

Assessing Multinational Production Through Foreign Direct Investment Statistics: Challenges and Recent Advances

Zenagui Sid Ahmed

Laboratory of Markets; Employment; Simulation, and legislation in the Maghreb Countries. University of Ain Temouchent- ALGERIA. Sidahmed.zenagui@univ-temouchent.edu.dz

Article Information

Article history

Received: 11 January 2025

Accepted: 19 September 2025

Published: 30 September 2025

Corresponding Author

Zenagui Sid Ahmed

Email: sidahmed.zenagui@univ-temouchent.edu.dz

Copyright © 2025, University center of Abdelhafid Bousof, Mila. This is an open access article under the CC BY-NC-ND license.

Suggested Citation

Zenagui S. A. (2025). Assessing Multinational Production Through Foreign Direct Investment Statistics: Challenges and Recent Advances, Finance and Business Economics Review, Vol. 9, No. 3, pp. 25-38.

DOI : 10.58205/fber.v9i3.2004

Abstract: Foreign direct investment (FDI) statistics are widely used as a proxy for multinational production and the activities of multinational enterprises (MNEs). However, FDI statistics have faced criticism due to their susceptibility to being influenced by financial motives that are largely unrelated to real production activities. This paper surveys recent advancements in the compilation of international FDI statistics aimed at addressing these challenges. We examine how these improved statistics enhance the alignment between FDI data and multinational production, offering clearer insights. Additionally, we provide practical guidance for applied researchers on effectively implementing these refined approaches in their analyses.

Keywords: balance of payment; foreign affiliates; foreign direct investment (FDI); multinational enterprises; multinational production.

1. Introduction

FBER

25

Foreign direct investment (FDI) is a critical category of international investment. According to the dataset by Lane and Milesi-Ferretti (2018), FDI stocks accounted for approximately 30% of global cross-border liabilities in 2015 and represented more than half of foreign financing in over a third of countries, many of which are developing economies. Alongside statistics on portfolio investment and other cross-border investments (e.g., bank loans), FDI positions reflect financial exposure and international financial integration across nations.

FDI distinguishes itself from other cross-border investments by the direct investor's objective to establish a lasting interest in the foreign affiliate. Typically, the foreign investor, often a corporation, seeks significant economic influence over the affiliate. Practically, this lasting interest is evidenced when the direct investor owns at least 10% of the affiliate's voting power. Financial transactions between the foreign investor and affiliate are recorded as FDI in balance of payments (BoP) statistics or, equivalently, in the international investment position (IIP).

1.1 Challenges to the Use of FDI Statistics

Concerns about the adequacy of FDI statistics for measuring patterns of multinational production have persisted. One of the primary critiques pertains to differences between FDI data and operational statistics of multinationals. Lipsey (2007), for instance, identified discrepancies between U.S. outward FDI data and statistics on the activities of U.S. multinational enterprises (MNEs) abroad, such as employment, value-added, and tangible assets. These discrepancies were attributed to tax avoidance strategies employed by U.S. MNEs and the growing significance of intangible assets in production.

Using a similar approach to compare FDI data and foreign affiliates (FAs) statistics, Beugelsdijk et al. (2010) revealed a systematic overestimation of FA operations in jurisdictions classified as offshore financial centers (OFCs). Conversely, they noted an underestimation of FA operations in countries with advanced financial systems, attributed to non-FDI financing sources. Other studies (Leino & Ali-Yrkkö, 2014; Sauvant, 2017) have also highlighted mismatches between FDI data and affiliates' capital formation or assets. Earlier surveys, such as Devereux (2007), provide a broader discussion of such discrepancies.

The broader context of financial globalization and the rising importance of profit-shifting by multinationals have intensified critiques of FDI statistics. Recent studies (Florez-Orrego et al., forthcoming; Brandt, 2023; Tørsløv et al., 2023) contextualize these concerns. Damgaard et al. (2024) advanced the debate by addressing three key statistical challenges: the impact of pass-through capital via special purpose entities (SPEs), the estimation of SPE components in FDI statistics for non-reporting countries, and methods to trace ultimate investors to better reflect substantive economic activities. Their work revealed that "phantom FDI," or investments into empty corporate shells, constitutes roughly 40% of global FDI, raising significant questions about the use of standard FDI statistics to measure real economic phenomena.

1.2 Recent Developments in Measuring FDI

National statistical compilers and international organizations have long acknowledged the limitations of FDI data and have made strides in improving its analytical utility. The OECD's Benchmark Definition of Foreign Direct Investment (BMD4, 2008) recommended the separate identification of FDI related to SPEs and classifications of FDI positions by the ultimate investing economy (UIE). These recommendations, also incorporated into the IMF's Balance of Payments and International Investment Position Manual (BPM6), aim to mitigate distortions caused by financial conduits and improve the accuracy of economic linkages reflected in FDI statistics.

