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Switzerland's position in Global Value Chains:

A systematic analysis of OECD's aggregated CbCR dataset

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Abstract

This thesis examines Switzerland's geographical footprint in global value chains using aggregated OECD Country-by-Country Reporting (CbCR) macro data from 2018 – 2021, which offers unprecedented coverage of multinational enterprises' financial, tax, and business activities. For this, an analytical framework for extracting key global value chain indicators from OECD CbCR macro data is introduced and applied to graphically analyse Switzerland's position in global value chains. To conduct the analysis, an Inside-Out perspective (the activities of Swiss multinational enterprise affiliates abroad) and an Outside-In perspective (the activities of foreign-controlled multinational enterprise affiliates in Switzerland) are employed. Moreover, a proprietary effective tax rate specification and an extrapolation methodology to address the systematic data asymmetry between the Inside-Out and Outside-In perspectives are presented. The CbCR data reveals a picture of Switzerland's position in global value chains that aligns with existing trade statistics and FDI data, particularly regarding the strong economic ties with the USA and contiguous EU countries. Leveraging the CbCR data's unprecedented geographical coverage of multinational enterprises' activities, this report also finds that OECD CbCR data serves as a potent starting point for subsequent, in-depth global value chain analyses and may be best used in combination with firm-level micro data.

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List of Abbreviations

AMNE	Activities of Multinational Enterprises
BEA	(U.S.) Bureau of Economic Analysis
BEPS	Base Erosion and Profit Shifting
CbCR	Country by Country Report (or Reporting)
DTA	Double Taxation Agreement
ESTV	(Swiss) Federal Tax Authority
ETR	Effective Tax Rate
FATS	Foreign Affiliates Statistics
FDF	(Swiss) Federal Department of Finance
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GNI	Gross National Income
GPML	Gamma Pseudo Maximum Likelihood
GVC(s)	Global Value Chain(s)
IOT	Input-Output Table
I-O	Inside-Out
MNE	Multinational Enterprise
OECD	Organisation for Economic Cooperation and Development
O-I	Outside-In
SECO	(Swiss) State Secretariat for Economic Affairs
SNB	Swiss National Bank
SPE	Special Purpose Entity
TiVA	Trade in Value Added
TNI	Transnationality Index
UNCTAD	United Nations Conference on Trade and Development
UPE	Ultimate Parent Entity
WGI	Worldwide Governance Indicator(s)
WTO	World Trade Organisation
WXD	Rest of World (OECD CbCR terminology)

1 Introduction

Global Value Chains (GVCs) have defined the organisation of global trade and production in the late 20th and early 21st centuries, despite globalisation slowing since the Global Financial Crisis in 2008 (World Bank Group, 2020, p. 14; OECD, WTO, & UNCTAD, 2013, p. 2). Particularly for Switzerland, a country with a comparatively small domestic market and a highly specialised, export-oriented economy, the integration into GVCs is of utmost relevance for maintaining economic prosperity and growth (Thakur-Weigold, 2018, p. 9; State Secretariat for Economic Affairs [SECO], 2025a, p. 14). Advancing the comprehension of GVCs is therefore crucial for understanding the functioning of today's globalised economy and the role of individual countries within it, such as Switzerland, as well as for informing effective policymaking (Johnson, 2017, p. 1). However, measuring GVCs and the participation of countries, industries and firms in GVCs remains an ongoing methodological challenge, stemming from GVCs' multidimensional nature, non-standardised treatment within the existing literature, and often significant data limitations (Santomarino et al., 2022, p. 76; Ahmad et al., 2017; Johnson, 2017, pp. 1, 28; Cadestin et al., 2018a, p. 7). Within the context of data scarcity, the availability of firm-level and ownership data has given rise to a methodological approach that focuses on Multinational Enterprise (MNE) activities for empirical GVC assessments (Amador & Cabral, 2016, p. 292). MNEs constitute a significant group of agents within GVCs, as they facilitate the linkages between local economies and global markets (OECD, 2019, p. 4). Thus, understanding MNE operations and/or ownership structures may provide insight into the scale, dispersion, and dynamics of GVCs.

One such data source disclosing MNE activity has been published by the Organisation for Economic Cooperation and Development (OECD). As part of the OECD's and G20's Base Erosion and Profit Shifting (BEPS) initiative, a reporting requirement was introduced mandating MNEs above a certain revenue threshold to report their global financial, tax, and business activity data on a country-by-country basis to the tax authority of their Ultimate Parent Entity (UPE) (OECD, 2013b, p. 8; OECD, 2015a, pp. 9–10). These MNE-level reports, also known as (micro) CbCRs, are subsequently transmitted to the OECD Secretariat by the respective tax authority, where they are published in an anonymised, by-country aggregated form as CbCR macro data (OECD, 2015b, p. 249). At the time of writing this thesis in 2025, the 2016 – 2021 annual macro CbCR vintages were publicly available on the OECD's data explorer.

OECD's CbCR data offers unprecedented geographical coverage of 11 standardised financial and tax variables and 13 business functions to which MNE entities can be categorised. Due to this value proposition, CbCR data may also serve as an additional data source for assessing a country's position in today's globalised economy (Santomarino et al., 2022; et al., Delpeuch et al., 2025).

Still, few papers use OECD CbCR data for explicit GVC analyses, and none¹ exists for Switzerland specifically. For Switzerland and other small, open economies, comparatively few dedicated GVC assessments exist at all, despite their integration into GVCs being pivotal (Verbeke et al., 2025, p. 1; Nathani et al., 2014, p. 12). Meanwhile, the OECD (2020) has used CbCR macro data as the basis for its tax revenue estimates of the Pillar One and Pillar Two proposals, while both the aggregated macro data and MNE-level CbCR micro data have mainly served as sources for empirical profit shifting analyses (Garcia Bernardo & Janský, 2024; Boukal, 2024; Fuest et al., 2022). Consequently, as CbCR data has not generally been a focus of academic research on holistic GVC assessments, no explicit methodology has been defined for systematically and comprehensively extracting GVC indicators from OECD CbCR data. Hence, this study seeks to answer the following question: *How can OECD CbCR data be systematically analysed to extract indicators of GVC integration, and what does such analysis reveal about Switzerland's position within global value chains?*

In answering this question, the study makes both methodological and empirical contributions to the literature on GVC assessments in the Swiss context. Methodologically, it introduces an analytical framework for extracting key GVC indicators from OECD CbCR macro data. Empirically, it applies this framework to the OECD CbCR panel data for the years 2018 to 2021, with Switzerland as the jurisdiction of focus. Specifically, this study focuses on both an Inside-Out (I-O) perspective, i.e., the activities of MNEs headquartered in Switzerland in foreign jurisdictions (Switzerland as the reporting² jurisdiction), and an Outside-In (O-I) perspective, i.e., the activities of foreign-headquartered MNEs in Switzerland (Switzerland as the counterparty jurisdiction). In both perspectives, four dimensions from the OECD CbCR data, that is, MNE sub-groups, economic activity, profits, and business activities, are extracted and analysed alongside additional economic and governance dimensions, as well as an effective taxation specification to compile a comprehensive report on GVC indicators for Switzerland. Regarding the taxation dimension, this study installs a proprietary Effective Tax Rate (ETR) computation to provide a taxation specification with sufficient geographical coverage for this study and to highlight a further use case of OECD CbCR data. Moreover, an extrapolation methodology is theoretically discussed and applied in the O-I chapter to counter the systematic coverage asymmetry in the OECD CbCR panel. Graphic presentations were thereby installed as the primary instrument for univariate and bivariate data analyses in the I-O and O-I perspectives, as they were found to best serve the primary intended contribution of this thesis, which is to present managers, economists, tax researchers, and policymakers with a broad, introductory analysis of Switzerland's integration into GVCs and, subsequently, spark further research within the highlighted domains.

¹ To the best knowledge of the author.

² The OECD uses the term “reference jurisdiction”. For conceptual clarity, this thesis employs the term “reporting jurisdiction”.

To further elaborate on the analysis methodology and empirical findings, this thesis proceeds as follows: Chapter 2 provides an introductory theoretical and empirical background on GVC participation and measurement, how Switzerland is positioned in GVCs by pre-existing trade and Foreign Direct Investment (FDI) metrics, and how the analysis of the Swiss OECD CbCR sub-panels contribute to a widened understanding of Switzerland's global economic footprint, both as a reporting and as a counterparty jurisdiction. Chapter 3 elaborates on the data used for this analysis, specifically the background, (dis-) advantages, and the main sample of the OECD CbCR macro data, as well as the additional data utilised. Moreover, the analytical framework for analysing the CbCR data and for structuring the main chapter, i.e., Chapter 4, is introduced. Chapter 4 subsequently presents the empirical results of the framework applied to the Swiss OECD CbCR sub-panels. In addition, the extrapolation model is presented to counteract the structural limitation of the CbCR panel from the O-I perspective. The following Chapter summarises the empirical results from Chapter 4 and discusses further research domains relating to the depth and breadth of this thesis. Chapter 6 concludes.

2 Theoretical context and literature review

This chapter provides an introduction to GVC theory and measurement concepts at both macro (i.e., country or industry) and micro (i.e., firm) levels, as well as the data sources commonly used for GVC research within each domain. That conceptual foundation is subsequently applied to Swiss firms and the Swiss economy, their integration into GVCs by existing trade and FDI metrics, as well as the location factors that make Switzerland a particularly interesting case for utilising MNE activity data to empirically assess its position in GVCs. The final subsection combines the insights from this chapter to identify the research gap and core contributions of this thesis, which are based on the OECD macro CbCR dataset, further elaborated in Section 3.

2.1 MNEs and GVCs in a globalised economy

Globalisation, which in today's context refers to the third epoch of the global integration of trade, capital and migration movements that started in the 1980's and 90's, inaugurated a new era of global welfare and introduced the understanding of production as a global paradigm (World Bank, 2002, pp. 31–51; OECD et al., 2013, p. 6; World Bank Group, 2020, p. 15–16). In symbiosis with the increasing economic interconnectedness³ and liberalisation efforts came the rise of comparatively large, internationally operating corporations, i.e., MNEs, which can be understood as cross-

³ Facilitated by a reduction in transportation and coordination costs, e.g. through “containisation”, digitalisation, a systematic liberalisation of cross-border trade, and a “globalised” corporate thinking (OECD et al., 2013, p. 6).

jurisdictional networks of affiliates embedded in a global production network referred to as GVC (Cadestin et al., 2018a, p. 31). Meanwhile, a GVC is similar to what is understood as an intra-firm value chain⁴, say, of a manufacturing company that generates value by transforming inputs through capital and labour, with the difference that “at least two (production) stages are in different countries” (World Bank Group, 2020, p. 17). To capture the multidimensional nature of GVCs and GVC participation, a common logic is to discuss their theoretical and empirical measurement considerations at the macro level before turning to the equivalent MNE-level (micro) discussion (Johnson, 2017; Amador & Cabral, 2016; Verbeke et al., 2025, pp. 3–4).

2.1.1 Macro perspective on GVC participation and measurement

From a theoretical standpoint, the reasons why individual countries participate in GVCs and, more generally, in international trade, can fundamentally be explained by the idea of comparative advantage, originally formulated by British economist David Ricardo in 1817. In essence, a country’s exports should consist of goods for which it has a relatively lower opportunity cost of production than other countries, i.e., a comparative advantage, while importing goods which other countries produce more efficiently, i.e., for which it has a comparative disadvantage (OECD, 2011, p. 11; Legge & Rupp, 2025, pp. 4, 8). Different factors constitute comparative (dis-)advantages. Among the most relevant are country-specific factor endowments, which are also the core proposition suggested by Heckscher (1919) and Ohlin (1933) in their factor-endowment theory (OECD, 2011, pp. 28, 152–153). These might entail abundant natural resources, a comparatively low wage level, or the magnitude of available land (Nielsen et al., 2016, p. 66; World Bank Group, 2020, p. 36). Further drivers of country-level GVC participation might include long-standing expertise in a particular industry, geographic location, and generally any factor that results in a comparatively greater productivity or specialised knowledge regarding a specific product or service (Legge & Rupp, 2025, p. 7; World Bank Group, 2020, pp. 36–37). Both the comparative advantage and the Heckscher-Ohlin theorem refer to overarching neoclassical ideas that explain general cross-border trade activity. Theories that are more specific in explaining recent GVC developments include Baldwin’s (2011) Unbundling theory, which explains the increase in fragmented production processes observed since the late 1980s (the second Unbundling) by lowered transaction costs, primarily facilitated by technological advancements.

Given their multidimensional nature, different conceptual approaches have emerged to measure GVCs and GVC participation at the macro level, of which the most relevant are outlined below. The first and simplest approach involves considering standalone trade data. As an example, country-specific trade data can be disaggregated into unfinished parts and intermediate products, which

⁴ See also Porter’s (1985) well-regarded definition of an intra-firm value chain.

are subsequently compared to flows of finished goods and services, providing an approximation of a country's relative position within global production networks⁵ (Amador & Cabral, 2016, pp. 285–287). While this approach stands out for its simplicity and comparatively high data coverage, the conceptual disadvantage of using standalone gross trade data as a participation indicator, generally, is that it reveals the origin of a good or service, but not whether a good or service will be fully absorbed in the importing jurisdiction or re-exported after further value-adding steps have been taken (Ahmad et al., 2017, p. 10; Amador & Cabral, 2016, p. 285; World Bank Group, 2020, p. 17; Nathani et al., 2014, p. 11). For this approach to yield meaningful insights, product classifications must be highly detailed, and avoiding double-counting of intermediate goods remains a major challenge (Ahmad et al., 2017, p. 10; Amador & Cabral, 2016, p. 285; Cigna et al., 2022, p. 6; UNCTAD, 2013, p. 4).

A second, more widely used group of approaches that account for the issues related to standalone trade data rely on global Input-Output Tables (IOTs), which combine harmonised national accounts data with bilateral trade statistics to highlight the value-added trade content generated of the country or industry covered (OECD, Johnson, 2017, p. 2; Ahmad et al., 2017, p. 11). Two main conceptual approaches to measuring macro GVC linkages utilising IOTs can be differentiated.

The first is aimed towards measuring the degree of participation in GVCs by highlighting the value added of the industry or country in question (Mancini et al., 2024, p. 670). The so-called Trade in Value Added (TiVA), referring to the decomposition of gross trade flows to identify the value added of each country along a GVC, is among the most common approaches in this domain (OECD & WTO, 2013). Specifically, TiVA indicators aim to compute the so-called “value-added exports”, i.e., the value generated by a source country within the final value of the good or service consumed abroad, which can subsequently be compared to gross exports of the respective source country⁶ (OECD & WTO, 2013, p. 1; OECD, 2023a, p. 9).

The second group of approaches focus on highlighting the positioning within⁷ GVCs (Mancini et al., 2024, p. 670). In this logic, the measurement concept of “upstreamness” assesses the average “distance” of a country or industry from the final demand (Antràs et al., 2012). A high level of “upstreamness” of a country or industry thereby characterises a large distance to the final consumer, i.e., mostly intermediate products (or services) are produced/provided. Conversely, “downstreamness” refers to the situation where most products and services are directly provided to the final demand. Closely related to the concepts of up- and downstreamness is the notion of forward- (supply- or seller-perspective) and backward-participation (buyer perspective) (Del

⁵ Countries having a high share of intermediate products are thereby assumed to be “deeper” integrated into GVCs.

⁶ Several TiVA indicators can be distinguished, as further outlined in OECD (2023a).

⁷ Note that measures of GVC position inherently capture some aspect of participation, given that positioning presupposes a degree of cross-border integration.

Prete & Rungi, 2020; World Bank Group, 2020, p. 18). Forward GVC participation occurs when a country's exports are used as intermediate inputs in the export production of other countries, whereas backward GVC participation refers to a country's reliance on imported value-added inputs in the production of its own exports (World Bank Group, 2020, p. 18). On that note, most countries are both forward (upstream)- and backward (downstream)-integrated into GVCs, depending on the industry in question (World Bank Group, 2020, pp. 17–18; Thakur-Weigold, 2018, p. 9; WTO, 2018, p. 2). For example, China is substantially forward integrated in the electronics and machinery sectors, while being backwards integrated in automotive manufacturing.

Given their methodological and computational complexity, these approaches naturally require sophisticated IOTs to map the flows of goods and services between countries. Commonly installed international IOTs include the World Input Output Database (WIOD) by the University of Groningen, OECD's Inter-Country Input-Output (ICIO) tables and the derived TiVA indicators, and the United Nations Conference on Trade and Development (UNCTAD) Eora Global Supply Chain Database⁸ (Amador & Cabral, 2016, p. 291; Johnson, 2017, pp. 17–20; World Bank Group, 2020, p. 18).

2.1.2 Micro perspective on GVC participation and measurement

A general understanding of GVCs at the macro level supports the analysis of MNEs, which play a central role in shaping GVCs and are described as the “architects of globalisation” (Verbeke et al., 2025, p. 2; World Bank Group, 2020, pp. 15–16). In 2014, MNE affiliates were estimated to account for 10% of global Gross Domestic Product (GDP), employ around 23% of the global workforce, and, most notably, coordinate a majority of the world trade through MNE-coordinated GVCs⁹, highlighting their relevance for global economic prosperity and policy design¹⁰ (OECD, 2019, p. 10).

A prominent theoretical effort to explain global MNE structures and the firm-level, geographically dispersed value creation within GVCs refers to the eclectic (OLI) paradigm, which provides a framework for determining whether, where, and how firms structure value-creating activities abroad (Dunning, 1980; Dunning, 2003). Being rooted in the Ricardian idea of comparative advantage, the OLI paradigm is essential in the context of this paper, as it integrates the most

⁸ See also Johnson (2017, pp. 3–20) for a comprehensive discussion of further Input-Output methodologies and data sources.

⁹ OECD (2019, p. 10) cites up to 80%, including intra-firm trade.

¹⁰ Note that local firms also participate in GVCs (indirectly), for example, by providing base and intermediary products to MNE affiliates (OECD, 2019, p. 12). For assessing GVCs, however, the focus typically lies on MNE activity, given their central role in constituting cross-border production networks.

relevant dimensions for explaining firm-level, cross-border activity. OLI refers to three distinct considerations.

First, *Ownership* advantages refer to an MNE's (intangible) assets, such as proprietary technology, brand value or superior cross-border coordination capabilities, that pose the firm's competitive advantage over local firms to overcome its "foreignness" in the respective market (Dunning, 1980, p. 9; Dunning, 2003, p. 23; Cadestin et al., 2018a, p. 8). Ownership advantages thereby help to explain why MNEs are clustered in knowledge-intensive industries (Cadestin et al., 2018a, p. 8).

Second, *Location* advantages refer to the destination-specific supply or demand factors that make operations abroad worthwhile for an MNE (Dunning, 1980; Dunning, 2003, p. 23). Supply-side location advantages relate to the Heckscher-Ohlin theorem from a firm's perspective and might include a jurisdiction's natural resources, cost-efficient or differentiated labour, geographic location, political stability, or the local tax rate (Dunning, 1980; p. 9, Markusen & Venables, 2000, p. 221; Cadestin et al., 2018a, p. 8). Demand-side location advantages refer to the local market size and/or growth, which has been discussed as an even more significant factor in MNEs' foreign activity decision rationale, particularly for horizontally organised MNEs (Cadestin et al., 2018a, p. 8; Yokota, 2005, p. 3). Given their relevance for explaining firm-level, cross-border activity, as well as the common data availability of *Location* advantage indicators, the report in Chapter 4 employs common *Location* indicators as "auxiliary" variables to analyse the Swiss OECD CbCR sub-panels.

Lastly, *Internalisation* advantages¹¹ are required for an MNE to invest in a foreign affiliate, i.e., commit to FDI¹², and thereby vertically integrate cross-border production processes (Cadestin et al., 2018a, p. 8; Yokota, 2005, p. 2). Hence, they can help to explain intra-firm structures of MNEs across countries, which potentially span several ownership levels in addition to their geographic dispersion (Dunning, 1980, p. 11; Dunning, 2003, p. 22; Alabrese & Casella, 2020, p. 119; Cadestin et al., 2018a, p. 8). However, internalisation benefits not outweighing the costs does not imply that no cross-border MNE activity occurs. Often, a firm may conduct business with third parties through licensing, franchising, or exporting its products to the relevant jurisdiction (UNCTAD, 2011, pp. 130–140; Cadestin et al., 2018a, p. 9). An expansion of GVCs, however, would result from either FDI commitments in the form of foreign affiliates or a non-equity partnership with a third party.

Empirical GVC measurements based on micro approaches have become increasingly popular with the rising availability of firm-level sources, though they are still significantly less employed than the aforementioned macro methods (Amador & Cabral, 2016, p. 292). Utilising firm-level survey data, one methodological approach that focuses on the degree of GVC participation also considers

¹¹ The *Internalisation* dimension was later added by Dunning to better explain *Ownership* and *Location* considerations (Dunning, 2003, p. 22).

¹² See also [UNCTAD's World Investment Report](#) series tracking annual FDI developments.

a trade-based view of MNEs (Johnson, 2017, p. 21; Amador & Cabral, 2016, pp. 292–293). “Offshoring and Input Sourcing”, i.e., the assessment of a firm's level of integration into GVCs via its reliance on foreign-sourced inputs, and the “Joint Exporting and Importing” approach that builds on the proposition of comparatively few firms accounting for a large share of both overall exports and imports, are discussed approaches in this domain, being conceptually similar to the macro measures that utilise IOTs (Johnson, 2017, pp. 21–25).

A conceptually different firm-level methodology aimed at assessing the within-GVC position utilises vertical ownership structures between UPEs and global affiliates (entities) of MNEs, which is also the overarching conceptual approach employed in this thesis¹³ (Amador & Cabral, 2016, p. 292; Johnson, 2017, pp. 25–26; Cadestin et al., 2018b). Specifically, this approach maps the geographical dispersion of MNE structures, while incorporating traditional firm-level accounting measures, such as revenues, depending on the disclosure of MNE activity (Santomarino et al., 2022; Johnson, 2017, pp. 25–26). On that note, firm-survey-based FDI statistics have been widely used to proxy MNE affiliate activity in GVC assessments, although FDI and MNE activity differ conceptually in terms of ownership and economic variables considered (Cadestin et al., 2018a, pp. 10–11).

Although data collection is technically conducted at the firm level, existing MNE-level GVC databases are often aggregated into an anonymised, i.e., by-industry or by-country, macro format, for confidentiality reasons (Amador & Cabral, 2016, p. 283). An exception is Bureau van Dijk's ORBIS database, which provides access to firm-level financial, ownership, and linkage data of private companies. Common aggregated firm- or MNE-level databases include the OECD's Activity of Multinational Enterprises (AMNE) database, the Foreign Affiliate Statistics (FATS) database by Eurostat, or country-specific MNE databases, such as the Bureau of Economic Analysis' (BEA) Activities of US MNEs database, which directly utilise inward (O-I) and outward (I-O) MNE affiliate data (Johnson, 2017, p. 26; Cadestin et al., 2018b; Del Prete & Rungi, 2020). The OECD CbCR dataset used in this thesis is also situated among this group of data sources, as further outlined in Chapter 3.1.

