



13TH IMF STATISTICAL FORUM

MEASURING **CROSS-BORDER** **ECONOMIC** and **FINANCIAL LINKAGES** in a Dynamic World

Rethinking data collection systems for a globalized production landscape

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Abstract

Globalization has transformed production, trade, and investment, challenging traditional approaches to measuring economic activity. Multinational enterprises (MNEs), with their complex cross-border structures, create significant statistical gaps, especially in areas such as factoryless production, merchanting, processing services, and intangible assets. In Spain, the creation of the Large Cases Unit (LCU) within the National Statistical Institute (INE) marks a paradigm shift, enabling direct engagement with MNEs, validation of their microdata, and coordination of statistical reporting across domains and with partner countries. Building on this foundation, INE is advancing a centralized data collection model. The MNEData project outlines a two-stage roadmap: a short-term phase targeting international trade and globalization flows of MNEs under LCU oversight, and a medium- to long-term phase aimed at integrating all economic information into a unified system. This strategy strengthens data quality, reduces reporting burden, and aligns with the INE2030 Strategy, positioning official statistics as a central actor in an increasingly digitalized and globalized data ecosystem.

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Introduction

The globalization of the economy is a complex and multifaceted phenomenon that has radically transformed the way firms operate and interact, fostering a growing interdependence among national economies. This profound integration poses significant challenges for the statistical measurement of economic activity, particularly regarding the collection, availability, and compilation of data in line with established statistical and accounting standards.

Within this context, multinational enterprises (MNEs) have emerged as key players, reshaping global patterns of production, trade, investment, and employment. These corporate conglomerates operate across multiple jurisdictions through intricate networks of subsidiaries, affiliates, and strategic partnerships, allowing them to optimize their commercial and fiscal strategies while enabling increasing specialization in goods and services production. MNEs represent not only a substantial share of national economic activity but are also subject to rigorous reporting obligations, both at the individual and consolidated level, which are essential for ensuring financial transparency and for assessing their overall economic position. Consolidated accounts, in particular, provide a holistic view of a group's performance by integrating results across subsidiaries and eliminating intra-group transactions. Their preparation demands highly centralized information systems and control mechanisms that are closely tied to strategic decision-making processes.

At the same time, in a highly digitalized and data-driven society, official statistics face mounting pressure to adopt innovative approaches to data production that enhance efficiency, promote information reuse, leverage technological innovation, and reduce the reporting burden on data providers. The initiative proposed in this paper reflects a *"concrete and measurable action, aimed at transforming the institution into a highly digitalized and efficient organization, grounded in technology and expertise, with a central role in the data ecosystem, solid foundations for the future, and a mandate to contribute to the modernization of official statistics in Spain and to reinforce the role of statistics in society"* (INE2030 Strategy³).

Motivations

Foreign trade statistics and the statistical challenge of globalization

The growing demand for high-quality and granular foreign trade statistics reflects the need for detailed and accurate information in today's global economic context. Traditional data sources — customs statistics for trade in goods and international trade in services surveys for trade in services — are increasingly insufficient to meet the needs of key users. This issue is particularly relevant as these sources serve as the primary basis for compiling foreign trade figures in national accounts and the balance of payments, both subject to highly demanding regulatory reporting requirements.

In Spain, the Bank of Spain, as the institution responsible for compiling the *Balance of Payments and the International Investment Position* statistics, is a key user of the *International Trade in Services Survey* (ECIS) conducted by the INE. In recent years, user demands for higher precision and greater detail have placed levels of pressure on this survey that a traditional sample-based operation—already complex in scope and content—struggles to meet.

³ <https://www.ine.es/dyngs/INE/en/index.htm?cid=1323>

This scenario presents a significant statistical challenge: globalization has not only increased the volume of international transactions but has also fragmented production processes across borders. These global production processes add substantial complexity to macroeconomic measurement, calling for innovative approaches and more integrated information systems capable of capturing the realities of modern international trade with greater accuracy.