In practice, several economies now disseminate FDI statistics that separate FDI through SPEs and report inward FDI by the UIE. These advancements align with complementary datasets, such as Eurostat's Foreign Affiliate Statistics (FATS), OECD's statistics on the Activities of Multinational Enterprises (AMNE), and project-level data on Greenfield investments and mergers and acquisitions. Additionally, the advent of country-by-country reporting (CbCR) for MNEs, as mandated by the OECD, has enhanced the understanding of multinational production structures. Recent contributions (e.g., Clausing, 2020; Fuest et al., 2022; Santomartino et al., 2022) highlight the practical applications of these developments and their influence on corporate behavior.

1.3 Purpose of this Paper

This paper aims to address the key critiques of FDI data as a measure of multinational production in light of recent advances in FDI data compilation. Specifically, it focuses on

BoP FDI statistics and defines "multinational production" as the real activities of MNE affiliates, such as output or sales, in line with prior academic literature (e.g., Alvarez, 2019; Arkolakis et al., 2018; Miroudot & Rigo, 2021; Ramondo et al., 2015).

The paper addresses three main critiques. First, it examines the issue of "phantom FDI" and its impact on aggregate and bilateral FDI statistics (Sections 2 and 3). And expands the discussion to fundamental assumptions about the productive nature of FDI financing, including the role of local financing in MNE affiliates. For each concern, the economic rationale is summarized, recent advancements in FDI compilation practices are reviewed, and analytical methods to address gaps in data are discussed. Section 4 concludes with practical proposals for reconciling FDI statistics with the measurement of multinational production.

1.4 Scope and Contributions of the Paper

As with any review, this paper faces certain constraints regarding the scope of the field it surveys. The primary limitation lies in the focus on balance-of-payment (BoP) data for foreign direct investment (FDI), which is generally available at the country level (and occasionally at the sectorial level). This focus is due to the extensive availability of BoP FDI data across countries and over time, and the gap between recent advancements in compilation standards for these data and their widespread critique in existing literature. The paper primarily discusses FDI stocks (also referred to as "positions") rather than FDI flows, as stocks better capture the scale of multinational presence within an economy. However, in certain cases, other data sets, including firm-level data, are addressed where they are closely related to the issues discussed in BoP data. Brandt (2023) offers a comprehensive overview of alternative data concepts linked to multinational corporations (MNCs) and multinational production.

FBER

27

The second delimitation concerns the paper's main focus on surveying developments and opportunities associated with BoP data, set against the background of challenges identified in the literature. This paper does not aim to provide an exhaustive survey of the literature; rather, it seeks to outline the key concerns about FDI data highlighted in both seminal and recent academic contributions. In doing so, it focuses on the literature that directly addresses the discrepancies, limitations, and challenges inherent in FDI data, while also presenting the advancements that have been made to address these issues.

The main contribution of this paper is to spotlight the potential of BoP FDI data to address long-standing concerns surrounding the measurement of multinational production. The existing literature on FDI statistics has often overlooked these recent developments, or the BoP data series reviewed in this paper were not yet available at the time of earlier studies (particularly those prior to 2010). By examining these improvements, the paper aims to provide useful insights for applied researchers and policy analysts who are investigating the patterns, drivers, and consequences of multinational production and FDI.

2. IS FDI MOSTLY FINANCIAL “PHANTOM” INVESTMENT?

“Phantom FDI” through Offshore Financial Centers is driven by Financial and Tax Motives, Weakening the Relationship between FDI and Multinational Production

2.1. What is the Potential Problem?

FDI is not solely motivated by production-based or “real” considerations. A significant body of recent research, particularly by Gabriel Zucman and collaborators, the EU Tax Observatory, and The Global Capital Allocation Project, has highlighted the role of international profit-shifting by multinational corporations (MNCs) (Tørsløv et al., 2023;

Wier & Zucman, 2022). To optimize or avoid corporate taxation, MNCs often establish affiliates in Offshore Financial Centers (OFCs), also known as “investment hubs,” which are typically low-tax jurisdictions. These affiliates may not perform actual production activities. Rather, MNCs use them to transfer assets, such as patents or intellectual property, to the OFC affiliates and subsequently engage in financial transactions that make profits appear in low-tax jurisdictions. As a result, the market value of these OFC affiliates increases, inflating the FDI statistics between the source and host countries.

The outsized role of OFCs in global FDI has led to significant criticism regarding the use of FDI statistics as a measure of multinational production. Two broad cases can be distinguished:

1. FDI parked in OFC affiliates – Primarily for tax avoidance purposes (Tørsløv et al., 2023).
2. OFCs acting as intermediaries – Where they serve as conduit jurisdictions between the investors' country of origin and the final destination of FDI, generating “conduit” or “pass-through” FDI (Borga & Caliandro, 2023; Casella, 2019; Damgaard et al., 2024). In these cases, OFCs may also be used to raise financing (Biswas et al., 2022; Blanchard & Acalin, 2016; Coppola et al., 2021), exploit investor protection mechanisms, or safeguard parent companies against political risks and claims on their affiliates (Lewellen & Robinson, 2013). According to Garcia-Bernardo et al. (2017), “phantom” FDI can thus be categorized into two types: sink-OFCs (which retain FDI) and conduit-OFCs (which pass through FDI).

