

## The 3rd SPARC Japan Seminar 2017 “Beyond Open Science”

# Q&A / Short Discussion

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● **Hayashi** I would like to take 10 minutes for questions and discussion. To be honest, I believe that the talks have been philosophical in nature, and the content has been difficult. Including if someone would like to clarify something, I would like to open the floor for questions.

● **Floor 1** I would like to ask a question to Professor David. At the begging of your talk, you spoke about how open science is a peculiar system that is not about market value incentives like it is in the conventional system. After that, you suggested that the incentives in open science are based on reputation.

Should we take this to mean that we must drive open science forward with the understanding that that reward systems based on market values and reputation systems are in opposition? Or is it that we must create a system where reputation is something of a stepping stone towards a reward system that will eventually become similar to the market value system? I would like to hear your thoughts on this subject.

● **David** That is a question that leads to a lot of confusion and bad policy. There is a movement in the EU and more widely to create a mixture of in-

centives within academic institutions by allowing them to file for patents on discoveries that were made using public funds, sometimes private funds, and by using the capabilities of their research personnel.

We have to decide on what research should be favored in an organization. What research should receive new buildings and new equipment? What research should receive new positions and expanded graduate students, since the graduate students are part of the workforce of the scientific departments? Those demands are driven by perceived profitability in many cases. Administrators and policymakers listen to industry and say, “Industry says this is what we need. This is the direction in which we see advances in science that will be a great benefit to the nation because they will be a great benefit to us.”

There was a famous episode which had to do with the military industrial complex. The head of GM said, “What is good for GM is good for the nation. What is bad for GM harms the nation. Consequently, we are pursuing the national interest by pursuing our profitability and the future wealth of our shareholders.” However, it turns out that shareholders are increasingly a small minority of the population, and not necessarily aware of pos-

sibilities for an advance in science that will possibly displace their industry. They want to sustain their industry. The larger the organization is, the more the internal organization depends upon managing its environment than on managing itself internally. It creates a structure of processing information from the outside, and in order to process information, you need to impose codes. Codes work in two ways. They get better and better the more they are used. The way you classify things gets easier, more refined, and so forth. It eventually blinds you to things that do not fit into a classification, and those are usually new things. New things are often potentially dangerous, things coming into your niche from the outside, things that are on the horizon but are being pursued somewhere else that you do not know about because you have no way of finding out. Consequently, a larger organization pursues a defensive strategy instead of trying to get informed about things. They spend their time defending the existing structure through political instrumentalities and control of public funds. In other words, they move defensively. The larger they are and the more political influence they have, the more you get allocation of resources that is not responding to the potential for the future, but is defending the legacies of the past in not understanding knowledge. It is defending a legacy position by controlling resources.

The mistake of the Bayh-Dole system was that it was misunderstood widely in the EU and many other countries. In France, in conversations with a government official, she did not have a clue of where this came from. However, she responded with '*Le nouveau défi américain*', the 'new American challenge'. They were doing something that was going to displace all the countries, and France

should have this system. However, we do not have a system in America. We have a chaotic government with federal branches that are often in conflict with each other, but we have enormous resources. Therefore, we can waste a lot in a chaotic system in a way that less well-endowed countries are unable to mimic. When some things seem to be working, other people want to imitate it. It is not a good way to guide policy.

One of the things they get wrong is that they put into the university system a conflicting set of motives. In other words, this is the market-oriented direction of research activity, and the internal science community direction of research with two different reward systems. You can either file for a patent, or you can work on publishing a paper in a leading journal that will be peer reviewed and will take a long time to come out. However, you can go to the patent office very quickly, and you want to go to the patent office very quickly. Therefore, as a result, the coexistence of these two reward systems tends to result in both systems' performance being degraded. People try to get out of teaching so that they can spend more time on their research because they are in a great hurry to file many patents, patents to protect their earlier position of their previous patents, so it is a different logic. Consequently, you have both internal struggles sometimes within departments, and internal competition for resources. It tends to pull resources away from the educational function. It shapes the kinds of students you want to admit, and favors students that are useful for supporting research. You can admit a lot of them. You have to house them, and you have to look after them.

Therefore, the system should mix subsystems with different motives and let them transact with

one another across doing what they can do for the other system, and receiving indirect funding through what the business community tells the government that they need to do to fund the public institutions. My motto in this is, when you have two conflicting systems that can work together if they are not intimately connected, you should mix but not blend. Blending means you put into one organization two different reward systems. People in industry will tell you, “That leads eventually to a dysfunctional business when you have two systems, one for recruiting people, and one for advancing them.” You do not necessarily advance them on the criteria with which you recruited them, and vice versa. You do not recruit them with the view that we would like to get people who we want to advance. Rather than cannon fodder for the next commercial war, we will use them, get rid of them when this product is finished, and so forth.

You touched on a key problem where things have gone wrong, because it takes an understanding of the merits of both the public sector and the private sector, and the framework which economists could supply.

● Hayashi I have a feeling that we just heard in one fell swoop a commentary on often discussed recent trends such as altmetrics. There are various different vectors for impact assessment, and as for how to count them, I believe discussion will lead to linking them to rewards systems.

● Floor 2 I am from John Wiley and Sons. Thank you, Professor David, and Professor Murayama, for the good presentations. We are a publisher, and I want to respond to something in Professor Murayama’s presentation on science as a

social system, which I think showed all the stakeholders involved that will be critical in driving to open science. From the publisher perspective, I see two angles. One is to help. There are two challenges that we are all working on. One is to drive behavioral change. This includes publishers, but is probably to help researcher behavior and incentives. I think the second is around infrastructure and sustainability.

On the first, I think Theodore Roosevelt talked about the ‘carrot and stick’ approach. In the transition to open access (or open science, rather) where the article remains and publishing remains an important part of academia and advancement, we can require open data to be a part of that future. Wiley and I know other publishers are experimenting with this. We are preparing open data mandates across a few hundred journals. I think the concern we had was that researchers who are so busy would resist. Would they still want to publish in our journals? What we learned is it is important to make the process easy as part of the submission process that very low-effort. You just drop in the excel tables and it gets sent to the appropriate repository.

The second part is around infrastructure. How do we ensure that our systems are open and interoperable with federated government infrastructure? Taking the example of the geoscientists of the world, if they prefer a certain repository, how can we ensure that it all connects together into one linked approach? This is part of the next steps for all the stakeholders, and publishers can help.

● Murayama Thank you very much. I agree with your views. I did not address the specific instrument to drive culture change or research-

er/institutional behavior. You are right, 'carrot and stick' works. My major concern is for the Japanese community. In Japan, policies are not really easily set up as packages. Some scientific societies are concerned with data repositories, but they do not care about journal publication policies. We need to harmonize the whole ecosystem including publication policy, data/data storage, and an interoperable data system. It would drive the research institutions to change how they store data in repositories and how they interact with other institutions. Otherwise, it is about interoperable infrastructure, so the issue is not impossible. Our data is pretty much not open. Our papers have also not been open. We need money to buy articles, and some articles are stored in NASA's old library, or US military libraries, for example. However, science has been advanced in this situation. In my personal view, we do not need to force researchers to open everything. We can do choose a moderate way of increased circulation of information and sharing between us. I think the publisher's cooperation is very much appreciated.