2.2 Switzerland within a globalised economy

Switzerland is a medium-sized, highly specialised and open¹⁴ economy with a small domestic market and few natural resources, deeply interconnected with international trade, capital and

¹³ Note that the OECD CbCR data allows a conceptual extension to assessing within-firm trade and ownership structures only, given the inclusion of a Third-Party Revenue variable. Section 3.1.2 discusses this further.

¹⁴ Referring to *de facto* openness, i.e., “the degree of integration into international markets based on actual (trade) flows”, when considering transit trade (Föllmi et al., 2018, p. 2).

migration flows (SECO, 2025a, p. 12; Föllmi et al., 2018; Frohm, 2024, p. 8; Thakur-Weigold, 2018, p. 9). Switzerland's access to foreign markets and integration into GVCs is thus of "highest importance" for sustaining its GDP per capita of \$99,565¹⁵, placing it among the wealthiest countries globally (Bernauer & Walter, 2023, p. 95; World Bank Group, 2025a; SECO, 2025a, p. 14; Frohm, 2024, p. 8).

With the general limitations of standalone trade data for assessing GVC integration in mind, Swiss trade statistics based on customs¹⁶ and Swiss National Bank (SNB) data are both granular and regularly available¹⁷, thus allowing the formation of an initial overview of Switzerland's economic profile. Starting with Switzerland as the exporting jurisdiction (I-O perspective), exports accounted for 75% of GDP in 2023, placing it among the top 25 countries globally in terms of exports-to-GDP ratio (Legge & Rupp, 2025, p. 11; Global Economy, 2025). Its goods exports are driven by Switzerland's highly specialised industries, particularly the pharmaceutical and chemical, watches and jewellery, and (heavy-) machinery industries (Bernauer & Walter, 2023, p. 102; Legge & Rupp, 2025, p. 11; Legge et al., 2024, p. 5). In these sectors, Swiss firms are highly differentiated. They exhibit a Revealed Comparative Advantage (RCA)¹⁸ of significantly greater than 1, indicating that Switzerland exports a greater-than-average share of respective products, i.e., it has a comparative advantage (Legge & Rupp, 2025, pp. 4, 11). Moreover, Switzerland charges significant price premiums on exports from respective industries.

Meanwhile, Switzerland is also one of the world's largest commodity trading hubs, with Swiss MNEs being heavily involved in the transit trade of precious metals¹⁹, oil, and agricultural products (SECO, 2018, pp. 3, 12). In addition, roughly 37% of all Swiss exports stem from services, which are less concentrated among individual categories than goods exports (Legge & Rupp, 2025, p. 11; Legge et al., 2024, p. 15). Geographically, the member states of the EU, the USA, China (for goods), and the UK (for services) constitute the largest export destinations in terms of export shares (Legge et al., 2024, pp. 4, 14). These specific countries are henceforth referred to as Switzerland's key trading partners.

Apart from outward goods and services trade, Switzerland is also a large exporter of capital, with a total outward (I-O) FDI stock (in the form of Swiss MNE affiliates and their assets) of CHF 1,288 billion in 2023²⁰, over 150% of GDP, yielding around CHF 94 billion in income (SNB, 2024, pp. 4,

¹⁵ Referring to the 2023 GDP per capita in the CHF USD conversion rate from August 2025. GDP in 2023 stood at \$884.9 billion, making Switzerland the 20th largest economy globally.

¹⁶ Referring to data from the Swiss Federal Office for Customs and Border Security (FOCBS).

¹⁷ See also the [Swiss Trade Monitor](#) series presenting Swiss goods and services statistics quarterly.

¹⁸ RCA captures a country's relative export specialisation by expressing how its export share of a particular good compares to the global average share of that good in world trade. See also Legge & Rupp (2025, p. 9).

¹⁹ Gold accounted for the largest single category of exported goods of Switzerland in 2023 (Legge et al., 2024, p. 5).

²⁰ Around a four-times increase from 2000 (SECO, 2024). Regarding FDI flows in 2023, Swiss MNEs invested CHF 49 billion more in foreign affiliates abroad than foreign-headquartered MNEs in Switzerland-based affiliates (SNB, 2024, p. 6).

10). Also, Switzerland-based MNEs employed around 2.5 million people abroad, over half of all domestic employees, and around 556,000 in the domestic market, underpinning the magnitude of activity of Swiss MNEs (abroad) (SNB, 2024, p. 16, 21).

From an importer's perspective (O-I), Switzerland is similarly integrated. Imports accounted for 63% of GDP in 2023, which, in combination with exports, explains the country's trade surplus of approximately \$57.3 billion²¹ (Federal Department of Finance [FDF] & Federal Office for Customs and Border Security [FOCBS], 2024, p. 6; Global Economy, 2025). The import profile (geographically and across goods and services) resembles the exports, with precious metals, pharmaceutical products, (heavy) machinery and automotive products accounting for the majority of goods imports by trade share in 2023 (Legge et al., 2024, pp. 4, 14). The inward FDI stock amounted to CHF 930 billion in 2023, while the number of employees working at Swiss affiliates of foreign MNEs is not readily available from conventional trade data sources (SNB, 2024, p. 12).

At both the macro and micro levels, as well as from outward (I-O) and inward (O-I) perspectives, Switzerland is a particularly interesting case for further assessments of GVC participation. Switzerland's comparatively small domestic market, high outward FDI stock, high density of specialised industries, its location factors (consider the *Location* dimension in the OLI framework), and its role as the headquarter jurisdiction for some of the world's largest multinationals are among the main reasons why it is worthwhile to devote further attention to highlighting Swiss MNE activity abroad and foreign MNE activity in the domestic market as a measure of GVC participation. Regarding location factors, Switzerland has historically exhibited a high degree of political stability and low corruption, which form the basis for the country's attractiveness for foreign trade and capital in the form of inward (O-I) FDI²² (Bernauer & Walter, 2023, p. 97). Although not a member of the EU, Switzerland is a member of the European Free Trade Association (EFTA) and currently maintains 34 bilateral trade agreements, as well as over 100 double taxation agreements, one of the densest DTA networks globally, highlighting the federal and cantonal recognition of the importance of GVC participation (SECO, 2025a, pp. 18, 21; FDF, 2024). The country is also considered a knowledge hub, home to some of the world's leading universities in natural and social sciences, giving MNEs access to a highly specialised labour market (Switzerland Global Enterprise, 2020, p. 11; Thakur-Weigold, 2018, p. 10). Moreover, Switzerland is frequently listed as a tax haven, among which it is one of the largest economies by GDP, driven by the aforementioned industries (Hines & Rice, 1994; Dharmapala & Rice, 2009; Tørsløv et al., 2022; Garcia-Bernardo & Janský, 2024, p. 4). The sensitivity of MNE structures to taxation has been a key focus for scholars empirically assessing MNE location decisions, leading to

²¹ Switzerland runs a trade surplus with the UK, USA, and Japan, whereas it has a deficit with the EU and China (Legge et al., 2024, p. 6).

²² Despite the Swiss Franc having appreciated against other major currencies over the last 20 years.

the conclusion that taxation considerations do affect MNE structures globally (Alabrese & Casella, 2020, p. 116). That being said, it is estimated that Switzerland is one of the greatest beneficiaries of tax-motivated MNE profit allocation globally, which, however, has only been mildly addressed with Switzerland explicitly in focus²³ (Garcia-Bernardo & Janský, 2024, p. 11; Tørsløv et al., 2022, pp. 1517–1518; Beer et al., 2019, p. 680).

2.3 Research gap and empirical contribution

The previous subchapters highlighted the relevance of MNE activity for today's globalised economy and for Switzerland in particular, as well as the methodological approach of utilising MNE ownership data for empirical GVC assessments. More generally, measuring and understanding a country's or individual MNEs' position in GVCs is a multidimensional and complex problem, which can be addressed by a variety of approaches and methodologies (Delpuech et al., 2025, p. 7; Verbeke et al., 2025, p. 2).

Regarding Switzerland, reliable trade data (at least for goods) and national IOTs are available at the macro level, while survey-based SNB FDI, AMNE, and FATS data exist at the micro level. However, determining Switzerland's involvement in GVCs using a single, or even a combination, of these sources is limited in terms of informativeness, scope, coherence, granularity and/or availability. For example, Swiss national IOTs are only available up to the 2017 reporting year and were historically updated on a three-year cycle (Federal Statistical Office, 2025). Moreover, while Swiss TiVA indicators can be found updated annually on OECD's data explorer, no corresponding micro-level dataset offers comparable granularity for utilising firm-level ownership data. Few Switzerland-specific empirical GVC assessments adopt a micro-level approach at all, with the SNB's FDI, AMNE, and FATS data being available only in highly aggregated or industry-level forms (Verbeke et al., 2025, p. 2; SNB, 2025).

Due to this methodological variety and considerable data restrictions, analysing Switzerland's position in GVCs naturally requires considering different datasets to form a comprehensive picture, with each dataset contributing a different dimension to the overall assessment. The aggregated CbCR dataset by the OECD potentially adds such an empirical dimension by providing standardised MNE financial, tax, and business activity data with unparalleled geographic coverage and disaggregation, as further elaborated in Section 3.1. This thesis is among the few empirical papers dedicated to using (aggregated) OECD CbCR data to assess a country's position in GVCs²⁴

²³ See also Brühlhart et al. (2023) for a distilled overview of Switzerland's corporate taxation system. They find that Switzerland's corporate tax base grew significantly from the 1990s, the advent of the third wave of globalisation, to 2018, driven by tax-privileged foreign affiliates in particular (Brühlhart et al., 2023, p. 4).

²⁴ See also Santomarino et al. (2022), who used CbCR micro data for analysing Italy's position in GVCs and are among the first authors to use CbCR for a country-specific GVC assessment. Some components of their approach have been installed in this thesis.

and the first²⁵ for Switzerland specifically. Analysing OECD CbCR data with Switzerland as the jurisdiction in focus, this thesis presents the following contributions:

First, it establishes a comprehensive yet conclusive analytical framework that allows for the extraction of relevant GVC indicators from the Swiss OECD CbCR sub-panel and, in theory, for any other country-specific GVC assessment. The introduction of such a framework is necessary because previous empirical works utilising CbCR data have generally not provided a systematic presentation of GVC indicators. Instead, individual indicators are scattered across the literature, each examined in isolation within separate studies. The framework is based on an iterative compilation of these individual GVC indicators, primarily sourced from previous non-CbCR GVC assessments and CbCR-based profit shifting²⁶ assessments. As further discussed in Section 3.2, the framework thereby provides a “mind map” for systematically analysing the Swiss OECD CbCR sub-panels and dictates the structure of the main chapter, i.e., Chapter 4.

Utilising this framework, the second and main part is a systematic report of the Swiss CbCR sub-panel, both from an I-O and O-I perspective, thereby placing this thesis among the few papers that employ MNE-level ownership data for a GVC integration assessment of Switzerland. That being said, the primary purpose of the analysis is to provide economists, tax researchers, government officials, and other interested individuals with an introductory, broad understanding of the global geographic dispersion of Swiss MNE affiliate activity and foreign MNE affiliate activity in Switzerland²⁷. Implicitly, the analysis also highlights whether and, if so, under what circumstances OECD CbCR data can be used for jurisdiction-specific GVC assessments, as well as the potential shortcomings of the data. Note that the installed aggregations, correlations, and methodologies of the analyses are intended to provide initial ideas for subsequent, more in-depth assessments. It is explicitly not the goal to interpret and discuss all covered sections and their underlying fundamentals in detail, which would be hardly possible in the scope of this thesis. However, potential in-depth research domains in the context of (Switzerland-specific) CbCR data analysis are subsequently discussed in Chapter 5.2.

²⁵ To the best knowledge of the author.

²⁶ Few papers are dedicated to the use of OECD CbCR data for GVC contextualisation. Some that use OECD CbCR data (mainly those focusing on profit shifting assessments) do, in part, assess other GVC dimensions.

²⁷ Similar visual and analytical assessments have been conducted in the field of economic and financial geography, such as by Haberly and Wójcik (2015), which analyse the determinants of offshore FDI.

3 Data and Methodology

The following chapter presents the contextual background, discussion, and sample of the data used for this thesis. It then introduces the analytical framework methodology, as well as the auxiliary variables applied. In combination, these sections aim to establish a structured foundation for the empirical analyses presented in Chapter 4.

3.1 OECD CbCR data

3.1.1 BEPS Action 13

As the third epoch of globalisation progressed, MNEs steadily built their global production networks, while digitalisation facilitated novel business models and cross-border economic activity. In this context, both domestic and international taxation systems have proven to have limited efficacy in preventing MNEs from exploiting legal arbitrage opportunities that allow them to reduce their corporate income tax burden (OECD, 2013a, pp. 5–7). While there are other ways to circumvent taxation in a specific jurisdiction, MNE-driven profit shifting²⁸ has been identified by the OECD as a significant source²⁹ of corporate income tax base erosion and the subsequent loss of tax revenues (OECD, 2013a, p. 5; OECD, 2025a). Issues related to profit shifting induced base erosion manifest notably in undermining the integrity of local tax authorities, an unfair redistribution of the public financing burden, and the introduction of systemic competitive advantages for MNEs over locally operating firms (OECD, 2013b, p. 8; OECD, 2025a).

In response to the issues related to BEPS, the OECD released the “Addressing Base Erosion and Profit Shifting” report in February 2013 at the request of the G20 finance ministers, highlighting the growing disconnect between the location of economic activity and that of taxation, and recommending the development of a coordinated multilateral framework to restore integrity of the international tax system (OECD, 2013a). In a second document, the OECD outlined the “Action Plan on Base Erosion and Profit Shifting” later that year. It contains 15 action points intended to provide jurisdictions a “toolkit” for combating BEPS by ensuring coherence among domestic tax rules regarding cross-border taxation, reinforcing requirements in existing international taxation standards, and increasing transparency about MNE activity (OECD, 2013b, pp. 13–14; OECD, 2015a, p. 3). The 13th Action Point aimed to “develop rules regarding transfer pricing

²⁸ Profit shifting refers to tax planning strategies that detach the location of corporate profit taxation from where the initial economic activity occurs by artificially shifting respective profits into low-tax jurisdictions (OECD, 2025a). This includes, for example, transfer pricing strategies that do not follow the arm’s length principle (Beer et al., 2019, p. 662). For an exhaustive discussion of profit shifting and other corporate income tax strategies, see Beer et al. (2019) and Heckemeyer & Overesch (2017).

²⁹ The OECD (2025a) estimates \$100 – 240 billion in lost tax revenue annually, 4 – 10 % of global corporate income tax revenues.

documentation to enhance transparency for tax administrations [...] [which] will include a requirement that MNEs provide all relevant governments with needed information on their global allocation of income, economic activity and taxes paid among countries” (OECD, 2013b, p. 23). The latter part of this statement was subsequently specified in a three-part reporting requirement, which requires MNEs surpassing a certain threshold in consolidated revenues³⁰ to file a standardised CbCR³¹ that outlines the group’s activity (including number of sub-groups, revenues split by intragroup- and third-party-origin, profits before taxes, taxes accrued, tangible assets and number of employees, i.e., Full Time Equivalents [FTE], among others³²), along with information about business activities, on a country-by-country basis³³ (OECD, 2015a, pp. 9, 16, 33–35). The MNE-level CbCR is then submitted to the tax authority of the jurisdiction of UPE and shared among tax authorities of the jurisdictions listed in the report³⁴ (OECD, 2015a, pp. 37–38; OECD, 2017, pp. 26–27).

To ensure coordinated domestic implementation of the BEPS minimum standards³⁵, including the BEPS Action 13 CbCR requirement, the OECD and G20 established the so-called “Inclusive Framework”, currently encompassing approximately 140 member states that monitor and peer-review the implementation progress in included jurisdictions (OECD, 2025b, p. 3). In 2025, over 120 jurisdictions of the “Inclusive Framework” had implemented a domestic legal framework for CbC reporting³⁶ (OECD, 2025b, p. 10). In Switzerland, the CbCR requirement was transposed into national law³⁷ in late 2017, and in-scope Swiss MNEs were first obliged to submit their CbCRs to the federal tax authority for FY2018 (Eidgenössische Steuerverwaltung [ESTV], 2025)³⁸. Including Switzerland, 52 reporting jurisdictions forwarded their CbCR data to the OECD secretariat for the FY2021 vintage, where it is published in anonymised, country-aggregated form (hence also referred to as CbCR macro data) on OECD’s Data Explorer. This publicly available CbCR macro data constitutes the database used in this thesis.

³⁰ The OECD guideline specifies €750 million in annual consolidated revenues, or the near equivalent amount in the respective domestic currency (OECD, 2015, p. 21). For Swiss MNEs, the threshold is CHF 900 million (ESTV, 2025).

³¹ The original idea of a CbC reporting standard can be found in Murphy (2003).

³² See the complete CbCR variable listing in Appendix D.

³³ Specifically, a CbCR must contain data from every jurisdiction in which an MNE group holds a constituent entity for tax purposes, regardless of the size of the business operations, aggregated at the sub-group level (OECD, 2015a, p. 17; OECD, 2024b, p. 75).

³⁴ The exchange of CbCRs among tax authorities is conducted bilaterally via “(Multilateral) Competent Authority Agreements” (CAA) or via tax treaties and Tax Information Exchange Agreements (TIEAs) (OECD, 2015a, pp. 37–38).

³⁵ With Action Points 5, 6, and 14, Action Point 13 is among the so-called “BEPS Minimum Standards”, which are subject to peer review among Inclusive Framework countries (OECD, 2025a).

³⁶ See also [BEPS Action 13 peer reviews](#) for 2017 – 2024.

³⁷ [ALBAG](#) (national law), [ALBAV](#) (implementation ordinance).

³⁸ Voluntary reporting was possible for Swiss firms for FY2017. However, that data cannot be unambiguously compared to the data generated in subsequent years through mandatory reporting.

3.1.2 Discussion of OECD CbCR data

With the intent of allowing tax authorities to conduct high-level transfer pricing risk assessments, the data gathered under the BEPS Action 13 CbCR requirement offers several advantages over other databases that capture MNE activity (OECD, 2015a, p. 42). First and foremost, OECD CbCRs provide unprecedented geographic coverage for assessing individual or aggregated MNE activity across the financial, tax, and business activity variables (Garcia-Bernardo & Janský, 2024, p. 5; Fuest et al., 2022, p. 445; Henlon, 2018, pp. 5–7; OECD, 2015, p. 9). BEPS Action 13 CbC reporting enables the analysis of MNE activity in up to 228³⁹ explicit counterparty jurisdictions, i.e., individual ISO-coded countries rather than aggregated regional groupings, including developing countries that were previously not covered in any MNE data source (Garcia-Bernardo & Janský, 2024, p. 5). Other databases that capture cross-border MNE activity, such as the Bureau van Dijk's Orbis database, the US BEA Activities of US MNEs database, or OECD's AMNE database, do not equal the geographic coverage or allow assessing affiliate activity by country with such a degree of granularity (Fuest et al., 2022, p. 455; Boukal, 2024, p. 5).

A second key advantage is the inclusion of both standardised tax and financial variables in one dataset. For example, CbCR data includes Income Tax Accrued (*Income Tax Accrued (Current Year)*)⁴⁰ and Income Tax Paid (*Income Tax Paid (on Cash Basis)*) variables per jurisdiction, a significant extension over MNE databases that were not initiated for BEPS-related risk assessments (Santomarino et al., 2022, p. 79). Compiling and combining different sets of variables from different datasets used for GVC contextualisation is often a major concern in MNE-level GVC assessments (Verbeke et al., 2025, pp. 9–11). OECD CbCR variables are standardised⁴¹, allowing greater comparability among individual jurisdictions (Santomarino et al., 2022, pp. 79–80). Among other sources for CbCR data⁴², OECD CbCR data also covers the most significant number of variables, that is, 10 financial and tax variables as well as 13 business activity categories, including intra-firm and third-party dimensions⁴³ (Aliprandi & Borders, 2024, p. 8; OECD, 2017, pp. 25–26; Amador & Cabral, 2014, p. 292). The geographic and methodological comprehensiveness is also why BEPS Action 13 CbCRs, both aggregated by jurisdiction and on MNE level, accelerated a novel instance of research on profit shifting activities in offshore jurisdictions, which were only sparsely covered in other MNE databases before OECD CbCR availability (Garcia Bernardo & Janský, 2024; Fuest et al., 2022; Boukal, 2024). However, the unparalleled geographic coverage, reporting granularity, and included financial variables also constitute BEPS Action 13 CbCR data as a well-

³⁹ Note that the coverage and granularity can vary drastically among reporting jurisdictions, as the degree of CbCR disclosure depends on respective national regulation, implementation progress and time period. This is further highlighted in Chapter 4.

⁴⁰ Terms in italics referring to the nomenclature of the OECD CbCR template.

⁴¹ Filing a CbCR is instructed in OECD's [implementation guidelines](#) (and respective national regulations)

⁴² Most notably, the GRI 207–4 reporting standard, national databanks such as the US IRS, as well as voluntarily published micro CbCRs, which can be found [here](#).

⁴³ See also Appendix D for a visual layout of the OECD CbCR template.

suited tool to form a “snapshot” picture of how a country is positioned within GVCs (Santomarino et al., 2022, p. 77; OECD, 2024b, p. 73). Lastly, CbCRs are filed by the UPE only, thereby reducing the issue of intermediate entities reporting and potentially leading to double-counting of variables (OECD, 2015, pp. 39–40).

However, OECD CbCR data also comes with limitations, of which the most relevant are outlined below. The first structural limitation is that only MNEs with consolidated revenues of at least €750 million (or equivalent) are considered in the data. While this threshold certainly covers the values of the largest MNEs in the respective reporting jurisdiction, the analyses in Chapter 4 must be interpreted with this structural limitation in mind. FATS statistics or Bureau van Dijk's Orbis data, as examples, also include smaller-scale MNEs (Santomarino et al., 2022, p. 80).

Moreover, as individual tax authorities compile CbCR data, differences in the initial handling of respective micro data must be expected (Delpuch et al., 2025, p. 12). Although the variables in the CbCR template are standardised, this may give rise to some degree of structural heterogeneity in the data. Also, the reporting MNE is free to choose the financial reporting standard from jurisdiction to jurisdiction⁴⁴, and the CbC reports are not audited, which might further exacerbate comparability issues within the CbCR panel (Hanlon, 2018, pp. 14–15; OECD, 2015, p. 32; Delpuch et al., 2025, p. 12). Although manual checks of potential irregularities in the data were conducted, this thesis cannot guarantee a comprehensive verification of a unified dataset, which should also be considered when interpreting the results.

