

Chapter 2

IP-Conditioned Government Incentives in China and the EU: A Comparative Analysis of Strategies and Impacts on Patent Quality

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Abstract This paper uses typological analysis to identify the strategies behind more than 70 IP-conditioned government incentive programs in China and 21 EU Member States, compares these strategies, and uses policy case studies to analyze the effects of patent subsidy programs in particular on patent quality. It finds that China and the EU both attempt to localize benefits of knowledge investment and discourage offshoring of taxable assets through controversial IP-conditioned tax incentives. At the same time, China appears to use IP-conditioned incentives on a larger scale, and more techno-nationalistically, than EU Member States; and although this strategy can be explained by China's position as a latecomer, some of these incentives nonetheless appear questionably effective at enabling catch-up. The analysis notes that while IP-conditioned incentives in the EU are most commonly intended to provide needs-based commercial support to SMEs, it is not uncommon for such types of incentives to be provided to large firms/other entities in China. Additionally, it is shown how IP-conditioned incentives lowering costs of utility model patents, when combined with lack of Substantive Examination for such rights, can lower patent quality—a situation Chinese policymakers have sought to address by adopting a strategy for reforming such incentives that evolves with the country's technological development trajectory.

Keywords Intellectual property · IP-conditioned incentives · Patent subsidies · China · EU · Typological analysis · Case study · Strategy · Patent quality · Catch-up

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2.1 Introduction

As mentioned in the introduction to this book, the study of the economic impacts of intellectual property (IP)-conditioned government incentives (hereafter referred to simply as “IP-conditioned incentives”) is perhaps more relevant today than ever before. As economies become more interconnected, IP is an increasingly important asset determining firms’ competitiveness (Maskus 1997; WIPO 2011). Also, governments are increasingly learning from one another’s experiences with IP-related policies and laws, and experimenting based on these experiences. Driven by these factors, state-provided IP-conditioned incentives seem to be proliferating in scale and scope in countries around the world.

As also mentioned in the introduction to this book, there is some useful recent literature investigating some aspects of some IP-conditioned incentives in Europe and China, the focus regions of this book. For example, de Rassenfosse and van Pottelsberghe de la Potterie (2013) discuss how differing patent fees can act as incentives or disincentives for patent filing. Evers et al. (2015) and Griffith et al. (2014) analyze the workings of patent box regimes in Europe and the types of incentives they create. Li (2012) suggests that provincial patent subsidies in China have significantly contributed to the country’s patent filing explosion, and provides a preliminary assessment as to how these subsidies have impacted patent quality. Forfas (2014) analyzes the impacts of various government incentives in Ireland for stimulating R&D and innovation, including several IP-conditioned incentives like patent subsidies. Harhoff and Hoisl (2007) analyze the functioning and the types of incentives created by inventor remuneration schemes in Europe, focusing specifically on the German system. Prud’homme (2012) analyzes the impacts of government-set patent targets and linked performance evaluations, among other IP-conditioned incentives, on patent quality and innovation in China.

Although current literature provides some insights into the strategies and economic impacts of some IP-conditioned incentives, a comparative analysis of the strategies and impacts of various IP-conditioned incentives in Europe, including the EU in particular, and China does not appear available. This gap in the literature is exigent to bridge to more fully understand how the strategies driving IP-conditioned incentives and the economic impacts of the programs compare and contrast among countries, and why. This leads to the following questions: *(1) How do China’s and EU Member States (MS)’ IP-conditioned incentives compare in terms of their underlying strategic objectives and impacts on patent quality? (2) If there are major differences, why is this the case? (3) What are the implications of these findings for policymakers?* This chapter’s preliminary investigation of these questions is intended as a starting point for contextualizing the other chapters in this book.

The chapter aims to contribute to the literature in several ways. First, it provides a typological analysis of the strategies behind a diverse range of more than 70

IP-conditioned incentives in the EU and China, based on a review of primary and secondary resources. Second, it provides a qualitative, as well as basic quantitative, comparative analysis of these strategies. Third, it provides mini policy case studies on the economic impacts of two incentive programs (patent subsidy programs from China and Italy) in terms of patent quality. Fourth, it fleshes out policy implications and recommendations from this analysis. This being said, the chapter attempts to only provide very preliminary insights to the research questions posed, as fully assessing them would require a much more extensive analysis.

The remainder of this chapter is structured as follows: the next section (Sect. 2.2) provides a brief conceptual framework to guide the comparative analysis performed, Sect. 2.3 outlines the methodological approach used to conduct the analysis, Sect. 2.4 presents the results and discusses their significance relative to the research questions posed, and Sect. 2.5 concludes and makes some policy recommendations.

2.2 Conceptual Framework

A multi-faceted conceptual framework is needed to ground a comparative analysis on strategies underlying IP-conditioned incentives in China and the EU and their economic impacts. The framework in Sect. 2.2.1 focuses foremost on concepts/factors potentially explaining similarities and differences in strategies behind IP-conditioned incentives in the EU and China. Although all of the IP-conditioned incentives reviewed do not exclusively focus on patenting, the vast majority of them do, and thus this conceptual framework focuses primarily on patent-relevant concepts. The framework is not intended to cover all possible factors determining strategic objectives behind IP-conditioned incentives, rather it is kept relatively straightforward to keep the subsequent analysis manageable. Some of the objectives may be inter-related, although were deemed worthwhile to distinguish. An effort was made to distinguish rationales behind IP-conditioned incentives were not overly narrow but also not overly broad (and thus quite broad rationales like encouraging firm competitiveness and jobs, although clearly overall objectives of the incentives, are not individually singled out).

The brief framework in the second part of this section focuses specifically on one key indicator of the economic impacts of IP-conditioned incentives: “patent quality.” In line with the scope of the research question set-forth in the introduction, this focus is intended to keep the research manageable (although other indicators of the economic impacts of such incentives, e.g. in terms of number of and revenue-generating significance of new products to market, could be investigated in future research).

2.2.1 *Factors/Concepts Explaining Strategic Objectives of IP-Conditioned Incentives*

2.2.1.1 **Broadest Factor: Latecomer Catch-up**

The most fundamental factor for distinguishing the strategic objectives behind IP-conditioned incentives in China and EU Member States (MS) is the fact that China is a latecomer nation (i.e. it began developing later than forerunner nations) economically and technologically seeking to catch up with forerunners, like those in the EU. Latecomers can benefit from state support in the form of development policies to catch up with forerunners (Gerschenkron 1962; Johnson 1982; Abramovitz 1986).

Given that lack of core indigenous IP rights is a pervasive problem limiting China's catch-up ability at present, whereby the IP landscape in many high-tech industries continues to be dominated by foreign incumbents (Song et al. 2010; Song 2013), IP-conditioned incentives may seem like an attractive tool to help domestic entities compete in this environment. Amidst this landscape, in addition to struggling to maintain freedom-to-operate in various technological fields, given their latecomer starting point, Chinese firms will likely have a more difficult time breaking into and growing in industries with strong foreign incumbent patent thickets (Song et al. 2010; Song 2013; Xiao et al. 2013), including those created by EU MS firms.¹ Latecomer nations like China with proactive state intervention may see IP-conditioned incentives as one way to navigate these patent minefields.

Of course, the pro-activeness of the government determines the extent to which catch-up goals are actually prioritized in strategies and targeted via policies. In China, both central-level and provincial-level government bodies are active in driving policy, forming a "catch-up consensus" (Chu 2011). This being said, China's system of economic decentralization, whereby the central-level government sets forth industrial policy guidance aimed at catch-up and this guidance is fleshed out and implemented by provincial and local governments, can complicate this process (Naughton 2007). It seems likely that the strategy behind China's IP-conditioned incentives aligns closely with this overall desire and buy-into catch up via state intervention. Although the governments of EU MS themselves face varying pressures to enhance their own technological and economic capabilities vis-à-vis each other and other nations, they are not driven by a catch-up consensus like in China, although it is the goal of the EU to further align MS to build an innovative EU.

¹As such, there may be an industry-specific element within the strategic objectives of countries that use IP-conditioned incentives. Specifically, in IP-intensive technological areas (e.g., in information and communication (ICT) technologies) (Hall and Ziedonis 2001; Hall 2009), the incentives may be seen as particularly important. However, because the IP requirements uncovered in the incentives presented in Table 2.1 in the Annex do not clearly focus on such industries (although, judging from the research performed, there is some indication that in practice some incentives are concentrated on patenting in certain industries, including ICT), this conceptual element is not discussed at length in this paper.

2.2.1.2 Other Major Factors

Stimulating Spending Enabling Research and/or Commercialization

Some IP-conditioned incentives are likely intended to encourage spending enabling research and/or commercialization, which collectively create innovation.² The public nature of knowledge spillovers means that firms cannot appropriate all returns from their research and development (R&D) investment, although an IP rights system can provide a method of appropriability (Arrow 1962). This market failure creates an incentive for firms to in some cases spend below the socially-optimal level of R&D (Bloom et al. 2013), which can hamper innovation. As such, government incentives and investment is needed to ensure more optimal knowledge investment (Martin and Scott 2000), and some IP-conditioned incentives may be intended to meet these ends.

Needs-Based Commercial Support

For individual inventors and small and medium-sized enterprises (SMEs) in particular, they may need support to stimulate their competitiveness in ways related to innovation as well as aspects of IP management not immediately related to innovation. SMEs often identify lack of access to financial resources as their topmost obstacle to growth (OECD 2004). Some of these entities may have limited financial and other resources to expend on innovation activities (although some in fact devote a significant portion of their resources to R&D and other innovation activities, and even more so, proportionally, than multinationals). These entities may have less financial resources and other resources to spend on managing IP—including IP acquisition, IP exploitation, IP maintenance (including renewing IP rights), and IP enforcement (WIPO 2004). In such circumstances, some IP-conditioned incentives may be intended to meet the commercial needs of individual inventors and SMEs.

Given their latecomer starting point, it is possible that individual inventors and SMEs in China in particular will have an even higher need for support for innovation activities and IP management potentially provided via IP-conditioned incentives than their counterparts in the advanced economies of the EU MS. In reaction to this need, and given the Chinese government generally pursues a highly active role in promoting technological catch-up, there may be more extensive IP-conditioned incentives offered in China than any individual EU MS.

Information Failure

Lack of IP awareness among newcomer individual inventors and SMEs may broadly constitute a type of “information failure” (Greenwald and Stiglitz 1986),

²As innovation encompasses the full process of research and inventing, as well as developing and commercializing the inventions (Schumpeter 1942), research (and invention) without commercialization is not tantamount to innovation.

which includes information asymmetry, a type of market failure. Many newcomers may have less perfect information (internally within the firm, or via external patent agents or other external advisors) than that available to a range of incumbents benefitting from advanced information tools and aggregation services developed through years of experience. Also, newcomers may enter into transactions with incumbents who black-box technology and/or adopt other information-withholding methods to provide incumbents with certain advantages, which limit spillovers. Encouraging development of IP via IP-conditioned incentives may be seen as one potential method to correct these market failures. Considering these dynamics and those previously mentioned regarding provision of needs-based commercial support, there may be more extensive IP-conditioned incentives offered in China than in any individual EU MS.

Localizing Benefits of Knowledge Investment

Geographic localization policies can play an important role in the generation and distribution of knowledge (Keller 2010). Such policies can encourage geographical concentrations of knowledge diffusion, which creates a virtuous circle/cycle by strengthening the knowledge base of the location, in turn attracting other innovating firms and leading to increase knowledge inflows in the future (Iammarino and McCann 2006). Some IP-conditioned incentives may aim to localize knowledge investment in order to facilitate the evolutionary processes mentioned.

Also, some IP-conditioned incentives may aim to localize the benefits of knowledge investment in order to avoid it being lost to other regions with stronger pull (or push) policies. The existence of IP-conditioned incentives in one jurisdiction may pressure another to develop similar or even more significant incentives in order to attract or retain R&D investments, technology transfer, and other forms of knowledge investment (UN 2005; OECD 2010, 2011). And similar pressure may be created to attract and retain R&D jobs (UN 2005; OECD 2010, 2011).

