

# FY2025 Survey on the Role of Japan's Intellectual Property System in the Economy

## Report Summary

### 1. Background

To effectively operate Japan's intellectual property (IP) system and enhance corporate innovation and competitiveness, it is important to understand trends in patents, designs, and trademarks in relation to corporate value and economic activity. Accumulating evidence that objectively demonstrates the relationship between IP and corporate behavior and market outcomes through the use of patent information is essential. Such evidence can serve as a foundation for patent examination, policymaking by the Japan Patent Office (JPO), and corporate IP strategies. Accordingly, this study examined the market valuation of environmentally related inventions, the effects of IP portfolios, the impact of employing PhD talent on patent activities, and recent domestic and international IP research in order to clarify the current status and future direction of the IP system.

### 2. Scope of the Study

The study analyzed the impact of environmentally related inventions on corporate market valuation, the effects of IP portfolios consisting of patents, designs, and trademarks on corporate performance, and the influence of employing PhD talent on the quantity and quality of patenting activities using firm-level econometric analysis. In addition, empirical studies on IP systems in Japan and abroad were collected and reviewed to improve understanding of Japan's IP system and derive policy implications.

### 3. Methodology

Firm-level panel datasets were constructed by linking intellectual property data, including standardized patent data, with survey information and corporate financial data. The study employed econometric techniques including regression analysis, propensity score matching, Difference-in-Differences (DID), and fixed-effects models. International research trends, particularly recent studies presented at the EPIP Annual Conference and other forums, were also reviewed. The analytical framework and interpretation of results were refined through advice provided by an expert committee.

### 4. Key Findings

#### Theme 1: Impact of Environmentally Related Inventions on Corporate Market Valuation

Using data on Japanese listed companies, the study examined the effects of environmental R&D and GX patents (environment-related patents) on Tobin's q, ordinary profit, market capitalization, and technology export revenues. The results indicate that the quantity of GX patents (number of filings) has a negative effect on these outcome variables, while the quality of GX patents (measured by citation counts) has a positive effect. The positive effect of citations was stronger than that observed for patents in general. Environmental R&D investment may have

negative direct and indirect effects through GX patents, whereas overall R&D investment showed positive direct and indirect effects. The quality of GX patents may also contribute positively to technology exports.

#### Theme 2: Impact of IP Portfolios on Corporate Performance

Using data on Japanese listed companies, the study empirically analyzed how the quantity, quality, and structure of patent portfolios affect corporate performance, including ROA and Tobin's q. The results suggest that simply increasing the number of patent filings may reduce short-term profitability, whereas accumulating high-quality patents with high citation counts tends to improve profitability. Companies with strong R&D capabilities benefit from both broad exploration across technology fields and focused investment in areas of comparative advantage. The findings also suggest the existence of information asymmetry between companies and investors regarding patent portfolio quality and IP management, and indicate that corporate disclosure can help mitigate this issue and support more appropriate valuation.

#### Theme 3: Impact of Employing PhD Talent in Private Companies on Patent Activities

The Japanese source text presents the same analytical findings as Theme 2. Accordingly, this translation follows the source text as provided. Using data on Japanese listed companies, the study analyzed the impact of patent portfolio quantity, quality, and structure on corporate performance. The findings indicate that high-quality patents contribute positively to profitability, that both exploration and specialization can improve performance in R&D-intensive firms, and that enhanced disclosure may reduce information asymmetry between companies and investors.

#### Theme 4: Review of Domestic and International Econometric Research Related to Intellectual Property Systems

The study systematically reviewed major domestic and international econometric research on intellectual property systems to identify insights relevant to policy development at the JPO. EPIP 2025 served as a primary source, supplemented by leading international journals in economics and management. Topics reviewed ranged from the effects of R&D tax incentives and patent fees to cyber-risk issues. The study also proposed three new analytical themes for future JPO research and highlighted the importance of evidence-based policymaking (EBPM) supported by detailed and diverse data on Japan.

### 5. Future Directions

The study demonstrated that environmentally related inventions can enhance corporate market valuation, that strategic use of IP portfolios can improve corporate performance, and that the employment of PhD talent may contribute to both the quantity and quality of patenting activities. Building on these findings, future policy discussions should consider institutional measures that encourage investment in environmental technologies and intangible assets, as well as initiatives that support the advancement of IP portfolio management. In addition, fostering corporate environments in which PhD talent can thrive is expected to strengthen research and development capabilities and promote sustained growth in intellectual property creation.

Continued incorporation of findings from domestic and international empirical research into JPO examination practices, policymaking, and corporate IP strategy support will contribute to strengthening Japan's overall IP ecosystem.

## **6. Keywords**

Intellectual property; patents; trademarks; econometrics; GX patents; green transformation; patent quality; technology exports; environmental R&D; corporate performance; IP portfolios; PhD talent; panel data analysis; propensity score matching; Difference-in-Differences (DID); patent equation; evidence-based policymaking (EBPM); EPIP 2025.