only way to get money for government expenditures would be through the consumption tax.

**Kobayashi:** Corporate tax is difficult.

**Kiyotaki:** Yes. In the case of corporations, capital also moves across the world, so it is not that easy to tax companies. Since many companies earn their income overseas these days, they create many subsidiaries and pay their taxes there. It is not easy to impose corporate tax.

In addition, the Ramsey Principle says that taxation should not be levied on products whose supply is elastic. It is said that taxing capital will cause a large distortion. Again, I think the consumption tax is the best.

**Kobayashi:** So there is less distortion in the case of the consumption tax?

**Kiyotaki:** It's not without distortion, but less than others. Then there is the large tax base. Also, when you have a consumption tax, you have to include it within the price of goods. The price must include the tax from the beginning, because if it is later added at the cash register, it will not be clear which price is authentic.

**Kobayashi:** Is that true in the US and Europe as well?

**Kiyotaki:** It's included in the UK and all of Europe. In the case of the US, the sales tax is totally different from state to state, so they add the tax to the price on purchase. The prices with the addition of the sales tax differ from state to state. In Europe, however, all VAT is an internal tax, so it is included in the price. It is upsetting to add the tax afterwards. You have to include the sales tax in the price from the beginning. Because if you explicitly add 10%, people will not like it.

**Kobayashi:** In Japan, there would be some cases where a sales tax is included within the price, but in general, the consumption tax is separately written on a receipt and must be paid separately from the authentic price.

**Kiyotaki:** They are doing it because it looks cheaper, but we must not do it.

**Kobayashi: In Japan, there is an aversion to a consumption tax.**

**Kiyotaki:** Since social security must be properly financed, there should be no problem if the consumption tax is combined with social security. When Yoshihiko Noda was prime minister, the DPJ, LDP, and Komeito reached a three-party agreement that called for integrated reform of the tax and social security systems. That was correct. It is still an integrated reform. If we want to continue the social security system, we must also increase tax revenues. We have to do both, tax reform and social security reform at once.

**Kobayashi: The burden of social insurance premiums has become so high for young people that there is no choice but to reduce them.**

**Kiyotaki:** Yes. In that case, the consumption tax would still be better. Rather than raising social insurance premiums, it would be better to raise the consumption tax by a smaller amount, because the tax base is wider and everyone pays. With pension premiums, there are people who do not pay, and if the number of people working gets smaller and the number of retired people becomes bigger, the tax base will decrease rapidly.

**Kobayashi: It is quite difficult politically to raise the consumption tax right now.**

**Kiyotaki:** Yes. It will eventually have to be raised. At that time, we will need a comprehensive reform of the tax and social security systems, as this is absolutely necessary to continue pensions, health insurance, and long-term care insurance. Japan has a low consumption tax compared to other countries. It is much lower than in Europe and other countries.

**Kobayashi: It is 10% now. I think there is still room to raise it to 20% or 25%.**

**Kiyotaki:** Yes. We can manage to raise it up to 20%. The other two things we need to do are to delay the retirement age and increase immigration. The only way is to have young foreign workers come in. Of course, the way to do this is difficult and there will be many conflicts. But the population will be decreasing, so we must increase the number of foreign workers who have already entered the construction industry and convenience stores.

**Kobayashi: Immigrants are indispensable in many fields.**

**Kiyotaki:** We cannot do without immigrants. When you go to an inn (ryokan) in the countryside, you often come across immigrants

working there. In many cases, we should encourage them to stay. If they work for two or three years and then go home, it will be like slash-and-burn agriculture, and it will not continue.

**Kobayashi: Then we have to consider a policy to bring in foreign human resources on the premise that they will be established as Japanese to some extent.**

**Kiyotaki:** Yes. There will be many harmful effects if we bring in too many people at once. But I think we cannot continue without foreign human resources, so it may be better to have them come when they are as young as possible. For example, we would like to have them come when they are university students, and if they like Japan they can go straight to work in Japan. Those who want to return to their home country can return to their home country. To a certain extent, both parties can choose.

**Kobayashi: Have high-level human resources come here.**

**Kiyotaki:** In a sense, they are doing a good job because they are scooping up highly talented people. Most of the leading American companies were founded by immigrants or second-generation immigrants, and Google, Apple, and Tesla are no exception.