Discouraging Offshoring of Taxable IP Assets

Tax incentives in different jurisdictions have led to tax planning that has eroded the taxable revenue base for many countries (OECD 2014a, 2015). IP-conditioned incentives may be partially to blame for these trends (see the chapters by Kalloe 2016; Garcia et al. 2016, in this book). At the same time, the threat of offshoring of taxable assets per se is likely one factor guiding the strategic objectives of IP-conditioned incentives, whereby some tax incentives are meant to discourage offshoring of taxable IP assets by encouraging them to be held locally. It is worth noting that the existence of IP-conditioned tax incentives in one jurisdiction, especially if close geographically, may pressure another to develop similar or more significant policies in order to keep IP assets based in the jurisdiction—a concept in line with competition and emulation-based policy diffusion theories (Graham et al.

2013; Morin and Gold 2014). It is worth also noting that the objectives of IP-conditioned tax incentives appear particularly closely intertwined with those discussed in the “localize benefits of knowledge investment” section above.

Techno-Nationalism

Some countries may seek to implement IP-conditioned incentives meant to “techno-nationalistically” build domestic industry. The term “techno-nationalism” refers to state intervention to replicate aspects of the technology development process using domestic (rather than foreign) capabilities as part of a strategy to compete internationally in high-tech industries (Hart and Prakash 2000). Generally, in situations where this ideology is at odds with foreign-domestic cooperation generating healthy growth, ardent techno-nationalism is often criticized as not necessarily economically prudent (Ostry and Nelson 1995).³ Various scholars have suggested that many of China’s technology policies, including those with IP requirements, are techno-nationalist in nature (Suttmeier and Yao 2011; Ernst 2011). At the same time, it is possible that techno-nationalist motives also guides some IP-conditioned incentives in some places in Europe (as well as in the US and other advanced nations), as such motives have driven high-tech industry development policies in the past (Ostry and Nelson 1995). Various factors, including polarizing historical events and changing economic landscapes, contribute to techno-nationalism (Ostry and Nelson 1995).

2.2.2 Importance of Patent Quality, and the Impacts of Policies on Patent Quality

Scholars have identified that valuable patents can enable technological advancement and other economic benefits in some industries and in some countries (Fink and Maskus 2005; Falvey and Foster 2006; Lopez 2009; Hall 2014). However, poor “quality” patents can create significant negative economic impacts. The definition of “quality” patents used herein follows the one in Prud’homme (2012), namely patents that meet the statutory requirements for patentability and contribute to economic, social, and/or environmental progress; and low-quality patents do not

³This is certainly not meant to say that it is not economically prudent for economies to adopt policies that enrich their own national economic interests. Nor does it ignore the fact that techno-nationalism can also refer to technology policy specifically meant to meet national security goals (Samuels 1994), which governments sometimes consider to be outside the scope of immediate economic policy considerations.

meet these criteria.⁴ Specifically, the self-reinforcing nature of an economy rife with low-quality patents leads rational firms to seek more low-quality patents rather than higher-quality patents (Wagner 2009). And poor patent quality generates uncertainty, which leads to lower incentives to innovate, which stifles technological development, entrepreneurship, employment, and ultimately growth and consumer welfare (Guellec and van Pottelsberghe de la Potterie 2007; Hall et al. 2003).

Even well-intentioned government IP policies meant to develop the domestic economy can drag down patent quality (OECD 2014b). Overly low costs of obtaining and maintaining patents, lack of legal safeguards for granting and enabling efficient invalidation of patents, among other legal, policy and institution-related factors can hamper patent quality (Prud'homme 2012; de Saint-Georges and van Pottelsberghe de la Potterie 2013). As such, poorly calibrated government policies can waste government resources better used in different ways to meet their strategic objectives. This axiomatically applies to IP-conditioned incentives as well.

2.3 Methodology

2.3.1 *Main Research Sources and Approach*

As a first step to investigating the research questions posed in this chapter, secondary sources were located that provided an overview of what countries throughout the world have IP-conditioned incentives. Key reports used in this regard include KPMG (2014), Deloitte (2014), Ernst and Young (2014), PWC (2014), Jaiya and Kalanje (2006), Harhoff and Hoisl (2007), and Lutze (2015). The research then focused on detailing the IP-conditioned incentives in China and EU MS specifically, and EU MS were chosen according to which ones had most readily available information from primary sources and secondary sources (often from government or consulting companies) available online. This ultimately resulted in a focus on policies/programs in China and 21 out of 28 EU MS: Austria, Belgium, Croatia, Cyprus, the Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Ireland, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Spain, Poland, Portugal, and the UK. The research on Chinese policies and their effects draws primarily on the research conducted in Prud'homme (2012, 2015). Best efforts were made to ensure the details of the programs researched were up-to-date, although given the often fast changing nature of such programs it is possible that at the time of publication of this chapter some details of the programs have already changed.

⁴It is possible to draw a distinction between “quality” and “value” when evaluating patents; however, for simplicity, the two are used interchangeably hereafter.

A skeleton typology of the main structural elements of the policies/programs was created, including the name of the promulgating country, IP requirements, other major requirements, and benefits. And each policy/program per country was reviewed and relevant information was added to flesh out this typology.

2.3.2 *Analysis*

2.3.2.1 **Identifying and Analyzing Trends in Strategies**

A multi-step analytical process was undertaken fitting within the broad three-part framework for qualitative analysis proposed by Miles and Huberman (1994): data reduction, data display, and conclusions. First, where readily available, secondary sources and the text of the policy documents (including the preamble, among other sections) were reviewed in an attempt to understand the strategic objectives behind the policies. Second, the literature was searched to understand the strategic objectives behind the policies; however, robust relevant literature was usually not readily available and thus some degree of inductive analysis was typically required to identify these strategies.

Third, typological analysis incorporating inductive analysis, which, according to Hatch (2002), is particularly fitting for research with a strong focus on artifact data (such as text of policies and laws), was used to identify potential strategic objectives of the policies/plans reviewed; these objectives were divided into the policies' "immediate IP-related objective" and "wider objectives." This basic inductive analysis was carried out based upon a juxtaposition of the structural elements of each policy (i.e. the main IP requirements, other major requirements per each policy/program, and benefits) vis-à-vis elements formative of the concepts behind IP-conditioned incentives. Herein, "immediate IP-related objectives" were chosen from the typology of IP management presented in WIPO (2004). The "wider objectives" came from the concepts discussed in Sects. 2.2.1.1 and 2.2.1.2; whereby relevant keywords were identified in the structural elements of each policy (e.g. requirements for SMEs, requirements to localize IP usage, fees for consulting/information services, etc.) that had a clear direct relationship with such concepts. Fourth, a few consultations with academics and lawyers familiar with the workings of certain IP-conditioned incentives were used to triangulate the results of the inductive analysis. Collectively, this analysis resulted in the creation of a typological chart (see Table 2.1 in the Annex).

Fifth, trends were then deciphered in the typological analysis by counting (using a function in word processing software) the occurrence of each strategic objective and categorization of IP-conditioned incentives depicted in the typology in Table 2.1 in the Annex per the clearest latecomer countries (i.e. China) and more advanced economies (i.e. EU MS). Conclusions were then drawn based upon these occurrences. This coding and counting approach to data analysis generally follows that prescribed in Miles and Huberman (1994).

2.3.2.2 Limitations of the Methodology

There are several limitations of the abovementioned methodology. First, the list of policies in Table 2.1 in the Annex is not necessarily an exhaustive list of all IP-conditioned incentives in the countries studied, although it is a list of the programs that could be readily identified. Second, for the analysis of China's IP-conditioned incentives in particular, given often differing non-IP-specific requirements (e.g. among provinces) in several IP-conditioned incentives in China, such incentives may have more main wider objectives than those explicitly identified in Table 2.1 in the Annex. Third, sometimes, given the limited information available on some of the incentives in the EU and China, some degree of supposition was required to identify their main immediate and wider objectives. Considering these limitations, it is important to note that there may be some IP-conditioned incentives existent in the EU and China that are unintentionally overlooked in the analysis, and the occurrences of the objectives identified by the counting analysis in this chapter are likely only lower bound estimates.

This being said, the counting analysis identifies general trends that appear to be distinct enough so that it seems unlikely they would be significantly altered even if some incentive programs were missing from the analysis. Further, considering the methodological limitations mentioned, special care was taken to cautiously word the findings. As such, it appears that the results based upon analysis of Table 2.1 in the Annex can be said to be reasonably robust.

2.3.2.3 Assessing Impacts on Patent Quality

Three main steps were followed to investigate the economic impact of IP-conditioned incentives on patent quality. First, patent subsidy policies in China and Italy were chosen for analysis. These countries and programs were chosen for several reasons: in order to make the analysis manageable, only two programs were chosen; one specific policy/program was chosen from China because it is the clearest latecomer among the countries studied, and Italy was chosen given it is a more economically advanced country than China, thus useful point of comparison; patent subsidy programs were chosen from both countries in an attempt to allow comparability in the cross-case analysis; and the programs were chosen given the ready availability of information to the author on the programs.

Second, mini case studies were then compiled on each of these policy programs and cross-case analysis was performed. These mini studies were formed primarily by summarizing existing literature on the effectiveness of the patent subsidy programs in China and Italy, and supplemented with a few consultations with experts from government and academia closely familiar with the programs. Case studies are valuable methods to investigate research questions that provide more context to the analysis than is often available in strictly quantitative studies (Yin 2003). Third, basic cross-cases analysis was performed by comparing and contrasting information

from the cases in order to identify major determinants of IP-conditioned incentive effects on patent quality, and the corresponding direction of such effects. Cross-case analysis is useful for comparing and contrasting multiple cases (Schwandt 2001; Creswell 2007; Yin 2003).

2.3.3 *Policy Recommendations*

Based on the findings generated from the aforementioned analysis, several policy recommendations were formulated. The recommendations were selected upon the condition that they were relatively intuitive to the reader based on the analysis. Also, they were selected upon the condition that they were important for policy-makers in China, the EU, and potentially elsewhere to consider when seeking if and how to create IP-conditioned incentives.

2.4 Results and Discussion

2.4.1 *Comparison of Strategies Behind IP-Conditioned Incentives in EU and China*

Table 2.1 in the Annex provides a typology of policy mechanisms and strategic objectives behind over 70 IP-conditioned government incentive programs in the EU and China. As noted in Sect. 2.3.2, despite several methodological limitations, it appears the main findings discussed in this section based upon analysis of Table 2.1 in the Annex are still reasonable. To keep the analysis concise, the objectives of the incentives are purposefully confined to what appear to be the *main* relevant objectives (drawn from the list in Sect. 2.2.1), although they may less so/more indirectly also aim to achieve other objectives. Assignment of an objective within the typology of course does not necessarily indicate the proposed policy mechanisms will actually be effective at meeting such an objective.

Using the counting approach to analyzing data in Table 2.1 in the Annex described in the methodology, a number of useful findings surface about how China's and EU MS' IP-conditioned incentives compare in terms of their underlying strategic objectives, and why there are some key differences. These are discussed below, as well as relevant implications for policymakers.

First, tax incentives are a highly prevalent type of IP-conditioned government incentive program used in EU MS.⁵ This seems likely explained by the competition

⁵Based on the counting analysis, the following categories of IP-conditioned incentives in the EU occurred with the following frequency (frequency in parenthesis): tax incentives (20), patent subsidy/patent and design subsidy programs (14), grants (10), service invention remuneration and

and emulation drivers behind policy diffusion, whereby tax incentives in one jurisdiction in the EU pressure another to develop similar or more significant policies in order to attract IP assets and/or otherwise keep IP assets based in the jurisdiction. Geographical proximity itself among EU MS may also lead to quick cross-border diffusion of such policies in the EU.

This indicates that European Commission policymakers should pay particularly close attention to the effects of these tax incentives. Even if the policies have negative economic effects, unless actually reviewed and properly overseen, they still may rapidly diffuse to other EU MS and/or further entrench themselves in the EU MS presently maintaining the policies. Realizing these issues, the European Commission is closely considering recent OECD initiatives to harmonize and better regulate IP-conditioned tax incentives (OECD 2014a, 2015; also see the chapter by Kalloe 2016, in this book). And the European Commission (at the time of writing of this chapter) is also specifically considering proposals brought by some EU MS to prohibit any EU MS to newly establish a patent-box after June 2016 and to also phase out all existing patent-box programs by 2021 (see the chapter by Kalloe (2016), in this book).

Second, it is noteworthy that several countries in the EU, and not just China, institute IP-conditioned grants and patent subsidy programs. It is worthwhile for EU policymakers to keep this in mind, if only to avoid blindly criticizing the Chinese policy environment for its heavy usage of grants and patent subsidy programs (among various other incentives) to stimulate patenting.