The presence of OFCs inflates FDI statistics and can lead to an overestimation of the extent of multinational production. In the common case of conduit structures, this further obscures the identity of the ultimate investors behind real FDI. Damgaard et al. (2024) coined the term “phantom FDI” to describe these investments related to OFCs, where the investment does not play a clear productive role in the host economies. Bolwijn et al. (2018) estimated that 30-40% of total FDI stock is routed through investment hubs, a figure that aligns with findings from other studies using alternative methodologies (Damgaard et al., 2024; Haberly & Wojcik, 2015; Turban et al., 2020). This share has increased significantly since the early 2000s (UNCTAD, 2015), but it has gradually declined since 2017, likely due to the tax reforms introduced by the 2017 US Tax Cuts and Jobs Act and the OECD/G20 Base Erosion and Profit Shifting Initiative.

2.2. *What is the Data Situation?*

Most conduit FDI is routed through Special Purpose Entities (SPEs), as detailed by Borga & Caliandro (2023), with nearly all investments involving SPEs being categorized as conduit. While conduit FDI through other entities may also occur, it is often linked to production activities in the host economy. Statistical compilers and international organizations have long recognized the distinct nature of SPEs and, in many cases, provide separate reporting on investment to and from SPEs within their Balance of Payments (BoP) data.

When data on SPEs is reported separately, analysts and researchers can choose whether to include or exclude SPE-related investments in their analysis. It is essential for analysts to understand the different approaches taken by various international data providers in reporting FDI statistics. For example, the IMF, through its Coordinated Direct Investment Survey (CDIS), includes SPEs in its reporting of bilateral FDI stocks. In contrast, UNCTAD removes SPEs from aggregate stock and flow figures when reported by countries, providing a clearer representation of multinational production dynamics. Additionally, organizations such as the OECD, Eurostat, and the IMF in their BoP and International Investment Position (IIP) data offer separate statistics for SPEs. This allows analysts to either include SPEs, subtract them from totals, or examine them as a distinct category.

By providing separate reporting of SPE-related FDI, these organizations offer greater flexibility for analysts to make informed decisions about the inclusion or exclusion of SPE investments based on their research objectives.

2.3. *Estimating Phantom FDI for Non-reporting Countries*

For countries that do not report data on Special Purpose Entities (SPEs), alternative analytical methods can be employed to estimate the size of phantom FDI. Several methods have been developed to estimate the scale of conduit FDI and to distinguish between real and phantom FDI. These methods include UNCTAD's implied investment method (Bolwijn et al., 2018; Casella, 2019), the IMF's approach to estimate real (and phantom) FDI (Damgaard et al., 2024), and a methodology based on the OECD/G20 Base Erosion and Profit Shifting (BEPS) initiative to extrapolate conduit investment probabilities from Balance of Payments (BoP) statistics on ultimate investors (Turban et al., 2020).

These methods primarily rely on the statistical relationship between Gross Domestic Product (GDP) and FDI stock—essentially, the relationship between the size of an economy and the amount of foreign investment it attracts. However, this relationship tends to break down for jurisdictions with a significant share of conduit FDI.

UNCTAD's Method: UNCTAD's method uses a direct linear relationship between the log of inward (or outward) FDI stock and the log of GDP. Economies displaying disproportionately high FDI relative to their GDP are identified as outliers, and the portion of FDI that exceeds the expected level based on GDP is attributed to conduit structures (Bolwijn et al., 2018). This approach highlights the economies where FDI stock is far greater than what would be expected based on their economic size, suggesting that a portion of the FDI is not linked to real production.

FBER

29

DEJ Method (Damgaard et al., 2024): The DEJ method makes a more direct extrapolation from available data on SPEs. It estimates the relationship between the share of non-SPE to total FDI and the ratio between total FDI and GDP (known as FDI intensity) in economies that report non-zero SPEs. Using this relationship, it extrapolates to other economies, estimating the share of “real” FDI and “phantom” FDI. This method essentially assumes that there is a limit to the amount of genuine FDI an economy can absorb. Any investment beyond this threshold is classified as phantom FDI.

While both methods share similar logic, there are key differences. The DEJ approach is more direct and empirically captures the relationship between the share of investment in SPEs and the relative size of an economy's GDP. UNCTAD's method, by contrast, derives the investment in SPEs by comparing the total FDI and GDP of the host economy, and attributes the difference to conduit structures. However, the DEJ method applies its relationship, based on a small sample of 16 countries reporting non-zero SPEs in 2017, to all economies globally, making the analysis susceptible to biases from extreme observations, such as large financial centers like the Netherlands and Luxembourg.