Furthermore, CbCR data is aggregated, not consolidated, at the MNE reporting level on a jurisdictional basis. This means that all CbCR values of affiliates in a certain jurisdiction are summed up, with intragroup transactions not being eliminated. While this is the desired reporting mode for displaying intragroup transactions, the potential for double-counting issues arises (Aliprandi & von Zedlitz, 2023, p. 6). This has manifested in the *Profit before income tax* variable, where OECD guidelines did not explicitly state whether to include intra-company dividends, resulting in inflated profit values, particularly in the jurisdiction of UPE⁴⁵ (Aliprandi & von Zedlitz, 2023, p. 6; Hugger et al., 2023, p. 12). Ignoring this issue would bias ETR estimations downwards and profitability ratios upwards (OECD, 2024a, p. 6). Moreover, so-called “Stateless” entities, which are not assigned to a particular tax residence, might contribute to double-counting of CbCR variables (OECD, 2024a, p. 4; Hanlon, 2018, p. 13). This thesis addresses double-counting issues and “Stateless” entities, as outlined in Chapter 3.1.3 and Appendix B for the ETR specification.

⁴⁴ Adjustments for differences in local accounting standards do not need to be made (OECD, 2015a, p. 32).

⁴⁵ Specifically, the OECD guidance on CbCR implementation did not explicitly state that intracompany dividends should be excluded from the *Profit (loss) before income tax* variable before 2020, potentially leading to inflated profit values reported (OECD, 2024c, p.12; OECD, 2024a, pp. 3–4). Apart from affecting profit ratios, the ETR may also be biased downwards, as discussed in Appendix B. For revenues, this was specified; hence, revenue values are not affected by this issue.

Also, while Switzerland is among the reporting jurisdictions that provide relatively disaggregated CbCR data to the OECD for the I-O perspective over the considered vintages⁴⁶, the data from the O-I perspective is considerably less comprehensive, as Switzerland can, in theory, only appear as a counterparty jurisdiction in the CbC reports of those reporting jurisdictions that themselves publish CbCR data. Lastly, due to the nature of country-aggregated CbCR data, this thesis can only assess one CbCR variable at a time. By contrast, CbCR micro data allows for combining variables (e.g., economic variables with business functions⁴⁷), as they can unambiguously be assigned to each reporting MNE. This is not feasible with the macro data used in this thesis.

3.1.3 Sample, cleaning and data transformations

The main sample⁴⁸ used in Chapter 4 is the 2018 – 2021 vintages CbCR panel, available on the OECD Data Explorer, comprising 56 reporting jurisdictions, 220 explicit counterparty jurisdictions, and a total of 672,037 country-pair year observations across all profit groupings⁴⁹. The entire panel was selected as the base file because it, by default, includes sub-panels with Switzerland as the reporting jurisdiction (I-O) and Switzerland as the counterpart (O-I). This setup enables direct cross-country comparisons within a single data frame. Additionally, the auxiliary variables used for displaying correlations and aggregations can be stored in a single data frame⁵⁰. The 2016 and 2017 vintages are excluded from the panel, as CbC-reporting became mandatory in Switzerland for FY2018, rendering previous vintages with only voluntary reporting challenging to compare (ESTV, 2025). Also, the 2016 vintage, in particular, reports with different definitions of the fiscal year considered, does not contain key reporting jurisdictions and is discussed to have further quality issues (OECD, 2024a, p. 2; Santomarino et al., 2022, p. 77; Hugger et al., 2023, p. 11). Moreover, so-called “Stateless” entities are excluded due to their potential for increasing double-counting issues, in line with previous (macro) CbCR assessments (Garcia Bernardo & Janský, 2024; Boukal, 2024). Regarding the inclusion of intra-company dividends, these are assumed to accumulate in the profits recorded at the UPE, as dividends from affiliates are typically paid at the top of the ownership structure (Hugger et al., 2023, pp. 12, 54). In the context of the CbCR macro data, this particularly affects the profits recorded in the domestic market⁵¹, i.e., the

⁴⁶ For other reporting jurisdictions, the I-O perspective might also not allow a granular assessment of CbCR variables.

⁴⁷ See also Santomarino et al. (2022).

⁴⁸ Note that the ETR computation and the methodology in Chapter 4.2.2 use different subsets from the main sample. These are elaborated in Appendix B and Appendix C.

⁴⁹ BEPS Action 13 CbCR data can be grouped by positive profit (Panel AI), loss-making (Panel AII), or total (loss and profit-making) (Panel _T) sub-groups. Unless explicitly stated otherwise, total sub-groups are considered in this thesis.

⁵⁰ The author of this thesis provides the data frame upon request via [mail](mailto:).

⁵¹ For example, profits of Swiss MNEs in Switzerland. Naturally, not all entities of Swiss firms in Switzerland are respective UPE.

jurisdiction of UPE. Hence, they are excluded in Chapter 4 and the ETR computation, following Boukal's (2024) approach. Finally, as a general procedure, notably higher or lower year-over-year changes within the CbCR variables considered in the Swiss and other country panels were identified and assessed; if deemed implausible, they were disregarded as potential reporting errors.

Meanwhile, the Swiss sub-panel in the I-O perspective (with Switzerland reporting) comprises 166 explicit counterparty jurisdictions (excl. four non-explicit jurisdictions) and 36,662 Switzerland-counterparty jurisdiction year observations across all profit groupings. Conversely, the O-I panel (with Switzerland as the counterparty jurisdiction) is significantly more limited, as further discussed in Chapter 4.2. 33 reporting jurisdictions explicitly report CbCR variables in Switzerland in the considered vintages, constituting 7,281 reporting jurisdiction-Switzerland year observations. The descriptive statistics for key CbCR variables of the Swiss I-O and O-I sub-panels are presented in Tables A1 and A2 of Appendix A⁵².

3.2 Methodology and additional data

The methodological considerations of this thesis refer to three components: first, the analytical framework for the systematic analysis of the (Swiss) OECD CbCR sub-panels from I-O and O-I perspectives; second, the ETR computations of the jurisdictions considered for cross-country comparisons within the analysis; and third, the extrapolation model used to estimate missing economic activity data in the O-I perspective. While the latter is further discussed in Chapter 4.2.2 and Appendix C, the former two are presented below.

This thesis's main contribution, i.e., the I-O and O-I analyses of the Swiss OECD CbCR sub-panels, is conducted using a framework that serves as a "mind map" for analysing the Swiss sub-panel (or any other, for that matter). Given the scarcity of empirical papers that descriptively analyse CbCR data for GVC contextualisation, the framework's concepts, variables, and ratios are assembled through an iterative literature review of empirical OECD CbCR (profit shifting) analyses, OECD guidelines, non-CbCR GVC analyses, and proprietary intuition where necessary. The framework and the resulting analysis of the Swiss OECD CbCR sub-panels are presented below, beginning at a conceptual level and progressing to the specific variables and ratios considered⁵³.

⁵² Further guidance on understanding and working with OECD CbCR data can be found [here](#).

⁵³ To avoid GVC measurement issues such as the arbitrary selection of variables and to enhance construct validity (Verbeke et al., 2025, p. 3), the framework was developed following Jabareen's (2009) structured process for theory-based conceptual framework construction. His qualitative, iterative approach was found to provide a suitable guideline for identifying and selecting relevant indicators from prior literature, refining these in interaction with the OECD CbCR data, and systemising them into a comprehensive analytical framework.

Conceptually, the descriptive analysis in Chapter 4 follows the OECD's (and SNB's) inward and outward FDI- and AMNE-measurement logic to explicitly distinguish Swiss MNE activity abroad (I-O) from foreign MNE activity in the domestic market (O-I) (Cadestin et al., 2018b, p. 27; SNB, 2025). This separation results in subchapters 4.1 and 4.2 (I-O and O-I perspectives, respectively)⁵⁴. Within each subchapter, the same set of CbCR dimensions is considered: First, so-called sub-groups (*Multinational enterprise sub-groups*), i.e., the agglomeration of entities/affiliates per jurisdiction that are ultimately controlled by the same UPE, following the analyses conducted by Santomarino et al. (2022, p. 85). Next, this thesis considers Revenues (*Total revenues, Unrelated party revenues, Related party revenues*), *Tangible Assets (Tangible assets other than cash and cash equivalents)*, and Employment on an FTE basis (*Employees*), which are common proxies for economic activity among the GVC literature (OECD, 2020; Turban et al., 2020; Verbeke et al., 2024; Delpuech et al., 2025)⁵⁵. Furthermore, the framework distinguishes Profits (*Profit (loss) before income tax*) from economic activity, as done in the existing CbCR profit shifting literature, the OECD Corporate Tax Statistics and Economic Impact Assessment of the Pillar One and Pillar Two proposals (Fuest et al., 2022; Godar et al., 2023, p. 20; Santomarino et al., 2022, p. 88; OECD, 2020; OECD, 2024b). The fourth CbCR dimension is constituted by a high-level business activity analysis⁵⁶, following the approaches of Delpuech et al. (2025) and Santomarino et al. (2022). Covering these CbCR dimensions ensures a systematic, non-redundant analysis of the most relevant GVC considerations contained in the data.

Within each of the four CbCR dimensions, a standardised yet variable-specific structure is presented, ensuring comprehensive extraction of GVC indicators from the data. First, an overview of the geographic dispersion of the respective variable is presented, where possible, on a global visualisation, similar to the annual CbCR variable presentations from the EUTAX Observatory (2025). Next, the CbCR dimension is aggregated by selected international agreements (such as by EU and non-EU membership) and by income group, based on Gross National Income (GNI) per capita values. Lastly, each CbCR variable is analysed based on its unique characteristics in the panel. For example, the relationship of Related- and Unrelated Party Revenues is assessed in the economic activity dimension, given the unique availability of those variables in the OECD CbCR panel. Meanwhile, the business activity dimension is assessed via a separate approach, following Delpuech et al. (2025). Also, due to the significantly limited geographic coverage, the O-I analysis is conducted in accordance with data availability. For example, the aggregations by selected

⁵⁴ Swiss MNE activity in the domestic market is highlighted in both chapters where necessary; however, it is not the main focus of the analyses.

⁵⁵ Verbeke et al. (2025) published a similar conceptual paper, analysing the positioning of Switzerland's largest MNEs using sales (revenues) and three capital dimensions (assets, employees, and patents) using annual report data. Given the overlap in considered dimensions, this thesis can be seen as complementary work.

⁵⁶ See Appendix D for the nomenclature of the OECD CbCR business activities.

international agreements and income groups are not presented, given the unknown magnitude of variables by omitted jurisdictions.

Seven “auxiliary” variables and variable groups are used to implement the analyses constituting this structure within each CbCR dimension. The rationale behind each is discussed below.

The default aggregation is, by nature of the CbCR data, by country-pair using ISO 3166-1 alpha-3 country codes, which are presented in Table D1 in Appendix D. This is the most disaggregated presentation of CbCR data in this thesis, given the use of CbCR macro data. Next, GDP and GDP per capita are included, which are common proxies used in the (CbCR-based) GVC literature for market size and development, respectively (Delpeuch et al, 2025; Cadestin et al., 2018b; OECD, 2020; Turban et al., 2020; Boukal, 2024; Nielsen et al., 2016). Annual GDP and GDP per capita values are compiled from the World Bank. As methodological extensions of GDP and GDP per capita values, GNI and GNI per capita are also considered. GNI is an ownership-based measure that incorporates income from foreign subsidiaries and is therefore more appropriate to use than GDP in certain analyses. GNI per capita follows the same logic, while GNI per capita values are grouped into five income groups, which are also commonly installed in OECD CbCR works (OECD, 2020; OECD, 2024b; Santomarino et al., 2022; Delpeuch et al., 2025): high income, upper middle income, lower middle income, low income and investment hub, whereby countries falling into the investment hub⁵⁷ category are excluded from the others, if applicable. The annual GNI and GNI per capita values are also compiled from the World Bank.

Chapter 2.2 indicated the EU's relevance for Swiss imports and exports. Hence, an EU membership indicator is applied for higher aggregations of the Swiss CbCR panel. An OECD indicator complements the EU dummy to identify potential structural differences between (non-) OECD countries in the Swiss I-O OECD CbCR sub-panel. To facilitate cross-border economic activity, its dense Double Taxation Agreement (DTA) network is seen as a central component in Switzerland's foreign economic policy, particularly concerning outward FDI (SECO, 2025a, p. 21). Moreover, as a highly export-oriented economy, Free Trade Agreements (FTAs) are essential for Switzerland's access to foreign markets. Hence, indicators for DTA and/or FTA partners with Switzerland are installed to reflect the potential effects of Swiss foreign economic policy and to aggregate the CbCR data further⁵⁸. Swiss DTA data is sourced from the Swiss State Secretariat for International Finance, while jurisdictions that maintain FTAs with Switzerland are compiled from the SECO.

On a side note, the I-O analysis also examines the sensitivity of Total Revenues, Tangible Assets, and Employees to the counterparty jurisdiction's governance indicator, as seen in Figure A4 in

⁵⁷ The OECD (2020, p. 26) and Hugger et al. (2023, p. 8) define investment hubs as countries with an inward FDI stock to GDP ratio of 150% or more. Hugger et al. (2023) use a similar CbCR panel, so their list of investment hubs is adopted for simplicity.

⁵⁸ In case of a DTA or FTA coming into force during the observation period, the average values from the post-enforcement period are considered in the aggregations.

Appendix A, following Cadestin et al. (2018b), Boukal (2024), and Haberly & Wójcik (2015). For the governance specification, this thesis follows Boukal's (2024) approach of computing the unweighted jurisdictional average value of the six⁵⁹ Worldwide Governance Indicators (WGI) from 2018 to 2021, compiled from the World Bank. The average WGI is furthermore incorporated in the extrapolation methodology of Chapter 4.2.2.

Lastly, taxation is also addressed. Taxation is among the most widely discussed drivers of foreign economic activity, and profits in particular⁶⁰, and is thus a central indicator of the profit dimension in the I-O and O-I assessments. This thesis employs a proprietary taxation specification, derived from a blended methodological approach by Boukal (2024), Garcia Bernardo & Janský (2024), and Hugger et al. (2023). Specifically, it uses a backwards-looking (i.e., realised) profit-weighted, jurisdictional ETR estimate based on the CbCR vintages from 2017 to 2021. This specification has been chosen over statutory rates, synthetic forward-looking effective rates, or previous ETR estimates⁶¹ using one CbCR vintage only, as it most accurately reflects the actual average income tax burden faced by MNEs in the jurisdiction in question, over the period considered (Garcia Bernardo & Janský, 2024, p. 3). Appendix B further details the ETR computation and presents the resulting average jurisdictional ETR estimates in Table B1.

Concerning the time dimension, the 2018 – 2021 averages of the per-year CbCR data and the auxiliary variables are used unless stated otherwise for three reasons: First, they provide greater robustness against year-specific outliers. As discussed in Chapter 3.1.2, BEPS Action 13 CbCR data may be subject to reporting errors in some jurisdictions in certain years. Taking the four-year averages minimises the impact of year-specific outliers and provides a representative “snapshot” of the average value of the CbCR variable examined. Secondly, the averages allow for greater country coverage. For example, CbCR data on Swiss MNE activity in Afghanistan is only available in the 2018 and 2019 vintages. In this case, the average from those two reporting years is considered, providing greater coverage and cross-sectional comparability to analysing individual vintages only. Thirdly, the year averages provide a robust measure, which can be displayed within the scope of this thesis. Figure 1 visualises the analytical framework, indicating what “auxiliary” variables are used within each CbCR dimension, i.e., sub-chapter⁶².

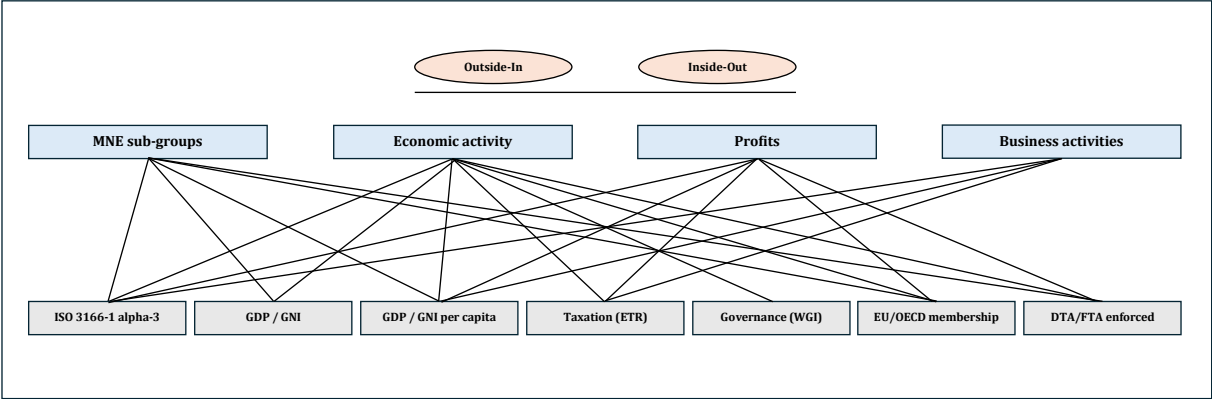
⁵⁹ [Voice and Accountability, Political Stability and Absence of Violence/Terrorism, Government Effectiveness, Regulatory Quality, Rule of Law, Control of Corruption.](#)

⁶⁰ A selected overview: For FDI (as a proxy of economic activity), see also Nielsen et al. (2016) (pre-CbCR meta-study of drivers of FDI, including taxation) and Haberly & Wójcik (2015); For profits, see also Beer et al. (2019) (pre-CbCR meta-study on the tax semi-elasticity of profit shifting), Tørsløv et al. (2022), Garcia Bernardo & Janský (2024).

⁶¹ See Appendix B for an elaboration on these tax rate specifications.

⁶² To maintain the scope of this thesis, not all combinations of CbCR and auxiliary variables are included in Chapter 4. The remaining visualisations and tables are provided in Appendix A.

Figure 1: Analytical framework for extracting GVC indicators from OECD CbCR macro data



Note. Own depiction. The blue sections refer to the OECD CbCR dimensions. The grey sections refer to the “auxiliary” variables. GNI per capita is grouped into income groups. EU/OECD membership and DTA/FTA indicators are jointly visualised and are only presented in the I-O section due to a lack of data coverage in the O-I perspective.

4 Switzerland's position in GVCs: Empirical Results

4.1 Inside-Out (I-O) analysis of Swiss MNE activity abroad

The I-O perspective with Switzerland as the reporting jurisdiction is among the most disaggregated subsets within the entire OECD CbCR panel, facilitating a granular, i.e., country-specific analysis. Considering the 2018 – 2021 averages of the observed variables, the Swiss I-O CbCR sub-panel explicitly reports some or all variables of the CbCR template for 166 jurisdictions and all variables for 136 jurisdictions⁶³. By this, Switzerland ranks second among the 56 reporting jurisdictions publishing CbCRs on OECD's data explorer in terms of country-specific granularity. Table 1 presents a comparison to other reporting jurisdictions.

As with the other reporting jurisdictions, Switzerland also reports data on non-explicit and/or higher-aggregated jurisdictions, such as “Other Africa,” which account for observations from the remaining jurisdictions in the respective region. Among these higher-aggregated areas, the so-called “Rest of World” (*WXD*) aggregation came in particularly useful, as it sums up all (explicit and aggregated) values of the considered variable⁶⁴. Hence, the *WXD* aggregation was essential for cross-jurisdictional comparability in the I-O analysis. MNEs with UPE located in Switzerland are henceforth referred to as Swiss MNEs for readability.

Table 1: Reporting jurisdictions of OECD CbCR data ranked by level of disaggregation

	Reporting Jurisdiction	Explicit Counterparty Jurisdictions	Explicit Counterparty Jurisdictions (a.v) ⁶⁵	Reporting Years ⁶⁶
1	DEU	172	170	(2016), (2017), 2018, 2019, 2020, 2021
2	CHE	166	136	(2017), 2018, 2019, 2020, 2021
3	CYM	160	159	2018, 2019, 2020, 2021
4	HKG	154	153	2018, 2019, 2020, 2021
5	ARE	149	149	2021
6	ROU	147	147	(2017), 2018, 2019, 2020, 2021
7	USA	144	136	(2017), 2018, 2019, 2020, 2021
8	CHN	140	140	(2017), 2018, 2019, 2020, 2021
9	JPN	140	140	(2016), (2017), 2018, 2019, 2020, 2021
10	PER	123	123	(2017), 2018, 2019, 2020, 2021

Note. Own depiction.

⁶³ Considering AFG as an example again, Switzerland only publishes the number of Swiss MNE groups, sub-groups, and entities on OECD's data explorer.

⁶⁴ For example, the observed value for Employees with *WXD* as the counterpart sums up the FTE equivalents of all foreign subsidiaries of MNEs with their UPE in the reporting jurisdiction. In the most extreme case, *WXD* is the only counterparty jurisdiction reported in the respective CbCR sub-panel (e.g. for the Czech Republic).

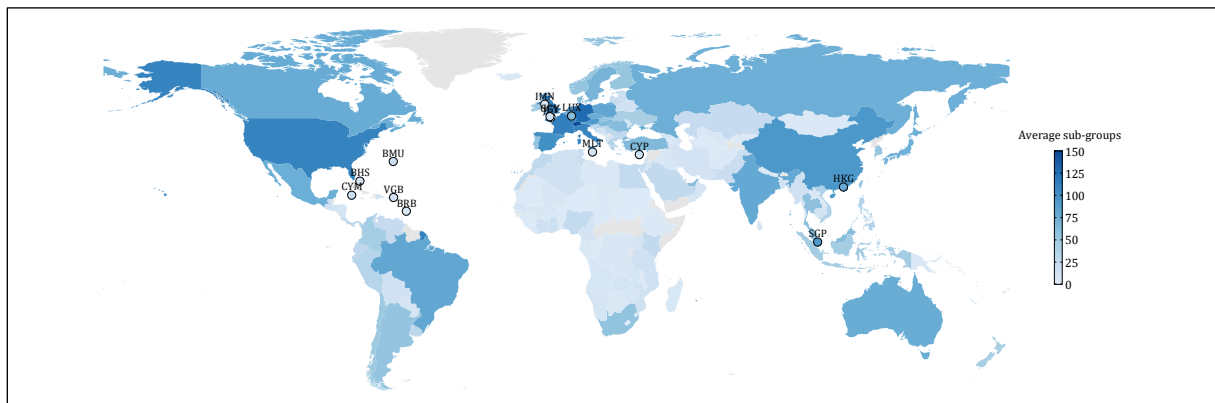
⁶⁵ a.v. = all variables, i.e., the number of counterparty jurisdictions, where the respective reporting jurisdictions' MNEs report all variables of the CbCR template.

⁶⁶ Reporting vintages 2016 and 2017 are highlighted in brackets, since they are not considered in this thesis, as outlined in Chapter 3.2.

