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Global norm of national treatment for patent uncertainties: A longitudinal comparison between the US and China

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ABSTRACT

Sporadic studies on the global norm of national treatment for patent uncertainties (NTPU) urge for insights of changes as well as for clarification to discrepancy. This global norm has been a concern for policy makers and practitioners for over a century, as a socially and strategically more significant matter than before for multi-lateral cooperation given the active technology transfer across borders. To fill in the void and extend prior studies, we examine the global compliance of NTPU from the perspective of patent pendency and granting by addressing three relevant questions: (1) Is NTPU upheld within countries? (2) How does NTPU diverge across countries? (3) How does NTPU change, as an outcome, over time? Based on the institutional theory, lagged regression modeling and longitudinal comparison of US and Chinese patenting, our findings reveal that: (1) NTPU is overall upheld because equality in pendency is demonstrated in both countries and in US granting, and foreigners are even favored for Chinese granting. (2) NTPU is comparatively divergent between the countries in pendency and granting due to national variations. (3) Regressive and progressive changes in NTPU are evidenced since both countries provide equal or higher granting, but longer pendency than before. Our findings contribute to theories by providing new insights to the global norm of national treatment and institutional theory from the perspective of patent uncertainties. We make novel empirical contribution to address NTPU changes of the top patent filing countries and methodological contribution to the longitudinal comparative study. The results also provide implications that concern policy makers and practitioners to handle patent uncertainties across borders.

1. Introduction

Facing patent uncertainties, how countries comply with the global norm of national treatment to deal with them is a significant policy, social and scholarly issue for clarity and new insights in the world business. We synthesize prior research (e.g. Harhoff & Wagner, 2009; Kotabe, 1992; Yang, 2008) to refer patent uncertainties as the uncertainties in applying for invention patents associated with pendency (i.e. uncertainty as to the duration from filing to granting a patent) and granting (i.e. uncertainty as to the decision to grant or reject a patent application). National treatment is defined as a global principle under which countries should reciprocate and assert equality to locals and foreigners (e.g. Aoki & Prusa, 1993; Horn, 2006; Scotchmer, 2004). It has become a global norm required by international organizations and an international expectation among countries, including issues from diplomacy, trade, technology exchange to intellectual property (IP). It obligates countries to exercise equality toward one another to enhance understanding and cooperation. The compliance of this principle is significant in the area of technology and patents for countries to

eliminate protective concerns of free-riding and benefit from effective global innovation (e.g. Bosworth & Yang, 2000; Gans, Hsu, & Stern, 2008; Scotchmer, 2004).

Despite the significance of this topic, scholarly endeavor on the global norm of national treatment has been confined within the political economy. The emphasis centers on the legal interpretation of statute compliance with policy practice (e.g. Briggs & Brown, 2012; Scotchmer, 2004), and the economic implications on national innovation (e.g. Aoki & Prusa, 1993; Geng & Saggi, 2015; Hall, 2007). Insightful works of national treatment studies are demonstrated in trade (e.g. Costinot, 2008; Horn, 2011; Staiger & Sykes, 2011), investment (e.g. Liddel & Waibel, 2016; Pillai, 2002), taxation (e.g. Horn, 2006; Horn, Maggi, & Staiger, 2010; Saggi & Sara, 2008), tariffs (e.g. Bagwell & Staiger, 2001; Battigalli & Maggi, 2003), product standard settings (e.g. Battigalli & Maggi, 2003; Costinot, 2008; Gulati & Roy, 2008), and dispute resolution (e.g. Liddell & Waibel, 2016; Pillai, 2002).

Meanwhile, national treatment demonstrates little in the context of IP (Geng & Saggi, 2015) rationalizing the need for insights to address voids, ambiguities, and discrepancy. Sporadic studies in the national

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treatment of trademarks seem broadly consistent that countries endeavor to meet the envisaged global norm (Charlier & Mai-Anh, 2007; Gillespie, Krishna, & Jarvis, 2002; Yang, 2007). In the area of patent uncertainties, however, three issues emerge for scholarly attention. Firstly, prior works have disagreements as to whether or not the global norm of NTPU is upheld despite the recognition that countries do make effort to comply with the principle. One camp of scholars argue that NTPU is unenforced because preferential treatment is given to locals (e.g. Kotabe, 1992; Liegalsza & Wagner, 2013; Webster, Jensen & Palangkaraya 2014). The other camp of scholars emphasizes that NTPU is enforced since equality or positive discrimination to foreigners is found within countries to handle patent uncertainties (e.g. Popp, Juhl, & Johnson, 2004; Wang, Shih, & Chuang, 2010; Yang, 2008). Secondly, existing studies have recognized the variations of NTPU among countries, but detailed disagreements in divergence making it the need for clarification and comparison. Advanced technological countries (US, UK, Germany and Japan) demonstrate variations in their compliance of national treatment in patent uncertainties in the pre-1988 era (Kotabe, 1992). The uncertainty variations tend to be associated with national patent systems (Harhoff & Reitzig, 2004; Popp et al., 2004). Within the patent system, countries are the most diverse in patent administration (Yang & Sonmez, 2013), that is, dealing with patent applications generates varied pendency and granting uncertainties. Thirdly, how countries have changed over time in enforcing NTPU seems a new issue for attention. Prior studies and practice impressions recognize changes under the tide of global integration (e.g. Popp et al., 2004; Yang & Sonmez, 2013). However, how and to what extent changes have taken place in NTPU, as an outcome, are new insights to add.

