

OPPORTUNITIES TO REAP FINANCING THROUGH IP FOR INNOVATION

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The past two to three decades have been frequently called the “pro-patent” or “pro-IP” era. This period has been characterized by steadily increasing patent and intellectual property (IP) filings with major IP offices throughout the world as well as widening ways of using IP in business contexts. In a transition towards knowledge-based economies, this development follows the observation that the value of firms is increasingly determined by intangible assets, such as know-how, brands, or technological skills. According to a study by Ocean Tomo, 84% of the value of firms represented in the S&P500 stock index in 2015 could be accounted for by intangible assets, while only 16% of the value was determined by tangible assets such as physical property. In 1973, the corresponding shares were 17% and 83%, respectively, hence almost reversed.¹

It comes, therefore, as no surprise that public policymakers have 1) put considerable efforts in place to make businesses aware of the importance of protecting their intangible assets against unauthorized use and/or unlawful copying by competitors, and have 2) advocated the use of intellectual property rights (IPRs) as a major means to achieve the respective protection—as IP rights have been created specifically for that purpose. To the extent that such awareness raising has reached businesses—which is a question in its own right—one can frequently observe that many firms have started to understand IPRs as a form of insurance a company should have. While such a view can be sufficient for a considerable share of firms, the “insurance-only” stance may, however, obscure perspectives of using IPRs in different and more proactive ways, such as for financing and revenue-generating purposes.

This chapter tries to promote a different view on IP—namely, as a tool that supports the financing of a firm as well as a tool to directly generate money that can fund and finance further

innovative activities.² Against this backdrop, the chapter addresses major opportunities with respect to the financing of innovations and IP, but also some notable challenges. At the end, it will discuss recommendations for businesses as well as policymakers in government.

The role(s) of IP in securing financing and funding of a firm

Corporate finance, as a specific area of finance, is concerned with financing the decisions of businesses with the goal of maximizing company (share) value. Financing decisions hereby are meant, amongst others, to define “a mix that maximizes the value of projects taken” with the mix covering debt and equity.³ According to Divestopedia, “...in short, any operation or aspect that involves the finances of an organization is part of corporate finance.”⁴

Discussions in corporate finance, therefore, focus on different sources of funding—be it debt, such as loans, or equity, such as investors buying stocks of a company. Arguably, grants for research and development (R&D) also have a financing functioning. Along these three dimensions, IPRs can have an important supportive function to leverage finance and to fund innovative activities.

IP and equity

In the case of equity, it is well known that IP can be particularly important for raising investments and investor interest.⁵ IPRs, and in particular patents, are especially significant for start-ups that aim to attract venture capital (VC).

To understand and experience this significance in practice, beyond mere statistics and marketing of patent attorneys, one only needs to turn to the many now popular business reality television shows where start-ups present their business ideas to a jury of potential investors. The magazine *Forbes*, for example, states in one of its pieces of advice given to entrepreneurs: “VC firms put their money where there’s IP. Look no further than Shark Tank [the United States of America (U.S.) version of such a business reality TV show, aired by ABC]. Have you ever watched an episode where the Sharks fail to grill the entrepreneurs on whether they have the appropriate IP protection?”⁶ An example given in the context of the Shark Tank show is that of entrepreneur Tara Brown.⁷ By asking the investors for funding to develop the IP of her firm further, she was able to increase sales for a novel non-heat hair roller from US\$70,000 before the show aired to more than US\$30 million within three months after the show.

Apart from such anecdotal evidence, one also has to underline the many academic papers that evidence the positive relationship between IP protection and VC. A good example here is the meta-analysis of Hall, who looked at 26 such studies.⁸ From all these studies, the conclusion of the author is that “...it is clear that venture capitalists prefer to fund firms that have patent applications underway”. The author also concludes that different studies offer different explanations for this positive relationship because “...some emphasize the relationship of patents to the underlying quality of the firm’s inventions, while others see the patents as pure signals. Still, others emphasize the contribution of the patent grant to appropriability.”⁹

The reasons for the significance of IP for investors are, therefore, manifold. First, start-ups—which usually lack larger sales records—can prove that their ideas have value. Their patented inventions must pass the patentability criteria during patent examination. Second, patents also provide for some assurance that the inventions behind a start-up may not be easily copied by other firms. Third, should the start-up go bust, the patents remain and can be sold or licensed to other entities, i.e., losses of the investors can be limited. And fourth, the patents may be “just a signal” to catch the attention of investors, to make the start-up more easily spottable in the market.