4.1.1 Swiss MNE sub-group presence abroad

The accumulation of MNE sub-groups provides an initial overview of the level of integration of Swiss MNEs in GVCs, aside from their actual economic activity. A sub-group can be understood as the combination of all constituent entities of an MNE (group) that report in a particular jurisdiction (Santomarino et al., 2022, p. 82). Assessing the number of sub-groups thus gives insight into how many Swiss MNEs operate, at least with one entity, in a particular counterparty jurisdiction. Following the analytical framework methodology, Figure 2 provides a country-level overview of the 2018 – 2021 average Swiss MNE sub-groups abroad.

Figure 2: *Swiss MNE sub-groups by counterparty jurisdiction*



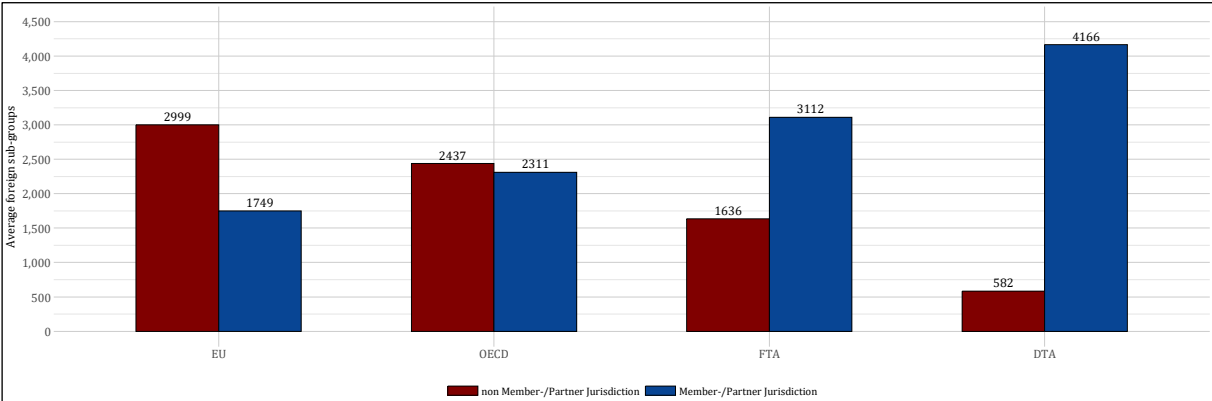
Note. Own depiction. The numerical values can be found in Table A3 in Appendix A. Click [here](#) to view and download the enlarged graphic.

Figure 2 reflects the findings suggested by Swiss trade statistics (Legge et al., 2024): Apart from the domestic market, Swiss affiliates are concentrated in the EU (including the UK), North America, and China. Of the 4,803⁶⁷ total foreign sub-groups, Swiss MNEs exhibit the highest presence in Germany, with 128 sub-groups, followed by France (114), the UK (114), and the USA (111). Also, Figure 2 clearly highlights the high level of disaggregation of the Swiss CbCR sub-panel (at least regarding MNE sub-groups), with only a few explicit African, South American and Asian jurisdictions not listed across the vintages considered. Meanwhile, the dark shading of Switzerland highlights the pronounced orientation towards the domestic market of Swiss MNEs (at 148 MNE sub-groups), as asserted by Verbeke et al. (2025).

⁶⁷ Totalling an average of 21,127 legal entities in foreign jurisdictions.

Figure 3 further aggregates foreign sub-groups of Swiss MNEs by EU and OECD membership, as well as whether their respective counterpart jurisdictions have an FTA or DTA in force with Switzerland. This plot illustrates that, despite the EU being the most relevant trading partner for Swiss MNEs, most sub-groups (63%) are located outside the EU zone⁶⁸. Meanwhile, with FTAs and DTAs in force for over 100 individual jurisdictions across all major economic zones, the Swiss DTA network, particularly, encompasses the vast majority (88%) of all foreign Swiss sub-groups. As a side note, no significant differences were observed in the average number of sub-groups per individual counterpart jurisdiction across the four aggregation categories.

Figure 3: Swiss MNE sub-groups grouped by selected international agreements



Note. Own depiction. This visualisation excludes sub-groups in the domestic market. The sum of sub-groups per category should, in theory, match the total of 4,803 average foreign sub-groups. However, some sub-groups cannot be assigned to explicit counterpart jurisdictions and are thus excluded from this figure. Click [here](#) to view and download the enlarged graphic.

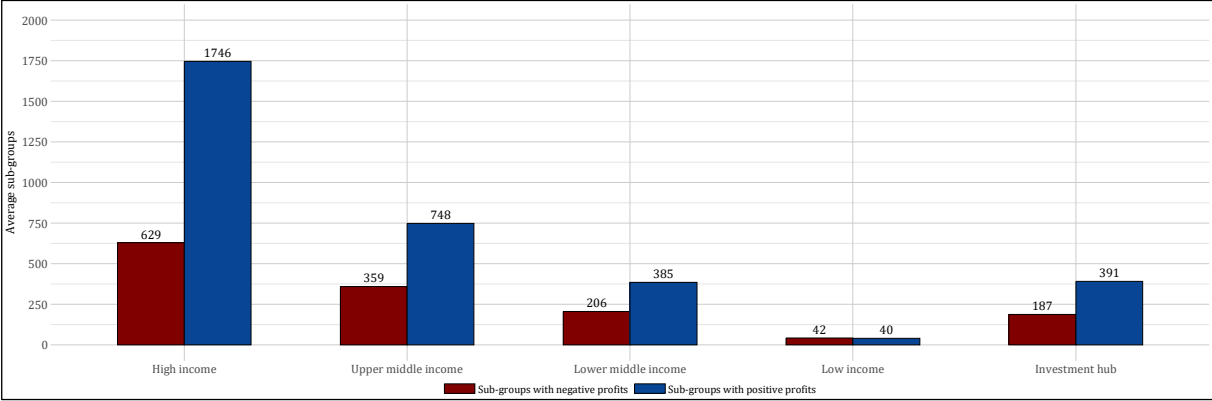
The OECD CbCR panel also allows for disaggregating the total into profitable and loss-making subgroups. To assess the dispersion of Swiss MNE subgroups across different levels of country development, Figure 4 aggregates both loss- and profit-making subgroups according to the OECD's (2020) and Delpuech et al.'s (2025) categorisation of income groups, based on GNI per capita and investment hubs⁶⁹. First, most positive and negative profit sub-groups are found in high- and upper-middle-income countries, which can be expected given their higher macroeconomic indicators and larger market sizes. Moreover, the proportion of Swiss loss-making sub-groups to those recording profits increases as income levels decrease, with loss-making sub-groups outnumbering the profit-making ones in low-income jurisdictions.

⁶⁸ UK's average is equally split between EU and non-EU due to Brexit taking place in 2020.

⁶⁹ Criterion: Inward FDI to GDP \geq 150%. Switzerland qualifies as an investment hub over the 2018 – 2021 period.

Furthermore, 578, or 12% of all foreign sub-groups, are located in investment hubs, an initial indicator that Swiss MNEs operate in tax-haven jurisdictions, given that the countries defined as tax havens and investment hubs largely overlap (OECD, 2020, p. 26; OECD, 2024b, pp. 91–93). Chapter 4.1.3 further focuses on profit and loss-making sub-groups and profits reported in investment hub jurisdictions.

Figure 4: Swiss MNE sub-groups grouped by income category



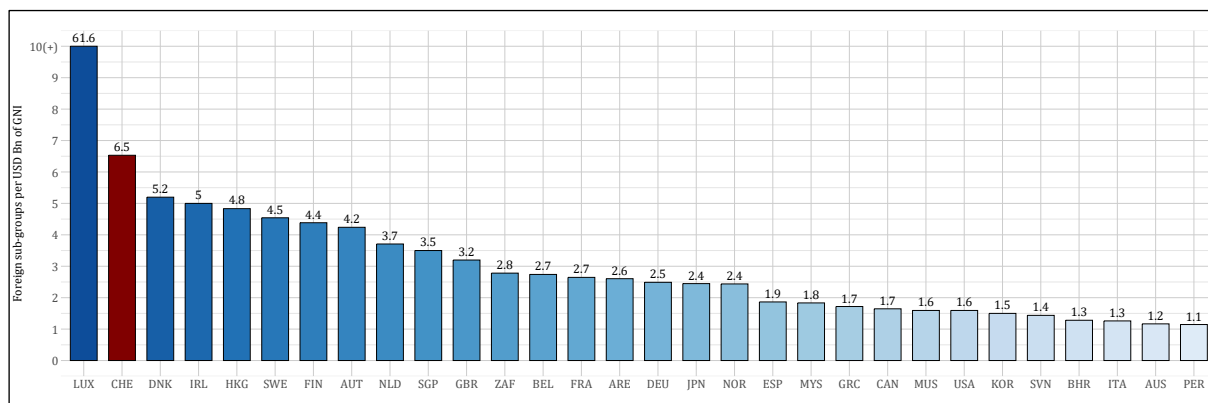
Note. Own depiction. This visualisation excludes sub-groups in the domestic market, which would be situated among the “Investment Hub” category. Click [here](#) to view and download the enlarged graphic.

Concerning the absolute value of foreign sub-groups to those of other reporting jurisdictions in the panel, Switzerland ranks fifth, after the USA, Germany, Japan, and France. Given the differences in economic output across these countries, however, it is reasonable to put the number of foreign affiliates into context relative to economic output⁷⁰. Figure 5 shows the proportion of non-domestic subgroups per USD billion of GNI across the highest-ranking reporting jurisdictions in the OECD CbCR panel⁷¹. Note that, generally, countries with a smaller domestic market tend to gain a larger share of their GNI from foreign sources (Puhr et al., 2023, p. 133). Switzerland exhibits the largest share of foreign sub-groups among high-GNI jurisdictions and is only preceded by Luxembourg and the excluded reporting tax havens, despite having multiple magnitudes of their GNI. Figure 5 thereby clearly indicates the significance of foreign MNE activity for Switzerland’s high GNI and GNI per capita.

⁷⁰ Note that GNI, as opposed to GDP, is used. GNI is an ownership-based measure that incorporates income from foreign subsidiaries, providing a coherent denominator for the analysis.

⁷¹ Data for CYM, BMU, and IMN are excluded from Chapter 4.1 except in the profits analyses (Chapter 4.1.3), as sub-groups with UPE in these jurisdictions have been found to likely consist of tax-motivated shell companies, skewing the analysis.

Figure 5: Foreign MNE sub-groups per USD billion of GNI of selected reporting jurisdictions

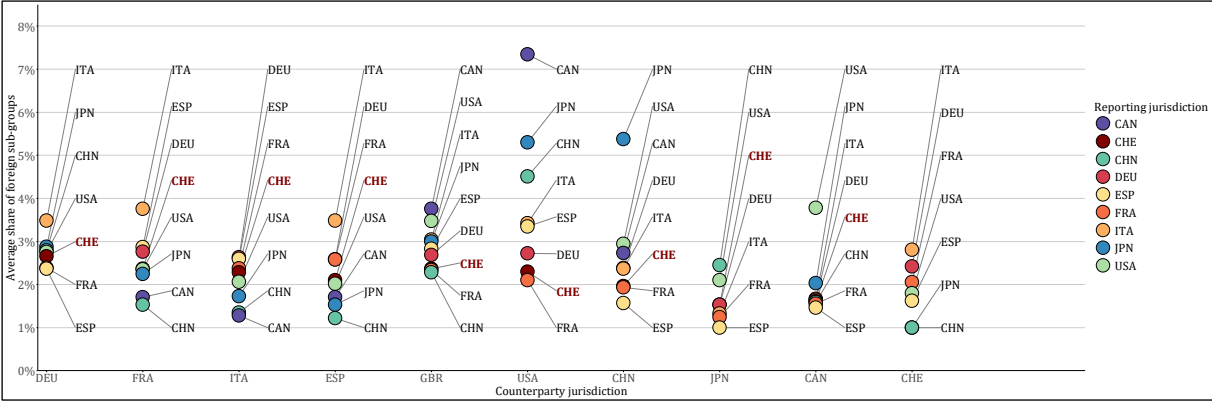


Note. Own depiction. The ratios of excluded reporters are: 418.8 (CYM), 201.0 (BMU), 13.5 (IMN). Luxembourg's (LUX) ratio is visually capped at 10 (the actual ratio is 61.6). Click [here](#) to view and download the enlarged graphic.

Lastly, the sub-group analysis considers the presence of (Swiss) sub-groups in selected key markets relative to the total foreign sub-groups in Figure 6, following a similar approach to Santomarino et al. (2022, p. 87). This graphic highlights the relative significance of the selected markets for Swiss MNEs, situating their presence in the context of that of MNEs from other UPE reporting jurisdictions. Overall, Swiss MNEs are represented in the lower mid-field in respective key markets compared to other major reporting jurisdictions, with approximately 2% of all Swiss foreign sub-groups located in each counterparty jurisdiction considered, as presented in Figure 6. Although relatively underrepresented in Anglo-Saxon economies, i.e., the UK at 2.3% and the USA at 2.2% of all foreign sub-groups, Swiss MNEs have a comparatively high share of sub-groups located in Japan, with 1.5% of all Swiss foreign sub-groups, only preceded by China and the USA⁷². Note that due to the conceptual limitations of the OECD CbCR macro data, it is only possible to derive the proportion of sub-groups located in each counterparty to the total foreign (*WXD*) sub-groups, presenting an initial estimate of the relative importance of the respective counterparty's market. It is not possible, for example, to determine whether the same or a concentrated group of MNEs accounts for the shares of sub-groups observed across the counterparties or which industries respective MNEs operate in.

⁷² Assuming that other reporting jurisdictions that do not explicitly report in JPN do not constitute a higher share.

Figure 6: Shares of foreign MNE sub-groups in key markets of selected reporting jurisdictions



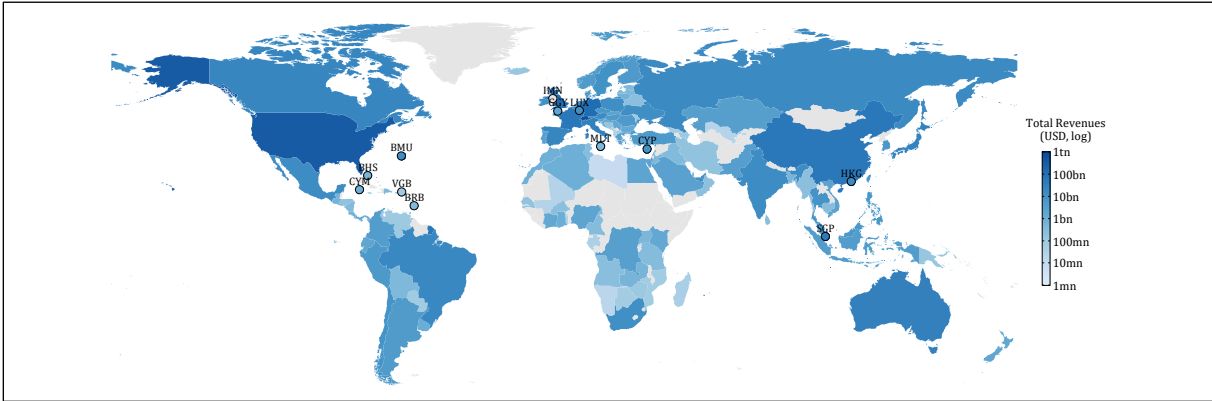
Note. Own depiction. The shares of the individual reporting jurisdictions are presented on the y-axis, while the respective counterparties (markets) are noted on the x-axis. Missing jurisdiction pairs are likely due to confidentiality requirements of the reporting jurisdiction. Domestic sub-groups are excluded across all reporting jurisdictions. Click [here](#) to view and download the enlarged graphic.

4.1.2 Economic activity of Swiss MNEs abroad

In accordance with previous academic work on empirically measuring GVCs and GVC integration (OECD, 2020; Turban et al., 2020; Verbeke et al., 2025), economic activity is approximated in this thesis via the (unrelated party) Revenues, Tangible Assets, and Employees (FTE equivalents) of Swiss MNE affiliates abroad. These three measures are assessed in a single sub-chapter as they strongly correlate throughout the CbCR panel⁷³.

As the OECD CbCR panel allows for differentiation between Related and Unrelated Party Revenues, the revenue variable is assessed separately from Tangible Assets and Employees. For this, Figure 7 presents the country-by-country distribution of Total Revenues by Swiss MNE affiliates.

Figure 7: Total Revenues of Swiss MNE affiliates by counterparty jurisdiction



Note. Own depiction. The numerical values can be found in Table A4 in Appendix A. Click [here](#) to view and download the enlarged graphic.

⁷³ Although all financial variables positively correlate in the CbCR panel, the Pearson’s r , r^2 , and Spearman’s ρ between the Unrelated Party Revenues, Tangible Assets, and Employees are particularly high at over 0.8 across all jurisdiction pairs in the entire panel. This is confirmed by Hugger et al. (2024, p. 62).

This figure, again, highlights the significance of Switzerland's key trading partners in its foreign economic activity and serves as a reference point for subsequent analyses. It also provides insight into the magnitude of Swiss economic activity abroad. On average, from 2018 to 2021, Swiss-headquartered foreign affiliates generated a total of \$1,281.2 billion in Total Revenues in foreign markets. Apart from the \$540.5 billion in Total Revenues recorded in Switzerland, the USA is by far the most significant foreign market for Swiss firms, with an average Total Revenue of \$306.9 billion. Germany, the UK, France, and China follow, with \$124.0 billion, \$121.9 billion, and \$60 billion of Total Revenues recorded in France and China, respectively. Note that a log scale is necessary to accurately depict the range of Total Revenues recorded by Swiss affiliates abroad, highlighting the relevance of the North American, European, and Chinese markets over South American and African jurisdictions, especially.

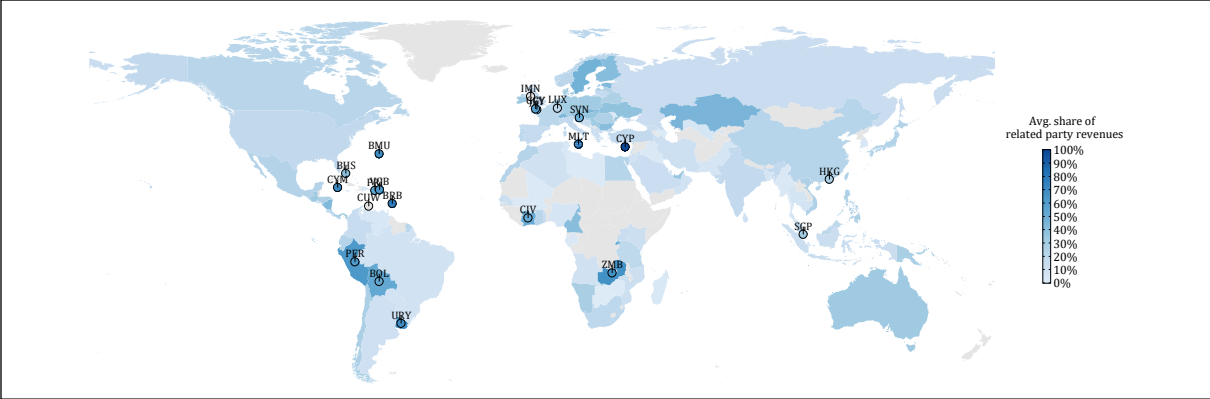
The revenue accumulations of Swiss MNE affiliates thereby exhibit a positive log-relationship with the counterparties' GDP, consistent with the intuition that Swiss MNE affiliates generate greater revenues in larger foreign markets (Cadestin, 2018b, p. 8; Dunning, 1980) (see Figure A1 in Appendix A). By contrast, GDP per capita, distance, and the average WGI exhibit limited explanatory power⁷⁴ for Total Revenues in the I-O case for Swiss MNE affiliates, aligning with the inconclusive, country-agnostic findings of financial geographers Haberly & Wójcik (2015) regarding counterparty GDP per capita and governance indicators in an FDI context (see Figures A2, A3, and A4 in Appendix A). Additionally, contiguous countries to Switzerland, namely Germany, Austria, France, Italy, and Luxembourg, are among the jurisdictions with the highest overall reported values of Total Revenues, indicating the significance of contiguity to neighbouring countries for Swiss MNEs. These characteristics are also utilised in Chapter 4.2.2 for O-I economic activity extrapolations.

As a variant of displaying Total Revenues, Figure 8 displays the ratio of Related-Party Revenues to Total Revenues by counterparty jurisdiction. By showing high or low ratios, the plot indicates whether potentially tax-motivated intragroup⁷⁵ or demand-driven economic activity with third parties constitutes the turnover of Swiss-headquartered MNEs in respective counterparty jurisdictions (ESTV, 2024, p. 13; OECD, 2017, p. 37).

⁷⁴ As indicated by R^2 values close to 0 (see Figures A2 – A4 in Appendix A).

⁷⁵ The OECD explicitly highlights that high ratios of Related Party Revenues are not necessarily a signal for BEPS activity; however, the likelihood of intragroup transactions not following the arm's length principle, such as excessive interest paid on intragroup debt, rises with the ratio increasing (OECD, 2017, p. 37).

Figure 8: Shares of Related Party- to Total Revenues of Swiss MNE affiliates by counterparty jurisdiction



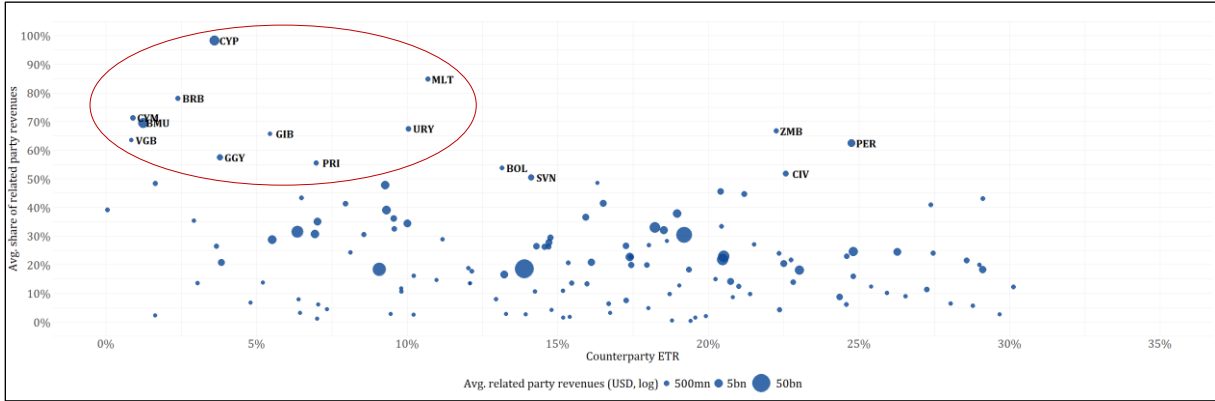
Note. Own depiction. Counterparty jurisdictions exhibiting a ratio of Related Party- to Total Revenues of >50% are explicitly highlighted in the figure. The numerical ratios can be found in Table A7 in Appendix A. Click [here](#) to view and download the enlarged graphic.

