



A podcast about the economics of trade & policy  
with Chad P. Bown

## Episode 196. How multinationals avoid taxes through technology licensing

[Episode webpage](#)

November 19, 2023

Transcript

(lightly edited)



**Chad Bown:** Multinational companies are everywhere in the global economy. Not only are they the companies carrying out a lot of the imports and exports that takes place internationally, but multinationals also innovate and come up with a lot of the world's ideas. Multinationals hold a lot of the world's intellectual property through things like patents, trademarks, copyrights and trade secrets. Multinationals are also getting paid a lot of money for licensing these ideas to companies in other countries who want to use them.

Multinational companies are also an important and hugely controversial part of the global tax system. When it comes to taxes, many policymakers are convinced that multinationals are not paying their fair share. Policymakers want to change the tax system to do something about it.

This episode explores these issues. What are the patterns of royalty payments involving multinationals and the licensing of their technology? How are these payments complicated by countries having big differences in the tax rates that apply to these multinationals? How would multinationals behave differently if policymakers got rid of really low tax countries called tax havens?



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To tackle all of this, I will be joined by a very special guest.

**Ana Maria Santacreu:** Ana Maria Santacreu, Federal Reserve Bank of St. Louis.

**Chad Bown:** Ana Maria Santacreu is a trade economist and Research Officer at the Federal Reserve Bank of St. Louis. She is an expert in technology licensing, intellectual property, and international tax. Today, Ana Maria is going to share results from some of her research into how multinational companies make licensing decisions, how they shift profits around the world, and how all that might change if policymakers get their way.

Hi, Ana Maria.

**Ana Maria Santacreu:** Hi, Chad.

**Chad Bown:** You are listening to an episode of *Trade Talks*, a podcast about the economics of trade and policy. I'm your host, Chad Bown, the Reginald Jones Senior Fellow, at the Peterson Institute for International Economics in Washington.

## THE EPISODE

**Chad Bown:** Ana Maria, today we are going to get into the weeds of some economic ideas that we have not really explored on *Trade Talks* before, especially when it comes to the details of intellectual property rights. So we're going to have to define some concepts.

To start, what is technology licensing and who does it?

**Ana Maria Santacreu:** Technology licensing is a practice where a company, a licensor, grants permission to another company, the licensee, to use its intellectual property. So think of patents, trademarks, trade secrets.

And this agreement typically involves a payment or a royalty fee from the licensee to the licensor. Now, these licensing deals aren't the typical mom-and-pop arrangements. They are mainly done by big multinational corporations that have a lot of intellectual property as an asset.

As examples, during the COVID 19 pandemic, the development and the manufacturing of vaccines involves significant technology licensing. In the case of Moderna, AstraZeneca, or



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Johnson & Johnson, these are companies that license their vaccine technology to other companies to scale up production and to allow distribution.

Another example is semiconductors. Everyone will have heard of TSMC, which is this Taiwanese company that is the largest manufacturer of semiconductors in the world. This company also operates under a licensing model. They do not develop chip the technology. Instead, what they do is manufacture chips based on technologies that have been created by other companies. For example, they license from companies like Qualcomm, NVIDIA, and MediaTek. These are companies that design semiconductor technologies but don't do the manufacturing.

And technology licensing doesn't only happen in these type of companies. It basically spans across many industries. It happens in retail. For example, Starbucks is a company that has a lot of intellectual property as an asset, and they also rely on technology licensing.

Another sector where technology licensing is very important is software – e.g., Google or Apple. These are companies that rely a lot on technology licensing to put their products into the market worldwide.

**Chad Bown:** Why is technology licensing so important for companies in these types of industries?

**Ana Maria Santacreu:** The reason is that these are sectors that are R&D intensive. That means that a big portion of their business activity and their resources are allocated to research and development.

For example, for industries like pharmaceuticals, semiconductors, and computer and software, between 15-20 percent of the revenues go into research and development.

**Chad Bown:** How do we even measure technology licensing across countries by these multinational firms? From a trade perspective, what are the exports and imports that we need to keep track of?

**Ana Maria Santacreu:** The data that are important to measure international technology licensing are royalty payments. So imagine, for example, Qualcomm or NVIDIA in the US that design the technology to produce chips. Imagine that they license that technology to TSMC in Taiwan.



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Now, TSMC is going to pay royalties to Qualcomm and NVIDIA. That's going to show up as an export of technology from the US – i.e., from Qualcomm to Taiwan – and an import of technology for Taiwan from the US.

**Chad Bown:** What stands out when you look at international technology licensing data? Are there big trends?

**Ana Maria Santacreu:** Let's start in 1995. This is a year in which the WTO was established and TRIPS, which is this a multilateral agreement that includes intellectual property provisions that was established as part of the WTO. What the TRIPS agreement had is minimum standards of IP protection that countries that wanted to be part of that agreement had to comply with. And this was especially important for developing countries because these were the countries that had to tighten up their intellectual property protection.