At the same time, as explained in the cross-case analysis in Sect. 2.4.2, until recently, many regions in China have not instituted safeguards (i.e. quality-ensuring requirements and sufficient institutional oversight mechanisms) in their patent subsidy programs to ensure patent quality. Also, the scale of China's IP-conditioned incentives at large and grants and patent subsidies in particular appears to be far greater than those of individual EU MS—in part because of the *de minimis* rules on subsidies within the EU (see Johannes Holzer's chapter in this book), but also given China's strong state intervention to enable latecomer catch-up as mentioned below. Accordingly, this indicates policymakers view safeguards as integral to avoid instituting IP-conditioned incentives that foster low-quality patents. It also indicates that policymakers in the EU cap legally-allowed subsidy amounts in all EU MS in an effort to support SMEs but limit distortions of competition that might significantly harm firm growth and consumer welfare. These principles are relevant to both the EU and China given that both regions have a great deal of decentralized economic governance and many diverse regions with a propensity to adopt diverse approaches to state aid.

Third, China clearly has the most sizeable and diverse IP-conditioned incentives out of any country studied, ranging from patent targets tied to performance

(Footnote 5 continued)

rewards (4), loans and financing (5), and other (4). The methodological limitations mentioned in Sect. 2.3.2 should be considered alongside these figures.

evaluations and non-monetary awards to service inventor remuneration and awards regulations. This finding represents the comparative aggressiveness of state intervention in China's economy in order to facilitate latecomer catch-up. Also, the large size of China's economy and sometimes dramatically different levels of development of industries and geographical regions therein may also contribute to the need to have sizeable and diverse incentives.

Fourth, IP acquisition is clearly the most common immediate objective of IP-conditioned government incentive programs in the EU and China, and grants and patent fee subsidies appear to be the most common policy vehicles for meeting these objectives.⁶ Several of these policies are intended to facilitate patenting abroad, others domestically, others both. Interestingly, some EU MS have IP-conditioned incentives reserved for IP acquisition in China in particular or provide larger amounts of funding for IP acquisition in China in particular than otherwise offered.

These findings show that IP-conditioned incentives are clearly more focused on enabling firms and other entities to acquire IP than other policies, like typical R&D subsidies, which are more focused on inputs into invention. This reinforces the idea that governments in both developed and developing countries view acquisition of IP in an increasingly inter-connected world as an important end in itself for government policy, although whether this is an optimal strategy deserves further research to better inform policymaking in China and the EU.

Fifth, IP exploitation is a relatively common immediate objective of many IP-conditioned incentives in the EU and China, and tax incentives appear to be the most common, although not only, policy vehicle for meeting this objective. And some countries have policies intended to facilitate both IP acquisition and IP exploitation, which respectively cover the intermediate and end outputs of the innovation process. IP maintenance and IP enforcement are much less common immediate objectives, although are objectives of some policies. Interestingly, some EU MS provide IP-conditioned incentives reserved for IP enforcement in China in particular. This finding shows that different types of policies are viewed by policymakers in the EU and China as better than others to immediately support different aspects of the IP management process.

Sixth, needs-based commercial support is the most common wider strategic objective behind IP-conditioned incentives in the EU.⁷ This is clearly exhibited in

⁶Based on the counting analysis, the following main immediate objectives of IP-conditioned incentives occurred with the following frequency (frequency in parenthesis): IP acquisition (53), IP exploitation (38), IP maintenance (13), and IP enforcement (7). For at least one program, although the main objectives appear to be counted, other objectives may in fact apply. The methodological limitations mentioned in Sect. 2.3.2 should be considered alongside these figures.

⁷Based on the counting analysis, the following main wider objectives of IP-conditioned incentives in the EU occurred with the following frequency (first figure in parenthesis is the frequency for all 21 Member States, and average frequency is the second figure): needs-based commercial support (35, 1.67), localizing benefits of knowledge investment (21, 1), stimulate spending enabling research and/or commercialization (15, 0.71), discourage offshoring of taxable assets (14, 0.67), latecomer catch-up (N/A for the purposes of this analysis), information failure (9, 0.43), and

the requirements that many of the incentives can only be utilized by SMEs. Given that over 99 % of firms in the EU are SMEs (which include microenterprises for the purposes of this chapter), and the under-resourced nature of SMEs mentioned in the conceptual framework, this should not be surprising. Interestingly, in several cases, needs-based commercial support provided by IP-conditioned incentives (e.g. subsidized costs for consulting services to identify infringement risks) appears intended to mitigate information failure experienced by SMEs, allowing them to better manage their intangible assets.

Seventh, it is noteworthy that a range of IP-conditioned incentives in China are not always clearly designed to provide/reserved for needs-based commercial support for individuals or SMEs. As such, comparatively well-resourced entities in China (including large Chinese firms) can take advantage of at least some of the IP-conditioned support provided. This point is also mentioned in Song et al.'s (2016), chapter in this book, which specifically focuses on patent subsidies, whereby the authors note this strategy may divert government resources away from entities needing them the most to catch up. And a similar point is raised in Long et al. (2013). At the same time, a number of Chinese IP-conditioned incentives, for example grants from some provincial technology development funds, appear targeted at SMEs. This represents a multi-faceted strategy behind China's current approach to IP-conditioned incentives: not only stimulating growth of the most needy latecomer enterprises, but also encouraging large firms to develop and exploit IP-intensive technologies in China. Further research is needed to determine if this strategy should evolve, and do so at a different pace in different provinces in China depending on their technological capabilities, and/or considering differences in industrial organization, and how exactly policies implementing the strategy should be designed in order to best facilitate catch-up.

Eighth, another common objective of IP-conditioned incentives in the EU appears to be localizing the benefits of knowledge investment within the EU MS making the policy. Tax incentives are the most common vehicle for meeting these objectives (and often also appear intended to discourage offshoring of taxable IP assets), although other types of policies, like patent fee subsidies are sometimes used. Some of these incentives require that the (a) IP be "self-developed"/developed in-house within the entity applying for the incentives, (b) the R&D behind the IP be conducted in the country providing the incentives, (c) the IP be registered in the country providing the incentives, and/or (d) the IP be commercially exploited in the country providing the incentives. These are relatively restrictive requirements, and

(Footnote 7 continued)

techno-nationalism (1, 0.05). The counting analysis for China yielded the following results: needs-based commercial support (3), localizing benefits of knowledge investment (7), stimulate spending enabling research and/or commercialization (7), discourage offshoring of taxable assets (1), latecomer catch-up (20), information failure (3), and techno-nationalism (4). For at least five programs in China and three in the EU, although the main objectives appear to be counted, other objectives may in fact apply. The methodological limitations mentioned in Sect. 2.3.2 should be considered alongside these figures.

there is controversy about how useful they are in meeting their objectives (see OECD 2014a, 2015; and the chapters by Kalloe 2016; Garcia et al. 2016, in this book). As such, these types of incentives deserve to be particularly closely studied by policymakers.

Ninth, China has a number of IP-conditioned incentives to localize the benefits of knowledge investment, some of which, although similar in some ways to the most restrictive incentive qualification requirements in the EU, appear even more restrictive and techno-nationalist. Although some EU MS have perhaps surprisingly restrictive requirements in their IP-conditioned tax incentives, there do not appear to be any requirements in any EU MS, as there are in China (at least from some provincial governments in the recent past), that IP from *foreign affiliates* in the country cannot qualify for incentives/monetary support from the government for innovation, but instead must meet restrictive “自主知识产权/zizhu zhishi chan-quan” (“indigenous intellectual property”) requirements (i.e. IP held by domestically-registered firms without foreign-majority ownership).⁸ Also, it does not appear that EU MS require “core” IP to be owned or exclusively licensed by entities in the country providing the IP-conditioned tax incentives in order to enjoy the benefits of the incentive, which, at the time of writing this chapter, is a requirement of China’s High and New Technology Enterprise (HNTE) tax deduction scheme.⁹

These comparatively more restrictive requirements in China are part of a state effort to enable domestic Chinese firms to catch up in a world where the IP landscape is dominated by foreign incumbents often inclined to avoid developing or transferring core technology in/to China in order to maintain their competitive advantages, avoid potential appropriability-loss given fears over China’s IP protection environment, and perhaps to minimize tax burdens. These are understandable strategic objectives. However, the extent to which these requirements actually meet policymakers’ objectives is not fully clear and deserves further empirical research; and, in fact, there may be negative economic impacts of the policies (see Prud’homme 2012, 2013; and the chapter by Garcia et al. 2016, in this book). Considering these findings, EU policymakers can better understand the rationale for restrictive Chinese IP-conditioned incentives, and Chinese policymakers can see that some of their policies are comparatively quite restrictive, potentially even to the detriment of meeting their underlying objectives.

⁸The sometimes differing definitions of “自主” intellectual property among different regions in China (whereby some are more restrictive than others) is likely owed to China’s policymaking system of economic decentralization which provides the different provinces notable autonomy in how they interpret and implement policy advice from the central level. (These dynamics of course also allow central-level policymakers to blame individual provinces for unpopular policies and encourage them to reform.).

⁹At the time of writing this chapter, there were ongoing discussions about potentially revising the qualification requirements in China’s HNTE tax scheme.

2.4.2 *Comparison of Economic Impacts of the Patent Subsidy Programs in China and Italy*

2.4.2.1 Mini Case-Study 1: Patent Subsidies in China

In an attempt to reach the ambitious innovation-related goals and quantitative patent targets set by China's central government,¹⁰ Chinese policymakers have developed a range of IP-conditioned incentives over the past decade. This has resulted in the promulgation of over 10 national-level quantitative patent targets and over 150 provincial/municipal quantitative patent targets, mostly to be met by 2015, linked to performance evaluations for government officials, managers of state-owned enterprises (SOEs), publically-funded research institutes, among others (Prud'homme 2012). And China has developed a massive system for subsidizing patents as one tool to meet these targets. At the provincial level, Shanghai was the first, in 1999, to institute a patent subsidy scheme, and by 2007, 29 of the 31 provinces/municipalities in Mainland China had launched a patent subsidy scheme (Li 2012). The provincial subsidies differ in their amounts and what they cover, although generally cover the costs of filing patents domestically at China's State Intellectual Property Office (SIPO) including patent application and examination fees, sometimes include annual maintenance/renewal fees,¹¹ and occasionally include patent attorney fees. They sometimes also cover the costs of filing patents abroad. Further, some Chinese subsidies related to IP, patents included, are given as grants or rewards not specifically linked to, and/or covering costs far beyond, official patenting fees (see Prud'homme 2012, and Table 2.1 in the Annex hereto). When the term "patent subsidies" is used hereafter in this section it refers to all these types of incentives.

¹⁰China's National Medium and Long-term Science & Technology Plan (2006–2020) (S&T MLP) sets the goals to become an "innovation-oriented" country by 2020 and a "leading science power" by 2050; the 12th Five Year Plan on National Social and Economic Development sets the target of 3.3 patents "owned" (note: the Chinese term here "拥有" is best translated as "owned" and is different from the term SIPO uses for "in force" [有效]) per 10,000 people; the National Patent Development Strategy (2011–2020) promulgated on November 11, 2010 prescribes that 2 million patents should be filed annually by 2015; and the National IP Strategy (2014–2020) promulgated on December 29th 2013 sets the target of 14 invention patents per 10,000 people. For more information on other central-level patent targets and all provincial-level patent targets see Prud'homme (2012, 2015).

¹¹Although not explored at length in this paper, it is important to note there are risks of subsidizing renewal/maintenance fees of patents (see Prud'homme 2014a) for one brief discussion in the context of China's subsidization of patent maintenance/renewal fees). Subsidizing renewal/maintenance costs of a patent, at least throughout the entire life of the patent, relieves the patentee of any post-filing financial responsibility to ensure that the patents are valuable to their business. For the very reason that patent renewal/maintenance rates are validated in the literature to be a useful measure of patent quality (because they represent that patentees are willing to spend their money to maintain only valuable patents), it would seem potentially unwise to remove this incentive. Also, removing this incentive could potentially clog the system with patents that are not "cleared" by normal market-based mechanisms, in turn inflating restrictions on firms' freedom-to-operate thus potentially stifling innovation.