The suitability of different IP rights to support finance very much depends on industries. For some industries, such as life sciences or other high-tech industries, patents are of such importance that they can be considered a currency for business formation, growth, and sustenance. In other industries, patents play less of a role, but other forms of IP might be significant—for example, trademarks that protect brands. Furthermore, entire business models can be built on top of IP rights. Franchising, as a form of IP commercialization, can be mentioned in this context.

IPR in debt financing

IPRs may also play a role in debt financing. Patents and other forms of IP rights can be used as collateral for loans.¹⁰ While the rationales for having IP rights back up loans may be similar to those used to back up equity investments, IP used for debt

finance is far less common than IP-backed equity counterparts. That said, it may still be a surprisingly vivid market. There are estimates that “...venture lenders, including leader Silicon Valley bank and specialized nonbank lenders, supply roughly US\$5 billion to start-ups annually”, and—in the context of debt finance—that “...patent assets and their exchange can play a meaningful friction-reducing role in innovation financing.”¹¹ On the other hand, there are study authors who state that “...only anecdotal evidence exists that ventures use patents as collateral to access debt financing.”¹² One can interpret these findings in two ways. First, there may indeed be opportunities for using IP in debt finance. Second, there may also be challenges ahead, and this is why the market for such finance exists but is small. We will discuss such challenges later in the chapter. Definitely, though, there is a lack of research and data on the use of IP-backed collateral for debt financing of firms.

The challenges have prompted some governments to intervene and foster the markets for IP-backed debt finance. China, for example, operates government programs that promote the use of IP rights as collateral by providing interest subsidies, specific funds for banks, as well as valuation guidelines and tools to lower the lending risk. Between 2018 and September 2019, it is reported that in the Guangdong province alone, the total amount of patent-collateralized loans may be worth 30 billion yuan (more than US\$4 billion), and that “thousands” of companies have benefitted from the schemes.¹³ A scheme in Singapore to support IP-collateralization that was launched in 2014 was, however, discontinued in 2018.¹⁴ Other examples include the Republic of Korea, where the Korean Development Bank (KDB) is said to have advanced US\$100 million to “...80 IP rich companies in the form of collateralized loans” and the IP Financing Scheme (IPFS) program of Malaysia, which “...is a RM200 million IP-financing program offered through Malaysian Debt Ventures Bhd” to support the use of IP as collateral.¹⁵ One issue with these government programs is that properly detailed evaluations of their outcomes do not seem to exist, at least publicly, that discuss in detail the successes and challenges of the schemes.

IP in the context of R&D grants

An often-overlooked financing function of IP rights may exist in the context of (government-provided) R&D grants. Here, we see two main strands with subtle differences in how IPRs are handled.

In the first strand, many government R&D subsidy programs require that patents and other forms of IP are filed/registered as a result of (successful) R&D projects. Governments want to foster research that results in the successful commercialization of products and services in the market, for which having IP rights is a requirement. However, policymakers and firms should take a very careful look at how the grant schemes are designed. The big fallacy is to believe that an applied-for IP right is equal to a commercialized R&D result. In fact, considerable follow-up research and development to reach, and move beyond, prototype stage may still be needed after a patent has been, for example, filed for an invention.