In both approaches, the underlying assumption is that each economy has a capacity to absorb genuine FDI based on its size. Any FDI that exceeds this capacity is considered phantom, with the assumption that it is unlikely to contribute meaningfully to real economic activity in the host country.

2.4. *What Should Researchers and Analysts Do?*

Researchers and analysts need to be transparent about whether the inclusion of “phantom” FDI affects their analysis. In certain studies, such as those focusing on international finance or global capital allocation at the macro level, phantom FDI may not be an issue. However, it

becomes problematic when studying multinational production patterns, as it distorts the true scope of real economic activity.

For studies focused on multinational production, it is recommended to use FDI data excluding SPE-investment, whenever feasible. If excluding SPE investment is not possible or preferred for other reasons, analysts have two main options:

1. Pragmatic Option: Exclude Offshore Financial Centers (OFCs) from the analysis, at least for robustness checks. This approach help in validation the results.

2. Sophisticated Option: Separate SPE investment from the overall FDI data through estimation methods. Since SPE data is typically available for certain countries, analysts can use this sub-sample to estimate the SPE component in their global FDI statistics. Methods like those by Turban et al. (2020) can be used, which provide a purely estimation-based approach to maintain comparability across countries. Alternatively, Bolwijn et al. (2018) and Damgaard et al. (2024) propose a hybrid approach that combines actual data for economies reporting SPEs with estimation for those that do not. Additionally, Brandt (2023) discusses other methodologies to estimate capital flight and profit shifting.

In cases where the study centers on tax evasion or similar issues, SPEs may be the focus of the analysis. In this case, the aforementioned SPE data sources or estimation approaches should be leveraged to separate financial activity from productive FDI.

FBER

30

For studies analyzing individual economies, particularly small countries where discrepancies can have significant impacts on the overall FDI picture, it is essential to perform economy-specific calibration. This involves integrating additional information and expert knowledge specific to each economy, such as:

- Firm-level data (e.g., from ORBIS)
- Inward FDI statistics from Eurostat and BEA
- Outward FDI statistics from BEA
- Direct consultations with central banks and national statistical offices (e.g., whether they report SPE data and their definition of SPEs)
- Country-specific literature and analysis

For researchers working with firm-level data, special caution is needed when dealing with data from OFCs, particularly for firms in finance, insurance, and business services sectors. The findings in Lopez Forero (2024) suggest that operational data, such as employment figures, differ systematically between firms investing in OFCs and those that do not.

2.5. Considerations for Future Research

The discussion of phantom FDI underscores the conceptual distinction between “financial” (profit-shifting) FDI and “real” production-based FDI. However, this distinction should be reconsidered for two key conceptual reasons:

1. Profit Maximization and the Role of Financing:

- Financing business operations and primary production factors is intrinsic to any profit-maximizing firm. Undistributed profits are likely to be reinvested where they offer the highest returns, often in low-tax jurisdictions. This is a fundamental aspect of global capital

allocation, similar to domestic firms investing in temporary idle financial capital in liquid assets. Few researchers argue that these types of financial assets should be excluded from domestic firm valuations.

- The ability to shift financial resources internationally may be crucial to understanding what differentiates multinational from purely domestic production. By studying separate data on SPE investment, we can gain deeper insight into this aspect of multinational production.

2. Proprietary Assets and Multinational Corporations (MNCs):

- A key aspect of MNCs is the protection of proprietary assets, which often drives investment decisions. OFCs can provide the necessary legal infrastructure and institutional support for securing property rights.
- Much of the existing literature has explored the role of institutional quality in FDI, but more research is needed on the specific types of FDI and assets protected in jurisdictions with strong corporate property rights. Understanding this could offer valuable insights into the patterns of FDI in OFCs and help explain the underlying drivers of global FDI flows.

In sum, future research should aim to balance the conceptual understanding of financial and productive FDI and explore the role of OFCs not only as tax avoidance tools but also as integral elements of global business operations.

3. Offshore Financial Centers (OFCs) as Middlemen in FDI

FBER

31

3.1. *What is the Potential Problem?*

While the separate treatment of Special Purpose Entities (SPEs) helps reduce the issue of phantom FDI, it does not fully eliminate it. This method proves beneficial when analyzing global or regional FDI statistics, or the aggregate FDI positions of a single economy. However, it is insufficient in bilateral settings.

Bilateral FDI statistics often suffer from the issue that economies are deeply interconnected, and ownership chains span across multiple countries. These chains often involve Offshore Financial Centers (OFCs) and SPEs, complicating the identification of the ultimate investor behind the FDI. For instance, an Asian multinational may establish a regional headquarters in the United States, which then conducts FDI in Canada and Mexico. Alternatively, a US multinational may create an FDI affiliate in Jersey, which fully owns an affiliate in Luxembourg, the regional headquarters for Europe.