These provincial patent subsidies have contributed to China's recent domestic patent explosion (Li 2012), as has intensifying R&D, competitive-threat driven foreign investment, and legal and institutional reforms (Hu and Jefferson 2009). (Additionally, the central-level government at one point offered subsidies for filing patents abroad, although sources indicate the Ministry of Finance has, in practice, discontinued this program.¹²) On one hand, some scholars have not been particularly concerned about the potentially negative bi-products on patent quality of China's recent drive to stimulate patenting—instead suggesting that China's technological catch-up strategy has intentionally been geared towards first focusing on quantity of outputs and then eventually shifting towards ensuring the quality of outputs. The rationale behind this approach is that without first building awareness of the importance of inventing and filing IP rights on such inventions, there will be an insufficient amount of domestic/indigenous innovations in China, continued domination of innovation trajectories by foreign incumbents, and thus limited technological catch-up (Zhu 2012). Indeed, in the early stages of China's technological development catch-up path, this approach seems to have its merits. On the other hand, there does not seem to be clear consensus on exactly when and how the state-led shift from patent quantity to quality should take place; and more concerning, the discussion has not always focused enough on dynamics related to IP-conditioned incentives and the utility model patent legal framework in particular.

In addition to increasing invention patent numbers, provincial patents subsidies, in combination with other incentive policies in China also appear to have contributed to the rise in domestic utility model filings. This finding is relatively well acknowledged in government, academic, and practitioner circles in China, and is confirmed by the empirical analysis by Long and Wang (2016), in this book. There has been so much of an explosion in utility model filings in China that from 2010 to 2013 utility model filings actually outnumbered invention patent filings (see Chart 2.1).

Amidst this surge, China's patent subsidies, in combination with other IP-conditioned government incentive policies, appear to have generated low-quality patents in a way jeopardizing the optimality of the country's catch-up trajectory. According to Lee and Kim (2010), the ratio of utility models to invention patents can be an indicator of the level of technological advancement (particularly catch-up) of a country—whereby more advanced countries prefer to patent more sophisticated technologies that are better (or can only be) protected by invention patents. Considering this basic metric and the relatively short lifespans of utility models in China, it appears that some of China's patent-related policies and practices (including patent incentives) contributed to a patent quality trajectory that has not kept up with the country's patent quantity upsurge (Prud'homme 2012). In effect, this has recently made China's technological development trajectory less than optimal (Prud'homme 2012, 2015).

More specifically, a combination of factors has directly contributed to this situation. In China, no Substantive Examination is conducted before utility models are

¹²Consultations with Song Hefa, December 2015.

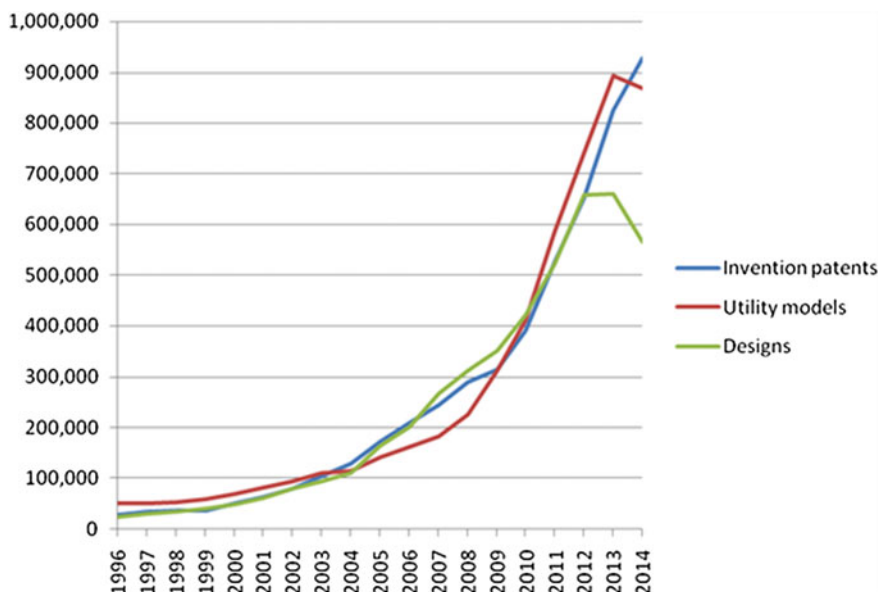


Chart 2.1 Patent filings in China, by type (1996–2014). *Source* Based on SIPO statistics

granted to ensure that they actually fully meet the statutory requirements for patentability (although a Preliminary Examination is conducted on formalities and “obvious” defects in utility model applications). And statute stipulates a lower inventiveness threshold for utility models than for invention patents. And the patent office only issues an administrative decision about whether a utility model fully meets statutory patentability requirements if a formal invalidation procedure is initiated (not via Substantive Examination prior to grant, nor upon pre-grant oppositions or observations, which do not exist for utility models in China). This system, which is shared by a number of other countries, per se does not create patent quality problems for all such countries. However, given that invention patents face a relatively higher threshold for patentability and a relatively more rigorous process (i.e. a Substantive Examination) to ensure they meet this threshold, there is a higher chance that, on average, granted invention patents are of higher quality (and perhaps value) than granted utility model patents (Prud'homme 2012).

Further, the criteria for qualifying for provincial subsidies in China have not been rigorous enough to safeguard against low-quality, unexamined utility models being awarded patent fee subsidies. For example, in the past, in many places in China, only a utility model application number was needed to claim subsidies. This environment was easy for entities to exploit to claim government-provided

incentives on IP rights—namely utility models and registered designs—that technically did not even meet statutory patentability requirements.¹³

Further, consultations with Chinese IP scholars indicate that in different provinces/municipalities, patentees have exploited the lack of coordination between local and provincial/municipal governments to make significant money from the patent subsidy scheme in a way not intended by policymakers. For example, in the past (prior to recent reforms) it was possible to separately apply and receive subsidies from the Haidian district government in Beijing and Beijing municipal government for patent-related costs, ultimately resulting in applicants receiving “double” subsidies from the government sometimes far exceeding the total costs of obtaining patents—even low-quality patents. This was not the intention of the government.

Recent research supports the idea that China’s patent subsidy policies have indeed contributed to a decrease in the quality of China’s patent stock. Gao et al. (2011) finds that the subsidies have encouraged behavior that maximizes patent quantity at the cost of quality, namely repeated patent applications; splitting inventions into smaller inventions just to boost the number of applications; filings for products that are already published or otherwise disclosed (in some cases for a significant amount of time) and thus are not patentable; and filing applications only to get an application number in order to claim subsidies but not even paying official patent fees. Dang and Motohashi (2013) empirically show that patent subsidies have encouraged patents with a particularly narrow claim breadth, an indicator of low-quality patents. Lei et al. (2013) empirically show that China’s patent subsidy system has encouraged firms to break-up inventions in an attempt to capture a greater amount of patent subsidies. Boeing and Mueller (2015) find that while China’s subsidies for PCT patent filings contributes to a rise in PCT applications, based on an analysis of International Search Report citations, the policies also contribute to Chinese PCT applications achieving only 34 % of the quality level of international PCT applications.

Most recently, the chapter by Song et al. (2016), in this book empirically shows that provincial subsidy policies issued from 2010 onwards encouraged patenting in China at a much faster pace than the subsidies from prior years, while at the same time also likely created a decline in patent quality. And the chapter by Long and Wang (2016) in this book empirically shows that China’s patent promotion incentives (including certain patent subsidies, as well as tax policies) have created a decline in the quality of domestic utility models and designs.

In reaction to these negative effects of Chinese patent subsidies and other incentives, various sub-central governments in China have recently instituted key initiatives to move away from a fixation on quantity of any type of patents at any

¹³Design rights in China, even though not dealing with technical inventions, are considered “patents” in China. They are not substantively examined.

cost. Many provinces now require that patent fee subsidies only be awarded to owners of a granted IP right. Shanghai, one of the richest sub-central regions in China (a municipality), revised its patent subsidy program several years ago so that it only provides subsidies for invention patents. Other provinces have followed in reforming some aspects of their IP-conditioned incentives, although questions remain about the extent to which lesser developed regions in China have reformed their IP-conditioned incentives to focus more on patent quality.

At the central level, measures implementing China's Patent Law were reformed to create better safeguards to limit low-quality utility models, including those spurred by IP-conditioned provincial government incentives (but certainly not intended to only limit subsidized low-quality utility models). Article 44 of the Implementing Regulations of the Patent Law was amended on January 9th 2010 to expand the scope of Preliminary Examination for utility models to assess "obvious" lack of novelty (and the same provision was also extended to designs) and "obvious" non-compliance with industrial applicability requirements. Also, the Patent Examination Guidelines were amended on September 16th 2013 to expand, albeit just slightly, the novelty assessment for utility models and designs.

Perhaps the most notable recent initiative to move away from IP-conditioned incentives that stimulate quantity of any type of patents at any cost is SIPO's Several Opinions on Further Improving Quality of Patent Applications promulgated on December 18th 2013 (hereafter "the Opinions"), which is also discussed in a brief January 21st 2014 SIPO interpretation of the Opinions.¹⁴ The Opinions recommend a number of important initiatives, for example that funding should only be given to granted utility models; Search Reports (or more substantive Patent Evaluation Reports) should be provided along with applications for utility model subsidies (if negative reports are actually used as a basis for rejecting subsidy applications, this in effect makes the threshold for awarding subsidies more rigorous than the SIPO examination undertaken to grant utility models); that the level of funding a subsidy recipient can obtain is not higher than the sum of all official charges and patent agency service fees that the recipient pays; that patent targets and performance evaluation systems better reflect patent quality; and that bad faith disincentives should be strengthened. Although there is some uncertainty as to exactly how the Opinions have been diffused from the central level down through the provincial and local levels due to China's sometimes disjointed system of economically decentralized governance, they constitute one of the most specific pieces of guidance in recent years to improve patent quality in China.

By way of another example, SIPO has recently started to view the higher ratio of utility model to invention patent filings in China as an indicator of a less-than-optimal innovation trajectory, and thus recently has targeted a ratio of

¹⁴Opinions available here (in Chinese) http://www.sipo.gov.cn/yw/2013/201312/t20131225_891833.html; Interpretation available here (in Chinese) http://www.sipo.gov.cn/zcfg/zcjd/201401/t20140121_899716.html.

more invention patents to utility models (Xinhua 2014a, b; Fu 2014). Also, the targets in the National IP Strategy (2014–2020) generally reflect a more sophisticated approach to state-led patenting than that of the past, namely one with greater emphasis on the need to stimulate patents that are actually commercialized and thus have value (Prud'homme 2015).

2.4.2.2 Mini Case Study 2: Patent Fee Subsidies in Italy

As illustrated in Table 2.1 in the Annex, Italy has a range of IP-conditioned incentives, including various patent fee subsidies.¹⁵ Some of these programs are administered directly by government departments, while others are administered by chambers of commerce or other private/quasi-private/non-governmental entities. The patent fee subsidies appear available only for SMEs (see Table 2.1 in the Annex for details).

Italy's patent subsidy programs do not seem to be significantly increasing domestic filings of utility models and designs, which are more prone than invention patents to be of low quality given that in Italy these rights do not undergo a Substantive Examination. As depicted in Chart 2.2, for over fifteen years the filings of utility model applications in Italy have come nowhere near to surpassing those of invention patents. And based on the rate of utility model filings in Chart 2.2, although this of course is very *prima facie* evidence per se, patent subsidy programs in Italy do not seem to have given rise to a significant increase in utility model patent filings in the country. This indicates that Italy's patent subsidy programs are likely having a less pronounced negative impact on patent quality than those in China.

Still, one useful assessment conducted by Xu and Federico (2016), featured in this book, of a sample of Italian patent fee subsidies from a major regional subsidy program (in Milan province) finds that those subsidies do not appear to have significantly improved or harmed patent quality. One reason that subsidized patents in Milan were not found to be of particularly high quality could be because of the lack of stringency of the requirements and procedures for granting the subsidies (although could also be related to the methodology used in the paper). The first edition of the patent subsidy program in Milan, administered by the local chamber of commerce, did not have stringent requirements for granting: in fact, the subsidies were automatically assigned in the order in which subsidy applications were received, with no real *ex-ante* assessment of the quality of the patents.¹⁶

¹⁵Information on a range of patent subsidy programs in Italy can be found here: <http://www.uibm.gov.it/index.php/incentivi>; and information on the IP box program in particular can be found here: <http://www.mise.gov.it/index.php/it/per-i-media/notizie/2033226-patent-box-ecco-il-decreto-attuativo>.

