Patents and the Measurement of International Competitiveness **G. Hyland**
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A monograph based on Dr. Scally's doctoral thesis under Dr. Kingston. He lectures in management & marketing at University College Cork Ireland with an IP-centric research focus leveraging his BSc (biz info tech) & PGD (stats). Dr. Kingston, Trinity College Dublin Ireland, lectures on industrial innovation. He devised the UK Cabinet Office's business expansion schemes (BES) and wrote the European Commission's "enforcing small firms' patent rights". Holding a DLitt and two MAs, he has published extensively in the overlapping fields of politics, economics and law.

Based on USPTO database (J. Hirabayashi) analysis; other primary/secondary references include Jaffe, A. B. & Trajtenberg, M. (2002) "Patents, Citations, and Innovations – a window on the knowledge economy" MIT Press Cambridge MA, Brown, J.R. (2001) "Privatizing the University – The New Tragedy of the Commons" Science 290, and OECD (2003) "Turning science into a business – patenting and licensing at public research organizations".

A two part format is used; international comparisons, followed by small entity (SE) data for selected countries. Introduction, summary and conclusions wrap the core chapters – OECD* small entities, non-profit patents, small firm patents, individual patents and non-OECD* countries. The premise is that patent count provides the basis for industrial competitiveness. A reference framework is created for analysis. The time period considered is a decade, 1994-2003. Patents are divided into three groupings – mechanical, electrical and chemical, as per Appendix-B. Since it is inherently difficult to compare countries due to the variety of their national systems (examination etc.) the USPTO small entity (SE) system is used. SE-patents are defined as non-profit, small firms (<500 employees) and individual. Citations & maintenance model patent quality & value. Five country groupings are used (ABCDE). The focus is OECD* (ABC) – OECD countries plus Israel (31). Group-A is the G7. Group-B has 14 countries: Australia, Austria, Belgium, Denmark, Finland, Ireland, Israel, Korea S., Netherlands, New Zealand, Norway, Spain, Sweden and Switzerland. Group-C contains the remaining OECD* countries (10). 103 non-OECD* countries (DE) are considered. Group-D consists of 32 countries including Taiwan (75% of non-OECD* patents), and Group-E the remaining 71 non-OECD* countries with SE counts mostly in single figures. Part-2 lists basic SE-patent data for 32 countries, the OECD* and Taiwan. Appendix-D contains Group-E abbreviated data (<18 SE-patents each '94-'03).

Part-1 focuses on Group-A & B. A flavor of harvested metadata follows: 25% OECD* patents granted by USPTO were SE-patents; minus the US (36%) that fell to 13%. SE-patent proportion per country varied from 4.4% (Japan) to 60% (Slovakia). 1994-2000 thirty firms accounted for just over 50% Japanese USPTO patents; Canon led. Combining Group-A & B; 45% are individual, 47% small firm, 9% non-profit patents. 80% SE non-US USPTO applications claimed priority, i.e. PCT filed thus interestingly 20% chose to file directly at USPTO first. Inventors – approximately 500/M Canadians, 600/M Taiwanese, 855/M Israeli patents over the period. Monaco, Lichtenstein, and the Cayman Islands (all Group-D) also have high SE-patents/M. 44% Cayman SE-patents, but only 3% Canadian, are US owned. Based on citations (>65%) US applications have substantially higher quality than other OECD*. Mechanical accounts for >60% of SE-inventions, but in non-profit groups where lab facilities are most likely, chemical dominates. The top-35 non-profit assignees are predominantly US universities, except for three Korean organizations (KIST, ETRI, KAIST), and the *Fraunhofer Gesellschaft*. Electrical and chemical account for 18% and 21% SE-inventions, with only slight variation between Group-A & B. Excluding US, individual patents – 73% are mechanical, 15% chemical, 13% electrical. US has highest OECD* inventor citation (>30%) but lowest patent maintenance rate (<65%). Overall Taiwan has highest rate-of-decay; >50% lapse after 4yrs, >75% after 8yrs.

Though essentially a "data-book" one wonders "what does it all mean, and so what"? Expanding the time domain to 20-25yrs (e.g. long term maintenance data) and reduction to economic practice would help enormously. Apparently a 15yrs version awaits publication; whilst the latter should include both legal (patent validity) and economic analysis (mapping "patent bank" strength vs. economic success vs. cost). Also compare and contrast with non-SE data.

Overall – excellent; easy to read helicopter view of the global small entity patent landscape.