In the Czech Republic, a system of performance-based research funding in place in the early 2010 years provided points for any patents and utility models that were filed in the course of research projects.¹⁶ Funding was made available to major actors of the Czech innovation system as a function of points obtained. This has led to a proliferation of utility model (UM) filings, which are non-examined patent-like IP rights. In essence, by using utility models, which are not substantively examined for whether the claims brought forward are worthy of IP protection, Czech innovators had the possibility to “print money” by registering as many utility models as possible. The national system by which R&D funding was allocated did not care whether the registered UMs and the inventions behind them had any reasonable commercial prospects. The system, therefore, led to increased costs for the Czech innovation system but not to more innovations entering the market. The system has since been reformed. The major lesson learned for research funders is that performance metrics for IP outputs must include an assessment of the potential commercial value and market outlook.¹⁷

In the second strand, another often-overlooked financing function of IP rights can be seen in the growing popularity of grants for research consortia, and in particular, transnational research consortia. The European Union (EU) has been at the forefront of the respective development. It has enacted different framework programs for R&D—now in its newest iteration called Horizon-Europe—that require parties from different countries to team up and work on common research projects.¹⁸ Participating in programs like Horizon means additional sources of funding and finance of R&D, on top of other benefits, such as knowledge and technology transfer among consortium partners and the establishment of networks.

The specialty of IP in consortia-based R&D funding lies in the contracts that govern the consortia—the consortia agreements. Here, participants, in their different contributing roles to a project, must know what type of existing know-how and IP is allowed to be used by and shared with the different partners (so-called background IP). Similarly, there must be an agreement as to how jointly developed research results, including, for example, patents, are to be shared among partners (so-called foreground IP). This means that there are quite a few demands laid upon the IP knowledge and IP management skills of consortia partners. Such IP management requires not only registration and filing of IP, but also strategic thinking and negotiating skills for the consortia contracts. However, the potential benefits—such as network formation, access to know-how by the partners, and learning—may outweigh the efforts.

Exchanges and marketplaces for IP—a source for innovation finance?

Soaring IP activities amid challenging issues for IP marketplaces

If IP can be used for both equity and debt finance, the question may then arise whether IP can be used to leverage financing opportunities through exchanges and marketplaces, the same

way that stock and/or bond exchanges can be used for capital finance by firms. After all, the usage of the word “assets” and “property” suggests that IP shares a number of characteristics with financial securities. As already mentioned, there is an ever-increasing supply of IP, which would suggest liquidity. Even if the ownership of IP is not transferred, there is clear evidence that (mostly bi-lateral) licensing is a significant activity to raise money for many companies, and this significance has been increasing over time.¹⁹

There is a short and a long answer to this question: the short answer is there may be respective opportunities. The long answer is that the issue at hand is rather complex and requires differentiated thinking. At the onset, in a very well-written essay discussing IP—and more precisely, patent—marketplaces, study authors Hagiu and Yoffie note:²⁰

“The patent market consists mainly of bilateral transactions, either sales or cross-licenses, between large companies. Such deals are privately negotiated and might involve hundreds or thousands of patents...outside of these bilateral deals, patent buyers and sellers frequently have a hard time finding each other. There is no eBay, Amazon, New York Stock Exchange, or Kelley’s Blue Book equivalent for patents, and when buyers and sellers do find each other, they usually negotiate under enormous uncertainty: prices of similar patents vary widely from transaction to transaction and the terms of the transactions (including prices) are often secret and confidential.”

Hagiu & Yaffie seem to focus their analysis on the sheer size of the markets. Indeed, there are no IP marketplaces that have the size and volume of a New York Stock Exchange or that of the mentioned large Internet platforms for trading physical goods. But there are numerous smaller initiatives to establish IP marketplaces, with some at least seemingly succeeding in niche markets, while others disappear after a short time. The latter phenomenon seems particularly common for marketplaces that rely solely on electronic trade.

A study by the consulting firm Technopolis for the European Agency for SMEs (EASME) and the European Commission sought to answer specific questions that might explain the seeming paradox.²¹ For example, why do so many initiatives fail with respect to the establishment of IP marketplaces, and none reach truly large sizes despite the soaring use of IP and the significance of IP trade and licensing? What can then be learned to establish better-suited mechanisms that aid in collaborations to commercialize IP for promoting innovation?