What I see in the data is that, after 1995, there was a huge increase in technology licensing in the world. And what is very interesting is that this increase was very different from the trend that we observe in merchandise trade. For example, between 1995 and 2019, merchandise trade increased by a factor of 1.3, but technology licensing increased by a factor of 3.

What this trend suggests is that technology licensing has become very important over time.

**Chad Bown:** Over time, technology licensing is becoming bigger and bigger. These multinational firms are getting paid a lot more money to share their ideas with a company in some other country. But tell us more about the patterns of technology being traded by these multinationals across countries. Which countries have companies that are paying royalties for ideas and which countries have the companies that are getting paid?

**Ana Maria Santacreu:** Technology licensing across countries is characterized first by advanced countries that are very productive, that do a lot of research and development – e.g., the US, Germany, and Japan – exporting a lot of licensing to other countries, hence receiving a lot of royalties.

Second, developing countries that have improved their intellectual property enforcement are countries that tend to receive more technology from the rest of the world – e.g., China and India.



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Third, countries that are closer to each other geographically, or culturally – like Canada and the US or Germany and France – tend to exchange more technology with each other.

**Chad Bown:** This technology and international licensing data is super interesting. For those of us who are new to this, to start, there appears to be some similarities between how firms trade their ideas internationally and what we know about how firms trade merchandise goods internationally.

OK. Now, Ana Maria, what got you first interested in looking into this international licensing data?

**Ana Maria Santacreu:** When I started the project, I was very interested in the US-China trade war. There were all these disputes over technology misappropriation by China. There were discussions on forced technology transfer, where American companies that wanted to operate in the Chinese market they had to create joint ventures with local firms and transfer all of their technology for free.

So, I started looking at royalty payments between the US and China, and what I saw is that there had been a huge increase in the amount of royalty payments that China was making to the US, especially from the 2000s. And these trends aligned pretty well with the theory that I had in mind that a rich country like the US (that was doing a lot of innovation) and a big country like China (that had been reforming its intellectual property rights) were going to exchange a lot of technology.

But to understand technology licensing between the US and China, you also want to understand what's happening with other countries in the world.

For example, what is technology licensing like between China and other regions? How does the US export technology to other countries?

And when I looked at royalty payments across other countries in the world, I saw that there was something weird going on, and I realized that there was a big missing part of the story.

**Chad Bown:** The royalty payments between the US and China looked OK, but royalty payments between other countries out there in the world looked weird.

Why? What was the missing part of the story?



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**Ana Maria Santacreu:** Tax havens.

Tax havens are countries that have very low tax rates, and we know that these countries are special because they don't have a lot of economic activity.

So think, for example, of Bermuda or the Cayman Islands. They don't do a lot of research and development, but there's a lot of technology licensing that is happening between these countries and innovative countries.

**Chad Bown:** Tell us more. What was it about the data for these tax havens that gave you the clue that something weird was going on with multinational companies.

**Ana Maria Santacreu:** So take the case of a country like Bermuda, which is well known for their beaches and their tourism, but where there's not a lot of research and development activities.

In Bermuda, the fees that it receives for technology that it is exporting to other countries are more than 150 percent than their GDP. This is in contrast to countries that are innovative and that do a lot of research and development, like the US, the United Kingdom, or Japan, where this number is about 0.5 to 1 percent of their GDP.

Furthermore, these tax havens like Bermuda or Luxembourg, despite not doing a lot of innovation themselves, they have net licensing trade surpluses within innovative countries like the US. What that means is that they are receiving more royalty payments from these developed countries than what they are paying in return for the use of the technology.

When it comes to developed countries, it's not only the US that is running a big deficit with these tax havens. We have other innovative countries like Germany, the UK, and France, that are running sizable trade deficits when it comes to technology licensing with the major tax havens.

And what these developed countries have in common is that they have high corporate tax rates. So this made me think that profit shifting may be a big part of this story.

**Chad Bown:** Profit shifting is moving profitable activity from one jurisdiction with a high tax rate to a second jurisdiction with a lower tax rate just to pay lower taxes. And profit shifting is something you are going to examine in your analysis of international technology licensing.



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OK. Now, I want to step back and talk about the theory. Given the world out there, how does a multinational company that might be generating ideas in one country think about licensing its technology to its affiliates in other countries. What are some of the tradeoffs that the multinational has to deal with?

**Ana Maria Santacreu:** Imagine a multinational corporation in the US that does research and development and comes up with a new idea. Imagine that this idea cannot be produced in the US and exported to another country. Instead, what the company has to do is to set up an affiliate in another country to commercialize the product in the world.