The light blue areas indicate that Swiss firms generate revenue by selling a product or service to a third party, thereby generating value added in respective jurisdictions. This is the case for most developed economies, including Switzerland’s most relevant trading partners, where a high proportion of the Total Revenues shown in Figure 7 result from transactions with third parties. In the USA, 83.4%, or \$255.0 billion of revenues, resulted from third-party transactions. By contrast, Swiss affiliates in Germany exhibited a slightly lower average share than in most other major trading partners, standing at 69.7%, or \$86.4 billion of Unrelated Party Revenues. The UK also ranked 81.6%, followed by France (78.2%) and China (77.1%). Conversely, it is easy to observe that the share of Related Party Revenues is particularly high in (offshore) tax havens, notably Cyprus (98.3%), Malta (84.8%), Barbados (78.1%), the Cayman Islands (71.4%) and the Bermuda Islands (69.5%)⁷⁶. This suggests that Swiss MNEs potentially employ intragroup transactions for tax-saving purposes in these jurisdictions (OECD, 2017, pp. 37, 59).

Nevertheless, one cannot observe an apparent relationship when plotting the share of Related Party- to Total Revenues of Swiss MNE affiliates against the respective counterparty ETR for most of the ETR range (see Figure 9). However, the tax havens in question, which in this thesis and the existing (CbCR) profit shifting literature (Garcia Bernardo & Janský, 2024; Boukal, 2024; Fuest et al., 2022; Tørsløv et al., 2022) have been found to have among the lowest ETR of jurisdictions reported in the CbCR data, cluster at the upper left corner of Figure 9 (see the red marking), highlighting that intragroup transactions play a crucial role in these low-tax jurisdictions.

⁷⁶ Comparing to an unweighted country average share of Related Party- to Total Revenues for Swiss foreign affiliates of 26.6%. Weighted by Total Revenues in the respective jurisdiction, the average is slightly higher at 28.3%.

Figure 9: Related Party- to Total Revenues of Swiss MNE affiliates by counterparty ETR



Note. Own depiction. The ISO-3166 codes of counterparty jurisdictions where the share of Related Party Revenues exceeds 50% are explicitly highlighted. The numerical values can be found in Table A7 in Appendix A. Click [here](#) to view and download the enlarged graphic.

Meanwhile, the absolute level of Related Party Revenues in these low-ETR jurisdictions (as indicated by the bubble diameters in Figure 9) suggests a moderate level of potential profit shifting by Swiss MNEs in offshore tax havens via intragroup transactions. Considering Related Party Revenues allocated to jurisdictions with an ETR of 5% or lower, however, Switzerland ranks second by absolute amount (after the USA) among all CbCR reporting jurisdictions, with approximately \$50 billion of Related Party Revenues allocated to respective low tax counterparty jurisdictions⁷⁷.

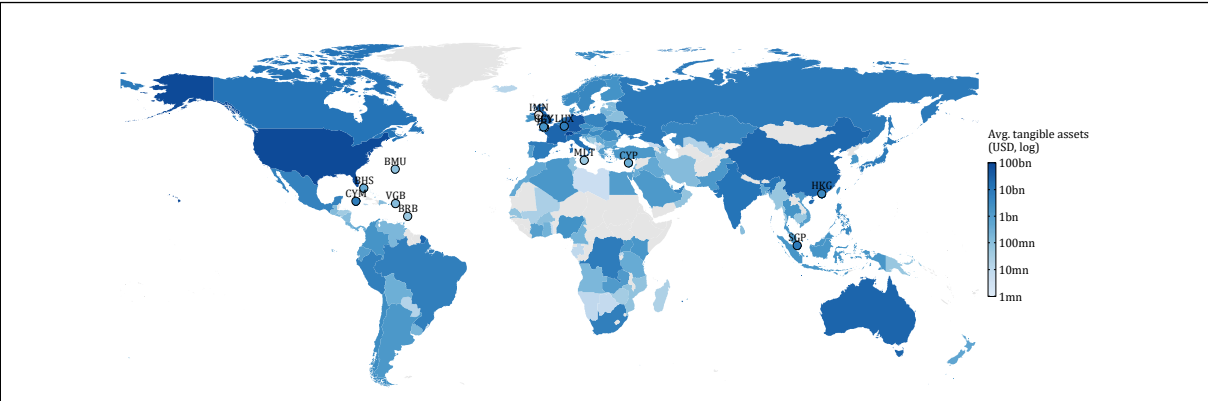
Considering Tangible Assets and Employees, Figures 10 and 11 provide insight into the levels and dispersion of both variables. One can observe that Swiss affiliates’ Tangible Assets⁷⁸ and human capital deployment follow the trend of Swiss trade statistics, accumulating in North America, Central Europe, and China in particular. Starting with Tangible Assets, of the total average of \$467.8 billion of foreign Tangible Assets recorded from 2018 – 2021, the USA, at \$78.3 billion, precedes Germany (\$42.9 billion), the UK (\$24.7 billion), Australia (\$24.3 billion) and France (\$23.0 billion). The USA also employed the highest average number of workers of Swiss MNEs abroad, averaging 318,659 FTE. The US is followed by Germany (179,149), China (171,710) and India (106,674), likely reflecting the workforce in the manufacturing sectors abroad. Note that both variables are also plotted on a log scale, with darker shades reflecting multiple magnitudes of lighter shades. For example, Swiss MNEs reported \$12.3 billion of Tangible Assets in Canada, approximately one-sixth of recorded assets in the USA, despite both blue shades being in the darker spectrum. Consistent with the patterns observed for Total Revenues, the levels of Tangible Assets and Employees also correlate strongly with GDP values, while being only mildly associated

⁷⁷ This conclusion must be drawn considering the dramatically varying reporting granularity in the OECD CbCR panel, particularly in low-tax countries. This is further discussed in Section 4.1.3.

⁷⁸ Tangible Assets (*Tangible assets other than cash and cash equivalents*) do not capture financial assets, cash and cash equivalents, and, naturally, intangible assets (OECD, 2015a, p. 34).

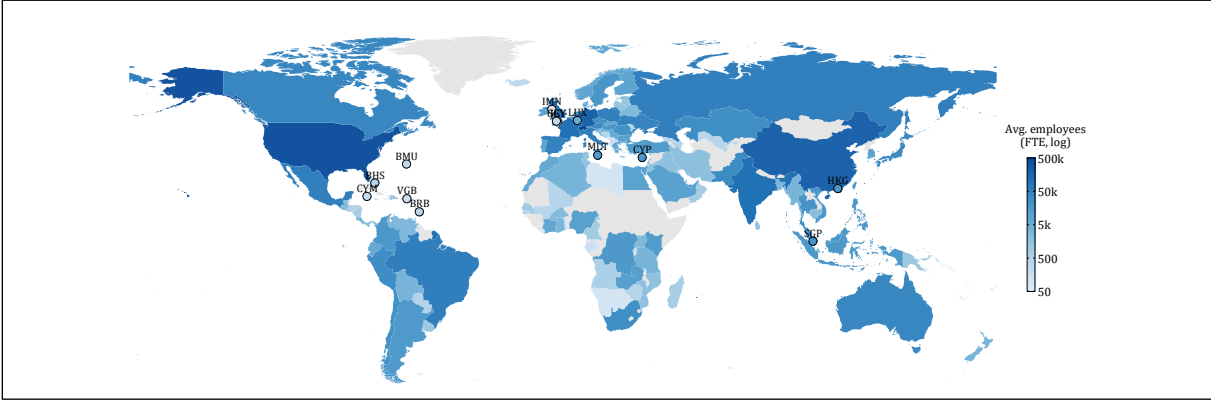
with GDP per capita, distance, and governance (average WGI) indicators of the counterparty jurisdictions (see Figures A1 – A4 in Appendix A).

Figure 10: Tangible Assets of Swiss MNE affiliates by counterparty jurisdiction



Note. Own depiction. The numerical values can be found in Table A5 in Appendix A. Click [here](#) to view and download the enlarged graphic.

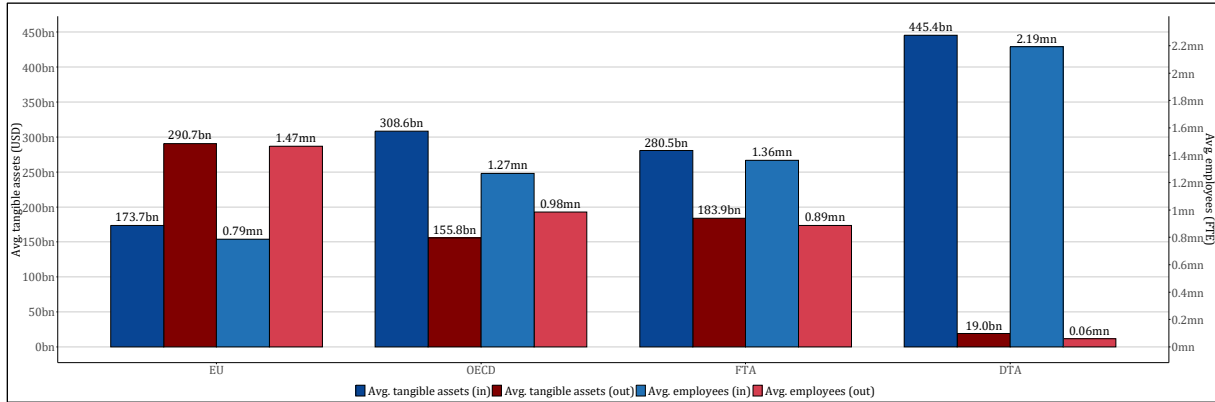
Figure 11: Employees (FTE) of Swiss MNE affiliates by counterparty jurisdiction



Note. Own depiction. The numerical values can be found in Table A6 in Appendix A. Click [here](#) to view and download the enlarged graphic.

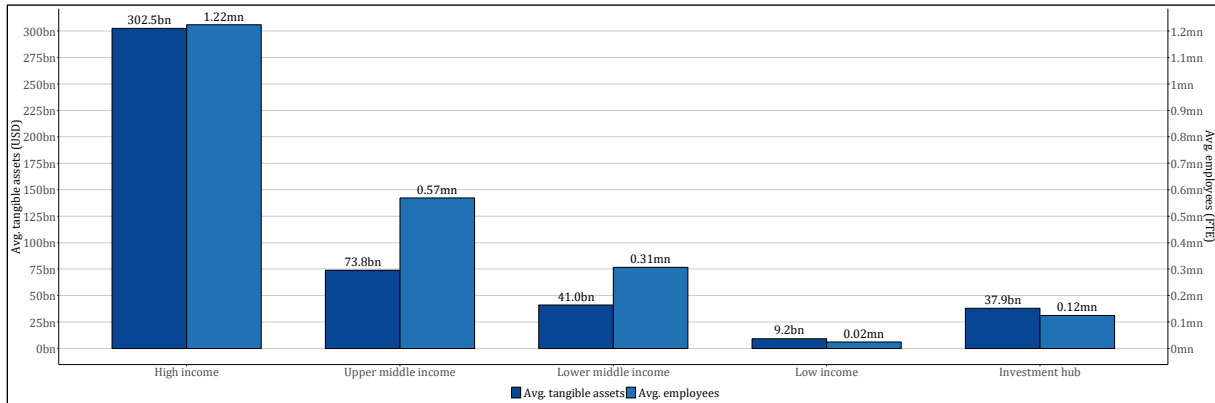
Following the analytical framework, Figures 12 and 13 aggregate both economic activity indicator variables by whether the counterparty jurisdictions are covered by EU, OECD, FTA, or DTA agreements, which approximately mirror the dispersion of sub-groups. In contrast to foreign sub-groups of Swiss MNEs, however, most Tangible Assets and Employees are located within OECD member states. Additionally, the Swiss DTA network encompasses an even larger share of Tangible Assets and Employees than in the case of sub-groups. Meanwhile, the aggregation of Assets and Employees by income group, as shown in Figure 13, is almost identical to that of the subgroups.

Figure 12: Tangible Assets and Employees (FTE) of Swiss MNE affiliates grouped by selected international agreements



Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

Figure 13: Tangible Assets and Employees (FTE) of Swiss MNE affiliates by income group



Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

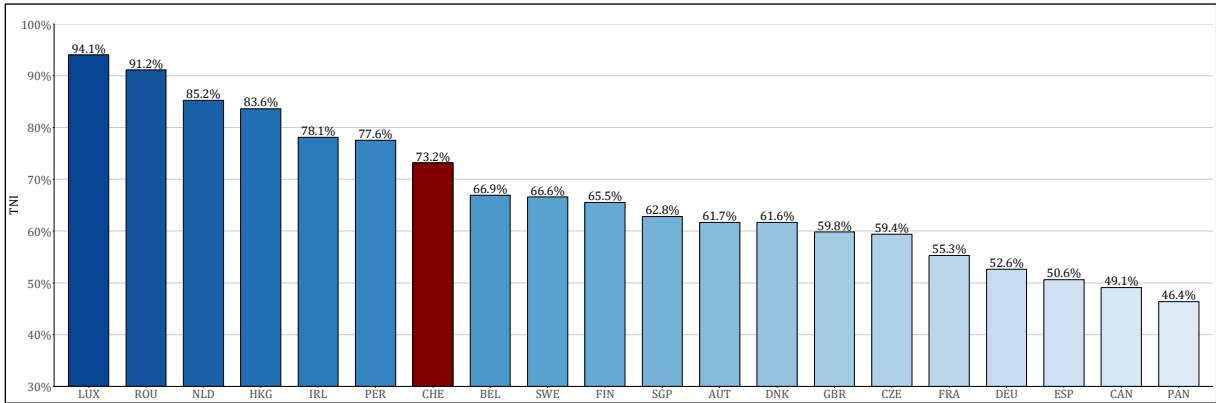
Lastly, the so-called Transnationality Index (TNI) by the UNCTAD (Puhr et al., 2023, p. 133; UNCTAD, 2024, p. 36) allows for compounding the foreign sales figures (i.e., *WXD* Unrelated party revenues), foreign assets (i.e., *WXD* Tangible Assets⁷⁹), and foreign Employees (i.e., *WXD* Employees) into a concise measure of relative transnationality, a proxy measure used for determining the integration into GVCs. Originally designed to quantify and rank MNEs' levels of operations outside their domestic market, the TNI is applied in this thesis on a macro level, i.e., country-by-country, to identify Switzerland's relative level of international economic activity. The TNI of (country) *i* is computed by:

$$TNI_i = \left\{ \frac{Sales_{foreign,i}}{Sales_{total,i}} + \frac{Assets_{foreign,i}}{Assets_{total,i}} + \frac{Employees_{foreign,i}}{Employees_{total,i}} \right\} \div 3 \quad 1)$$

⁷⁹ Note that Tangible Assets are used (as opposed to Total Assets) because the CbCR template does not capture intangible assets.

Similar to Figure 5, smaller countries can be naturally expected to have a higher TNI than countries with a comparatively larger domestic market, given that they must penetrate foreign markets at a certain threshold to ensure economic growth (Puhr et al., 2023, p. 133). With this in mind, the TNI may serve as a straightforward, integrated indicator for the relevance of foreign economic activity for the respective MNEs. As presented in Figure 14, Switzerland ranks seventh among reporting jurisdictions in the OECD CbCR panel by TNI, with foreign-situated Unrelated Party Revenues, Tangible Assets, and Employees making up an average of 73.2% of the respective total measures (domestic and foreign).

Figure 14: Transnationality Index (TNI) by reporting jurisdiction



Note. Own depiction. The x-axis denotes the 3166-1 alpha-3 code of the reporting jurisdictions. Click [here](#) to view and download the enlarged graphic.

4.1.3 Profits of Swiss MNEs abroad

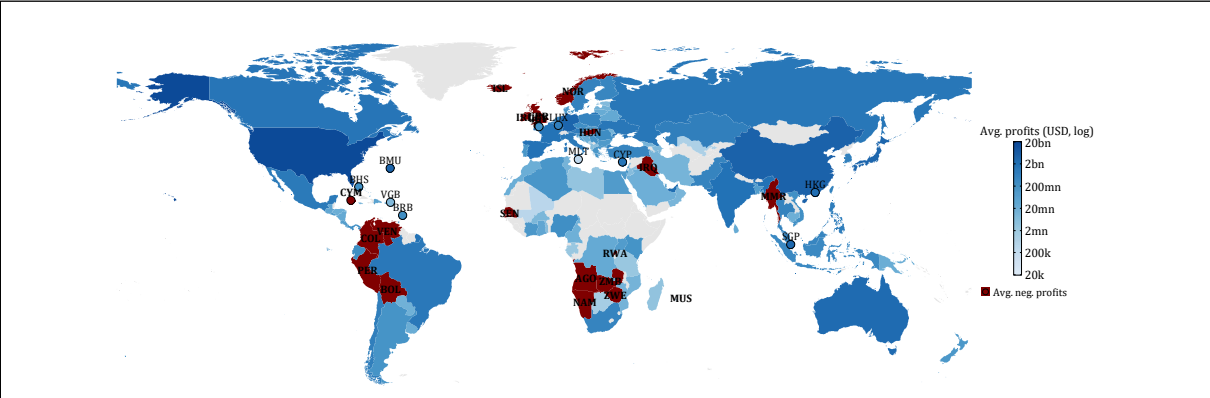
Considering the purpose of highlighting BEPS-related risks to tax authorities (OECD, 2015, p. 42), the Profit (*Profit (loss) before income tax*) variable is among the key indicators in the OECD CbCR panel. While multiple factors have been discussed to play a role in the dispersion of affiliates, often proxied by FDI (Borga et al., 2020; Mistura et al., 2019; Nielsen et al., 2016), and economic activity of MNEs, a significant fraction of the existing empirical CbCR literature focuses on the dispersion of MNE profits and their accumulation in tax havens, driven by the (effective) tax rate. While this thesis is not exclusively focused on profit shifting activities of Swiss MNEs, this chapter focuses on the allocation of profits by Swiss MNEs, whether a pattern to the ETRs of respective counterparties can be observed, and, if so, how Swiss MNEs behave in their foreign profit allocation in comparison to other Reporting Jurisdictions in the CbCR panel.

This is particularly interesting, given that Switzerland is considered a tax haven itself (Tørsløv et al., 2022, p. 1506; Hines & Rice, 1994), while being a highly export-oriented industrial nation that is deeply integrated within GVCs, as evidenced by the dispersion of Swiss affiliates and economic

activity in the previous chapters. Meanwhile, the I-O profit aggregations by selected international agreements and by income groups are presented in Figures A5 and A6 in Appendix A, respectively, considering the scope of this thesis.

Figure 15 illustrates the global dispersion of the profits recorded by Swiss MNE affiliates, presented on a log scale. As seen in Chapter 4.1.1, the OECD CbCR allows for differentiation between profit- and loss-making sub-groups, which collectively constitute the total sub-groups. For aggregation purposes, Figure 15 considers total sub-groups, and it can be observed that, on average, Swiss MNEs recorded losses in some counterparty jurisdictions, i.e., the losses of loss-making sub-groups exceeded profits recorded during 2018 – 2021, with the loss-making jurisdictions clustering in South America, Southern Africa, and certain North European states.

Figure 15: Profits of Swiss MNE affiliates by counterparty jurisdiction



Note. Own depiction. The numerical values can be found in Table A8 in Appendix A. Swiss domestic profits are ignored, as outlined in Chapter 3.1.3. Click [here](#) to view and download the enlarged graphic.

For example, Swiss MNEs recorded positive profits in the UK before 2020, but incurred losses in 2020 and 2021, which exceeded their previous positive profits, likely due to the impact of Brexit in 2020. At -\$3.65 billion, Swiss affiliates in the UK recorded the highest average loss in absolute terms, followed by Zambia (-\$895 million), an extremely high figure given the total recorded average Total Revenues of \$613 million by Swiss MNE affiliates. Interestingly, the Cayman Islands (-\$786 million), Guernsey (-\$736 million), and Ireland (-\$511 million), each being discussed as tax havens, recorded negative profits for all sub-groups considered from 2018 – 2021. Whereas earlier vintages showed positive profits in respective tax havens, they were outweighed by the losses recorded in later years, especially in 2020 and 2021, similar to the UK⁸⁰. Note that each of these counterparty jurisdictions still hosted Swiss MNE sub-groups reporting positive profits.

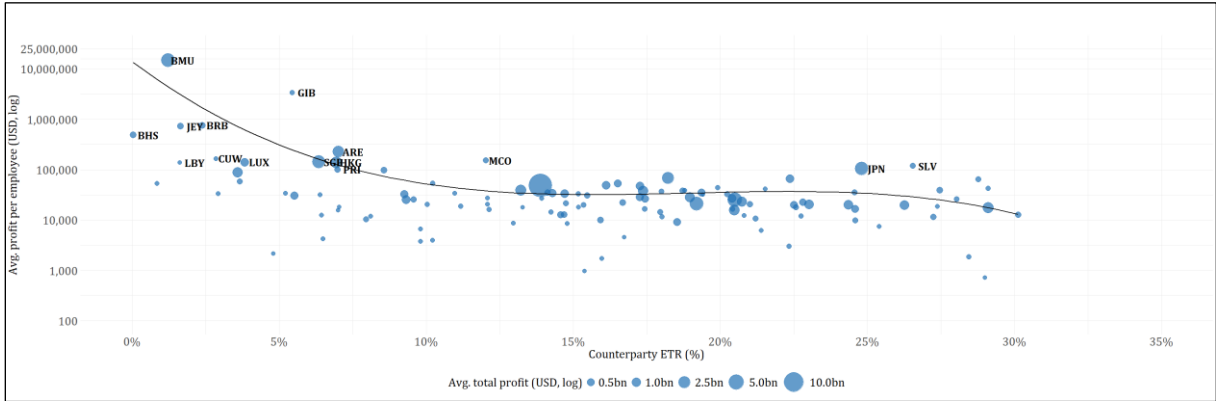
The blue-highlighted jurisdictions, or average positive profit-exhibiting counterparty jurisdictions, continue to focus on the most relevant trading partners, namely the USA (\$15.56

⁸⁰ Note that the Cayman Islands (British Overseas Territory) and Guernsey (Crown Dependency) may also have been indirectly affected by Brexit due to their constitutional ties with the UK.

billion), China (\$4.37 billion), Germany (\$3.76 billion), and Japan (\$3.46 billion). An outlier in terms of recorded positive profits relative to market size (GDP/GNI) is Bermuda, where Swiss affiliates recorded \$3.90 billion in profits, Switzerland's third-largest average profit hub, after the USA and China.