**Kobayashi: Regarding finances, there is talk now of an independent fiscal institution that publishes some 30-year long-term forecasts of fiscal trajectory. Do you have any comments?**

**Kiyotaki:** That is certainly a good idea. That's how you make projections for balancing public finances.

**Kobayashi: In Japan, the Cabinet Office issues forecasts for up to 10 years into the future, but not 30 or 50 years. In the US, UK, and Australia, forecasts are made every year or every two years for the next 50 years.**

**Kiyotaki:** We should make long-term forecasts. Moreover, it is a good idea to do it in a neutral place.

**Kobayashi: One idea is to do it through a research organization like the Congressional Budget Office.**

**Kiyotaki:** It is good to do it through such a third institution, and to make a forecast from an independent and neutral standpoint.

**Kobayashi: Actually, when we talk about this kind of thing in Japan, there is great opposition or a curt**



response from the government agencies.

**Kiyotaki:** They think their jurisdiction will be harmed.

**Kobayashi:** Some members of the Diet are talking about doing it, but it seems to be politically a challenge to achieve it.

**Kiyotaki:** It is a good idea, although it may indeed be difficult because of vested interests.

## Future of Economics

**Kobayashi:** Finally, on the big picture, what do you see as the future of economics?

**Kiyotaki:** That's something we don't know either. I began by studying about money, thinking about an economy in which the circulation of money is essential. I started from the idea that it might be quite different from the kind of economy in which the market works well in the Arrow-Debreu style, and then focused on the role of money as liquidity. I have been working with John Moore and others on the role of money as a means of savings, or short-term savings. My research with Randall Wright focuses on money as a medium of exchange. Recently, I have been working with Kosuke Aoki at the University of Tokyo on money as a unit of account.

All three are somehow related, and in the end I do research by considering the economy in which the role of money is essential. Since there is no money in the Arrow-Debreu model, I have been researching the economy where money fulfills an essential role. This would be closer to reality and more important for understanding the modern market economy.

As for rational expectations, one criticism raised when they first appeared is that everyone may know what is close at hand, but not what is in the distance.<sup>1</sup> We know the price of what we buy or sell, but don't know much about what comes from far away. Recently, many people have been researching how to analyze such an economy. Even if information is largely available, people can't interpret all of the information available, which Christopher Sims defines as rational inattention. Of course, there is a lot of research on private information. There is also research that loosens the assumption of rationality. In particular, micro economics researchers are actively studying such issues.

**Kobayashi:** Is there a uniform standard for loosening the assumption of rationality?

**Kiyotaki:** No. There is no such standard yet pinpointing where to loosen the rationality assumption. Rational inattention means that you cannot digest all the information, so you focus on what is most

important to you. Or, in some cases, you can understand the information in your immediate vicinity, but not so much in faraway places. Since there is no standard, much research is based on the assumption of imperfect information, or private information.

Concerning financial frictions, the way in which assumptions are made can vary slightly from problem to problem. It may be difficult to understand everything in one recipe.

**Kobayashi:** I recently heard of a discussion in neuroscience about using cognitive resources to analyze expectations in such a way as to minimize some objective function. If we use this theory, we can assume limited rationality in problems that use a lot of cognitive resources, but can assume fully rational expectations in problems that require less use of these resources.

**Kiyotaki:** But I feel that the theories of cognitive resources are kind of taking the phenomena in reverse in order to explain them in a unified way. For example, when price theory says that this kind of demand has emerged, it is sometimes taken in reverse in order to see what kind of utility function would justify that demand. It might be similar to that. There is not really such a thing as cognitive resources, but as a convenient tool to explain some phenomena, economic researchers have introduced the limits of cognitive ability or the cost functions in the opposite direction. Perhaps they are reverse-engineering, as in what is the best way to explain many phenomena in a unified way.

**Kobayashi:** That's right. In analytical mechanics, the Hamiltonian, for example, came out as a tool to explain various mechanical phenomena in a unified manner.