The first decision that the multinational company in the US is going to make is where to open this affiliate. It's going to look for a country that is productive, that has good intellectual property rights (so there's a lower risk of someone in the country imitating its technology), and then it's going to set up the affiliate in this country, it's going to license the technology in this country, and it's going to receive royalties from that country.

Now imagine that we're also in a world in which there are tax differences across countries. So what the multinational corporation in the US has to decide is whether it's going to license the technology to that affiliate and receive royalties that are going to be taxed at the rate of the US.

Alternatively, it could take advantage of these tax differences across countries, and what it could do is to sell the intellectual property to the affiliate in that country so that all the profits that are generated with that intellectual property are going to be taxed at the tax rate of the affiliate in that country.

So think, for example, of Ireland. What the multinational corporation is achieving by doing that is shifting profits from the US – which could be taxed at a higher tax rate – to Ireland – which are taxed at a low tax rate. In essence, it is maximizing its global profits.

**Chad Bown:** Ireland is one country with super low tax rates, but Ireland might also be attractive for US multinationals because it is part of the European Union. The US multinational's affiliate that is operating in Ireland could export to the EU from there, Ireland has good intellectual property rights protection, and it has a skilled workforce to make things.

But what about the case of the pure tax havens out there, like a Bermuda?



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**Ana Maria Santacreu:** So in that case, what's going to happen is that the multinational corporation in the US is going to sell the intellectual property to an affiliate in Bermuda. And now this affiliate is going to license the use of this intellectual property to a firm in a country like France where production is going to happen, and all the royalties that this French firm is going to pay to Bermuda are going to be taxed at the rate of Bermuda.

**Chad Bown:** Multinationals may license their technologies to take advantage of different economic characteristics between countries – this is sort of like international trade. But multinationals also may also sell their technologies to affiliates in other countries to take advantage of different corporate tax rates.

So that's the theory. When you look at the data through the lens of this theory and your model, what do you find?

**Ana Maria Santacreu:** Rich countries that do a lot of research and development tend to export more technology on average. Countries that are large, that are very productive, and that have good intellectual property protection tend to receive more royalties on average. And countries that are closer to each other, both geographically or culturally, tend to engage in more royalty payments, in more technology licensing. And this is exactly identical to what we found in the raw data. So there's nothing surprising here.

But what is surprising is that I find a big role of differences in corporate tax rates across countries when explaining this data on royalty payments. In particular, what I find is that countries that have higher tax rates compared to their trading partners tend to pay more royalty payments than what they receive in return.

For example, in the case of the US, what we see is that it's paying more royalties to countries like Bermuda or Ireland than it is receiving from these countries. So what that suggests is that multinationals in the US are taking advantage of these tax differences across countries to shift profits and minimize their tax liabilities.

**Chad Bown:** Firms shift profits and minimize their tax liabilities, but they are just responding to incentives out there found in countries' tax laws. Why is this a problem?

**Ana Maria Santacreu:** Many argue that this has created some sort of prisoner's dilemma where countries are lowering tax rates more than they would like to do.





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Governments are fearful that if they increase rates, companies are going to shift their intellectual property to countries that are more tax friendly. What we see is that countries are lowering tax rates, and we have a race to the bottom.

So in the late 2021, the OECD was leading negotiations that led to a multilateral tax reform that was proposing a global minimum tax of 15 percent.

**Chad Bown:** Policymakers globally recognized this race to the bottom problem and the OECD helped them negotiate a worldwide arrangement where they would all agree to impose a minimum tax of at least 15 percent. Now, the United States has NOT passed into law the OECD global minimum tax - that was entire saga that we covered in Episode 165.

But for research purposes what you are going to do is to take your model and use it to examine what might happen if countries globally were to do something like that. Maybe not a common global minimum tax, but at least getting rid of the effects of these tax havens somehow. Specifically what do you look at?

**Ana Maria Santacreu:** I'm going to explore what international technology licensing and innovation would have been in a world where each country taxed its firm's foreign profits at the same rate as its domestic profits.

For example, imagine a multinational corporation in the US where domestic profits are going to be taxed at 21 percent. Now imagine that this company has an affiliate in Bermuda and those profits were taxed at 0 percent. With my policy they are also going to be taxed at 21 percent.

Now take a multinational in Ireland where profits are taxed at 12 percent. The foreign profits are going to be taxed at 12 percent. So I'm going to keep heterogeneity in the tax rates, at which different countries are taxing their profits, but I'm going to equalize the tax rates on domestic profits and foreign profits.

**Chad Bown:** What do you find?

**Ana Maria Santacreu:** I find that imposing additional taxes on foreign profits is going to have a significant impact on international technology licensing. What I find is that now developed countries are not going to have an incentive to sell their intellectual property to a foreign affiliate because tax rates are going to be the same as in the domestic country.