The birth of the Spanish LCU

Ministerial Order 378/2022, dated 27 April, established the Large Cases Unit (LCU) within the INE. The LCU is tasked with several key functions, including:

- Direct engagement with multinational enterprise groups (MNEs) to determine, through intensive profiling, their statistical structure and the information they are required to provide to meet statistical obligations stemming from both European and national legislation.
- Collection, analysis, and validation of microdata submitted by multinational groups to the INE for use across all core statistical operations—structural and short-term business statistics, innovation surveys, and more—while leveraging other available data sources. This process includes direct contact with the groups to address detected inconsistencies and gather additional information not currently captured within the system.
- Collaborative analysis of globalization-related issues—particularly those linked to the Gross National Income (GNI) European verification cycles and multinational group data reconciliation—together with other relevant INE departments, other national compilers (like, where appropriate, the Bank of Spain). Additional information requests to MNEs may be made when necessary to ensure the accuracy of these analyses.

In fulfilling its mission, the LCU manages a portfolio of large companies and multinational enterprise groups selected according to their economic significance and complexity. The unit maintains close oversight of each group's global activities and sustains direct communication with their executive leadership. This portfolio is expected to expand progressively in the coming years, ultimately achieving substantial coverage of multinational enterprises operating in Spain, and by extension, of the economic activity and employment they represent in the national economy.

The analysis conducted so far has revealed notable gaps in the current statistical system regarding the measurement of certain global operations carried out by MNEs, with non-negligible implications for national macroeconomic aggregates. In this context, and in line with suggestions from the multinational groups themselves, the LCU is also exploring opportunities for greater centralization of statistical reporting to INE, along with customized data collection channels and technological solutions adapted to the information systems and preferences of these key respondents.

The role of the LCUs in the international arena

LCUs have been described as an “*effective response to the potential problems that large actors — multinational enterprise groups — pose to official statistical systems*” (Hussain, Peltola & Mahajan, 2019) and as “*essential for improving the quality and coherence of economic data related to large multinational enterprises*” (UNECE, 2018). Within Europe, the establishment of an LCU or a similar dedicated structure within National Statistical Institutes (NSIs) has already become standard practice in the vast majority of countries, and several well-established examples also exist internationally.

Two core functions define the role of LCUs: (1) profiling multinational enterprise groups, which involves delineating their network of affiliates and mapping them to the appropriate statistical units; and (2) analyzing their global operations and statistical reporting, ensuring accuracy and consistency across the statistical system.

In the statistical production process, the work of LCUs generally begins immediately after data are collected from these large economic agents and their subsidiaries. LCUs review the consistency of this information and pursue their objectives through direct engagement with the senior management of the enterprise group. This process may lead to targeted adjustments to the microdata submitted to statistical sources when discrepancies of significant magnitude are detected.

In more advanced implementations, such as in the Netherlands and Denmark, all microdata reported by multinational enterprises are validated and cleaned by the LCU, a responsibility also foreseen in the mandate of INE's LCU. Moving further, in leading examples like Canada, Ireland, and the United Kingdom, LCUs not only validate and refine all economic information reported by major multinational enterprises but also take an active role in data collection itself. This is achieved through centralized, group-level reporting systems that are technologically customized to align with the information systems and preferences of the enterprises. The resulting microdata form an integrated and interoperable foundation for all statistical operations measuring the activity of these groups, enhancing both data quality and efficiency across the statistical system.

A chance for changing the paradigm of multinational enterprise data collection

In Spain, the establishment of the LCU has effectively introduced a new approach to engaging with key economic data providers, and even to the collection of such information. In its interactions with multinational enterprise groups, the LCU has frequently encountered a strong interest from group management in ensuring the internal consistency of statistical information provided to third parties across all subsidiaries, as well as in systematizing and optimizing the internal collection of such data.

This experience naturally leads to the consideration of centralized data collection and reporting for statistical purposes, akin to the practices already in place for consolidated accounting within the group, or as implemented in countries with a longer tradition and more developed practices in this area. Such an approach is particularly suitable for capturing information on a group's global operations, for which a complete view is often unavailable at the subsidiary level.