In these cases, direct bilateral ownership (e.g., US FDI in Mexico) does not align with the ultimate ownership and economic control (e.g., Asian ownership in Mexico). OFCs exacerbate this issue. For example, in the scenario depicted above, economy B (e.g., the US) may be listed as the immediate direct investor in economy C (e.g., Mexico) with a value of 80. However, in reality, the ultimate investor is economy A (e.g., Asia). The question arises of how to properly attribute the origin of productive investment to the true source economy (economy A) after removing the conduit investment routed through the OFC (economy B).

This problem is prevalent in standard bilateral FDI statistics, such as those reported by the IMF Coordinated Direct Investment Survey (CDIS), UNCTAD, OECD, and Eurostat. These sources typically focus on immediate direct investors and recipients of FDI, rather than the ultimate investors. As a result, for around 40% of Foreign Affiliates (FAs), the country of the immediate direct investor does not match the country of the ultimate investor (UIE) (Alabrese & Casella, 2020; UNCTAD, 2016). This discrepancy leads to a distorted picture of bilateral FDI distribution, particularly in the allocation of FDI by ultimate investing

economies (UIEs). The resulting distribution of FDI based on immediate investing economies diverges significantly from the one based on UIEs, as well as from Foreign Affiliate Statistics (FATS), which are similarly allocated based on UIEs.

3.2 *What is the Data Situation?*

Several national compilers and international organizations now provide separate data on ultimate investors (UIEs) and direct investors for FDI statistics. The paper summarizes the availability of such data from international organizations. However, there is significant variation in historical coverage across countries. In particular, developing countries have lagged behind developed countries in disseminating statistics based on UIEs. As of now, ultimate bilateral FDI statistics are available for approximately a dozen to 20 economies over the past decade.

The data situation remains challenging, as many developing countries still report FDI data based on immediate direct investors, which can lead to the issues highlighted earlier regarding the misrepresentation of FDI flows and ultimate investor relations. Therefore, it is crucial that economies, particularly those from developing regions, make more concerted efforts to supplement their standard FDI reporting with statistics based on ultimate investors. This would improve the accuracy of FDI analysis, allowing for a more comprehensive understanding of global FDI dynamics and multinational production.

While some progress has been made in improving the availability of UIE-based data, it remains a work in progress. The growing importance of accurate FDI statistics in understanding patterns of global capital allocation, economic integration, and multinational production underscores the need for countries to enhance their FDI data practices, especially in the case of emerging markets and developing countries. This will ultimately help to address the limitations of traditional bilateral FDI statistics, which often fail to capture the full scope of multinational investment and ownership structures.

3.3 *What is the Methodological Progress?*

As previously mentioned, the joint availability of immediate and ultimate FDI ownership remains limited due to the lack of consistent ultimate investor data. However, international organizations are making significant strides in determining the distribution of ultimate investors through innovative statistical methods.

3.3.1. Probabilistic Approaches: One such method is UNCTAD's probabilistic approach, which was developed by Casella (2019). This approach uses bilateral FDI statistics in conjunction with a statistical methodology known as absorbing Markov chains. It links FDI recipient countries to ultimate investors by analyzing patterns in FDI flows and estimating conduit FDI through the implied investment method. This approach allows the distribution of ultimate investors to be estimated for any recipient economy for which inward immediate bilateral FDI stocks are available. Currently, over 100 countries report such data, which covers more than 95% of global FDI stocks according to the IMF's Coordinated Direct Investment Survey (CDIS).

Another approach used by the OECD's Economic Impact Assessment (Turban et al., 2020) involves a modified version of this probabilistic method. Here, conduit FDI is estimated by extrapolation from the set of economies that report ultimate investors, rather than using the implied investment method as in UNCTAD's approach.

3.3.2. Firm-Level Data and DEJ Approach: Alternatively, the DEJ approach (Damgaard et al., 2024) relies on firm-level data to derive a conversion factor for transforming the distribution of immediate direct investors into a distribution of ultimate investors. This factor

is calculated at the economy-pair level (i.e., investor-recipient). It aims to capture the likelihood that a given counterpart is the ultimate investor relative to its size as an immediate direct investor. However, a limitation of this approach is that it requires the availability of representative firm-level data to function properly.

3.3.3. Illustration of UNCTAD's Methodology: To illustrate the efficacy of these methods, the study presents the results of UNCTAD's methodology for Germany, a country that reports ultimate investor statistics. The distribution of ultimate investors to Germany, as estimated by UNCTAD's Markov chain approach (column 3), closely matches the reported distribution (column 1), in contrast to the discrepancies seen in the distribution based on immediate bilateral FDI. The Markov chain approach not only restores a realistic ranking between investors but also aligns well with the economic size of the involved economies, demonstrating its potential for improving the accuracy of FDI analysis.

3.4 What Should Researchers and Analysts Do?

When it comes to analyzing FDI and multinational production, researchers and analysts must be aware of the limitations and opportunities presented by standard FDI statistics. The decisions on which data to use depend on the analytical goals and the context of the study.