Looking at the relevant literature and data, as well as executing a thorough interview program with IP finance and tech transfer experts, it emerged that one major difficulty for developing IP markets further is that not all patent/IP licensing is the same. The most crucial distinction seems to be that there are two different market segments—“stick licensing” and “carrot licensing”:²²

- “Stick licensing” refers to the situation where a technology is already used by a company, and the holder of the underlying IP rights (a different company) wants the

technology-using firm to obtain a license. This kind of licensing relies heavily on litigation—or the threat of litigation—against alleged IP infringers. It is, therefore, also termed as enforcement or assertion licensing. In discussions on patent/IP monetization markets or brokered IP/patent markets, it is usually this type of licensing and market segment that is referred to.

- “Carrot licensing” describes a different situation “...where parties are interested in a certain technology or knowledge and thus actively pursue a license.... This corresponds in many instances not only to the licensing of patents, but also know-how, i.e., technology licensing.”²³ In carrot licensing, therefore, a technology transfer takes place.

The distinction is important as both types of licensing have different characteristics and potential public support needs—even if the boundaries between the two markets are also to an extent fluid.²⁴

The “stick licensing” markets

In the case of stick licensing, one significant lever for policymakers is enforcement—the better the enforcement options, the more this IP licensing market segment will thrive. This segment of IP transfer, licensing, or IP monetization is the domain of mostly private patent brokers, which are usually small firms that specialize in monetizing IP portfolios. At any time, there may be a high two-digit to low three-digit number of such brokers operating worldwide. The strong reliance on the possibility to litigate is evidenced in the marketing of a number of these firms. They may offer outright support to firms in following up on patent infringements and brokering licensing deals. Some of the firms successfully operate marketplaces of their own, where the listings resemble listings of tradable financial securities. One can find “bid” and “ask” prices for IP portfolios, for example.

A revealing and important piece of information on such exchanges is the availability of evidence of use (EoU) for listed IP packages. EoUs are being compiled to demonstrate that some market players may already be using patented technologies but fail to pay royalties to owners of the respective patents. Hence, if there is a good EoU, the related IP portfolios become financially attractive. Whoever owns them gets the right to sue said market players for patent infringement and obtain royalty payments—mostly through settlement out of court, as litigation in the courts can be a lengthy, expensive, and risky option for both defendants and plaintiffs.

Another feature of stick licensing is that it is mostly (larger) portfolios of IP rights for a technology that are the subject of interest. The reason is because it is much easier to challenge a single patent—for example, in terms of its validity—which is an important defense for alleged patent infringing parties. Also notable in the stick market is that technology transfer is taking place to a lesser extent, if at all. This reflects the observation that patent infringers have been able to put the technology to use without exchanging with the patent owners, although this is unlawful. Hence, patents listed in stick markets may resemble

to an extent the physical goods markets: it is more about the patents (as “commodities”) being traded and, to a lesser extent, about the technology, which includes both the patents and the know-how to put the patents to use.

As a bottom line, stick licensing markets may provide an opportunity for firms to obtain finance via the services and marketplaces of patent/IP brokers, if they have IP of reasonable quality and portfolio sizes that may already be partially infringed on or used by other parties. For many public policymakers, however, driving the market through increased litigation possibilities may not be very appealing—amidst a fiery debate about whether increased litigation actually spurs innovation or not, in a market where enforcement-related IP licensing agreements that are settled out of court make very few details public with respect to the terms of the agreements, and in battles between parties where there may be no clear black-and-white.

The “carrot licensing” markets

Once government policymakers are aware of the existence of different IP trade and licensing segments and realize that certain actions on their part may have effects that are difficult to advertise to their constituents, they may be tempted to focus specifically on the carrot licensing market segments. After all, this sees benevolently collaborating partners with little to no dispute, at least initially, harmonically trying to cover complementary needs which will result in the (co-)development of new innovations. Would it not be good to have marketplaces specifically for that purpose—to allow sellers and buyers of the respective IP to find each other more easily, given that unsuccessful “matchmaking” has been identified as a major barrier to technology transfer?²⁵