¹⁶Consultations with Federico Munari, January 26th 2016.

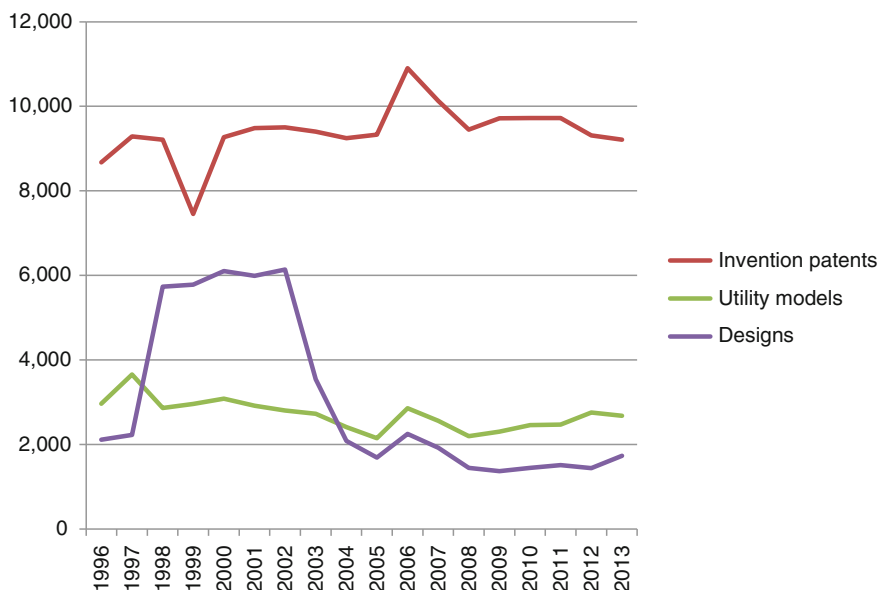


Chart 2.2 Patent and design filings in Italy (at UIBM), by type (1996–2013). *Source* Based on WIPO statistics for total applications (direct and PCT national phase entries) by filing office. Figures for 2014 not available at time of research

Fortunately, the current requirements for being granted patent fee subsidies from major patent programs in Italy are relatively strict. For example, the Brevetti+ patent subsidy program funded by the Italian Ministry of Economy and administered by the Italian Patent Office (UIBM) considers the outcome of the Search Report before awarding patent fee subsidies.¹⁷ Consultations with UIBM officials indicate that UIBM prides itself on instituting a strict set of qualification criteria and oversight process for a range of different programs for subsidizing patent costs.¹⁸

This being said, there is a lack of comprehensive assessments of the impacts of all of Italy's patent subsidy programs on patent quality. As such, significantly more research is warranted in this area, especially as new Italian government programs, like the Brevetti+ 2 program, which started on October 6th 2015, are rolled out in an attempt to improve competitiveness of Italian firms.¹⁹

¹⁷ibid.

¹⁸Consultations with Giovanni de Sanctis, UIBM on May 22nd 2014 at IP Key-SIPO roundtable on utility model patents at SIPO in Beijing, China; Prud'homme (2014b).

¹⁹Consultations with a representative of UIBM on October 13th 2015. See more information on the Brevetti+ 2 program here: <http://www.uibm.gov.it/index.php/06-10-2015-brevetti-2-invia-la-domanda>.

2.4.2.3 Cross-Case Analysis

Several findings can be drawn from the abovementioned cases studies. First, in the short-to-mid-term, governments in latecomer nations like China may adopt the strategy of using IP-conditioned incentives (e.g. patent subsidies) largely to build awareness of the importance of patenting and increase quantity of patents, and in the process willingly sacrifice some quality of the patent stock. This strategy appears intent on first and foremost addressing the dynamics particularly relevant to latecomers mentioned in Sect. 2.2, namely the need to catch up, lack of IP awareness and perfect information, and perhaps the challenge of cutting through incumbent patent thickets.

Second, after reaching a critical point, pressure will arise to shift the strategy to focus more on quality of patents, and in the process attempt to also meet other potential objectives, including stimulating innovation, discussed in Sect. 2.2. Amongst other modes, this evolution may take place via reforms to IP-conditioned incentives and/or institutional mechanisms governing them to ensure they have stricter requirements that better filter out low-quality patents and only promote higher-quality patents. As such, it appears important to very carefully monitor and quickly calibrate IP-conditioned incentives to ensure that the shift to a higher-quality patent stock is not overly delayed thus potentially slowing the catch-up process. Herein, there may be different “crossing-over” points for different regions in China whereby IP laws and institutions change based on local abilities to shift from being IP imitators to innovators (Yu 2009, 2013, 2015); and this may mean that regions that are more economically and technologically advanced in China should move especially quickly to ensure their IP-conditioned incentives stimulate higher quality patents.

Third, the qualification requirements within IP-conditioned incentives are important safeguards of patent quality. In the past, there were relatively few qualification requirements in some provinces in China for entities seeking to claim subsidies for patenting costs—sometimes all that was required was an application number for a utility model or design application. More recently, Chinese provincial governments, guided by detailed advice from SIPO, have realized the need to strengthen their qualification requirements for patent subsidies and have already or are currently undertaking initiatives to do so. In Italy, a number of programs have rather stringent qualification requirements, which may ensure a minimum level of quality of patents subsidized by such programs; however, more research is warranted into how the quality of patents resulting from the various Italian patent subsidy programs may differ depending on qualification criteria for, institutional oversight of, and amount and type of support offered by such programs.

Fourth, IP-conditioned incentives afforded to utility models and designs are particularly prone to have negative effects on patent quality, especially if lacking sufficiently stringent qualification requirements. As clearly illustrated in the case of China, the costs of utility models have a significant impact on the propensity of entities to file and maintain utility models, and IP-conditioned incentives that lower these costs and even provide monetary support/awards beyond these actual costs can have a very significant impact on the ultimate filing and usage of these rights. This created a significant patent quality problem when combined with the statutorily-mandated lack of a Substantive Examination of utility models prior to grant, lack of pre-grant oppositions or observations to challenge the granting of utility models, and lower inventive step for utility models. And this situation was exacerbated in areas with insufficiently stringent qualification requirements in IP-conditioned incentives. This particular mix of lack of legal and policy safeguards resulted in the stimulation of low-quality IP rights in China—which, in the worst cases, included subsidizing rights that (paradoxically, even if granted) did not technically meet statutory patentability requirements.

There does not appear to be as compelling evidence that the low costs and IP-conditioned incentives for patents (sometimes including utility models) in Italy are having a significant negative impact on the quality of the country's patent stock. This is likely owned to a combination of factors in China that collectively do not exist in Italy in the same way, namely: widespread government pressure on some Chinese entities to file IP (often without specifications on the quality of this IP) in order to meet performance review requirements; existence of different types of significant patent-related IP-conditioned incentives all over China without significant patent quality-related qualification requirements; and willingness of Chinese entities to file low-quality utility models (and designs) primarily to meet the aforementioned performance requirements, to acquire a very low cost or cost-free IP right (which, even if low quality, could provide some benefits as a commercial negotiation tool, especially for latecomer firms), and/or to shrewdly make money from the government from filing such rights.²⁰ This being said, the exact extent to which such programs have impacted patent quality in Italy is worth further study.

Fifth, institutional coordination and oversight can play an important role in determining the impact of IP-conditioned incentives on patent quality. For example, less-than-optimal coordination between some district and municipal/provincial governments in instituting patent subsidies lead to abuse of the program in China that likely wasted government resources better spent on encouraging higher-quality patents. There may be a benefit of administering patent subsidy programs through non-government or quasi-government entities, but only if they have more management expertise than government departments. Further, in Italy, past experiences indicate that even if leaving patent subsidy programs to an external body to

²⁰It is also possible that, on average, the technological advancement of utility model filers in China is lower than those in Italy, therefore contributing to this situation. However, in the absence of an empirical comparison, this is speculation.

implement, the government should ensure that the qualification requirements in the programs are stringent enough to avoid subsidizing low-quality patents.

2.5 Conclusions and Policy Recommendations

2.5.1 *Conclusions*

This chapter provides insights into how China's and EU MS' IP-conditioned incentives compare in terms of their underlying strategic objectives and impacts on patent quality, and some key differences among these incentives and reasons for the differences. It also highlights implications of these insights for policymakers.

The first set of findings in the chapter is drawn from typological analysis of the policy mechanisms and strategic objectives behind IP-conditioned incentives in the EU and China. First, IP-conditioned tax incentives are the most prevalent type of IP-conditioned incentive in EU MS and there are some indications they are having negative economic effects. Second, unbeknownst to some, both EU MS and China institute IP-conditioned grants and patent subsidy programs, and policymakers in both regions can learn from each other's experiences with these particular policies. Third, in order to facilitate catch-up, China clearly has more sizeable and diverse IP-conditioned incentives than any EU MS.

Fourth, IP acquisition is the most common immediate objective of IP-conditioned government incentive programs in the EU and China, and grants and patent fee subsidies appear to be the most common policy vehicles for meeting these objectives. These trends reinforce the idea that governments in both developed and developing countries view acquisition of IP in an increasingly inter-connected world as an important end in itself for government policy, although whether this is an optimal strategy deserves further research to better inform policymaking. Fifth, different types of policies are viewed by policymakers in the EU and China as better than others to support different aspects of the IP management process.

Sixth, needs-based commercial support is clearly the most common wider strategic objective behind IP-conditioned incentives in the EU. Seventh, a range of IP-conditioned incentives in China are not always clearly designed to provide needs-based commercial support for individuals or SMEs; and further research is needed on whether China's strategy and implementing policies in this regard should evolve, and perhaps evolve differently among regions and industries in China, to best facilitate catch-up. Eighth, the second most common objective of IP-conditioned incentives in the EU appears to be localizing the benefits of knowledge investment within the EU MS making the policy. Ninth, China has a number of IP-conditioned incentives to localize the benefits of knowledge investment, some of which, although similar in some ways to the most restrictive incentive qualification requirements in the EU, appear even more restrictive and techno-nationalist—potentially even to the detriment of meeting their underlying objectives.

The next set of findings in the chapter is drawn from analysis of the patent subsidy programs in China and Italy in particular. First, in the short-to-mid-term, governments in latecomer nations like China may adopt the strategy of using IP-conditioned incentives largely to build awareness of the importance of patenting and increase the quantity of patents, and in the process willingly sacrifice some quality of the patent stock. Second, after reaching a critical point, pressure will arise to shift the strategy to focus more on quality of patents, and in the process attempt to also meet other long-term objectives such as stimulating innovation. Third, the qualification requirements within IP-conditioned incentives are important safeguards of patent quality. Fourth, IP-conditioned incentives afforded to utility models (and possibly designs) are particularly susceptible to creating negative effects on patent quality given the often relatively low statutory and procedural requirements for granting these rights. And if incentives lacking sufficiently stringent qualification requirements are provided for these rights, they can significantly hamper patent quality. Fifth, institutional coordination and oversight can play an important role in determining the ultimate impact of IP-conditioned incentives on patent quality.

2.5.2 *Recommendations*

Based on the aforementioned conclusions, several policy recommendations appear both intuitive and important for policymakers to consider in China, the EU, and potentially elsewhere, when seeking if and how to create IP-conditioned incentives:

- Patent subsidies (including patent fee subsidies, among others) should only be paid to patents that are eventually granted.
- Generally speaking, IP-conditioned incentives should have stringent enough qualification requirements to ensure they do not create a significant drag on the quality of a country's patent stock. While there can be strategic differences in these requirements among economies pending their levels of technological development, latecomer economies need to ensure they are not overly lax with their requirements because this may hamper catch-up.
- In jurisdictions providing IP-conditioned incentives for unexamined utility models and/or utility models with low (or no) inventive step requirements, the qualification requirements for such incentives should be especially carefully calibrated because they may notably affect patent quality.