With the high absolute recorded profits in Bermuda serving as a first indicator for Swiss MNEs to allocate profits into (offshore) tax havens, it is common among the profit shifting literature to set profits in relation to an economic unit, where employee headcount, i.e., FTE, is a common measure (Tørsløv et al., 2022, p. 1517; Boukal, 2024, p. 11; Garcia-Bernardo & Janský, 2024, p. 4). Comparatively higher ratios⁸¹ of profitability per employee imply a misalignment of profits and economic activity, i.e., shifted profits. With the counterparty ETR being discussed as a major driver of foreign profits⁸², Figure 16 plots the profitability per employee against the ETR observed for all explicit counterparty jurisdictions recorded in the Swiss CbCR sub-panel. The ISO-3 codes of jurisdictions with a profitability per employee of \$100,000 or more are explicitly highlighted.

Figure 16: Profitability of Swiss MNE affiliates by counterparty jurisdiction's ETR



Note. Own depiction. The regression line represents a third-degree (n = 3) profit-weighted polynomial fit between counterparty ETR and the average profitability of Swiss MNEs. Click [here](#) to view and download the enlarged graphic.

One can observe that the profitability of Swiss foreign affiliates increases in a non-linear fashion (note the log scale of the y-axis) in jurisdictions below the 7.5% ETR mark, which aligns with Boukal's (2024) and Garcia-Bernardo & Janský's (2024) country-agnostic findings using a similar OECD CbCR macro dataset. Swiss firms thus follow the non-linear pattern of allocating substantially greater profits to respective low-ETR jurisdictions than what economic activity might suggest. Aside from the absolute profits recorded, indicated by the bubble diameter, Bermuda also stands out as an outlier in terms of profitability per employee, with an average of \$14.90 million per Swiss MNE employed FTE. This compares to an unweighted average

⁸¹ This refers to implausibly high ratios, beyond the argumentation of merely having efficient operations in the respective jurisdiction.

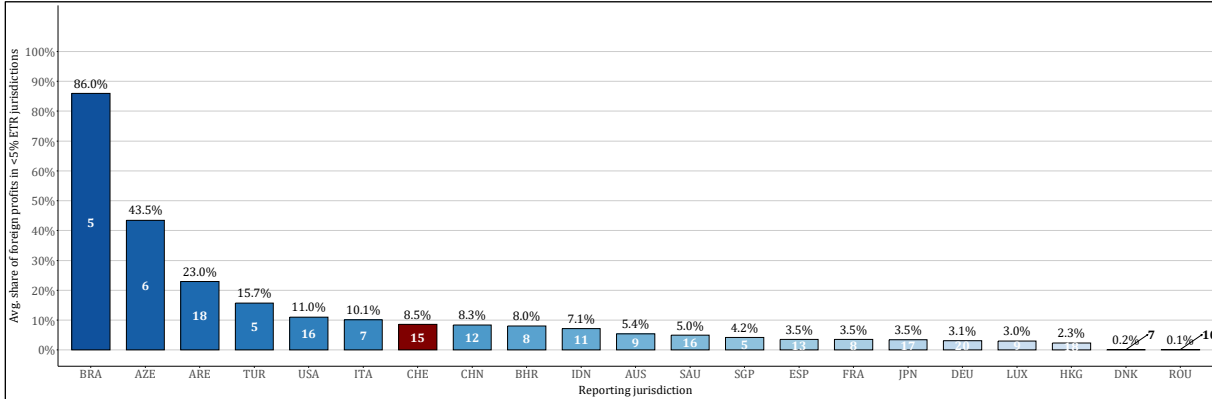
⁸² The most suitable specification of the ETR and its relation to profit shifting is subject to debate. See also Boukal (2024, p. 3) and Garcia-Bernardo & Janský (2024).

profitability per foreign FTE of \$204,500 and a profit-weighted average of \$858,400 (significantly driven by Bermuda) across all counterparty jurisdictions considered.

The high profitability in low-ETR (offshore) jurisdictions raises the question of how Swiss MNE affiliates compare to those of other reporting jurisdictions regarding profits allocated to respective low-tax jurisdictions. Figure 17 illustrates this comparison. It plots the share of all foreign profits allocated to jurisdictions with an ETR of 5% or lower as a percentage of the total foreign profits recorded in *WXD*. Domestic profits are excluded from the analysis, as discussed in Chapter 3.1.3.

To ensure representativeness, while facing the issue of differing reporting granularities among jurisdictions in the OECD CbCR panel, the criteria for reporting jurisdictions displayed in Figure 17 are that they must report in at least five explicit $\leq 5\%$ ETR jurisdictions and at least one (offshore) tax haven⁸³. The number of explicit $\leq 5\%$ ETR jurisdictions reported by each listed reporting jurisdiction⁸⁴ is presented within each bar.

Figure 17: Shares of foreign profits allocated to tax havens of selected reporting jurisdictions



Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

First, it can be observed that the reporting granularity varies significantly among reporting jurisdictions in terms of explicitly reported tax-haven jurisdictions ($\leq 5\%$ ETR). Hence, the relative assessment must consider the number of explicit jurisdictions reported, with higher numbers indicating greater representativeness of the share. Second, among all foreign profits located in $< 5\%$ ETR jurisdictions, Switzerland ranks 7th at 8.5% of all foreign profits reported in 15 $\leq 5\%$ ETR counterparty jurisdictions, following Brazil (86.0%), Azerbaijan (43.5%), the United Arab Emirates (23.0%), Turkey (15.7%), the USA (11.0%), and Italy (10.1%). By this measure, Switzerland ranks fourth among OECD countries in the CbCR panel, after Turkey, the USA, and Italy.

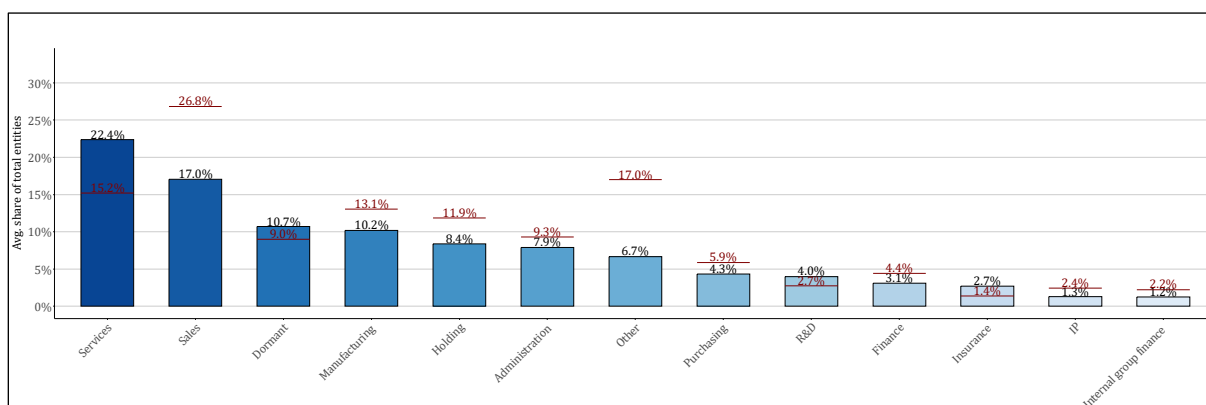
⁸³ These are: BMU, CYM, BHS, IMN, CYP, VGB, GGY or JEY.
⁸⁴ BMU and CYM have been excluded as reporting jurisdictions.

4.1.4 Business activities of Swiss MNEs abroad

Lastly, the OECD CbCR panel provides insight into the business activities of MNEs, distinguishing between thirteen different categories⁸⁵ assigned to individual legal entities. Note that each constituent entity must be assigned to *at least* one of the business activity categories when filing the CbCR template, i.e., an entity can also be categorised into multiple activities (OECD, 2015, p. 35). For the analysis of business activity data, this thesis follows a methodology similar to that presented in Delpuch et al. (2025, pp. 14–18). Moreover, due to systematic and implausible outliers in the Swiss business activity sub-panel for the 2018 vintage, this chapter’s analysis is conducted using the 2019 – 2021 OECD CbCR vintages only.

Figure 18 presents the relative share of Swiss foreign affiliates assigned to each business activity as a percentage of the total foreign (*WXD*) entities. As a reference point, the red markers indicate the average global share of each business activity across all reporting jurisdictions during the same period, yielding similar results to those of Delpuch et al. (2025, p. 15)⁸⁶.

Figure 18: Business activities of Swiss MNE affiliates abroad



Note. Own depiction. The red bars refer to the average global share of respective business activity across all reporting jurisdictions. Click [here](#) to view and download the enlarged graphic.

First, it can be observed that Switzerland assigns each entity according to only one business function, given that the shares across each business function add up to approximately 100%, making the interpretation relatively straightforward⁸⁷. Services (*Provision of services to unrelated parties*) constituted the highest share of foreign affiliates, at 4,848 legal entities or 22.4% of the total average foreign (*WXD*) entity count of 21,670⁸⁸. At 7.2 % percentage points above the global

⁸⁵ The classifications can be found in Figure D2 in Appendix D.

⁸⁶ In contrast to Delpuch et al. (2025), this thesis does not impute non-existent country-year pairs with the value 0, as it was found that this would distort the Swiss sub-panel. Moreover, *total sub-groups* only are considered for coherence.

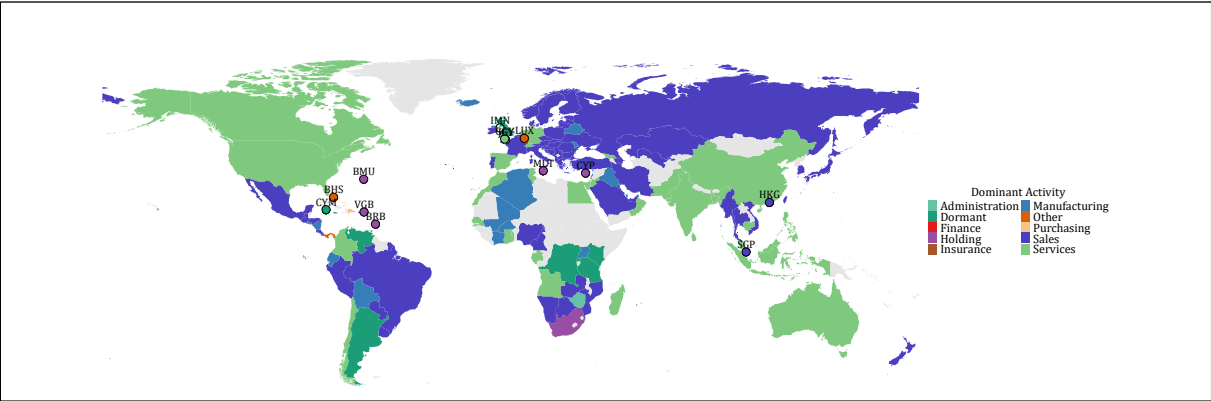
⁸⁷ The global average (red) shares across all reporting jurisdictions add up to approximately 121%, indicating that other jurisdictions categorise some affiliates into multiple business activities.

⁸⁸ Note that the deviation from the previous entity count results from the different OECD CbCR vintages considered.

average, this underlines Switzerland's strong presence in the services sector. Conversely, the Swiss share of Sales (*Sales, marketing or distribution*) entities is almost 10 percentage points lower than the global average across all reporting jurisdictions. The same counts for IP (*Holding or Managing Intellectual Property*) and R&D (*Research and Development*) associated entities, where the Swiss average is roughly half that of all countries included in the OECD CbCR panel. Apart from the Other (*Other*) category, the shares of Swiss MNE entities in the remaining business functions are in line with the global averages.

While the absolute number of entities likely depends on the nature of the business activity and legal factors of the respective counterparty jurisdiction (Delpeuch et al., 2025, p. 19), Figure 19 illustrates each counterparty jurisdiction according to the dominant business activity, based on the constituent entity count of Swiss MNEs.

Figure 19: Dominant business activities of Swiss MNE affiliates by counterparty jurisdiction



Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

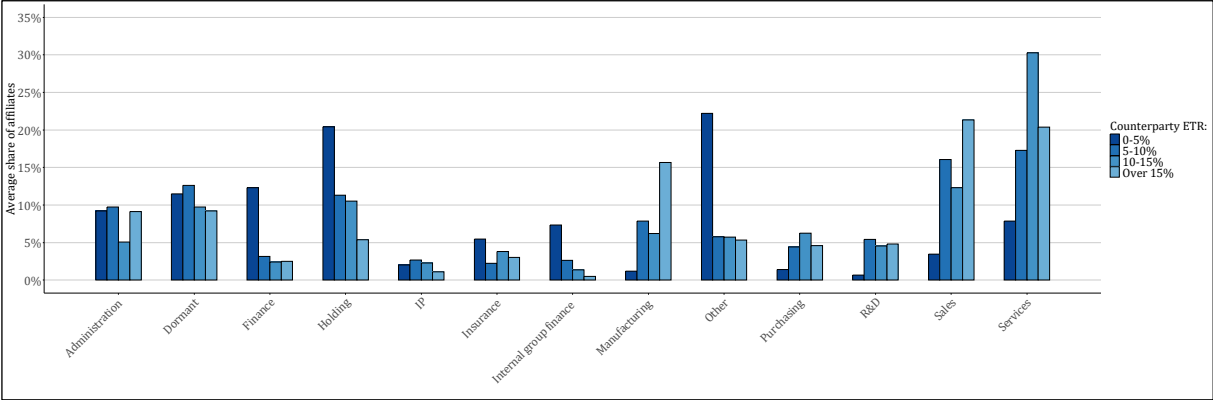
It can be observed that, although not constituting the highest share among Swiss foreign affiliates (see Figure 18), Sales entities exhibit the greatest country presence, being the dominant function in 61 of the 138 counterparty jurisdictions available for the analysis, including jurisdictions in CEE, the Middle East, South America, and Southern Africa. Additionally, Sales entities are the second most prevalent business function in approximately half of the counterparty jurisdictions where Service entities dominate. Meanwhile, Swiss Services affiliates constitute the dominant business activity in 33 counterparty jurisdictions, including North America, Germany, China, India, the Netherlands, Spain, Australia, and Switzerland itself.

Naturally, R&D, IP, and Internal Group Finance (*Internal Group Finance*) activities are not the dominant activities by absolute and relative values in any explicit jurisdiction. Notable jurisdictions where the share of R&D classified Swiss affiliates is particularly high include developed industrial economies, led by Japan (10.1%), Germany (9.8%), Denmark (9.4%),

Switzerland itself (8.8%), and Austria (8.2%)⁸⁹. Meanwhile, IP and Internal Group finance entities are particularly concentrated in prominent tax havens, including Malta, the Cayman Islands, Bermuda, Gibraltar and Ireland.

These results support Delpuech et al.'s (2025) assumption that certain business functions are performed more frequently in jurisdictions with high or low ETRs, respectively. Based on this assumption, Figure 20 illustrates the share of business functions performed by Swiss foreign affiliates, categorised by the counterparty's ETR. For classifying the distribution of business activities against tax rates, this thesis differentiates between four ETR bins: 0 – 5%, 5 – 10%, 10 – 15%, and over 15% ETR counterparty jurisdictions, which are mostly industrialised countries where most Swiss constituent entities are located⁹⁰. Note that the relative shares displayed refer to the share of affiliates within each tax bin that perform the respective function.

Figure 20: Business activities of Swiss MNE affiliates grouped by counterparty jurisdiction's ETR



Note. Own depiction. Shares per ETR bin across all business functions total 100% of affiliates in the respective ETR bin. Click [here](#) to view and download the enlarged graphic.

Figure 20 illustrates that, among affiliates located in the 0 – 5% ETR bin, the shares of Finance (*Regulated financial services*), Internal Group Finance, Holding (*Holding shares or other equity instruments*), and Other related entities are the most prominent, constituting 54.5% cumulatively of all affiliates⁹¹. The shares of respective activities are also significantly higher in the 0 – 5% ETR bin compared to those in the other tax bins. For example, the share of Holding entities among affiliates in the 0 – 5% ETR bin (20.4%) is approximately four times (5.4%) the share of Holding entities in the over 15% ETR bin. Meanwhile, Manufacturing (*Manufacturing or production*), Sales, and Services show an inverse picture, with a large proportion of entities from the higher tax bins

⁸⁹ These shares refer to the average entities categorised as R&D to the total average entity count in the respective jurisdiction.

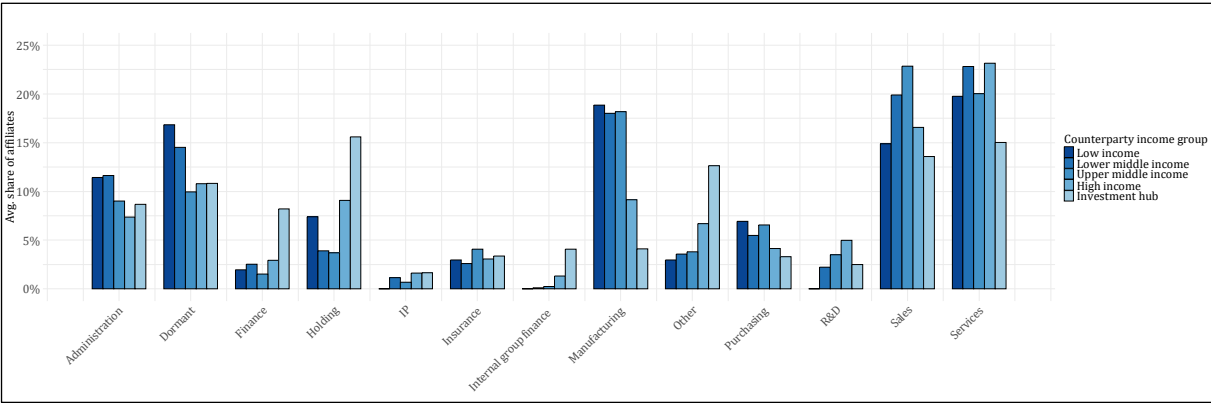
⁹⁰ Almost half (45.6%) of all Swiss foreign entities are located in counterparty jurisdictions assigned to the over 15% ETR bin.

⁹¹ As argued by Damgaard et al. (2019, p. 12), a significant fraction of FDI values observed, especially in offshore tax havens, come in the form of so-called special purpose entities (SPEs), i.e., entities with “few or no employees, little or no production [...] and no other activities than holding and financing”. Figures 20 and 21 confirm their observation for the Swiss I-O sub-panel.

being categorised among these three categories, while such affiliates in the 0 – 5% ETR bin constitute only a relatively small fraction. This indicates that Swiss foreign economic activity occurs mostly in high-tax jurisdictions, confirming the results from Chapter 4.1.1 and 4.1.2. The prevalence of Holding, Manufacturing, Sales, and Services of Swiss entities in corresponding tax bins also aligns with the cross-country findings from Delpuech et al. (2025, pp. 17–18).

As a variant of the categorisation of business activities by ETR bin, Figure 21 presents the business activities of Swiss MNE affiliates grouped by the income group of the counterparty jurisdictions. One can observe the strong relative presence of Holding, Internal Group Finance, Finance, and Other categorised entities in investment hub counterparty jurisdictions, implicitly highlighting the overlap between investment hubs and low-tax jurisdictions. Figure 21 also clearly highlights the manufacturing footprint of Swiss MNEs, which is situated primarily among low- to upper-middle-income economies, i.e., emerging economies. Along with Sales and Services entities, which are relatively widespread across all income groups, Manufacturing entities thereby account for the majority of foreign entities of Swiss MNEs in these jurisdictions. Together, Figures 20 and 21 indicate a functional differentiation across jurisdictions: market-driven activities, such as Sales and Services, are primarily located in higher-tax, high-income economies, whereas coordination, financial, and holding-related functions are concentrated in investment hubs and other low ETR jurisdictions.

Figure 21: Business activities of Swiss MNE affiliates by income group



Note. Own depiction. Shares per income group across all business functions total 100% of affiliates in the respective income group. Click [here](#) to view and download the enlarged graphic.

4.2 Outside-In (O-I) analysis of foreign MNE activity in Switzerland

By nature of the OECD CbCR panel, the Outside-In (O-I) perspective for Switzerland is significantly more restricted regarding data availability than vice versa. Of the total of 56 reporting jurisdictions for the 2018 – 2021 CbCR panel, which would have been the theoretical maximum of reporting jurisdictions, only 33 report their MNEs' CbCR variables explicitly in Switzerland (including Switzerland itself). Thus, any of the following analyses must be made under consideration of the omitted reporting jurisdictions, which might alter the results in the case of explicit reporting in Switzerland. For the same reason, the methodologies employed to analyse each O-I CbCR dimension also differ from those in the I-O analysis⁹².

As an overview of CbCR reporting in Switzerland, Table 2 presents the reporting jurisdictions that explicitly report from an O-I perspective (i.e., for Switzerland as their counterparty), the reporting years for Switzerland as their counterparty, and whether all variables of the CbCR template are reported.

Table 2: Reporting jurisdictions reporting OECD CbCR data in Switzerland

	Rep. Jur.	Reporting Years in CHE	a.v ⁹³		Rep. Jur.	Reporting Years in CHE	a.v
1	ARE	2021	Yes	18	IND	(2017), 2018, 2019, 2020, 2021	Yes
2	AUS	(2017), 2018, 2019, 2020, 2021	Yes	19	ITA	(2017), 2018, 2019, 2020, 2021	Yes
3	AZE	2021	No	20	JPN	(2017), 2018, 2019, 2020, 2021	No
4	BEL	2019, 2020, 2021	Yes	21	LUX	(2017), 2018, 2019, 2020, 2021	Yes
5	BHR	2021	No	22	MEX	(2017), 2018, 2019, 2020, 2021	Yes
6	BMU	(2017), 2018, 2019, 2020, 2021	No	23	NLD	2018, 2019, 2021	Yes
7	BRA	(2017), 2018, 2019, 2020, 2021	Yes	24	NOR	2018, 2019, 2020, 2021	Yes
8	CHE	(2017), 2018, 2019, 2020, 2021	Yes	25	PAN	2019, 2020, 2021	No
9	CHN	(2017), 2018, 2019, 2020, 2021	No	26	PER	2018	No
10	CYM	2018, 2019, 2020, 2021	Yes	27	PRT	2019, 2020, 2021	Yes
11	DEU	(2017), 2018, 2019, 2020, 2021	Yes	28	ROU	2018, 2019, 2020, 2021	No
12	DNK	(2017), 2018, 2019, 2020, 2021	No	29	SAU	2018, 2019, 2020, 2021	Yes
13	ESP	(2017), 2018, 2019, 2020, 2021	No	30	SGP	(2017), 2018, 2019, 2020, 2021	Yes
14	FRA	(2017), 2018, 2019, 2020, 2021	Yes	31	TUR	2019, 2020, 2021	Yes
15	GRC	2019, 2020, 2021	No	32	USA	(2017), 2018, 2019, 2020, 2021	No
16	HKG	2018, 2019, 2020, 2021	Yes	33	ZAF	(2017), 2018, 2020, 2021	Yes
17	IDN	2019, 2020, 2021	No				

Note. Own depiction.