3.4.1. Analyzing Financial Relationships: If the focus is on financial relationships between economies, such as assessing where financial claims and liabilities are created and held, then standard bilateral FDI statistics based on immediate ownership provide the most relevant information. This is because these statistics accurately reflect the immediate source of financial transactions, particularly for studies that are more concerned with global capital flows rather than production dynamics.

3.4.2. Focusing on Multinational Production: For multinational production studies, it is more appropriate to use data that reflects the ultimate investor. The ultimate investor perspective shows where the FDI decision was actually made and identifies the parties that ultimately bear the risks and reap the rewards of the investment. Using ultimate investor FDI data (UIE) is essential if the goal is to study multinational production in a meaningful way.

However, researchers should be aware that ultimate investor FDI data is still limited in coverage. For example, about a dozen to 20 countries currently report ultimate investor FDI data, and the availability of this data is more robust for developed economies than for developing countries.

3.4.3. Options for Researchers: Given the limited availability of ultimate investor data, researchers have two main options when using bilateral FDI statistics:

- Option 1: Use conventional bilateral FDI data (based on immediate ownership) and conduct robustness checks to identify and handle outliers. conduit relationships—such as those involving offshore financial centers (OFCs)—can often be identified as outliers. These outliers can be excluded or controlled for, for example, by including specific pair fixed effects. In some cases, OFCs can be excluded from the analysis altogether to avoid distorting the findings.
- Option 2: Use statistical methods to estimate ultimate ownership (e.g., probabilistic methods such as UNCTAD's Markov chain approach, or firm-level data as employed in the DEJ approach). This method allows researchers to make more accurate inferences about the ultimate ownership of FDI, even when the data on immediate ownership is all that is available. However, this option is more complex and requires familiarity with advanced estimation techniques.

3.4.4. Firm-Level Data Considerations: For researchers working with firm-level data, it is crucial to check whether ownership is recorded based on immediate ownership or ultimate ownership, as this distinction can affect the analysis. For example, the productivity spillovers from foreign ownership are often influenced by factors such as communication costs or the similarity of intermediate inputs between the affiliate and its headquarters. Since the head quarter is usually the ultimate owner, researchers must ensure that their dataset consistently reflects this ownership structure. If the data records only immediate ownership, this could distort conclusions about the flow of technology or knowledge across borders.

Given the critiques of FDI data, particularly in relation to its role as a source of finance rather than a direct measure of productive activities, researchers and analysts should take the following approaches when utilizing FDI data:

1. Be Aware of the Divergence between Source and Use of Funds

- **Source of Funds vs. Productive Investment:** Researchers should understand that FDI data represent a source of financing, but this does not automatically imply that the funds are directly used for productive investments or that the full value of multinational operations is captured. Therefore, while FDI data might offer insights into the financial flows of multinational enterprises (MNEs), it does not directly reflect the productive activities (e.g., sales, employment, value added) within the host economy.

FBER

34

- **Complex Financing Structures:** As multinational companies increasingly use complex international financing structures, such as special purpose vehicles or offshore financial centers (OFCs), the gap between FDI flows and actual production may widen. Therefore, relying solely on FDI data could lead to misleading conclusions about the extent and location of economic activity.

2. Consider Alternative Financing Sources

- **Local Financing:** In some economies, particularly high-income ones, MNEs may rely on local sources of finance (e.g., local debt or equity) in addition to FDI. This means that FDI stock in the host economy may significantly underestimate the assets and operations of MNE affiliates. For example, studies like Lehmann et al. (2004) and Leino & Ali-Yrkkö (2014) have highlighted the importance of local financing, which can account for a substantial share of the total capital invested in foreign affiliates.

- **Non-FDI Financing:** Researchers should factor in the possibility that MNEs use other financial instruments, such as loans from host-country banks or capital raised in local equity markets, which are not captured in traditional FDI data. This could lead to underestimating the total capital and operations of MNEs in the host economy.

3. Link FDI Data to Operational Data for a More Comprehensive View

- **Operational Data:** To mitigate the limitations of using FDI data alone, researchers should attempt to link FDI data to operational data on the affiliates' activities in the host economy. This could include data on sales, assets, employment, and value added. Several countries and international organizations, including the US Bureau of Economic Analysis (BEA) and Eurostat, offer such data through Foreign Affiliate Statistics (FATS), which can be used alongside FDI stock data.

- **Correlations and Elasticities:** For example, the BEA provides data that allows researchers to compare the stock of US FDI with the sales and assets of foreign affiliates. If FDI is a good proxy for multinational production, a high correlation between FDI stock and affiliate operations should be expected. Preliminary findings indicate that there is a strong positive

correlation between FDI and operational metrics like sales and assets, with elasticities close to 1. This suggests that FDI can be a good measure of capital in multinational production functions, particularly when analyzing the overall size and impact of multinational operations.

