

Intellectual property rights and technological innovation: Case study of renewable energy adoption

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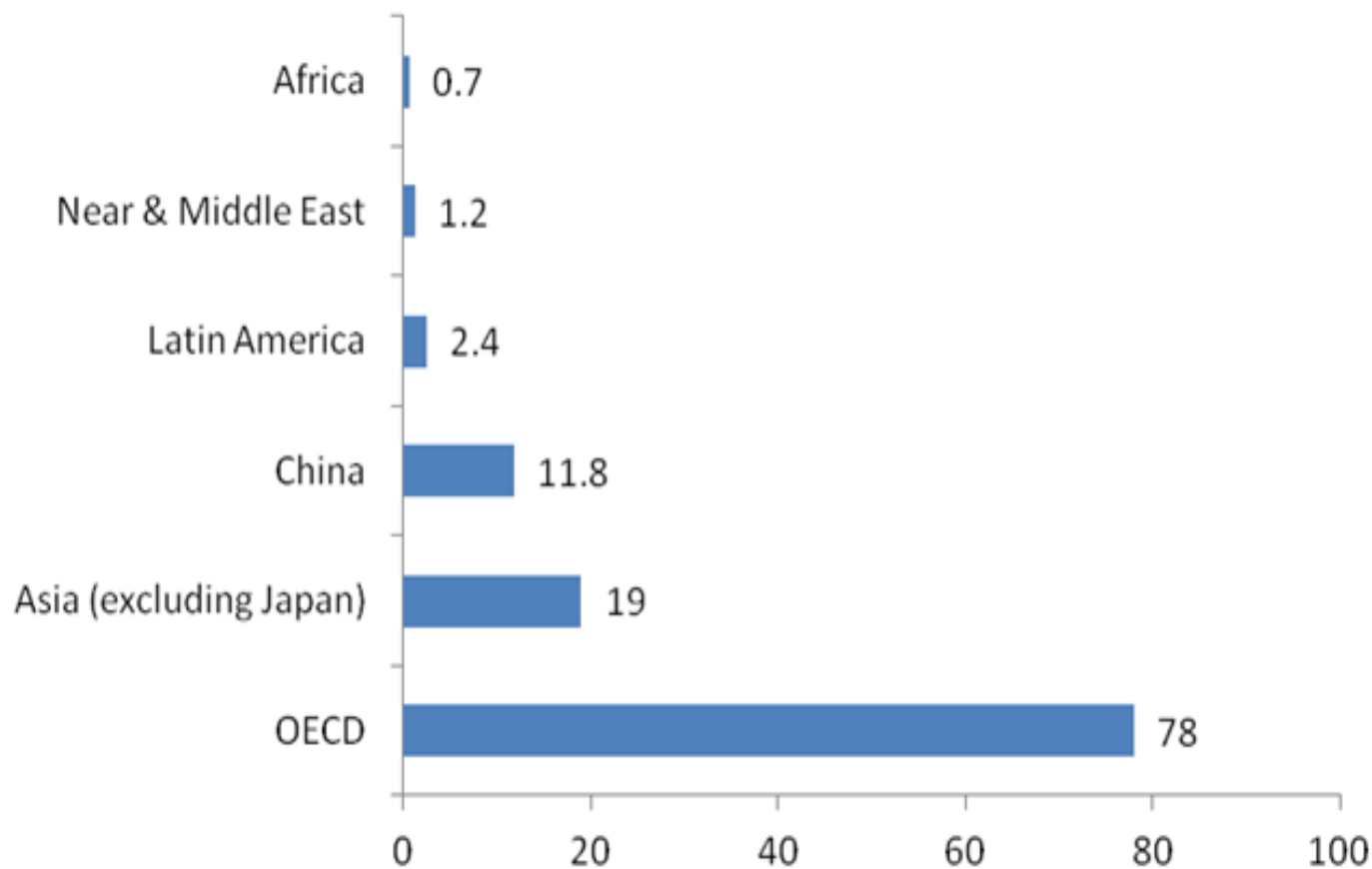
Outline

- Background
- Research question and objectives
- Literature review
- Method and data
- Summary of results
- Conclusions
- Limitations and agenda for future research

Background

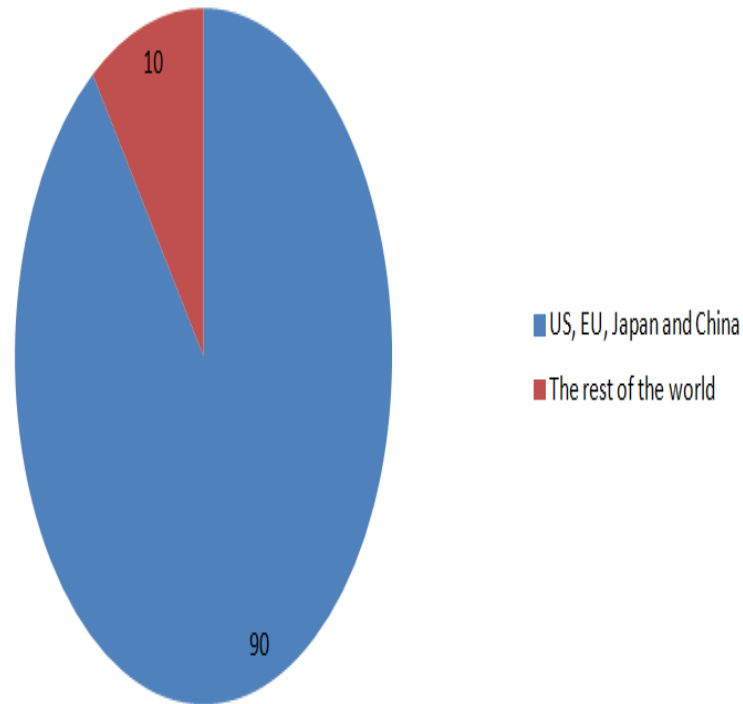
- The objective of IPR protection is to foster innovation and economic development.
- Controversy with introduction of TRIPS in 1995.
 - Differences in resource endowment, economic status and technological advancement ===➔ trade, FDI and technology transfer
 - Developed countries vs developing countries
 - Branstetter et al. (2010) vs Chaudhuri et al. (2006)
- Technology transfer and innovation are key issues in the Rio+20 UN Conference on Sustainable Development discussions, but IPR which are related to them are barely mentioned (Latif, 2012).
- Renewable and clean energy technology is key to CO₂ emission reduction and climate change mitigation.
- Emerging debates on TRIPS and climate change/environmental-related technologies.