- The qualification requirements for IP-conditioned incentives for design rights should be carefully calibrated to avoid providing state support to designs with little economic or social value.
- Requiring a positive Search Report as a precondition for receiving patent subsidies for utility models serves as a useful patent quality safeguard.
- Patent renewal/maintenance fees should be very cautiously subsidized, if at all.
- Institutional oversight/administration mechanisms must be carefully calibrated in order to prevent abuse of IP-conditioned incentives. Private or quasi-private entities may sometimes be useful for administering IP-conditioned incentives but still require some oversight by the government.
- Further studies should be conducted on the impacts of restricting certain types of IP-conditioned incentives to SMEs as an industrial development strategy.
- Oversight of IP-conditioned incentives should be more centralized in China to the extent possible, including via strict monitoring and evaluation of provincial and county implementation of SIPO's December 2013 Opinions on Further Improving Quality of Patent Applications.
- Further study is required into the impacts, including the potentially negative ones, of restrictions on the support provided by some Chinese IP-conditioned incentives to only support “自主/indigenous” IP (i.e. only IP held by domestic entities without foreign-majority ownership), and requiring “core” IP ownership or worldwide exclusive licenses.
- EU policymakers should adopt new restrictions, possibly like those proposed by the OECD and several EU MS at the time of writing this chapter, on IP-conditioned tax incentives currently proliferating among EU MS.
- Chinese policymakers should familiarize themselves with EU MS' approaches to IP-conditioned incentives, including *de minimis* rules related to subsidies which are relevant to economically decentralized economies like China.
- In order to most constructively engage with China, foreign policymakers can benefit from understanding why China strategizes the way it does and that some often-criticized IP-conditioned incentives are not completely unique to China.

Acknowledgements The author would like to thank the managers of IP Key for allowing him to write this chapter (as well as edit the book in which this chapter is published) as part of his work responsibilities. This being said, the opinions expressed in the chapter are those of the author and do not necessarily represent those of the IP Key project or any institutions with which it has cooperated in any way. The author would also like to thank Gao Xintong of IP Key for helping with the research of IP-conditioned incentives in the EU featured in the Annex of this chapter.

Annex: Typological Analysis

See Table [2.1](#).

Table 2.1 Strategies behind and details of IP-conditioned government incentives in the EU and China

Country	Policy mechanisms		Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s) Wider objective(s)
Austria	Grants	Grants and counseling services. Up to 50 % of eligible costs are covered. Eligible costs include those for translations and legal fees amounting to 5000–10,000 EUR. (May also cover litigation costs in cases of infringement.)	IP in emerging markets, especially China	SMEs	IP enforcement (abroad) Needs-based commercial support; Information failure
	Grants	Can cover costs related to patent registration, maintenance, marketing, and enforcement. For registration, covers up to 100 % of eligible costs, capped at 18,000 EUR. For marketing, up to 100 % of eligible costs funded. For the identification of intellectual property violations and for enforcement of existing intellectual property rights whereby 50 % of eligible costs are covered, capped at 100,000 EUR	Must involve costs related to patents and other IP fitting into one of the following categories: costs for registering/granting patents in emerging markets outside Europe; consultancy services for patenting in China, India, and Russia; patent marketing, identification, licensing and exploitation and enforcement of IPR nationally or internationally	SMEs	IP acquisition (abroad); IP maintenance; IP exploitation; IP enforcement Needs-based commercial support; Information failure; Stimulate spending enabling research and/or commercialization
	Grants	Up to 50 % of IP enforcement costs covered, capped at 100,000 EUR	Costs for legal services for IP infringement identification and enforcement	SMEs except for those in the tourism/leisure industries	IP enforcement Needs-based commercial support; Information failure

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
Belgium	Grants	Grants for industrial research or repayable grants for experimental development. Covers costs of acquiring patents from outside sources	Patents must be in-licensed or ownership transferred from outside sources	Young innovative companies	IP exploitation	Needs-based commercial support; Localize benefits of knowledge investment
	Patent subsidy	Subsidies range from 15 to 50 % of costs of registering and maintaining patents	Patents should ultimately be commercially exploited in the Walloon region. Patents registered abroad also eligible	SMEs registered in the Wallonia Region	IP acquisition; IP maintenance; IP exploitation	Needs-based commercial support; Localize benefits of knowledge investment
	Patent subsidy	Costs of filing and maintaining patents. Benefits range from 35 to 70 % of eligible costs, depending on nature of project and entity. A 15 % increase in costs covered when involving patents resulting from collaborations with research institutes	Patents	SMEs who undertake part of their commercial activities in the Brussels-Capital Region	IP acquisition; IP maintenance	Needs-based commercial support; Localize benefits of knowledge investment
	Tax incentives (patent box)	80 % reduction of qualified income from exploited patents, with a maximum effective tax rate of 6.8 %	Eligible IP includes patents, supplementary protection certificates, or know-how closely related to the patents. Patents should be self-developed or acquired and registered in Belgium under the	All Belgian-resident entities subject to Belgian corporate income tax. Belgian branches of nonresident entities subject to nonresident	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives			
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
China ^b			EPC or PCT regime. Eligible income includes that from licensing patents or sale of patented products	Belgian corporate income tax		
	Grants	Provincial and/or local subsidies/grants from science and technology-related government funds (e.g. Technology Invention Fund for SMEs, Key Technology Invention Project Fund)	Entities newly develop 自主知识产权 (<i>zìzhù zhīshǐ chǎnquān</i>) (hereafter “indigenous IP”) or obtain the rights to indigenous IP. Note on definitions: some provinces and localities in China have—at least in the recent past—defined 自主知识产权 as only IP developed by and owned by (or sometimes in-licensed from) a wholly-Chinese-owned entity. Definitions of the term may differ among regions in China, and may differ from the central-level government’s definition of the concept. See Prud’homme (2012, 2013) for more details`	Requirements vary, offered to SMEs but often not only SMEs	IP acquisition	Needs-based commercial support; latecomer catch-up; techno-nationalism

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives			
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
	Grants	Grants/subsidies from the Central Foreign Trade Development Fund (CFTDF) (itself composed of over 37 billion RMB) and/or other funds	Indigenous IP requirements on products being exported	Exporting certain volume of products; other requirements vary	IP exploitation	Latecomer catch-up; (likely some) techno-nationalism
	Grants	Subsidies/grants (e.g. of 1 million RMB)	Indigenous patents incorporated into technical standards	Requirements vary	IP acquisition; IP maintenance; IP exploitation	Latecomer catch-up; (likely some) techno-nationalism; stimulate spending enabling research and/or commercialization
	Grants	Funding from national S&T programs (e.g. the Key Technologies Program, 863 Program, 973 Program, Torch Program, National Key Laboratories program)	Newly developed and owned IP or the rights to IP otherwise obtained (can include indigenous IP requirements)	Requirements vary	IP acquisition	Stimulate spending enabling research and/or commercialization; Latecomer catch-up
	Government procurement	Government procurement contracts awarded	Indigenous IP requirements Note: In 2011, central government officially stated that indigenous IP requirements should be delinked from government procurement preferences	Requirements vary	IP exploitation	Latecomer catch-up; techno-nationalism; other objectives may apply
						(continued)

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives			
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
	Reduced patent fees and delayed payment ^e	Various programs. Reduced or delayed payments allowed for official filings fees and/or maintenance and renewal fees. Sometimes provided at flat rate	Pending the program, can be allowed for utility models, designs, and/or invention patents	Requirements may vary	IP acquisition (domestically); IP maintenance	Needs-based commercial support; latecomer catch-up
	Patent subsidy	Various programs. Covers costs of official fees for filing patents abroad; sometimes includes attorney costs for preparing filings, and maintenance and renewal costs; can potentially cover other generally related costs. Sometimes provided at flat rate Note: some sources indicate that central-level subsidies are no longer offered for international filings, although provinces still offer subsidies for international filings	PCT or other international patents. In some cases, allowed for utility models and designs in addition to invention patents	Requirements may vary	IP acquisition (abroad); IP maintenance	Latecomer catch-up
	Patent subsidy	Various programs in different regions in China. Covers costs of official fees for filing patents in China; sometimes includes attorney costs for preparing filings and maintenance and renewal costs; can potentially cover other generally related costs. Sometimes provided at flat rate	Patent requirements vary. In some cases, allowed for utility models and designs in addition to invention patents	Requirements vary	IP acquisition (domestically); IP maintenance	Latecomer catch-up

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
	Patent targets	Tied to work performance reviews	Patent requirements vary	Government officials, state-owned enterprise managers, university and public research institute managers, etc.	IP acquisition	Latecomer catch-up; Information failure
	Risk assessments/FTO analysis	Various types of support (financial or otherwise) for risk assessments/freedom-to-operate analysis for filing and exploitation of IP	Often for patents, although can cover resources needed for risk assessments for other IP, filed in China and/or abroad	Requirements may vary	IP acquisition; IP exploitation	Information failure; latecomer catch-up
	Financing	Funding from venture capital and other financing entities (via pledge financing, Patent Banks, etc.) directly affiliated with the government	At least sometimes set indigenous IP requirements	Requirements vary	IP acquisition; other objectives may apply	Latecomer catch-up; other objectives may apply
	Tax incentives	High and New Technology Enterprise (HNTe) tax scheme, which affords a 10 % reduction of the Enterprise Income Tax, 150 % super deduction for R&D expenses, and a potential business tax deduction	Utility models, designs for which the pattern and shape of a product is changed in a “non-simple” manner, software copyrights, proprietary integrated layout design rights, and	10 % of employees must engage in R&D; at least 30 % must be technology personnel holding college diplomas or higher degrees; certain ratio required of qualifying	IP acquisition; IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment; latecomer catch-up

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
			new plant varieties. Applicant should own "core" IP independently-developed in China or the applicant should obtain worldwide exclusive rights to such IP for 5 years or more Note: potential changes to these requirements were being discussed at the time of drafting this chapter	R&D expenditures to sales revenue for the most recent three financial years		
	Tax incentives	Benefits vary among regions	IP requirements vary among regions	Requirements vary among regions	IP acquisition; IP exploitation	Localize benefits of knowledge investment; latecomer catch-up
	IP insurance	Patent enforcement insurance, patent infringement liability insurance, or other IP insurance provided by government-affiliated entities	IP requirements vary	Requirements vary	IP enforcement	Information failure; other objectives may apply
	Monetary awards	Monetary awards (e.g. Worker Inventor Award, Women Inventor Award, Juvenile	Often for patents, but may be provided for other types of IP (can have	Requirements vary	IP acquisition	Latecomer catch-up; (can include) needs-based commercial support; (continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
		associated with “well known” trademarks				
	Large-scale experimental IP programs	IP Demonstration Enterprises, IP Demonstration Cities, Patent Navigation Programs, and various other programs	IP requirements vary pending the program	Requirements vary pending the program	IP acquisition; IP maintenance; IP exploitation; IP enforcement (may vary among programs)	Latecomer catch-up; other objectives likely apply
	Service invention remuneration and rewards	Specific statutory remuneration and rewards need to be paid unless a “reasonable” remuneration and reward agreement between the entity and its service inventor is reached Note: as specified by 2015 draft regulation	Creative achievements made in China on subject matter that can be protected by patents (invention patents, utility models, designs), plant varieties, integrated circuits layout designs Note: as specified by 2015 draft regulation	Entities with service inventors	IP acquisition; IP exploitation	Stimulate spending enabling research and/or commercialization; Latecomer catch-up
	Laws on S&T development	Government rules on types of support required specified in the Law on S&T Progress, as well as the Law on Promoting the Transformation of S&T Achievements	Patents and other types of intellectual property. Restrictions on foreign ownership and exclusive licensing of IP if resulting from state-funded research	Various requirements, particularly applicable to universities and public research institutes but also firms using government funding	IP exploitation	Latecomer catch-up; stimulate spending enabling research and/or commercialization

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		IP requirements	Other major requirements of recipients	Strategic objectives	
	Benefits category	Brief description of benefits			Immediate objective(s)	Wider objective(s)
Croatia	Patent subsidy	Subsidize patent registration costs up to a maximum of two patents at 120,000 HRK per patent in Croatia and 180,000 HRK for international applications	Patents	Privately owned, knowledge-based SMEs located in Croatia	IP acquisition (domestically and abroad)	Needs-based commercial support
	Tax incentives	Super tax deduction of between 175–250 %, depending on the type of research activities, for costs including depreciation of costs to buy patents, or licensing fees of technologies used for research activities	Patents	Engage in projects involving basic research, applied research, or technical feasibility studies	IP acquisition	Stimulate spending enabling research and/or commercialization
Cyprus	Tax incentives (patent box)	80 % deduction and a maximum effective tax rate of 2 % for royalties from licensing of IP and capital gains from the sale of IP	Self-owned (not sub-licensed) patents, trademarks, industrial designs and copyrights	Entity is subject to the company tax regime of Cyprus	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment
	Tax incentives	Annual capital allowance deduction of 20 % of cost of developing and acquiring IP. Capital allowance is tax deductible over 5 years including the year of IP acquisition	Intangible assets as defined under the Patent Rights Law, Intellectual Property Law, and Trademarks Law	Entity is subject to the company tax regime of Cyprus	IP acquisition	Discourage offshoring of taxable IP assets; other objectives may apply