The respective challenges for policymakers to support carrot licensing may turn out to be even higher than for the stick licensing markets.²⁶ One major issue is that in carrot licensing markets, where there is a technological gap to be covered for a company, an existing patent is highly unlikely to be a turnkey solution for the gap. There is a need to adapt the technology to the respective use case. This will usually require further development of the initial patent. It entails that both parties—the hopeful licensor and the licensee—must develop together a common understanding of the problems to be solved and what the patented technology can and cannot contribute to the solution. It also entails putting to use the know-how of the inventor regarding the invention—know-how that is hard to fully embody in the few pages that make up a patent specification. The Technopolis study has illustrated that such “adaptation” may go as far as the licensor being able to help develop a business use case for his/her licensee. Negotiation experience, cultural differences between the parties, and common R&D become a topic, amongst others. Hence, in carrot licensing, one can usually observe a shift from the pure transfer of IP to the transfer of technology and knowledge accompanied by co-development efforts. Trade or exchange takes place in earlier phases of the development of innovation compared to stick licensing. The situation is further aggravated by the fact that the timing must be right: the potential licensee must have a technology

need exactly at the time a corresponding technology is made available and patented.

Against this backdrop, it becomes clear that setting up marketplaces that treat IP as a tradable uniform commodity akin to iron ore will face particular difficulties in the context of carrot licensing. The more successful of these marketplaces will operate in highly personnel-intensive manners, with an (electronic) exchange being at best an auxiliary tool. Their mode of operation will more closely resemble that of consulting firms, where able experts support the “buyers” and “sellers” of the IP/technology to align their mutual understanding, co-develop the innovations further, create use cases, etc. For firms that seek to find licensing partners—and hence further financing—by placing their patents simply on an electronic exchange, this is bad news. Chances are high that the posted patent will just stay there, listed forever. Significantly more effort is needed to commercialize the patent. For policymakers, the Technopolis study delivers the message that there is no silver bullet for improving the IP markets by establishing a purely electronic IP marketplace with public funds.²⁷ Rather, a bundle of measures is necessary, and, even then, persistence, as well as realistic expectations, may be needed to see the efforts come to fruition.

Common issues in all forms of IP-supported finance

Generally, neither the stick nor the carrot licensing markets can be described as highly liquid, with successful carrot licensing agreements being less commonplace than their enforcement-related counterparts. One problem or barrier to all types of IP finance activities—be it debt or equity finance—is valuation.²⁸ Intellectual property differs from real property in that the value of IP is very context specific. By definition, a patent, for example, protects a unique invention. Hence, patents cannot be a uniform commodity, such as iron ore. Moreover, the value of the same IP may be different for different companies. One IP portfolio may be very valuable for a company in a certain technology or market position, while, for another firm, the same IP portfolio may be worthless. One particular piece of IP by itself may be worthless, but as part of a portfolio of rights may be extremely valuable. Eventually, one must conclude that there is no such thing as a uniformly-accepted standard method for valuing IP.

Given the sparsity of information on already struck deals, it is no surprise that intermediaries, such as brokers, licensors, and licensees, find it difficult to price a license. Taken together, these factors also explain why purely electronic IP marketplaces may find it so hard to succeed: operators must cater to heterogeneous rather than homogenous goods. There is hence a strong need for human interaction and intermediation for valuing the IP. This also applies to stick licensing, even if the respective requirements in carrot licensing are arguably higher.

The valuation, liquidity, and enforceability challenges described are also major challenges for using IP as collateral in debt finance. On top of these three barriers, there are also barriers unique to IP-based debt financing. One such barrier is banking regulations.²⁹ Standards like Basel-III set a very strict framework of requirements on how much capital a bank needs to set aside

to match the risks associated with certain types of collateral. IP may not meet these criteria. Eventually, one also has to see that while venture funders take a look at the company and its future prospects as a whole, debt funders are restricted to solely assessing the collateral, i.e., the IP.³⁰ This may be one important factor for why equity-based IP finance is currently more successful than the still nascent IP-backed debt finance.