Despite the restricted data availability, two aspects should be considered beforehand: First, major trading partners, like the USA, Germany, or Japan, explicitly report in Switzerland, given that they publish comparatively disaggregated sub-panels within the OECD CbCR panel. Hence, although the

⁹² For example, aggregations based on EU- and OECD membership, DTA and FTA partners, and income groups are ignored due to the unknown magnitude of the omitted countries.

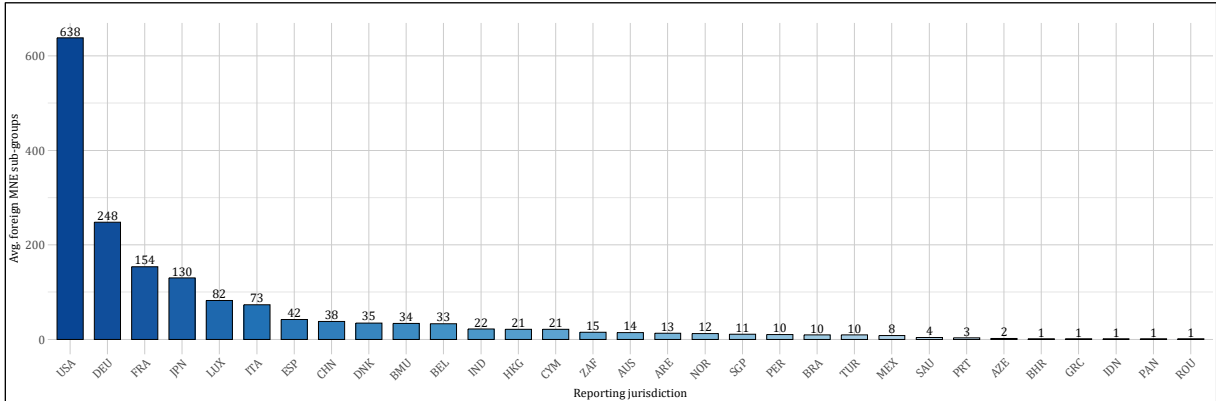
⁹³ a.v. = all variables of the OECD CbCR template.

O-I perspective lacks the previous chapters' country coverage and granularity, it can be reasonably assumed that, nevertheless, a substantial share of the overall CbCR values is reported in Switzerland by the developed countries and its major trading partners. Second, the OECD (2020) developed an extrapolation model based on gravity indicators to estimate missing values of (CbCR) data in the Economic Impact Assessment of the Pillar 1 and Pillar 2 proposals. This thesis introduces a modified version of the model to extrapolate missing economic activity, specifically Total Revenues, Tangible Assets, and Employee (FTE) counts, in order to estimate missing CbCR values in Switzerland, as discussed in Chapter 4.2.2. While these estimates are not a substitute for actual “hard” data, they mitigate for some constraints in data availability, particularly for the Total Revenues variable, for which estimates can be made for jurisdictions beyond the theoretical maximum of 57 reporting jurisdictions. Furthermore, the model highlights another use case for OECD CbCR data.

4.2.1 Presence of foreign MNE sub-groups in Switzerland

Commencing with an overview of the global dispersion of MNEs with UPE in foreign reporting jurisdictions, which hold sub-groups in Switzerland (referred to as foreign MNEs), Figure 22 presents the number of Switzerland-based sub-groups per UPE jurisdiction. Of the total 1,790 average foreign sub-groups recorded in Switzerland, US-based firms constitute the highest number of MNEs with at least one entity located in Switzerland, at 638 sub-groups, followed by Germany (248), France (154), Japan (130), Luxembourg (82), and Italy (73).

Figure 22: Foreign MNE sub-groups in Switzerland by reporting jurisdiction

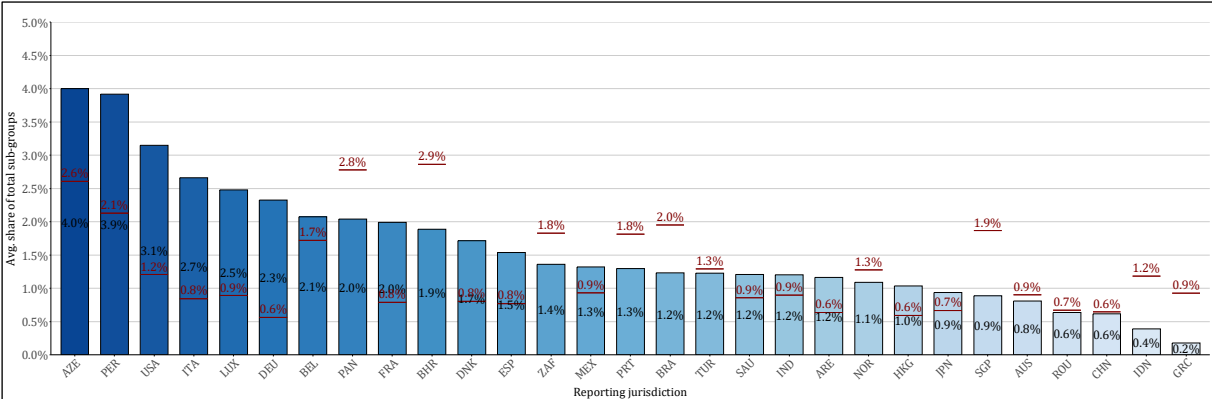


Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

Note that countries contiguous to Switzerland (France, Italy, Luxembourg, and Germany⁹⁴) report among the highest absolute numbers of subgroups, indicating that contiguity is also relevant for reporting jurisdictions in Switzerland, as in the I-O perspective.

Naturally, reporting jurisdictions with larger overall economic output tend to report more subgroups (more generally, higher values of all respective CbCR variables) in the counterparty jurisdictions considered. To adjust for differences in economic output of the reporting jurisdictions, the blue bars in Figure 23 relate the number of subgroups located in Switzerland to the reporting jurisdiction’s total (domestic & foreign) subgroups⁹⁵. To compare these shares to the “norm” of the respective reporting jurisdiction, the red marks indicate the average share of subgroups per counterparty jurisdiction of the reporter.

Figure 23: Shares of MNE sub-groups in Switzerland to total MNE sub-groups by reporting jurisdiction



Note. Own depiction. The blue bars and black highlighted percentages refer to shares in Switzerland. The red markers refer to the average share of foreign-located sub-groups per counterparty jurisdiction. Click [here](#) to view and download the enlarged graphic.

While subgroups located in Switzerland generally constitute a relatively small share of the total subgroups of respective reporting jurisdictions, the role of Switzerland regarding relative subgroup allocation presents a different picture than that shown in Figure 22. From a relative perspective, Azerbaijanian (4.0%) and Peruvian (3.9%)⁹⁶ MNEs report the highest shares of subgroups in Switzerland, followed by the USA (3.1%), Italy (2.7%), and Luxembourg (2.5%). Compared to the corresponding shares of Swiss (foreign) MNE subgroups abroad in the I-O perspective, the shares of Switzerland-located subgroups of foreign MNEs headquartered in key

⁹⁴ Austria does not explicitly report CbCR data in Switzerland.
⁹⁵ As discussed in Chapter 4.1.2, countries with a smaller domestic market tend to generate a higher share of their GNI from foreign subgroups. Considering all (domestic and foreign) subgroups thus eliminates the bias of countries having naturally a higher proportion of foreign (W/XD) subgroups.
⁹⁶ Note that, despite having the highest relative share of Switzerland-based subgroups, the absolute counts (2 subgroups for AZE and 10 subgroups for PER) are significantly below those of the other reporting jurisdictions and might potentially be subject to measurement error.

reporting jurisdictions, i.e., German, French, Italian, Spanish, the USA, Japanese, and Chinese MNEs, are approximately reciprocal (see Chapter 4.1.1, Figure 6).

4.2.2 (Extrapolated) economic activity of foreign MNEs in Switzerland

Aside from displaying the numerical “hard” OECD CbCR data for Total Revenues, Tangible Assets, and Employee counts from OECD CbCR panel (see also Table A9 of Appendix A), this section introduces, discusses, and presents the results of the model used to extrapolate missing year jurisdiction-pair values, which are subsequently averaged to estimate foreign economic activity indicators in Switzerland. The model should serve as both a further examination of how OECD CbCR data can be utilised beyond the previous analyses and as a means of addressing missing data points in the O-I perspective.

Conceptually, the extrapolation model builds on the Gamma pseudo maximum likelihood (GPML) estimator⁹⁷ (Santos Silva & Tenreyro, 2006) equation used in the Economic Impact Assessment of the Pillar One and Pillar Two proposals by the OECD (2020)⁹⁸, which builds on the propositions from the gravity model of trade (Tinbergen, 1962). For extrapolating non-diagonal (i.e., non-domestic) bilateral values for Total Revenues, Tangible Assets and Payroll (salaries are used instead of FTE counts), the OECD (2020) installed a base model for estimating the Total Revenues of MNEs with UPE in country_{*i*} (reporting jurisdiction) in country_{*j*} (counterparty jurisdiction), which is subsequently multiplied by an adjustment factor to arrive at Tangible Assets and Payroll estimates, respectively.

The baseline specification is constituted by:

$$\text{Total Revenues}_{i,j} = \beta_0 + \beta_1 \log(GDP_i) + \beta_2 \log(GDP_j) + \beta_3 \log(\text{Distance}_{i,j}) + \beta_4 \log(GDPpc_i) + \beta_5 \log(GDPpc_j) + \varepsilon_{i,j} \quad (2)$$

where the log of GDP and GDP per capita of reporting and counterpart jurisdictions and the log of the distance between country_{*i*} and country_{*j*} are used to extrapolate missing bilateral Total Revenues by the OECD (2020, p. 239).

⁹⁷ In accordance with the OECD (2020, p. 280) and Turban et al. (2020, p. 65), a GPML estimator was chosen for the extrapolation model, as it was found to provide the best a priori fit for OECD CbCR data. See the GPML documentation in R [here](#).

⁹⁸ The same equation is also presented in the OECD Taxation Working Paper No. 52 (Turban et al., 2020) and in modified form, in the updated Pillar Two Impact Assessment (Hugger et al., 2024). Haberly and Wójcik (2015, pp. 83–85) also employ a similar baseline specification to estimate bilateral FDI levels.

Intending to install a model specifically targeted at estimating economic activity in Switzerland, this thesis incorporates additional control variables compiled from other CbCR-related profit shifting studies, existing FDI literature, and the findings from Chapter 4. First, with five vintages of CbCR data available to this thesis, the modified equation includes a year-specific index $t \in \{2017, \dots, 2021\}$ for any time-variant regressor, i.e., GDP, GDP per capita, and the average WGI introduced below⁹⁹. The 2017 vintage is considered in the model to increase the number of available data points. By including year dummy variables, any systematic time differences in the Total Revenues, Tangible Assets and Employees (FTE) estimates are captured by the Year Fixed Effects, allowing the estimated β -coefficients on the regressors to reflect only within-year, cross-sectional variation. The term γ_t in Equation (3) denotes this full set of year fixed effect dummies from 2018 – 2021, with the 2017 vintage serving as the omitted baseline.

Following Boukal (2024) and Delpuch et al. (2025)¹⁰⁰, the (non-log specification¹⁰¹) ETR of country_{*i*} and country_{*j*}, is also included to address potential taxation bias in the allocation of economic activity. Moreover, the equation includes the average WGI of country_{*i*} and country_{*j*} jurisdictions, following the hypotheses of Cadestin et al. (2018b), Boukal (2024), and Haberly & Wójcik (2015), which suggest that better-governed jurisdictions attract higher sales (and profits and FDI, respectively)¹⁰². Lastly, contiguity-, EU- and OECD membership dummies for both country_{*i*} and country_{*j*} are included, based on the results from Chapters 4.1 and 4.2.1, which indicated the significance of these dummies for Switzerland in particular¹⁰³. With the additional regressors introduced, the GPML gravity equation used to estimate the Total Revenues of country_{*i*} in country_{*j*} (Switzerland) in year_{*t*} is given by:

$$\begin{aligned} \text{Total Revenues}_{i,j(=CHE),t} = & \beta_0 + \beta_1 \log(GDP_{i,t}) + \beta_2 \log(GDPpc_{i,t}) + \beta_3 WGI_{i,t} + \beta_4 \log(GDP_{j,t}) + \beta_5 \log(GDPpc_{j,t}) + \\ & \beta_6 WGI_{j,t} + \beta_7 \log(\text{Distance}_{i,j}) + \beta_8 ETR_i + \beta_9 ETR_j + \beta_{10} EU_i + \beta_{11} EU_j + \beta_{12} OECD_i + \beta_{13} OECD_j + \beta_{14} \text{contig}_{i,j} + \\ & \gamma_t + \varepsilon_{i,j,t} \quad (3) \end{aligned}$$

⁹⁹ For greater robustness against year-specific outliers, this thesis assumes constant ETRs across years, given the *Income tax accrued's* sensitivity to yearly tax exemptions or tax holidays, distorting average ETR estimates (Hugger et al., 2023, pp. 21, 63). Note that ETRs have been found empirically to decrease over extended periods of time (Dyreg et al., 2017).

¹⁰⁰ Boukal (2024) installed taxation in the context of a gravity equation aimed at explaining profit allocations of MNEs, using the same CbCR panel as this thesis. Delpuch et al. (2025) employed taxation to explain the jurisdictional shares of business activities, utilising the 2017 – 2021 OECD CbCR panel.

¹⁰¹ For model simplicity, this thesis employs a non-log ETR specification, as also suggested by Boukal (2024). Note that a log or squared ETR specification might also be used to better explain non-linear relationships between taxation and bilateral Total Revenues.

¹⁰² Haberly and Wójcik (2015, pp. 86–90) also employed EU- and OECD dummies, as well as taxation control variables.

¹⁰³ Additional regressors and time fixed effects were included, as recommended by Dr Sébastien Turban from the OECD, who co-developed the base model (OECD, 2020; Turban et al., 2020).

Following the methodology of this thesis, the year-specific Total Revenue estimates are subsequently averaged across the vintages considered. Furthermore, results are classified into bins for better interpretability.

To estimate non-recorded Tangible Assets and Employees (FTE) values¹⁰⁴ of country_{*i*} in country_{*j*}=Switzerland, the baseline Total Revenue estimate is multiplied by a country_{*i*}-specific factor that adjusts the respective revenue estimate (OECD, 2020, pp. 240–241). Assuming that the ratios constituting the adjustment factors, which are discussed below and in Appendix C, do not systematically change over the vintages considered, and for model simplicity, year fixed effects are not included in their computation.

Three segments constitute the adjustment factors for Tangible Assets and Employees (FTE) estimates, respectively (OECD, 2020, pp. 240–241; Turban, 2020). The first segment is constituted by the ratio of the global Tangible Assets and Employees (FTE) over the global Total Revenues recorded in the OECD CbCR panel:

$$\text{Global Average Ratio}_a = \frac{\sum_{i=1}^J \sum_{j=1}^J X_{a,i,j}}{\sum_{i=1}^J \sum_{j=1}^J \text{TotalRevenues}_{i,j}} \quad (4)$$

where $\sum_{j=1}^J X_{a,i,j}$ denotes the 2017 – 2021 average value of variable *X* with index *a*, with $a \in \{\text{Tangible Assets, Employees (FTE)}\}$, recorded globally across all counterparty countries_{*j*} by MNEs headquartered in reporting country_{*i*} in the OECD CbCR panel. $\sum_{j=1}^J \text{TotalRevenues}_{i,j}$ represents the Total Revenues recorded globally across all counterparty countries_{*j*}¹⁰⁵ by MNEs headquartered in reporting country_{*i*}. The resulting two constants thus reflect the ratio of global Tangible Assets and Employee (FTE) values to global Total Revenues. These can be found in Appendix C.

Next, the so-called δ_1 factor adjusts the Global Average Ratio_{*a*} by the specific average ratio of Tangible Assets and Employees (FTE) to Total Revenues recorded in country_{*j*} (=Switzerland) by MNEs headquartered in reporting country_{*i*}:

$$\delta_{1,a,j=CHE} = \frac{\sum_{i=1}^J X_{a,i,j=CHE}}{\sum_{i=1}^J \text{TotalRevenues}_{i,j=CHE}} - \text{Global Average Ratio}_a \quad (5)$$

¹⁰⁴ While the OECD (2020) estimated payroll (i.e the total salaries paid in country_{*j*} by MNEs with UPE in country_{*i*}), this thesis estimates FTE-equivalents (Employees) using the same conceptual approach, in line with the variable recorded in the CbCR template.

¹⁰⁵ The $\sum_{j=1}^J X_{a,i,j}$ and $\sum_{j=1}^J \text{TotalRevenues}_{i,j}$ components are operationalised via the *WXD* counterparty jurisdiction variable.

Here, $X_{a,i,j=CHE}$ denotes the 2017 – 2021 average value of variable X with index a , with $a \in \{\text{Tangible Assets, Employees (FTE)}\}$, reported in country $_j$ (=Switzerland) by MNEs headquartered in country $_i$. $TotalRevenues_{i,j=CHE}$ denotes the Total Revenues reported in country $_j$ (=Switzerland) by MNEs headquartered in country $_i$. Thus, the two δ_1 segments are defined as the ratios of Tangible Assets and Employees (FTEs) to Total Revenues of OECD CbCR reporting jurisdictions that publish their MNE activity in Switzerland. The δ_1 estimates for Tangible Assets and Employees (FTE) can also be found in Appendix C.

Lastly, the δ_2 segment adjusts for the reporting country $_i$'s specific global ratio of X_a to Total Revenues across counterparty countries $_j$. δ_2 is given by:

$$\delta_{2,a,i} = \frac{\sum_{j=1}^J X_{a,i,j}}{\sum_{j=1}^J TotalRevenues_{i,j}} - \text{Global Average Ratio}_a \quad (6)$$

Equivalent to the Global Average Ratio $_a$, $\sum_{j=1}^J X_{a,i,j}$ denotes the 2017 – 2021 average value of variable X with index a , with $a \in \{\text{Tangible Assets, Employees (FTE)}\}$, recorded globally across all counterparty countries $_j$ by MNEs headquartered in reporting country $_i$. $\sum_{j=1}^J TotalRevenues_{i,j}$ represents the Total Revenues recorded globally across all counterparty countries $_j$ by MNEs headquartered in reporting country $_i$. Note that the δ_2 segment requires respective CbCR values for each reporting jurisdiction, i.e., country $_i$, limiting the country coverage of the Tangible Assets or Employees (FTE) estimates to the 57 reporting countries included in the CbCR data. While not providing the same coverage as the Total Revenue estimation of the base model, this still compensates for the 24 reporting jurisdictions that publish OECD CbCR data, which do not explicitly report Tangible Assets and Employees (FTEs) in Switzerland. The δ_2 estimates for Tangible Assets and Employees (FTE) can be found in Table C2 in Appendix C.

Following the OECD (2020, pp. 240–241), the adjusted GPML gravity models for estimating the Tangible Assets and Employees (FTE) of MNEs headquartered in country $_i$, in counterparty country $_j=CHE$ in year $_t$, are subsequently given by:

$$\text{Tangible Assets}_{i,j=CHE,t} = \text{Equ. 3) } \times \{ \text{Global Average Ratio}_{a=\text{Tangible Assets}} + \delta_{1,a=\text{Tangible Assets}} + \delta_{2,a=\text{Tangible Assets}} \} \quad (7)$$

for Tangible Assets, and

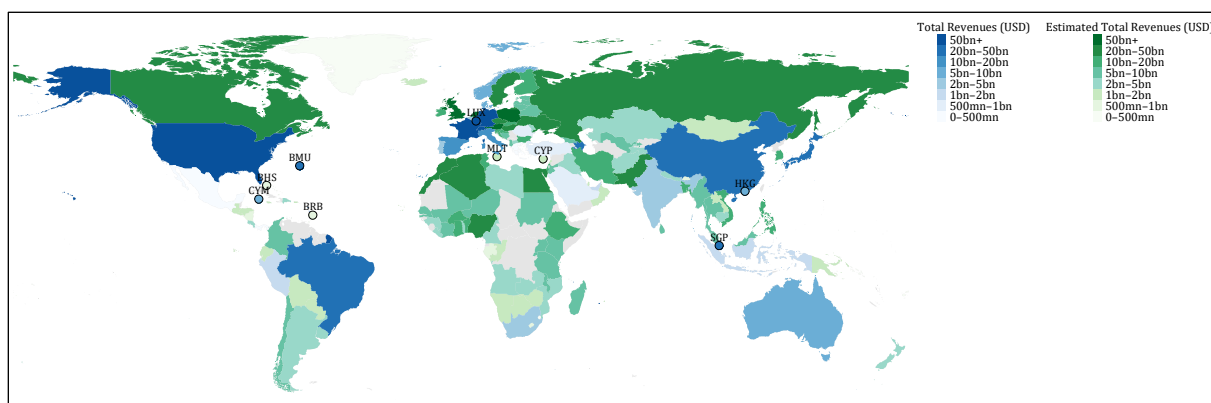
$$\text{Employees}_{i,j=CHE,t} = \text{Equ. 3} \times \{ \text{Global Average Ratio}_{a=\text{Employees}} + \delta_{1,a=\text{Employees}} + \delta_{2,a=\text{Employees}} \} \quad (8)$$

for Employees (FTE).

Due to the cross-sectional heterogeneity of the OECD CbCR panel, five CbCR sub-panels were used to arrive at different β -coefficient estimates for the model. Appendix C presents the initial data cleaning, base sample, and empirical results for the five sub-samples considered, as well as the final model configuration used to extrapolate missing values for Total Revenues, Tangible Assets, and Employees (FTE).

As in the I-O analysis, the results for Total Revenues are assessed separately from Tangible Assets and Employees. For this, Figure 24 presents the dispersion of Total Revenues of foreign MNEs in Switzerland by jurisdiction of UPE. The blue-highlighted countries refer to the 33 reporting jurisdictions that explicitly publish their CbCR data in Switzerland (e.g. Germany, France, and China), as seen in Table 2. For better comparability, the hard data of the blue-highlighted jurisdictions were also grouped into bins. The green-highlighted jurisdictions present the estimated Total Revenues in Switzerland based on the GPML gravity extrapolation model by jurisdiction of UPE. Note that, contrary to Chapter 4.1, the colour shades refer to the magnitude of the respective variable in Switzerland recorded by MNEs with UPE in the highlighted jurisdiction.

Figure 24: (Extrapolated) Total Revenues of MNE affiliates in Switzerland by reporting jurisdiction



Note. Own depiction. The numerical values can be found in Table A9 (for CbCR-recorded Total Revenues) and Table A10 (for model-based Total Revenues estimates) in Appendix A. Where both CbCR “hard” data and extrapolated values are available, CbCR “hard” data is displayed. Click [here](#) to view and download the enlarged graphic.