Given the above rationale, our study centers on the compliance with the global norm of national treatment in dealing with patent uncertainties (NTPU). Accordingly, we address three relevant questions: Q1) Is NTPU upheld within countries? Q2) How does NTPU diverge across countries? Q3) How does NTPU change, as an outcome, over time?

Within the above research remit, we test relevant hypotheses to clarify disagreement (Q1), extend prior studies (Q2) and fill in a void (Q3). We formulate hypotheses based on national treatment principle and the institutional theory, as our theoretical foundations, prior empirical studies, practice impressions and our logical argument. To answer the first question, we hypothesize that countries enforce NTPU in the form of patent pendency within countries and that countries continue to provide equal treatment in granting in the US, but in China, locals continue to be favored. To answer the second question, we predict that countries diverge rather than converge because NTPU has not been achieved equally among countries. As for the third question, with the bilateral- and international- pressure, and national effort toward global integration, progress toward NTPU is a desire and reasonable anticipation, but requires hard evidence.

To test the hypotheses and answer the questions, we use patent data in filing (9.28 million in the US and 5.27 million in China) and in granting (4.4 million in the US and 1.55 million in China), and conduct a longitudinal data analysis (1985–2014) of lagged regressions and comparative studies (1985–2002 and 2003–2014). We chose China and the US as our comparators to test these hypotheses due to the dominant role they play in the patenting world. According to the World IP Organization (WIPO), they account for 57% (22% US and 35% China) and 46% (20/26%) of the world total filing and granting of patents in 2014. As the world highest patent filers and grantors, they are also attractive countries for foreign patenting activities (i.e. 26/48% of total filing respectively for China and the US; 42/49% in granting; 1985–2014). Moreover, the US is the 2nd largest foreign filer (next to Japan) in China while China files far more patents in the US than in any other foreign countries. They also represent the most dynamic in making policy changes over the past three decades motivating us to evidence whether countries have progressed or regressed in NTPU.

By addressing these hypotheses, we contribute to theories, empirics

and methodology. Theoretically, we enrich the central notion of national treatment for patent uncertainties by explaining and taking a stand as to the disagreement on its global compliance (e.g. Kotabe, 1992; Webster et al., 2014; Yang, 2008). We also demonstrate (seems to be the first time from the perspective of NTPU) that the institutional theory of universalism (e.g. Eden, 2010; Ruggie, 1992; Yang & Sonmez, 2013), functionalism (Scholte, 2001; Sgard, 1995; Wijk & Ramamma, 2007), and change (e.g. Bush, 1987; Oliver, 1992; Scott, 1995) are fundamental in interpreting NTPU. Institutions refer to the rules of the game in society (e.g. formal: rules and regulations and informal: value and cultural understanding; North, 1991; Scott, 1995) and are essential for effective functions of the market with reduced uncertainties (Dunn, 2000; Meyer, Estrin, Bahaumik, & Peng, 2009; Williamson, 1985). Institutions also help explain why IP systems are different and difficult to harmonize across nations (Peng, Ahlstrom, Carraher, & Shi, 2017a,b; Yang & Clark, 2005; Yang, 2003a,b). We are thus able to link the theory-empirics to check consistency and disagreement. In return, our findings also help contribute to explain the institutional theory, as an implementation, in addition to a cause and process. Empirically, we extend prior studies to address the discrepancy in the two camps of arguments for or against compliance. We also extend the empirical understanding in spatial terms by addressing the two largest patenting countries. Addressing the changing nature of national treatment represents our novel empirical contribution in temporal terms as to how NTPU has improved. Methodologically, we model lagged regressions and conduct comparative analysis to analyze NTPU. The results help reveal the significant role that the two countries have for each other in patenting and provide implications for policy, practice and bilateral collaboration since rapid granting is a strategic goal for owners (Harhoff & Reitzig, 2004).

2. Theory, empirics and practice, and hypotheses: global norm of national treatment for patent uncertainties

In this section, we rely on the institution theory, empirical evidence and practice impressions to explain NTPU under patent systems and develop hypotheses. In this process, we also discover disagreements, inadequacy and void of NTPU surrounding the three research questions. Our logical arguments based on the above evidence help integrate the theory, empirics and practice, and position the hypotheses.

2.1. Is NTPU upheld within countries?

The institutional theory of universalism emphasizes the significance of international institutions and helps explain the global norm of NTPU (Eden, 2010; Ruggie, 1992; Yang & Sonmez, 2013). Due to the interdependence of countries (Eden, 2010), international institutions emphasize universalism to allow countries to benefit from shared interests and address common issues (Ruggie, 1992). Despite the complexity, countries are obligated, and often willing to integrate because they recognize their own limitation in generating all needed technologies (Bosworth & Yang, 2000; Yang, 2004). Under the universalism of international institutions, countries harmonize important rules to achieve broad integration. Therefore, global norm of national treatment should be in place, as a minimum standard for countries to comply with. One of the effort toward integration therefore is to look at how administratively efficient countries are to handle patent applications (Sherwood, 1997).

In addition to the theoretical support for NTPU, sporadic empirics seems congruent as to national treatment for pendency. That is, findings show equal pendency regardless of applicants' country of origin, for example, in the US (Kotabe, 1992; Popp et al., 2004; Yang, 2008) and China (Liegalsza & Wagner, 2013; Yang, 2008). Meanwhile, these studies disagree on the extent of uncertainty within pendency: Kotabe (1992) and Popp et al. (2004) conclude that foreign applicants endure less uncertainty than their local peers within the equality in the US,

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