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We're going to see an increase in royalty payments. For example, now the US, instead of paying royalties to Bermuda or Ireland, is going to start receiving royalties from these countries.

And this is not just the case of the US. We see that other developed countries like Germany, France, and the United Kingdom are going to start receiving more royalty payments. In total, developed countries are going to double the amount of royalty payments that they are going to be receiving from tax havens.

And this is going to have big distributional consequences, especially for tax havens, because now they are going to lose the royalty payments that they were receiving.

**Chad Bown:** There are losses to the tax haven countries, but there are big gains in royalty payments coming to the multinationals in the US, Germany, France and other innovative countries that their governments can then collect tax revenue on. In the least, this helps to solve the race to the bottom problem and by acting collectively governments can generate tax revenue more effectively. But does this come for free?

**Ana Maria Santacreu:** Unfortunately, this does not come for free. Despite the rise of royalty payments in innovative and developed countries – because these royalty payments are going to be taxed at a higher tax rate – this could have a negative impact on research and development. It's going to decrease innovation, and this may have long term growth consequences.

What this exercise is telling us is that there is a tradeoff of this type of policy. You can end the tax haven problem by taxing foreign profits at a higher rate, but the tradeoff is that if you push too far, the innovators that are doing research and development may have less incentive to innovate.

**Chad Bown:** So the key question turns on how big this disincentive to innovate really is. One issue is whether these multinational firms were at the socially optimal level of innovation and R&D in the first place.

**Ana Maria Santacreu:** So it doesn't necessarily imply that by reducing R&D, countries like the US or Germany or Japan are going to depart from this optimal outcome of R&D. It could very well be that they were doing too much innovation in the first place. Essentially, innovators in the US or in Germany or in Japan were engaging in too much R&D because the perceived value of the R&D that they are doing was artificially inflated by this ability to shift profits to these tax havens.



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**Chad Bown:** Maybe as an example of too much innovation, suppose there is a global coffee company out there. Because the taxes it faces on its profits are so low – because of these tax havens – the coffee company innovates too much. It does more R&D than society needs. It starts hiring extra scientists and sending them into a basement lab somewhere to come up with yet one more type of half caffeinated double pump whipped vanilla latte with pumpkin spice and peppermint.

The idea is that maybe some of these multinationals are innovating too much and taxing profits might prevent the socially worst ideas from being invented.

That is one possible reason why collectively raising taxes on multinationals might not be that bad. Are there others?

**Ana Maria Santacreu:** More generally, there is this broader question of how closely these profits that are generated by these companies align with underlying research and development activities. For example, some argue that these profits are extraordinary. The profits go beyond their usual returns, and these companies would still do the same R&D efforts that they would do even if they were subjected to global taxation.

The idea is that there are certain aspects possibly related to branding or market dominance that are reflected in markups that are not reflected in the true value of the technology that are going to increase profits. So policies that are going to tax foreign profits at a higher rate are not really going to affect this R&D activities that these firms are doing.

Now this is an important question, but it's also a very complex question to address because we've never experienced a world where there are global minimum tax rules, and therefore there's uncertainty on how this proposed global taxation policies might truly impact this balance between profits, innovation, and research efforts.

**Chad Bown:** Ana Maria, as my last question, if you could provide policymakers and researchers with one takeaway from your research, what would it be?

**Ana Maria Santacreu:** So my research has uncovered one particular channel in which multinational corporations are shifting profits around the world, which is technology licensing.

What that means is that if governments get together and agree to a global tax that can avoid these profit shifting practices, then that is going to affect incentives of firms to do research and



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development. This is going to have an impact on innovation and long term prospects, and we don't really know what the side effects of these policies are going to be.

What this suggests is that these policies are going to open up many other questions that we don't have a good answer to, but this research is a first step to try to understand how there are things other than tax revenues that are going to be affected through these types of policies.

**Chad Bown:** Ana Maria, thank you very much.

**Ana Maria Santacreu:** Thank you, Chad.

## **GOODBYE FOR NOW**

**Chad Bown:** And that is all for *Trade Talks*.

A huge thanks to Ana Maria Santacreu at the Federal Reserve Bank of St Louis. Do check out Ana Maria's paper titled "International Technology Licensing, Intellectual Property Rights and Tax Havens." It will soon be published in the journal *The Review of Economics and Statistics* and I will post a link to the paper on the episode page of the *Trade Talks* website.

Thanks to Melina Kolb, our supervising producer. Thanks to Sarah Tew, on digital. As always, thanks to Collin Warren, our audio guy.

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<insert super funny double underscore joke here>. ■

## **Read more...**

- Santacreu, Ana Maria. Forthcoming. [International Technology Licensing, Intellectual Property Rights and Tax Havens](#). *The Review of Economics and Statistics*.