Developing an Enterprise-Centered Framework for Taiwan's International Trade Statistics through Linked Administrative Data

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Abstract

This study develops an integrated microdata framework for Taiwan's international trade statistics by linking customs records with administrative data. Using business tax registration records to identify the relationships between headquarters and branch establishments, export and import transactions reported by branches are consolidated to the enterprise level, providing a more complete representation of enterprise trade activities. The linked microdata are further enriched with enterprise characteristics from multiple government agencies, enabling multidimensional analysis of trading enterprises and supporting the development of short-term export forecasting models. The study makes three main contributions:

1. Enhancing official statistics through linked administrative data

   The study integrates customs declarations with business tax registration, business tax filing and assessment data, labor insurance, and income tax withholding records to derive a wide range of enterprise characteristics, including industry, employment size, trading status, and export intensity. These linked data provide rich information while reducing reporting burdens on enterprises. The analytical framework is broadly consistent with the practices adopted by statistical agencies in the European Union and the United States, allowing international comparability.

2. Understanding the structure and behavior of Taiwan's trading enterprises

   (1) Manufacturers and wholesalers dominate Taiwan's external trade. Manufacturing accounts for the largest share of both exports and imports, whereas exports declared by transportation and warehousing enterprises have risen rapidly in recent years, reflecting the growing practice of outsourcing export declarations to logistics providers.

   (2) Although two-way traders (enterprises engaged in both exporting and importing) account for only about 30% of trading enterprises, they contribute over 90% of total trade value.

(3) Nearly 30% of Taiwan's exporters have an export intensity of 75% or above, exceeding the shares observed in Korea and the EU. These enterprises account for about 60% of Taiwan's exports, comparable to that of small open economies such as the Netherlands and Switzerland.

(4) The top 20 enterprises accounted for 56.0% of total exports in 2025, up from 28.6% in 2016, reflecting the expansion of domestic production capacity by ICT manufacturers and the growing role of transportation and warehousing enterprises in export declarations.

(5) Because fewer firms entered export markets than exited them, the number of exporting enterprises declined from 76,819 in 2016 to 64,231 in 2025. Small and medium-sized enterprises (SMEs) recorded both higher entry and exit rates than large enterprises, while their net entry rate remained negative throughout the period.

(6) Decomposition analysis shows that export growth was driven mainly by continuing exporters expanding existing products in existing markets. The contribution of market entry and exit to export growth was minimal.

(7) The distribution of enterprise-level export growth rates indicates that large enterprises experienced much lower volatility than SMEs, reflecting advantages in economies of scale, resource allocation, and risk management that contributed to more stable export performance.

3. Developing short-term export forecasting models using enterprise-level trade data

This study develops a range of short-term export forecasting models by combining enterprise-level trade data with external real-time indicators using a walk-forward approach with an expanding window. Among the individual models, SARIMA and a modified LASSO model achieve the best forecasting performance. Model combination further improves both directional accuracy and forecast precision, consistently outperforming both benchmark models and expert judgment, demonstrating its practical value for official trade statistics and economic forecasting.