By adopting this model, the collection of statistical information from large enterprises could be dramatically streamlined, reducing the numerous channels through which information is currently reported to the INE to a small number of consolidated channels covering a significant portion of the national economy. For instance, the 40 multinational groups within the LCU's portfolio in 2025 have a combined turnover of €370 billion (compared with Spain's GDP of €1.46 trillion) and encompass over two thousand subsidiaries and other entities, a significant portion of which are included in INE's statistical survey samples.

Furthermore, this approach lays the foundation for two innovative elements in statistical production:

- Economic information from the group and its subsidiaries would be highly integrated from the point of reporting, ensuring coherence across the dataset.

- It would enable cross-cutting validation and imputation of microdata across the group and its subsidiaries, facilitating the integration of information from multiple statistical operations.

Finally, this approach opens the possibility of providing multinational groups with value-added services, such as integrated analysis of their own information within the statistical framework, which could be both useful and informative for them. This would reinforce the view of large enterprises as key stakeholders in the statistical process, and the statistical office as a provider of data-related services, going beyond its traditional role as a producer of statistics within the emerging data ecosystem.

Strategic alignment with INE2030

The project proposed here, with a vision spanning the short, medium, and long term, is closely aligned with the broader vision of “*how we want the INE to be in 2030*” and several of the ten transformative projects underpinning the INE2030 Strategy.

Among the risks already identified in the INE2030 Strategy is the “*competition with private actors*”. To mitigate this risk, the strategy emphasizes the need to strengthen the INE’s role in society by highlighting the rigor, usefulness, neutrality, quality, and technical expertise of public statistics. Yet, the strategy also notes that this is not sufficient: perceptions of obsolescence or a lack of adaptation to technological trends may work against traditional institutions such as the INE.

Large enterprises, the focus of this project, form part of these “private actors”. They are expert users of statistics and, in some cases, data holders and producers of statistical information. The experience of the INE’s LCU in direct engagement with corporate management demonstrates that, on one hand, there is a high sensitivity to the role of official statistics and the relevance of the data reported; on the other, such engagement generates very positive returns in terms of the INE’s image and public statistics credibility. Multinational management expresses a strong appreciation for the technical complexity and detailed work involved in compiling their data into official statistics. In short, these interactions provide a way to mitigate both the risk of competition and the perception of obsolescence, while highlighting the rigor, usefulness, neutrality, quality, and technical expertise of public statistics.

Consequently, large enterprises are key stakeholders in the future of public statistics and, as such, must be strategically engaged. Aligned with the INE2030 Strategy, this proposal seeks to capitalize on opportunities to enhance data quality by ensuring greater reliability, precision, and relevance, while simultaneously reducing the reporting burden on enterprises. Its ultimate goal is to guarantee the accuracy of business information used in statistical production and to streamline the reporting process, facilitating more efficient and effective data provision by these key actors to the INE.

Challenges in measuring international trade: statistical frameworks, limitations, and evidence from Spain

The international trade in the current statistical framework

The measurement of international trade presents significant challenges in the context of a highly integrated global economy. The current international statistical system, guided by accounting standards such as the System of National Accounts (SNA 2008/2025) and the Balance of

Payments Manual (BPM6/BPM7), is based on two key principles to ensure that global economic activity is accurately reflected in national macroeconomic aggregates:

- Change of ownership over physical movement: international trade in goods is recorded when ownership changes between a resident and a non-resident, regardless of whether the goods physically cross a national border.
- Economic ownership over legal ownership: economic control of goods and assets takes precedence over their legal ownership for statistical purposes.

While these principles provide conceptual consistency, they also highlight the limitations of customs statistics — the traditional source of foreign trade in goods data — which primarily capture goods physically crossing borders. They do not account for transactions where ownership changes without cross-border movement, such as merchanting, global production arrangements, or offshore provisioning of fuel and other goods at foreign ports and airports.

To address these gaps, complementary data sources are essential. In Spain, the ECIS survey plays a central role in measuring trade in non-tourism services between residents and non-residents, supporting Balance of Payments and National Accounts compilation. In addition, ECIS collects information on other key international operations, including merchanting, processing services and transactions involving intellectual property (IP) and R&D services. These activities, closely linked to global production chains, are critical to capturing the economic reality of globalization.