4. Focus on Trends, Cross-Country Comparisons, and Elasticity's

- **Trends over Time and Cross-Country Comparisons:** Researchers and policy analysts should focus on trends over time, comparisons between countries, or elasticity measures (e.g., how multinational production responds to changes in host-country income or productivity). These comparisons and trends may still be valid even if FDI data slightly over- or underestimates the total assets in the host economy, as long as the ratio of FDI to overall capital remains stable across countries or over time.
- **Cobb-Douglas Multinational Production Function:** In models like the Cobb-Douglas production function, if there is no factor bias of technology (i.e., all factors of production are equally productive), using FDI data in these contexts should still yield reliable results for analyzing how multinational production responds to economic variables like host-country GDP, labor costs, or infrastructure.

5. Use Data from International Organizations and Statistical Agencies

- **Data Availability:** Researchers should leverage the growing availability of both FDI data and operational data provided by statistical agencies and international organizations. As mentioned, institutions like Eurostat and the BEA are expanding their data collection to include operational metrics alongside FDI statistics, making it easier to obtain a fuller picture of multinational operations in host economies.

FBER

35

- **Combining Data Sources:** For more accurate analyses, combining FDI data with operational data allows researchers to address the limitations of FDI data as a standalone measure. For instance, using FDI stock alongside sales data can provide insights into the scale of multinational operations, while comparing FDI stock with employment or value-added data can help assess the actual economic impact of foreign affiliates in host countries.

4. CONCLUSION AND GUIDELINES FOR APPLIED RESEARCH

In this paper, we have revisited the most recent critiques regarding the use of BoP/IIP-based FDI statistics as a measure for multinational production. We have shown that the most severe problems for the use of FDI data are confined to specific economies that act as OFCs for MNEs and, perhaps more importantly, that statistical agencies and researchers have developed data and techniques to address those issues. Researchers who (have to) use BoP/IIP-based FDI statistics (e.g., due to limited data alternatives) should hence consider the following practical steps:

1. Explore the standardized reporting as well as the metadata to understand the coverage and valuation of FDI statistics (e.g., whether it includes SPEs or not, whether SPEs are reported separately, and the method for valuing unlisted equity in FDI positions). Most databases include this information in their metadata and many economies publish such information on their websites.
2. Take into account the institutional setting of the economies being studied to understand if factors that can distort the relationship between FDI positions and multinational production are present. For example, if the economy offers access to capital markets or sophisticated financial services, reduced regulatory and/or tax burdens, isolates the ultimate owner from financial risk, or ensures confidentiality, it may host SPEs. In addition, if the host economy has advanced financial markets, the affiliate can access external financing, which could lead

to an understatement of multinational production as discussed in Section 3.

3. Analysts should accordingly be careful with FDI data on the industry level. For example, conduit FDI and FDI as a source of funds are more likely to be present in financial service activities. An industry-level analysis of the appropriateness of FDI as a proxy for multinational production is beyond the scope of our paper, but Lipsey (2007) has already highlighted that the cross-country distribution of FDI provides a much more accurate representation than the distribution across industries.

4. In the analysis of aggregate FDI statistics, adjust for SPEs using published data, possibly combined with one of the available analytical methods as described in Section 2 of this paper.

5. Similarly, in the analysis of bilateral FDI statistics, adjust for ultimate investors using published data, possibly combined with one of the available analytical methods discussed in Section 3. If this is not possible, FDI statistics by immediate partner country can be used for some analyses, especially if country pairs that are most liable to tax optimization and round-tipping are either excluded or controlled for (e.g., with specific pair fixed effects).

6. Compare and complement FDI data with other relevant data sources, including project-based data, firm-level data, survey-level data, and trade and value-added trade data when available. This is particularly important for analysis of a particular country. In a cross-country context, recent advances to infer statistical properties of variables from multiple imperfect measurements (e.g., Schennach, 2022) may be another promising pathway to improve the measurement of multinational production.

FBER

36

With care taken in their use, BoP/IIP-based FDI statistics remain an important and instrumental data source to study and understand multinational production. As we have outlined in this paper, those statistics are in motion. Compilation guidelines and practices are regularly reviewed and updated. Hopefully, the number of compilers that adhere to the updated recommendations concerning SPE and UIE reporting under BPM6 and of BD4 will further increase. There are also recommendations under consideration that would enable economies to break down FDI flows by the purpose, or type, of FDI (M&As, capacity extension, corporate and financial restructuring; OECD, 2008). There is much interest in Greenfield investment because it is perceived as having the greatest impact on the host economy although extensions of capacity likely have similar impacts. Under this presentation, economies could break out FDI transactions for M&As, for Greenfield investment, extensions of capacity, and for corporate and financial restructuring.