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
Czech Republic	Reduced patent fees ^a	50 % reduction of the application fee	Utility models	For individual inventors	IP acquisition	Needs-based commercial support
	Tax incentives	Eligible costs related to IP can be fully expensed in the year of acquisition or amortized over a seven-year period	Patents and know-how (including purchasing rights and licenses to utilize patents or know-how)	Entities subject to Danish tax code	IP acquisition	Discourage offshoring of taxable IP assets; other objectives may apply
	Service inventor remuneration and rewards	(Required by government, but paid by employer.) Specific statutory remuneration and rewards need to be paid unless the value of the invention does not exceed what the employee, in view of his working conditions as a whole, may reasonably be assumed to produce	Inventions that are patentable as invention patents or as utility models in Denmark	Public or private entities which employ the service inventor	IP acquisition; IP exploitation	Stimulate spending enabling research and/or commercialization
Finland	Grants	Covers 50 % of eligible costs for obtaining all rights to inventions through purchasing or licensing, and procuring analyses related to protecting the product or service (e.g. via patenting)	Can cover patents	Micro-enterprises	IP acquisition	Needs-based commercial support; Information failure
	Service inventor remuneration and rewards	(Required by government, but paid by employer.)	Inventions patentable in Finland	Public or private entities which employ the service inventor	IP acquisition; IP exploitation	Stimulate spending enabling research

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
France		Specific statutory remuneration and rewards need to be paid unless it was agreed otherwise before the invention was made				and/or commercialization
	Loans	Covers expenses for protecting IP by applying for registration ranging from 50,000 to 5 million EUR (note: some sources alternatively indicate the cap is 3 million EUR)	Patents	SMEs established for over 3 years, which have filed a patent or a digital creation, have assisted in the R&/or D/innovation, or have incurred significant expenditures for R&D within the last 24 months	IP acquisition	Needs-based commercial support
	Loans	Loans (ADI) repayable with a zero interest rate, whereby 25–65 % of eligible costs can be covered. Eligible costs include those for patent filing and maintenance, and acquisition of technical knowledge	Patents, technical knowledge	SMEs	IP acquisition; IP maintenance	Needs-based commercial support
	Loans	Loans (ADICI) for 65 % of eligible costs for firms with fewer than 250 people, 50 % for firms with 250–2000 people.	Can cover patents	SMEs collaborating with foreign partners	IP acquisition; IP maintenance	Needs-based commercial support

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s) Wider objective(s)
		Eligible costs include those for patent filing and maintenance			
	Support for patents in standards	Patents bought by Fonds souverain de propriété intellectuelle (FSPI) (administered by Caisse des Dépôts et Consignations, entrusted by the French government) are licensed to businesses; advocacy of inclusion of patents of French or European origin in international standards and patent pools	Patents resulting from French research	Focus on SMEs	IP acquisition; IP exploitation Needs-based commercial support; (possibly some) techno-nationalism; localize benefits of knowledge investment
	Reduced patent fees	50 % discount of patent application, examination, and maintenance costs	Patents	SMEs	IP acquisition; IP maintenance Needs-based commercial support
	Patent subsidy	50 % of costs for preparing and filing an entity's first patent, capped at 10,000 Euros	First patent application of the SME	SMEs	IP acquisition Needs-based commercial support
	Tax incentives	Tax credit covering 30 % of first 100 million Euros of qualifying R&D expenses, plus 5 % for any amount exceeding 100 million	Patents stemming from the R&D conducted	Qualifying activities must occur fully in the EU	General (IP acquisition and IP exploitation appear most relevant) Stimulate spending enabling research and/or commercialization; Localize benefits of knowledge investment

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
	Tax incentives	Full exemption from CIT for first profitable year and 50 % exemption for the second profitable year	Qualifying companies that file patents	“Innovative Company” (Jeune Entreprise Innovante) status, which is granted for SMEs no more than 8 years old with R&D spending that accounts for at least 15 % of expenses	General (IP acquisition and IP exploitation appear most relevant)	Needs-based commercial support; stimulate spending enabling research and/or commercialization
	Tax incentives (patent box)	Reduced tax rate of 15 % including social tax contributions, with a maximum effective tax rate of 16.245 %, for royalties and capital gains from disposal of IP (except where the sale takes place between a firm's affiliates)	Patents, utility model certificates, associated industrial/manufacturing processes that can be viewed as an essential element of a patent, and plant right certificates. Must be for patents recorded or eligible to be recorded in France Acquired IP is subject to a two-year holding period (no such requirement if IP results from the R&D activities conducted by the company/is self-developed)	Entities subject to tax code in France	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		IP requirements	Other major requirements of recipients	Strategic objectives	
	Benefits category	Brief description of benefits			Immediate objective(s)	Wider objective(s)
Germany	Patent subsidy	Eligible costs include prior art search, cost-benefit analysis, patent and utility model registration in Germany; and application fees in other countries; and preparation for exploiting the rights. 50 % of eligible costs funded, capped at 8000 EUR per firm. Provided under the SIGNO program Note: the SIGNO program ended at the end of 2015 and has since been replaced by the WIPANO initiative designed by BMWi	Patents or utility models developed through in-house process within 18 month before application	Firms with up to 250 employees and under a certain ceiling for turnover (i.e. SMEs) who have headquarters or production facilities in Germany, and no patent or utility model registrations in the last five years	IP acquisition; IP exploitation	Needs-based commercial support; information failure; stimulate spending enabling research and/or commercialization
	Patent subsidy	Eligible costs include the fees for preliminary examination of the invention (fixed at 375 EU), substantive examination of the invention (including prior art search) (1200 EU), strategy consultation and coordination for patent application preparation (2000 EU), patent application fees (official fees and expenses for patent attorneys) (10,000 EUR) and activities for exploiting an invention (3000 EUR)	Patents and utility models	SMEs which operate exclusively in principal industries with a subsidiary or permanent establishment in Germany, and have no patent or utility model registrations in the five years prior to applying for support	IP acquisition; IP exploitation	Needs-based commercial support; information failure; stimulate spending enabling research and/or commercialization

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
	Service inventor remuneration and rewards	Employee is entitled to reasonable compensation from the employer; payment of which is due no later than three months after the IP rights to the invention have been granted (required by government, but paid by employer) The specific amount of the remuneration depends on the value of the invention, and the share factor of the inventor, which represents the expected contribution of the inventor	Inventions made during the course of the employment contract and are either the result of the activity of the employee in the company or are mainly based on the company's experience or work Note: Non-exploited patents, including "defensive patents" (preventing competitors to enter with equivalent products) and "storage patents" (patents withheld for future developments) are also remunerable under the German law. The former is seldom remunerated in practice as the criteria are too difficult to meet. The latter is usually remunerated	See columns to left	IP acquisition; IP exploitation	Stimulate spending enabling research and/or commercialization

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives			
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
Hungary	Patent subsidy	Up to 90 % of costs relating to international patent applications are funded under the VICACE Programme	Patents filed abroad	SMEs	IP acquisition (abroad)	Needs-based commercial support
	Tax incentives (patent box)	50 % deduction with a maximum effective tax rate of 9.5 % (deduction capped at 50 % of total pre-tax profits) for royalties and capital gains from disposal of IP	Self-developed or purchased IP including patents, industrial designs, know-how, trademarks, trade names, trade secrets, and authentic works protected by copyright. Some incentive programs require that the IP is registered and owned locally	Entities subject to tax code in Hungary	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits from knowledge investment
Italy	Grants	Incentives for maximizing the economic value of patents. 80 % of eligible costs funded, capped at 70,000 EUR. Eligible costs include consultation fees for patent industrialization, management, and/or transfer	Patents already filed with UIBM, EPO or WIPO and subject to substantive examination	Micro-enterprises and SMEs with a registered and operating office in Italy	IP exploitation	Needs-based commercial support; information failure; stimulate spending enabling research and/or commercialization
	Grants	1000 EUR for design applications in Italy or an EU country; 1000 EUR for a design application in one non-EU country; 3000 EUR for a design application in 1–5 non-EU	Application for registration of a design in Italy, EU countries, or non-EU countries	Micro-enterprises and SMES with a registered and operating office in Italy	IP acquisition (domestically and abroad)	Needs-based commercial support

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Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
		countries; 4000 EUR for design applications in more than 5 countries. An additional 1500 EUR provided for design applications filed in the US or China				
	Patent subsidy	Awards for patenting. Up to 5 applications per award type, total award capped at 30,000 EUR Note: incentive discontinued as of December 3rd 2015	Patent applications filed at UIBM, or extension (of one or more applications) of a national patent with the EPO or WIPO (via the UIBM) and subject to substantive examination	Micro-enterprises and SMES with a registered and operating office in Italy	IP acquisition (domestically and abroad)	Needs-based commercial support
	Financing	Risk capital (IPGest) from National Innovation Fund for investments up to 1.5 million EUR over a 12-month period per firm	Self-owned or licensed patents	Micro enterprises and SMES incorporated as join-stock firms with operating offices in Italy	IP exploitation	Needs-based commercial support; localize benefits of knowledge investment
	Loans	Debt capital from National Innovation Fund in the form of bank loans of a maximum of 3 million EUR per firm and a maximum duration of between 36 months and 10 years. Eligible costs include investments in tangible and intangible assets and costs of consultancy services supplied by external consultants	Patents, designs or utility models, registered and valid in Italy, or patent applications with a negative search report issued by the EPO	Micro enterprises and SMES located in Italy	IP exploitation	Needs-based commercial support; information failure

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s) Wider objective(s)
	Tax incentives (patent box)	Tax exemption from corporate income tax or local tax of 50 %, making the effective tax rate 15.7 %; the exemption is reduced to 30 % for 2015 and 40 % for 2016 respectively	Patents (granted or in granting process, including invention patents and utility models, patents for plant varieties and semiconductors' topographies), trademarks (registered or in registering process, including collective marks), legally protected models and designs, and software protected by copyrights. Also business, commercial, industrial and scientific information and know-how which can be held as secret and whose protection can be legally enforced can be eligible. Licensing or the direct exploitation of IP required	Individuals that carry out business activities. Italian resident firms or Italian affiliates of non-resident/foreign firms	IP exploitation Stimulate spending enabling research and/or commercialization; discourage offshoring of taxable IP assets; localize benefits of knowledge investment

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
	Tax incentives	Tax credit for up to 50 % of incremental eligible expenses with cap of 2.5 million EUR. Eligible costs include those for purchasing technical knowledge and patents	Purchases of technical knowledge and patents	Minimum annual investment of 50,000 EUR but yearly turnover not exceeding 500 million EUR	IP acquisition	Needs-based commercial support
	Trademark subsidy	Trademarks+ program for international trademarks: 80 % of eligible costs covered, capped at 4000 EUR for each application designated in a single country, or 5000 for two or more countries. If the designation is in Russia or China, an amount 10 % + 1000 EUR higher than the aforementioned amount will be provided. A maximum of 15,000 EUR is available per firm under the program. Eligible costs include trademark creation, priority searches, costs of trademark acquisition and licensing in WIPO countries, and WIPO application and registration fees.	Trademarks filed abroad	Micro enterprises and SMEs registered and with operating offices in Italy which are holders or applicants on a national or EU trademark	IP acquisition (abroad); IP exploitation	Needs-based commercial support

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives			
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
		For Community Trademarks registered at OHIM (now EUIPO): 80 % of eligible expenses incurred, capped at 4000 EUR for each trade mark application filed at OHIM (now EUIPO). The facility can be granted up to the maximum of 15,000 EUR per company. Eligible costs include designing the new brand, trademark search and assistance for filing, assistance for the acquisition of the trademark or registered nationally, support for the licensing of the trademark and filing fees. Note: Incentive discontinued as of March 2015				
Ireland	Grants	Enterprise Ireland RDI Fund: up to 50 % of total cost of R&D project funded, with maximum grant of 650,000 EUR for standard projects and 150,000 EUR for small projects, with patent costs not exceeding 20 % of eligible project costs. Eligible	IP granted in Ireland or abroad	Irish firms, particularly SMEs	IP acquisition (domestically or abroad)	Needs-based commercial support