Statistical gaps in measuring globalization and international trade

The statistical observation of globalization and international trade reveals several persistent gaps, particularly in capturing increasingly complex global production and trading arrangements. The main issues identified can be grouped into five categories:

- 1) *Factoryless* production: purchases and sales of goods with non-residents conducted entirely abroad, without physical transformation or crossing the national border, linked to globally managed manufacturing processes.
- 2) *Merchanting*: international trading of goods by residents with non-residents, where goods are neither transformed nor enter the domestic economy.
- 3) *Processing* services without ownership change: cross-border manufacturing or transformation services contracted from a non-resident, where ownership of goods remains with the client.
- 4) Offshore provisioning and other goods operations: transactions involving purchases or sales of goods abroad, such as fuel provisioning for aircraft or ships at foreign ports and airports, without customs registration.
- 5) *Intellectual Property Products* (IPPs): cross-border acquisitions, sales, or transfers of intangible assets, including R&D, copyrights, and patents.

Currently, cases (1), (2), and (3) should be reported through the ECIS, following guidelines from the SNA 2008, BPM6, and the *UNECE Guide to Measuring Global Production* (2015). Case (5) is also partially covered by ECIS under categories for intellectual property services, R&D services, and intangible assets.

Commented [PQ1]: Please provide the questionnaire details where this info is derived.

However, analysis by the LCU shows frequent underreporting and significant deficiencies in capturing these operations. These analysis highlight that:

- Currently, these global production arrangements are present in 33 of the 40 MNEs in the LCU's portfolio.
- Significant underreporting or misreporting has been detected in 5 of the 40 groups, requiring ad hoc interventions to correct macroeconomic statistics.
- Deficiencies (requiring ongoing monitoring, though not retrospective revisions) were observed in the majority of groups, while only a small subset of flows were fully captured.

The main causes behind these gaps include:

- Survey design limitations: sampling approaches struggle to measure highly specific, economically significant operations concentrated in certain sectors or companies.
- Respondent misunderstanding: survey respondents often misinterpret questions related to complex international flows.
- Lack of group-level perspective in MNE's subsidiaries: respondents from individual entities within multinational groups, lacking visibility of the group's global strategy, are frequently unaware of global production arrangements strategies, which undermines statistical reporting.

Furthermore, some operations, such as case (4), remain entirely outside the current statistical system, meaning they are not reflected in national macroeconomic aggregates. Additionally, SNA 2025 will introduce a new recording rule for *factoryless* production, classifying it as general merchandise (gross imports and exports) rather than net trade margins, thereby emphasizing the manufacturing nature of *factoryless goods producers*. This change will further restrict ECIS's ability to capture these operations, as the survey classify them as *merchanted* transactions (linked to a global production arrangement) rather than as general merchandise.

MNEData Project: a new approach to measuring global production and international trade in macroeconomic statistics

The limitations of current statistical and administrative data sources for measuring international trade in macroeconomic statistics, combined with the opportunities created by the new infrastructure resulting from the establishment of the LCU, justify taking a significant step forward in the production of foreign trade and globalization statistics. The MNEData project is proposed to address these challenges by improving coverage and accuracy in capturing economic activities associated with multinational enterprise (MNE) flows.

MNEData proposes a two-stage roadmap: a short-term phase (2025–2027), with a focus on foreign trade and globalization flows, and a medium/long-term phase, which aims to embed a fully integrated and innovative statistical large companies framework for the production of all economic statistics.

Short-Term Phase (2025–2027)

In its initial stage, MNEData would be launched as a new statistical action aimed at capturing detailed, exhaustive (legal unit-level) data on foreign trade in services and global production arrangements (such as *factoryless* production, *merchandising*, *processing*, and other goods transactions not crossing borders) for all MNEs included in the LCU's portfolio. The approach emphasizes centralized data collection at the MNE level and establishes a direct relationship with identified focal points within each group, supported by continuous engagement from the LCU.