Conclusions and recommendations

The following are the major conclusions of this chapter:

- There are indeed numerous opportunities to use IP for financing innovation for many firms, if they understand IP rights not only as an insurance policy but also as an active tool for finance purposes.
- However, it is evident that some types of uses of IP finance are more challenging to implement than others.
- Some types of uses of IP for finance—such as IP in consortia agreements in collaborative settings—constitute particularly untapped potential.
- Good know-how of the workings of the IP system in general, the potential value different types of intellectual assets and IP in a company might have, as well as excellent IP management skills are key for success.

A respective set of recommendations for both policymakers and firms, therefore, should build on improving a differentiated know-how and information base around IP-based finance. Against this backdrop, the following recommendations for policymakers and firms seem sensible.

Fostering the use of IP audits by firms

Firms should use offerings that provide for an assessment of all of their IP assets, while governments should implement respective schemes for first-time IP audits and improve existing schemes for firms.

Many countries have, with various degrees of success, implemented publicly supported “first” audits of the IP situation of a firm. Running under different names such as “IP Audits Plus” (United Kingdom), “IP Prediagnosis” (France), or “discover. IP” (Austria), these schemes attempt to analyze the whole IP situation of a firm and identify where potentially valuable intellectual assets and IP may be found. Firms should be made aware of and use such offerings. Policymakers should look at implementing respective schemes, if they have not done so, and improving the existing ones. A key success factor is the availability of well-trained service-providing staff that can bridge technical, legal, and management/business know-how and that is able to develop, with the consulted firm, a joint strategic understanding of the IP of the firm. Complementary measures should be considered, such as individual IP coaching after the initial audit has taken place, to ensure proper implementation of recommendations, or the use of self-assessment tools (e.g.,

prior to an audit) such as the ipAwarenessAssessment web tool of the United States Patent and Trademark Office (USPTO) or the IP Healthcheck questionnaire of the United Kingdom (U.K.) IP Office.

Improving the know-how of firms in relation to the usage of IP in collaborative settings

Firms in sectors where (R&D) collaborations are a topic need to be well-versed in the management of IP rights in collaborative settings, and governments should ensure adequate awareness raising in this regard.

With the growing prevalence of R&D consortia funding, open innovation approaches, and even “straightforward” licensing, firms must improve their know-how regarding how to manage their IP in such setups. In many countries, policymakers have yet to improve respective support efforts. While there seems to be a lot of material available with respect to the “basics” of IP, such as how to file a patent or trademark, the use of IP in collaborations is more sparsely covered. There is a need for a comprehensive support package that may cover things like negotiation tips, information collection on licensing terms, or support in the provision of what firms should look for when drafting a licensing agreement. Some countries have successfully developed model licensing contracts, for example, the United Kingdom’s Lamberts Toolkit, Austria’s Intellectual Property Agreement Guide (IPAG), Ireland’s Knowledge Transfer Ireland (KTI) model agreements, and Germany’s BMWi model agreements for R&D collaborations. Most of these attempts have their roots in university-industry technology transfer licensing. There may be a need for adaptation to business-to-business (B2B) settings. Also, it might be good to have an international exchange—sharing experience with respective solutions—followed by implementation of successful models in countries that have not yet worked on offerings.

Improving the know-how of intermediaries

Among business finance intermediaries, non-IP specialists need basic IP know-how too.

Apart from addressing firms directly, there is also a need to improve the IP know-how of important stakeholders and business intermediaries in the finance sector. This includes educating banks—for example, with training programs for how to value IP. Other important target groups are investor associations, R&D and innovation supporting agencies, cluster organizations, etc.

Taking a careful stance to foster IP markets

Policymakers need to consider differentiated approaches if they aim to design and implement measures to improve the IP finance markets.

Experience has shown that a number of seemingly straightforward solutions to the challenges of IP finance and licensing markets should be taken with a grain of salt:

- The first solution concerns the establishment of electronic IP marketplaces. Given the non-commodity character of IP as described and the valuation issues, it is highly likely that simple electronic marketplaces will not deliver on expectations. More successful private marketplaces are very personnel-intensive undertakings, akin to consulting firms.
- Another solution concerns the use of “simple” IP filing indicators as a major requirement to obtain (R&D) funding. The example in the article shows that ill-designed systems may primarily produce costs and hardly any positive effects. Policymakers wanting to advance technology transfer from university to industry should not count patents and IP alone but should pay more attention to the commercial outlook or context of the applied-for patents and IP.