**Kiyotaki:** There is a similar feeling. I try to think of ways to explain this in terms of phenomena. Andrew Lo of MIT and others are talking about evolutionary theories, which means that in the field of finance, competition is fierce, but it does not mean that there are rational expectations.

**Kobayashi:** Is that in the financial market?

**Kiyotaki:** Yes, when we explain it in the financial market, we bring the assumption of intense competition, but we don't necessarily have to assume rational expectations. In the midst of intense competition, a kind of survival of the fittest will occur. Then, as a result, I sometimes conclude that what has remained is a kind of cost function that appears to be minimized.

If it is a financial phenomenon or if you are solving a complex problem or something like that, you think about it to some extent

depending on the problem at hand. When the concept of rational expectations came up, it was impossible to assume everything with that. When the concept of bounded rationality came up, the idea arose that it would be better to do something like bounded rationality. It seems that a lot of people are quite influenced by Herbert Simon.

In that sense, there may not be a single way to get it all right at once, depending on the issue. Even with frictions, there are many different ways of placing assumptions, such as labor market frictions, financial market frictions, and so on.

**Kobayashi: Is there some sort of relationship between your research on money and this view of rationality?**

**Kiyotaki:** There may be. My research puts friction in it. People can't all meet at once, or they can only meet bilaterally. Or they can't collect their debts properly, and in some cases, they may go bankrupt. I try to include those frictions to explain the reality of the situation.

**Kobayashi: Is it possible that friction is actually due to cognitive resource limitations?**

**Kiyotaki:** Yes, there is that possibility, but on the other hand, friction is really an incentive issue. If the borrower does not face a consequence when defaulting, he or she will not return the loan. There are many ways to do it. Whether it is the limit of recognition, the limit of private information, or the limit of contract enforcement, we can choose according to the problem and the nature of the problem. I don't think it is always necessary to choose one or the other.

Perhaps the Arrow-Debreu model under rational expectations, with complete contract enforcement, is a good benchmark. But it may not be sufficient to explain the current situation. You would have to extend it a bit more.

**Kobayashi: So there is a direction for such development.**

**Kiyotaki:** Yes. That has been the direction for the past 30 years or so. They are mostly theories with heterogeneous agents, and there are not many people who are fans of the representative agent paradigm anymore, even in macroeconomics.<sup>2</sup>

**Kobayashi: Certainly not. In that sense, the New Keynesian model of Calvo pricing<sup>3</sup> was very popular in the central banking world at one time.**

**Kiyotaki:** We still use it, because it is useful as a benchmark. But there are certainly more and more things that cannot be explained

properly without the proper heterogeneous agent framework.

**Kobayashi: Then will the New Keynesian model be moving toward greater complexity in the future?**

**Kiyotaki:** If we make things too complicated, they become incomprehensible, so we try to simplify things somewhere. However, in terms of macroeconomics, there has been some progress in the heterogeneous households and firms world, for example, in considering financial frictions and labor market frictions, or in considering the limits of acquiring and processing information properly. The debate about the right or wrong of rational expectations is no longer there.

**Kobayashi: That is all. Thank you very much.**

## References

1. The theory of rational expectations assumes that economic agents produce forecasts that are systematically correct. That is, they know everything except inherently random elements of the economy. It is the mainstream theory for beliefs in macroeconomics.
2. The assumption of a representative agent means that the model economy is populated by identical agents (households, firms, etc.). It stands in contrast to heterogeneous agents.
3. In models with Calvo pricing, firms cannot change the prices at which they sell their goods unless a random signal comes, which occurs with a constant probability over time. The name comes from Guillermo Calvo, a professor at Columbia University.

**Interviewer:** Keiichiro Kobayashi is a professor of Department of Economics, Keio University. He has experience in the economic policy-making process as a former government official at the Ministry of Economy, Trade and Industry. His interest in economic research led him to join RIETI and pursue an academic career. He has been an active commentator on economic policy issues, in particular fiscal and monetary policies, such as how to eliminate non-performing loans after the bubble economy in Japan. His current interest covers areas such as innovation and income inequality.

JS

Written with the cooperation of Sebastian Guarda, a Ph.D. Candidate in the Department of Economics at Princeton University, specializing in macroeconomics and behavioral economics.