Key features of this phase include:

- Quarterly data collection centralized at the MNE level, covering all legal entities within each group operating in Spain, with clear identification of the subsidiaries involved in each operation.
- Tailored digital reporting tools leveraging international statistical or accounting standards (SDMX, DDI, XBRL) and automated data exchange solutions (EDI) to ensure efficiency, timeliness, and reduced reporting burden.
- Integration with ECIS: MNEData will take over the collection of information on the MNE covered by the LCU's portfolio, while ECIS will focus on the remaining business population, according to its traditional sampling design. Results from both sources will be combined to compile Spain's *Balance of Payments and International Investment Position* statistics, ensuring coherence with European regulations (EU Regulation 2019/2152).

The short-term implementation of MNEData is expected to:

- Improve the quality and granularity of information on global production arrangements, which require in-depth understanding of MNE strategies to ensure accurate macroeconomic representation.
- Close existing gaps in trade measurement, particularly for goods not crossing borders.
- Maintain the current levels of coverage, precision, and compliance of ECIS for non-LCU entities, preserving its role in measuring international trade in services.

Medium/Long-term phase: a fully integrated system for large companies

Once the short-term phase is consolidated, MNEData would evolve into a comprehensive platform for centralizing, validating, and disseminating all economic data on the largest enterprises (most of them, MNEs) operating in Spain. This phase, aligned with modernization initiatives at INE, would create a unified statistical infrastructure capable of capturing both structural and short-term economic data at the group, enterprise, and legal-unit levels.

The key objectives of this phase include:

- Centralized reporting and *account management* approach: the LCU would act as a dedicated account manager for each company under its portfolio, providing support for data reporting and ensuring consistency across all statistical domains.
- Technological integration: reporting systems would be fully adapted to centralized submissions and harmonized with companies' internal information systems.

- Data integration: all information collected through MNEDData would feed directly into a future INE's data space, enabling its systematic reuse across all statistical production processes.
- In its most advanced form, MNEDData would serve as the cornerstone of an integrated, large companies-focused approach to economic statistics, strengthening Spain's capacity to measure globalization phenomena and aligning its practices with those of leading countries in this *account management* approach in data collection from business.

Conclusions

Globalization has profoundly transformed production and trade systems, creating major challenges for the statistical measurement of national economies. This paper highlights that traditional approaches to data collection — based primarily on customs statistics and sample surveys — are increasingly insufficient to capture the growing complexity of multinational enterprise (MNE) operations. The fragmentation of production processes, the expansion of modalities such as factoryless production, merchanting, or processing services without ownership change, as well as the growing importance of intangible assets, all demand more integrated and adaptive methods of data gathering.

In this context, the establishment of the Large Cases Unit (LCU) within the INE marks a decisive step toward a new paradigm in engaging with large enterprise groups. Acting as a direct interlocutor, validator of microdata, and coordinator of statistical consistency at the group level, the LCU opens the door to centralized reporting systems aligned with best practices already consolidated in pioneering countries such as the Netherlands, Canada, or the United Kingdom. The MNEDData project, conceived as the natural evolution of the LCU, represents a strategic proposal to enhance the quality, coverage, and coherence of globalization statistics, strengthening Spain's ability to meet the demanding international standards in national accounts and balance of payments compilation.

Moreover, the experience shows that close cooperation with MNEs not only facilitates the consistency and accuracy of reported data but also reinforces the credibility and legitimacy of official statistics in a growing competition context with private data providers. Ultimately, investing in innovative, digitalized, and large companies-focused data systems appears essential to ensure the future relevance and sustainability of public statistics. This approach is fully aligned with the INE2030 strategy and positions official statistics as a key actor within the broader data ecosystem, capable of responding effectively to the challenges of an increasingly globalized economy.

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Additional useful tips to consider:

- **Clarity and Accessibility:**
 - Write in clear, concise language, avoiding unnecessary jargon.
 - Consider the paper's audience, ensuring that both experts and non-experts can grasp the core ideas.
- **Consistency:**
 - Maintain a consistent tone and style throughout the paper.
 - Ensure all sections are well-integrated, with smooth transitions between them.
- **Review and Revise:**
 - Allocate time for multiple rounds of revision, focusing on clarity, coherence, and accuracy.
 - Consider seeking feedback from colleagues or mentors before finalizing the paper.