R & D (%) investments in different regions in 2005 according to Gaillard (2010)

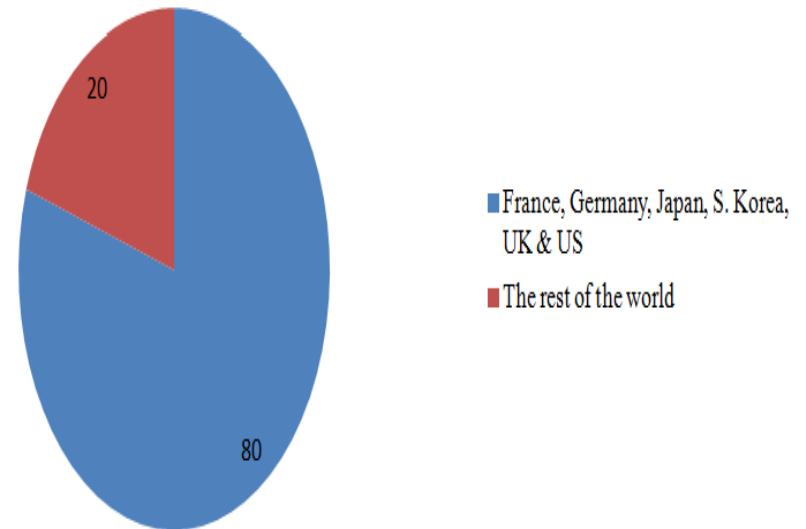


Origin of energy technologies according to Correa (2013)

% concentration of technological development



% of patented innovations in carbon capture, geothermal, solar PV and wind energy technologies



Research question

- Does stronger protection of intellectual property rights hinder renewable energy adoption?

Research objectives

- To conduct a preliminary investigation of the impact of IPR protection on renewable energy adoption using econometrics analysis.

Literature review

- IPR, trade and growth (Taylor, 1994; Adams, 2010, OECD, 2003).
- IPR, innovation and technology transfer (Copenhagen Economics, 2009; Barton et al., 2007; Falvey et al. 2004).
- IPR and clean technology (Barton, 2007a; IRENA, 2013; Chu, 2013; Lewis, 2007).
- The impact of IPR depends on the context (OECD, 2013; Maskus & Okediji, 2010; Favley & Foster, 2006).
- Approach: Theoretical, qualitative analysis, case studies and legal perspectives.
- Econometric analysis is rare and different measures of IPR protection.

Method and data

Estimation technique

- Regression analysis

Baseline model

$$RE_{it} = \alpha_0 + \alpha_1 IPR_{it} + \alpha_2 GDP_{it} + \alpha_3 OPEN_{it} + \varepsilon_{it}$$

Data

- IPR data - Ginarte-Park Index (Ginarte & Park, 1997; Park, 2005) === 1980-2005....., 2010
- RE, RD, GDP, OPEN (World Devt. Indicators)
- 102 countries; 1990-2010

Summary of Results

RE	I	II	III	IV
IPR	-0.13**	-0.06*	-0.22	-1.43***
GDP		-0.22**	-0.25*	-0.47***
OPEN		0.13***	0.13***	0.13***
IPR ²			0.12	
IPR*GDP				0.05**
IPR*RD				0.03*
Constant	3.857	-8.417	-9.105	-12.911
Adj. R ²	0.012	0.892	0.914	0.942
No. of obs	510	510	510	510
F-stat	***	***	***	***
Country FE	√	√	√	√

*** p<0.01, ** p<0.05, * p<0.1

What does the results mean?

- IPR protection has a negative impact on renewable energy adoption
- No evidence of non-linear impact of IPR on renewable energy
- Trade openness and economic development have significant impact on renewable energy adoption
- There is an interaction effect between IPR and economic development and IPR and R&D capabilities

Conclusion

- Strengthening IPR protection may slow the adoption of renewable energy
- The effect of IPR protection on the adoption of renewable energy may depend on the level of development and R&D capabilities of a country

Limitations and potential improvements

- Lack of availability of data on renewable energy innovations for large panel of countries (available for only OECD countries from 1999)
- Relative impacts of IPR protection on different types of renewable energy technologies
- Latest data on IPR protection (GIPC data)
- Develop IPR index solely for (renewable) energy technologies
 - Liu and La Croix (2015) – IPR index for pharmaceutical products

Thank you for listening!

Questions, comments and suggestions....