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives			
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
		patent costs include those for preparing, filing, reviewing, validation, and translating the application, among potential others				
	Grants	Commercial case feasibility grant: grants from 10,000 to 15,000 EUR	Foreground IP generated in the project owned by the designated institution	Higher education institutions and research-performing organizations in Ireland	IP exploitation	Stimulate spending enabling research and/or commercialization; localize benefits of knowledge investment
	Patent subsidy	HEI Patent Fund—grants usually capped at 20,000 EUR at second stage filing with initial costs covered by firm; Industry Patent Fund Administration of these funds appear to now be handled by relevant Technology Transfer Offices with support from Enterprise Ireland under the technology transfer strengthening initiative	Patent filing fees	Patents from higher education institutions for HEI Patent Fund; etc.	IP acquisition	Several objectives may apply

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
	Tax incentives (patent box)	Maximum effective corporate tax rate of 12.5 % but can be reduced to 2.5 %, capped at 80 % of total taxable IP trading profits in any given period Note: new changes proposed in October 2015 to this tax scheme, including reducing tax rate to 6.25 % of overall expenditure and income from qualifying IP	Income arising from the exploitation of IP is eligible. Eligible IP includes: copyrights, trademarks, trade names, brands, brand names, domain names, service marks, patents, registered designs, software and the right to use or deal with software, secret processes or formula, and know-how. Patents should be self-developed, and acquired patents subject to arm's length restrictions for "connected party," acquisitions (see Sect. 10 (6) of Ireland's Taxes Consolidation Act for a definition)	Companies subject to corporate income tax regime	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment
Latvia	Grants	Micro enterprise and SME new product development program: up to 60 % of eligible costs covered, capped at 14,300 EUR. Eligible costs include those incurred by enforcing IPR	Patents, industrial designs, topographies of semiconductor products	Micro enterprises and SMEs	IP enforcement	Needs-based commercial support

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Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives			
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
Lithuania	Patent and design fee subsidies	Up to 95 % of eligible costs covered, capped at 100,000 LTL per patent/design registration. Eligible costs included those for filing, use of attorney, search, examination, translation, and maintenance of PCT patent applications in Europe; prior art search with the EPO; and registration, publication, deferment, translation and use of attorney for design registration	European or PCT patent registrations, OHIM's (now EUIPO's) Registered Community Design or international design registrations	SMEs and science and research institutions registered in Lithuania	IP acquisition; IP maintenance	Needs-based commercial support; Information failure
Luxembourg	Tax incentives (patent box)	80 % tax exemption for net income, with a maximum effective tax rate of 5.84 % on royalties and capital gains from exploited IP Note: tax scheme to be abolished as of July 1st 2016	Patents, software, designs, models, trademarks, and domain names. IP registered/owned locally, developed or acquired after December 31st 2007. IP should not be acquired from an affiliated company/eligible IP should be developed in-house.	Entities subject to corporate income tax law in Luxembourg	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment

(continued)

Table 2.1 (continued)

Country	Policy mechanisms				Strategic objectives	
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
Malta	Tax incentives (patent box)	Full tax exemption of royalty payments, advances or similar income from qualifying IP	Owned patents, trademarks, and copyrights (including software). Individual owners of patents must have engaged in the development process	Entity subject to Malta's corporate income tax regime	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment
	Tax incentives	Tax deductions for R&D expenditures including those for patents (up to 25 % of total project costs)	Costs for registering intellectual property, or R&D related to personnel, instruments and equipment, etc.	Registration of Industrial Property Rights by SMEs attained from the qualified R&D activities carried out from Malta Eligible projects completed within 36 months from the date of approval	IP acquisition	Needs-based commercial support; localize benefits of knowledge investment; stimulate spending enabling research and/or commercialization
	Tax incentives	Tax credit for costs incurred for IP registration, including those for application preparation, translation, and filing and prosecution; and those for defending the validity of the right during opposition proceedings	Patents as well as other industrial property rights	Registration (obtaining and validating) of Industrial Property Rights by SMEs attained from the qualified R&D activities carried out in Malta. Expenses	IP acquisition; IP maintenance	Needs-based commercial support; localize benefits of knowledge investment; stimulate spending enabling research and/or commercialization

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		IP requirements	Other major requirements of recipients	Strategic objectives	
	Benefits category	Brief description of benefits			Immediate objective(s)	Wider objective(s)
		For small-sized enterprises, 70 % of IP costs incurred by industrial research and 45 % of those incurred by experimental development. For medium-sized enterprises, 60 and 35 % respectively Eligible costs include: costs preceding grant of IP rights, translation costs, costs incurred in defending the validity of the right		can be covered within 24 months from the date when the R&D project is finalized		
Netherlands	Tax incentives (patent box)	75–80 % deductions of corporate income tax on royalties and capital gains from exploited patents	Self-developed IP for which a patent or intangible asset resulted from research and development work formally recognized by a Research and Development Certificate. IP owned in the Netherlands	Entities subject to the corporate tax code of the Netherlands	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment
Spain	Patent subsidy	Up to 80 % of expenses covered, capped at 60,000 EUR per application. For individuals and SMEs, up to 90 % of expenses covered, capped at 65,000 EUR. Eligible costs	Patents and utility models	Private sector, especially individuals and SMEs	IP acquisition	Needs-based commercial support

(continued)

Table 2.1 (continued)

Country	Policy mechanisms			Strategic objectives		
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
		include those for filing and translating applications under the EPC or PCT regime. Also can include costs of prior art searches				
	Tax incentives (patent box)	Maximum effective tax rate of 15 % and a 60 % deduction on income from licensing and transfer of IP	Patents, secret formula or processes, designs or models, plans; rights on information of industrial, commercial or scientific nature. Self-developed or acquired IP	Entities subject to the Corporate Taxation Act of Spain	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment
	Service inventor remuneration and rewards	(Required by government, but paid by employer.) The employee is entitled to obtain a "reasonable remuneration" even if it is otherwise agreed upon before the coming into existence of the invention	Patentable inventions	Public or private entities that employ the service inventor	IP acquisition; IP exploitation	Stimulate spending enabling research and/or commercialization
Poland	Patent and design fee subsidies	35–75 % of eligible costs covered depending on the size of the entity and nature of project. Subsidies available range from 2000 to 400,000 ZL.	Patents, utility models, and industrial designs	SMEs established in Poland	IP acquisition	Needs-based commercial support

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		IP requirements	Other major requirements of recipients	Strategic objectives	
	Benefits category	Brief description of benefits			Immediate objective(s)	Wider objective(s)
Portugal		Eligible costs include those for preparation and filing of IP applications				
	Patent subsidy	Patents+ program: up to 90 % of eligible costs funded, capped at 800,000 ZL per project. Eligible costs include operational costs for patent applications and market research, wages, subcontracting costs and overheads	Patent applications under the EPC or PCT regime in countries other than Poland	SMEs, higher educational institutions and research institutions	IP acquisition (abroad)	Needs-based commercial support
	Tax incentives (patent box)	50 % deduction with effective tax rate of 15 % for royalties, capital gains and compensations derived from certain IP	Patents, utility models, and industrial designs. Self-developed IP from activities performed in Portugal	Entities subject to corporate tax code of Portugal	IP exploitation	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment
UK	Tax incentives (patent box)	56.5 % deduction with effective tax rate of 10 % for royalties, capital gains from exploiting IP, and damages for IP infringement and insurance payments	UK or European patents and supplementary protection certificates. Patents should be self-developed or exclusively licensed. Eligible entities should be taxpayers actively involved in the patent development cycle	Entities subject to the corporate tax code of the UK	IP exploitation; IP enforcement	Discourage offshoring of taxable IP assets; localize benefits of knowledge investment

(continued)

Table 2.1 (continued)

Country	Policy mechanisms		Strategic objectives			
	Benefits category	Brief description of benefits	IP requirements	Other major requirements of recipients	Immediate objective(s)	Wider objective(s)
	Patent subsidy	Smart offered by innovate UK: the incentive consists of 3 categories: Proof of Market, Proof of Concept, and Development of Prototype. The eligible costs include that for patent filing and maintenance. Patent filing costs for new IP generated by eligible projects, capped at £7500 per project. Patent maintenance is eligible as part of the overhead, the cap of which depends on the category the project belongs to. For Proof of Market, the maximum grant is £25 k, and up to 60 % of total project costs. For Proof of Concept, up to £100 k and 60 % of total project costs. For Development of Prototype, £250 k, up to 35 % of total project costs for medium enterprises and 45 % for small and micro enterprises	Patents	UK-based SMEs engaging in R&D activities	IP acquisition	Needs-based commercial support

Sources various IP and commerce-related laws and other measures of the different countries; Ernst and Young (2014), Deloitte (2014), KPMG (2014), PWC (2014); Erawatch portal (<http://erawatch.jrc.ec.europa.eu/>); Austria Wirtschaftsservice (<http://www.asg.at/>); Innoviris (<http://www.irisnet.be/>); Wallonia Region incentives/DG06 platform (<http://www.ncpwallonie.be/en/>) and <https://recherche-technologie.wallonie.be/>); Ecofunding Platform EU (<http://www.ecofundingplatform.eu/>); Jaiya and Kalanje (2006), Prud'homme (2012, 2013), Harhoff and Hoisl (2007); Tuotevayla Product Track (

Forfas (2014); French INPI (<http://www.inpi.fr>); Prestation Technologique Réseau (PTR) (<http://les-aides.fr.html>); Patent France (<http://www.francebrevets.com/>); Legifrance (<http://www.legifrance.gouv.fr/>); Bpifrance (<http://www.bpifrance.fr/>); WIPO (2006), European Commission (2014); German Federal Ministry of Economics and Technology (www.signo-deutschland.de); Lutze (2015, 2016); Irish Finance Bill No. 95 of 2015; Ireland's Taxes Consolidations Act of 1997; Hungarian IP Office (<http://www.hipo.gov.hu>); Italian Patent and Trademark Office (<http://www.uibm.gov.it>); Technopolis (2007); Enterprise Ireland (<http://www.enterprise-ireland.com/en/>); Latvia Investment and Development Agency (<http://www.liaa.gov.lv>); Lithuanian Science, Innovation and Technology Agency (<http://www.mita.lt>); MaltaEnterprise (<http://www.maltaenterprise.com/en>); Polish Agency for Enterprise Development (<http://larr.pl/>); and National Center for Research and Development of Poland (<http://www.ncbir.pl/>); House of Commons (2001); Ekos (2007); Scottish Enterprise (<http://www.scottish-enterprise.com/>); and Innovation UK Technology Strategy Board (<https://interact.innovateuk.org/>)

Notes

Table 2.1 is not necessarily an exhaustive list of all IP-conditioned government incentives provided in the countries listed, although it is a listing of the incentives for which information was most readily accessible during the research for this chapter. Tax deductions for IP-derived personal income were excluded from the chart given difficulty in confidently identifying the most up-to-date information on these programs for all countries analyzed. Service inventor remuneration rules are only listed when governed by a special legal measure outside the patent law (some EU countries, for example, Austria, France, Italy, and the UK, have service inventor remuneration and reward requirements embedded in their patent laws—see Table 2 in Lutze (2015) for details of inventor remuneration programs in EU countries). The “wider objectives” column in Table 2.1 attempts to identify the *main wider objectives* of the policies, but other objectives may still apply. See Sect. 2.3.2 in the methodology for a discussion on these and other limitations of the counting analysis used in this chapter based on Table 2.1

Assignment of an objective (immediate or wider) within Table 2.1 of course does not necessarily indicate the proposed policy mechanisms will actually be effective at meeting such objective(s)

^aOther countries listed in Table 2.1, outside the Czech Republic and China, very well may have programs reducing IP fees for certain entities, but these are not discussed in the table given difficulty in confidently identifying the most up-to-date information on such programs

^bGiven often differing non-IP-specific requirements (e.g. among provinces) in several IP-conditioned incentives in China, such incentives may have more main wider objectives than those explicitly identified in Table 2.1

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Government Incentives**

Prud'homme, D.; Song, H. (Eds.)

2016, X, 328 p. 22 illus., 18 illus. in color., Hardcover

ISBN: 978-981-10-1117-7