Creating context-specific approaches

Businesses in industries where IP is used will likely face challenges that are specific to their firm, market environment, and industry. A proper response is a tailored corporate IP strategy, tied closely to the overall business strategy and catering to financial goals. Generally speaking, there must be an understanding that different types of IP finance market segments and instruments need to be treated differently. Therefore, a key success factor is, as a final conclusion and recommendation to policymakers, differentiated and context-specific approaches.

Notes:

- 1 Ocean Tomo, 2019.
- 2 The article is trying to focus here on the use of IP to fund/finance innovation. This needs a bit more clarification. The patent system, for example, by its very design is meant to foster innovation. It provides monopoly-like rights for a time-limited period, so that inventors can recuperate R&D costs. Such R&D would not have been undertaken by inventors absent patent protection, because competitors would simply copy the R&D results without themselves investing in R&D. In this analysis, we discard this specific incentivizing/financing function and look at instances where patents and other IP are used to generate monetary income streams that can, in addition to said incentivizing function, help fund innovative activities. However, money is fungible. It is difficult to link, in many instances, specific income streams directly to specific innovative activities. In this article, it is therefore assumed that at least part of the monetary income generated with the help of IP is also used for developing innovations.
- 3 Damodaran, n.d.
- 4 Divestopedia, 2015.
- 5 Haeussler et al., 2009.
- 6 Juetten, 2015.
- 7 Ciccattelli, 2017.
- 8 Most of these studies relate to developed countries, e.g., the U.S., Canada, Israel, or Germany. But VCs sometimes decide to fund companies also in less developed countries (if they have a good enough business model) and also help, as will be discussed further below, in funding further the continued costs for applying and using appropriate IP protection.

- 9 Hall, 2019.
- 10 British Business Bank – UKIPO, 2018.
- 11 Hochberg et al., 2018.
- 12 Fischer et al., 2014.
- 13 Shenggao, 2019.
- 14 British Business Bank – UKIPO, 2018.
- 15 Duff et al., 2019.
- 16 Good et al., 2015.
- 17 Radauer et al., 2011.
- 18 The rationale—a peculiarity of the European system—is rooted in the principle of subsidiarity. The principle states that the EU should, as a supranational organization, only be active in endeavors that cannot not be (well) handled at purely national level. Transnational R&D is such a case in point. National R&D supporting agencies will usually not spend their taxpayers' money to subsidize research by parties abroad. The EU Framework Programme (FP)/Horizon programmes can be seen in this context as an early adoption of the open innovation concept that has been increasingly gaining popularity and advocates manifold types of inter-organizational collaborations to spur the development of innovations.
- 19 Zuniga et al., 2009; Radauer et al., 2013.
- 20 Hagiü et al., 2013.
- 21 Radauer et al., 2019.
- 22 Reinhardt, 2008.
- 23 Radauer et al., 2019.
- 24 Radauer et al., 2019.
- 25 Zuniga et al., 2009; Radauer et al., 2013.
- 26 Radauer et al., 2019.
- 27 See also Radauer et al., 2016; As far as the electronic marketplaces are concerned, this study conducted in Germany worked out a number of success factors for any who want to set up such a platform. While the study looked at the wider area of platforms that support "open innovation" collaboration, the success factors are basically similar if one were to establish an IP platform for "carrot licensing".
- 28 British Business Bank—UKIPO, 2018.
- 29 British Business Bank—UKIPO, 2018.
- 30 OECD, 2015.
- Duff, & Phelps. (2019, December). Confederation of Indian Industry. Retrieved from IP-Backed Financing: Using Intellectual Property as Collateral: <https://ciiipr.in/pdf/CII-Duff-&-Phelps-Report-on-Using-IP-as-Collateral-2019.pdf>
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