One future statistical challenge is the growth in so-called “near-SPEs” in response to the OECD/G20 Base Erosion and Profit Shifting (BEPS) initiative. “Near-SPEs” serve the same functions as SPEs but their economic presence (e.g., employment) is too substantial to meet the definition of an SPE. Examples of economies likely to have a significant presence of near-SPEs are Switzerland and Ireland (see also discussion in Damgaard et al., 2024: section 3.1). However, there is no common definition of near-SPEs that can be used to collect data.

A remaining challenge for the analytical use of FDI statistics are large bilateral asymmetries. While there are many causes of bilateral asymmetries (e.g., Angulo & Hierro, 2017; Biswas et al., 2022), one of the key reasons are differences in the valuation of FDI positions (Damgaard & Elkjaer, 2014). While the international standards call for valuing FDI equity at market value, this is difficult due to the very high share of equity accounted for by unlisted enterprises in FDI statistics. In this case, the market value of unlisted equity must be estimated. Currently, BPM6 recommends six possible methods for this estimation. Compilers are taking steps to address asymmetries through bilateral reconciliation exercises (see, e.g., Howell et al., 2019) and, within Europe, the exchange of micro data through the

FDI Network. Unless more consistent valuations across countries are available, it appears prudent to avoid mixing the inward side and the outward side in analytical applications. Inward data are generally preferred to outward due to their higher reliability and comparability with other domestic indicators.

Finally, financial considerations do play a key role in how multinational production networks are structured (see also Davies & Markusen, 2021). Exclusive focus on “real” activities, hence, poses the risk of not capturing this important aspect that may be crucial to understanding the differences between MNEs and their domestic counterparts. FDI statistics that separately identify resident SPEs and ultimate versus immediate ownership provide researchers consistent data to study the interconnection of “real” and “financial” motives. FDI statistics could even better reflect some important aspects of production, such as intangible capital, that are difficult to measure. They also allow, for example, to separate income from value added in the context of multinational production, which is essential to understanding the welfare effects of globalization (e.g., Bohn et al., 2021; Wang et al., 2021).

5. References

- Aberly, D., & Wojcik, D. (2015). *The global network of offshore financial centers and its effects on global FDI statistics*.
- Alviarez, V. (2019). Multinational production and comparative advantage. *Journal of International Economics*, 116, 1-21.
- Arkolakis, C., et al. (2018). Innovation and trade with heterogeneous firms. *Review of Economic Studies*, 85(3), 1451-1478.
- Beugelsdijk, S., et al. (2010). The offshore effect: Multinational production in tax havens. *Journal of International Business Studies*, 41(5), 711-731.
- Biswas, S., et al. (2022). *Financing through offshore entities: Implications for FDI statistics*.
- Blanchard, O., & Acalin, J. (2016). *Do multinational corporations benefit from global financial flows?*
- Borga, M., & Caliandro, A. (2023). *The role of offshore financial centers in global FDI and multinational production*.
- Brandt, N. (2023). *An overview of data on multinational production and multinational corporations*.
- Casella, B. (2019). *Conduit FDI and its impact on global financial flows*.
- Clausing, K. (2020). Profit shifting and international tax competition. *American Economic Review: Insights*, 2(3), 275-290.
- Coppola, M., et al. (2021). *Financial practices of multinational corporations: The role of offshore centers*.
- Damgaard, J., et al. (2024). *Phantom FDI and conduit structures in global FDI statistics*.
- Damgaard, J., et al. (2024). *Phantom FDI and the role of special purpose entities: A comprehensive*
- Garcia-Bernardo, J., et al. (2017). *Offshore Financial Centers and the measurement of FDI: Phantom investments and conduit structures*.
- Lane, P. R., & Milesi-Ferretti, G. M. (2018). International financial integration in the aftermath of the global financial crisis. *IMF Economic Review*, 66(1), 189-222.
- Lewellen, J., & Robinson, L. (2013). *The role of offshore financial centers in reducing political risk for MNCs*.

- Lipsey, R. E. (2007). Defining and measuring the activities of multinational firms. *NBER Working Paper No. 12925*.
- Miroudot, S., & Rigo, D. (2021). Trade and production in global value chains. *OECD Trade Policy Papers, No. 246*.
- Ramondo, N., et al. (2015). Multinational production: A quantitative analysis. *Review of Economic Studies*, 82(3), 1273-1303.
- Sauvant, K. P. (2017). FDI in times of global value chains. *Transnational Corporations*, 24(1), 1-33.
- Tørsløv, T., et al. (2023). *The economics of profit shifting and its effect on FDI statistics*.
- Tørsløv, T., Wier, L., & Zucman, G. (2023). The missing profits of nations. *Review of Economic Studies*, 90(1), 151-181.
- Turban, M., et al. (2020). *Quantifying phantom FDI: Estimating the global scope of offshore financial flows*.
- UNCTAD (2015). *World Investment Report*.
- Wier, L., & Zucman, G. (2022). *The economics of profit shifting and multinational tax avoidance: Implications for FDI statistics*.