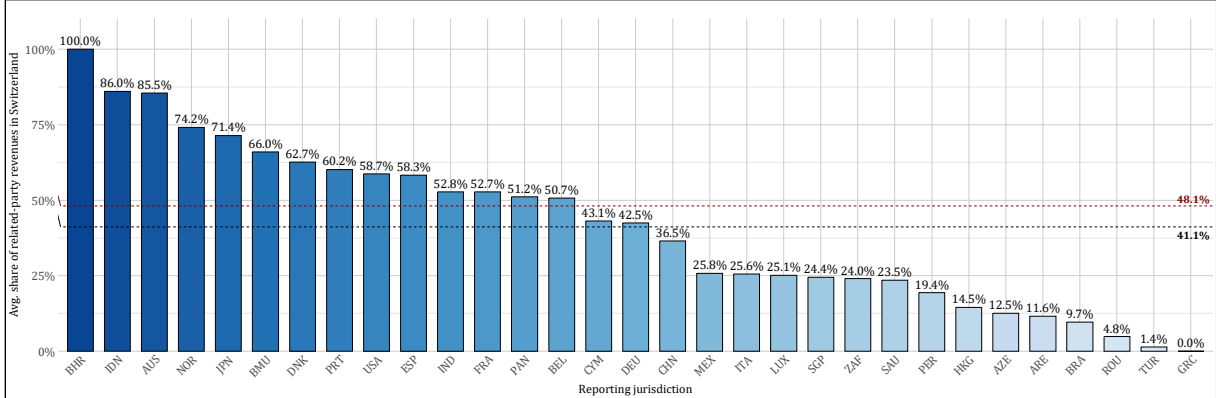
The overall dispersion of average Total Revenues recorded in Switzerland appears to be reciprocal to the I-O perspective, i.e., foreign MNEs recorded higher Total Revenues in Switzerland if Swiss MNEs recorded higher revenues in the respective jurisdiction of UPE. This comes as little surprise, given that greater market opportunities for Swiss MNEs abroad are usually constituted by greater economic output of the counterpart, which is, again, reflected in comparatively greater activity in Switzerland. Among foreign MNEs, US-based firms stand out significantly, with an average of

\$548.4 billion in Total Revenues recorded in Switzerland, making it the fourth-largest destination of US foreign revenues, after Ireland, the UK, and Singapore.

Contiguity also appears to play a role in the O-I perspective, given that Luxembourgish (\$150.8 billion, approximately 166% of Luxembourg’s GDP in 2024), French (\$124.3 billion), and German MNEs (\$106.3 billion) rank after US firms. Regarding the extrapolated (green-highlighted) values, one key advantage of using widely available macroeconomic data for the extrapolations is evident. Combined with the hard data from the 33 jurisdictions that explicitly report CbCR data in Switzerland, the country coverage is comparable to that of the Swiss I-O perspective, which encompasses a total of 151 jurisdictions. While the estimated values constitute a significant fraction of the country coverage, the model-based estimates allow for an initial impression of what CbCR Total Revenues could have been reported. The highest extrapolated Total Revenues are constituted by MNEs based in Europe, specifically in the United Kingdom, the Netherlands, Poland, Sweden, the Czech Republic, and Austria. This seems plausible given their economic output, existing trade and FDI data and the findings from Chapter 4.1.2. Meanwhile, since Total Revenues are extrapolated while only mildly considering the MNE density of the reporting country, the Total Revenue estimations for Central and Eastern Africa are particularly likely to be overestimated.

Another limitation of the model specification is that it does not differentiate between Related and Unrelated Party Revenues, which are necessary to validate real economic activity (in Switzerland). Thus, to assess whether the Total Revenues in Switzerland result from third-party transactions, only the ratios of Related Party- to Total Revenues by the 33 explicit reporting jurisdictions can be considered, as presented in Figure 25.

Figure 25: Related Party- to Total Revenues of MNE affiliates in Switzerland by reporting jurisdiction



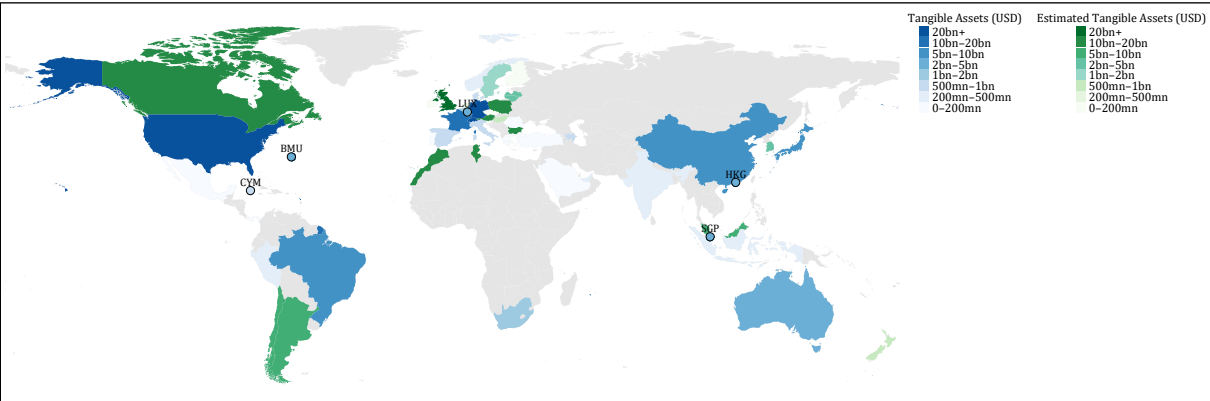
Note. Own depiction. The red line refers to the weighted average share of Related Party- to Total Revenues recorded in Switzerland. The black line refers to the unweighted average share. Click [here](#) to view and download the enlarged graphic.

It is easy to observe the wide range of Related Party Revenue shares among reporting jurisdictions in Switzerland. While Bahrain-based¹⁰⁶ MNEs seem to record Related Party Revenues exclusively, almost half of the highlighted reporting jurisdictions recorded a share of 25% or less in Related Party Revenues, indicating a high degree of real economic activity with third parties in Switzerland.

Nevertheless, the share of Related Party Revenues in the Swiss market recorded by Switzerland's most relevant trading partners (inter alia the USA, Japan, France, and Germany) is significantly higher than the share recorded by Swiss MNEs in respective markets. This is reflected in the unweighted and Total Revenue weighted average shares of Related Party Revenues recorded in Switzerland. The unweighted average stands at 41.1% (vs. 26.6% for Swiss MNEs in foreign markets), while the by Total Revenues-weighted average share stands at 48.1% (vs. 28.3% weighted average for Swiss MNEs in foreign markets)¹⁰⁷, which reflects that MNEs with particularly high Total Revenues, most notably US-MNEs, recorded a comparatively high share of Related Party Revenues in Switzerland.

Considering the recorded and extrapolated Tangible Assets and Employees in Switzerland, Figures 26 and 27 present the recorded and estimated values, with the countries of UPE highlighted. As the δ_2 adjustment factors require the individual reporting jurisdiction's global ratio of Tangible Assets and Employees to Total Revenues, respectively, the country coverage for these two economic indicators is bound by the number of reporting jurisdictions in the OECD CbCR panel, i.e., 57. While this limits the country coverage significantly, estimates can be made for some European jurisdictions in particular that do not explicitly report in Switzerland.

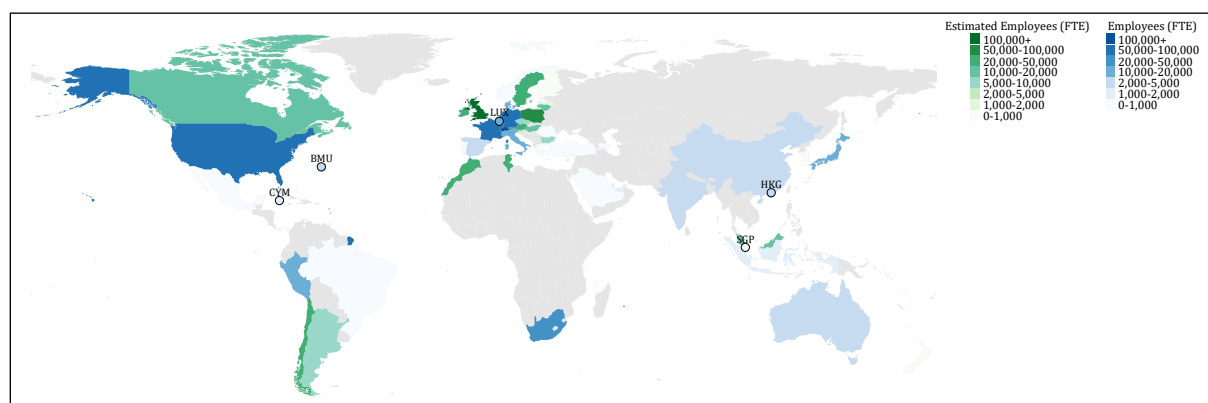
Figure 26: (Extrapolated) Tangible Assets of MNE affiliates in Switzerland by reporting jurisdiction



Note. Own depiction. The numerical values can be found in Table A9 (for CbCR-recorded Tangible Assets) and Table A11 (for model-based Tangible Assets) in Appendix A. Click [here](#) to view and download the enlarged graphic.

¹⁰⁶ Note that Bahrain MNEs recorded an average of \$1.4 million of revenues in Switzerland, multiple magnitudes less than by other reporting jurisdictions.
¹⁰⁷ Note that the ratios of Related Party to Total Revenues of Swiss MNE affiliates abroad consider significantly more jurisdictions than vice versa. However, even when comparing the average ratios of Swiss MNEs among the 32 jurisdictions that report CbCR data in Switzerland only, it is evident that the shares are still significantly lower, at 23.1% (unweighted) and 22.5% (weighted).

Figure 27: (Extrapolated) Employees (FTE) of MNE affiliates in Switzerland by reporting jurisdiction



Note. Own depiction. The numerical values can be found in Table A9 (for CbCR-recorded Employees (FTE)) and Table A11 (for model-based Employees (FTE)) in Appendix A. Click [here](#) to view and download the enlarged graphic.

Following the trend of previous CbCR dimensions, US MNEs recorded the highest average Tangible Assets value, at \$60.3 billion, marking Switzerland as the 10th single largest destination of US foreign Tangible Assets. German (\$29.4 billion), French (\$10.5 billion), Chinese (\$6.2 billion), and Japanese MNEs (\$5.9 billion) follow next. Moreover, the extrapolation estimates indicate that MNEs headquartered in the United Kingdom, Canada, Poland, Morocco, and Bulgaria hold the largest Tangible Asset values among jurisdictions not explicitly reporting in the Swiss CbCR sub-panel.

Regarding Employees (FTE), US firms also constitute the highest absolute FTE count at 85,273. By contrast to Total Revenues and Tangible Assets, however, the gap to the following UPE jurisdictions, i.e., Germany (82,637), France (54,742), and, interestingly, South Africa (31,985), is significantly smaller. Meanwhile, the extrapolation estimates rank MNEs with UPE in the United Kingdom, Poland, Tunisia¹⁰⁸, Austria, and Sweden to have the highest FTE among jurisdictions not reporting explicit CbCR data in Switzerland.

4.2.3 Profits of foreign MNEs in Switzerland

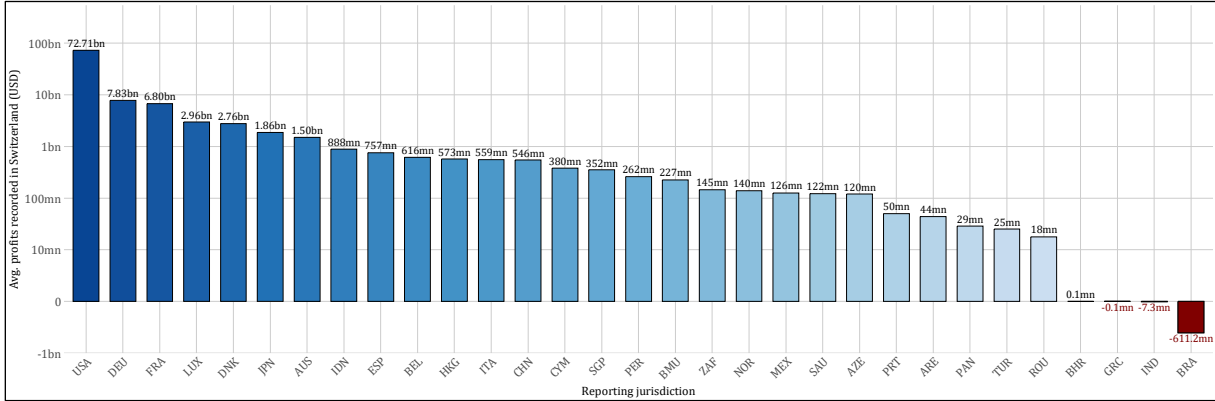
While the OECD (2020) also proposed a methodology for extrapolating missing profit data, such model would be beyond the scope of this paper, especially given that Switzerland, due to its comparatively low ETR, can be expected to attract profits greater than what economic activity might suggest (Tørsløv et al., 2022, pp. 1517–1518; Garcia Bernardo & Janský, 2024, p. 8; Brühlhardt et al., 2023, p. 4; Fuest et al., 2022, p. 455), demanding additional complexity of such a

¹⁰⁸ The estimate for Tunisia in particular seems relatively high and highlights the conceptual limitations of the extrapolation estimates.

model. Hence, this subchapter focuses on the “hard” CbCR data for profits recorded by available foreign MNE affiliates in Switzerland.

Considering both profit and loss-making sub-groups, Figure 28 presents the absolute profit values recorded by foreign MNEs in Switzerland, grouped by jurisdiction of UPE¹⁰⁹.

Figure 28: Profits of MNE affiliates in Switzerland by reporting jurisdiction



Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

Of the total average positive profits of \$102.4 billion¹¹⁰ recorded in Switzerland by foreign MNEs, US-headquartered firms are by far the largest profit recorders, at an average of \$72.71 billion or around 70% of all foreign profits recorded in Switzerland. German MNEs, the next largest group, reported only a tenth of US profits, or \$7.83 billion, followed by France (\$6.80 billion), Luxembourg (\$2.96 billion), and Denmark (\$2.76 billion). Note that a log scale was used to visually accommodate the differences in reported positive profits. As in the I-O profit analysis in Chapter 4.1.3, the losses of some sub-groups outweigh the positive profits for respective MNE groups, with Greek (-\$100,000), Indian (-\$7.3 million), and Brazilian MNE affiliates (-\$611.2 million) in Switzerland recording net losses over the 2018 – 2021 vintages considered.

While the order of listed reporting jurisdictions can be reasonably expected, the magnitude of US profits¹¹¹ in particular raises the question of whether a misalignment of economic activity and profits reported in Switzerland by respective reporting jurisdictions can be observed using the available OECD CbCR data. Switzerland has been discussed as one of the largest beneficiaries of tax-induced profit shifting, with estimates of shifted profits into Switzerland ranging depending

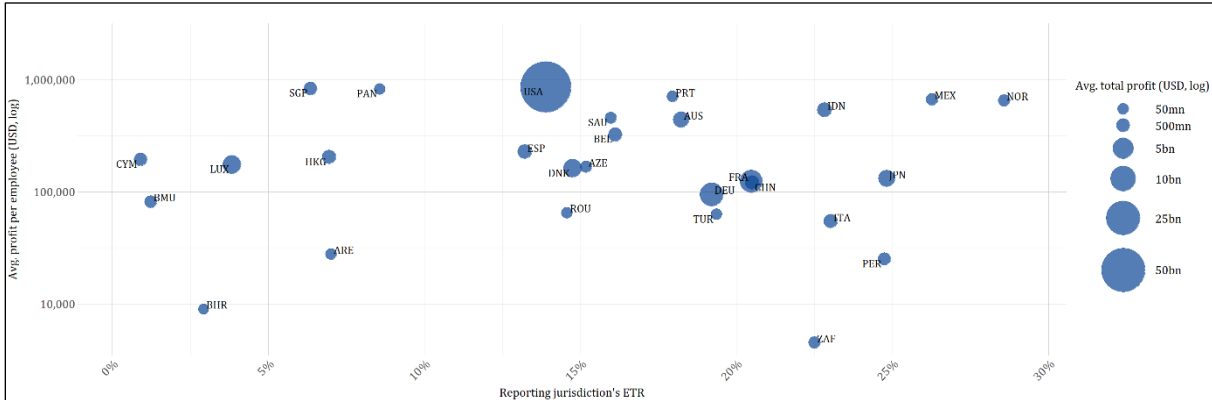
¹⁰⁹ Bermuda- and Cayman Islands-headquartered MNEs are also considered here, as they may be relevant for misaligned profit analyses.

¹¹⁰ This figure excludes the average losses from Greek, Indian and Brazilian MNEs. Considering these would lead to \$101.8 billion.

¹¹¹ Also considering the relatively high share of Related Party Revenues among US-headquartered and other reporting jurisdictions’ affiliates in Switzerland.

on the methodology and vintages considered¹¹² (Garcia Bernardo & Janský, 2024, p. 8; Tørsløv et al., 2022, p. 1518). Following the methodology from the I-O profit analysis in Chapter 4.1.3, Boukal (2024), and Garcia-Bernardo & Janský (2024), Figure 29 displays the profit per employee recorded in Switzerland per reporting jurisdiction, with bubble sizes indicating absolute profit values. Following the intention of high-tax countries having a greater incentive to shift profits into Switzerland (and other low-tax jurisdictions, generally) (Tørsløv et al., 2022, p. 1524), the ratios are plotted against the ETR of the respective reporting jurisdictions to identify a possible sensitivity of the reporting jurisdiction's level of taxation and potentially misaligned profits in Switzerland.

Figure 29: Profitability of MNE affiliates in Switzerland by reporting jurisdiction's ETR



Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

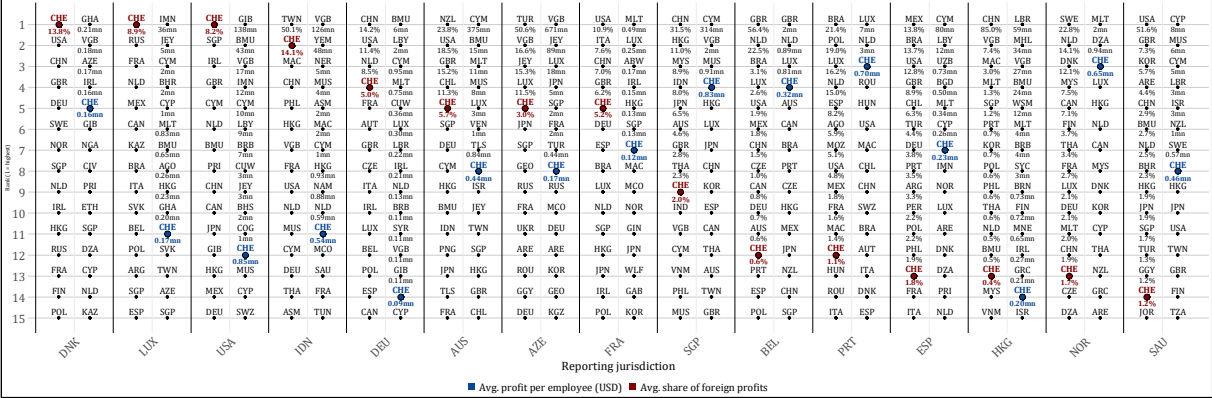
Two takeaways emerge from Figure 29. First, although the small sample size limits a definitive conclusion, the profitability ratios and absolute profits allocated to Switzerland do not appear to correlate with the reporting jurisdiction's effective taxation. This suggests that, in the case of Switzerland, the reporting jurisdictions' ETR does not play an apparent role in the shifting of excess profits. Secondly, the maximum profitability ratios for foreign MNEs in Switzerland are significantly lower than those for Swiss MNEs abroad (see Figure 16 in Chapter 4.1.3). This is also reflected in the profit-weighted average profitability of foreign affiliates located in Switzerland compared to those of Swiss MNEs abroad in the I-O perspective. The profit-weighted average profitability of Switzerland-located affiliates stands lower at \$656,450, compared to the \$858,400 observed in the I-O profit assessment¹¹³. By contrast, the unweighted profitability per employee of foreign affiliates in Switzerland is slightly higher than that of Swiss-headquartered MNEs abroad, at \$293,650 versus \$204,500 in the I-O profit assessment.

¹¹² E.g. Garcia Bernardo & Janský (2024, p. 8) estimate \$53.3 billion of misaligned profits allocated to Switzerland in 2017 using CbCR data; Tørsløv et al. (2022, p. 1518) estimate \$58 billion for 2015 using multiple pre-CbCR data sources.

¹¹³ While Bermuda-located profits drive this ratio for Swiss affiliates abroad (I-O), US-headquartered MNEs largely drive the higher profit-weighted profitability in Switzerland (O-I).

Following these and previous empirical findings on Switzerland as a foreign profit destination, the question arises of how Switzerland compares to other counterparty jurisdictions in attracting foreign profits, particularly other (European) tax havens (Brühlhart et al., 2023; Fuest et al., 2022, p. 455). For this, Figure 30 presents two dimensions: 1) Profits allocated and 2) profits per employee, in each of the highest-ranking 15 counterparty jurisdictions, per reporting jurisdiction. Specifically, each reporting jurisdiction's left column ranks the share of profits recorded in the listed counterparty jurisdictions as a percentage of the reporter's total foreign profits (e.g., Danish MNEs reported 13.8% of their foreign profits in Switzerland, ranking Switzerland as the largest single destination for Danish foreign profits). The right column ranks profitability per employee across the respective counterparty jurisdictions, with higher profitability ratios corresponding to higher rankings (e.g., Danish MNEs had \$160,000 in profits per employee in Switzerland, ranking Switzerland seventh in terms of profitability per employee among all counterparty jurisdictions of Danish MNE affiliates). Plotting both ratios allows for assessing whether the (high) ranking of an individual profit destination is potentially constituted by excess, i.e., shifted profits. For a better overview, the Swiss rankings are highlighted in red (for the share of allocated profits in Switzerland) and blue (for profits per employee in Switzerland). Moreover, any jurisdiction ranked higher than Switzerland in both dimensions has its share of profits and profitability per employee explicitly plotted. The reporting jurisdictions are sorted by Switzerland's ranking in the left column, from left to right¹¹⁴.

Figure 30: Ranking of profitability measures of MNE affiliates in Switzerland by selected reporting jurisdictions



Note. Own depiction. The left column per reporting jurisdiction presents the fifteen largest single profit destinations ranked by the share of all foreign (WXD) profits allocated (with Switzerland highlighted in red). The right column per reporting jurisdiction presents the fifteen highest-ranking counterparty jurisdictions ranked by the profitability per employee of the respective MNE affiliates (with Switzerland highlighted in blue). Click [here](#) to view and download the enlarged graphic.

When reporting jurisdictions are ranked according to the relative importance of Switzerland as a profit destination, the resulting list closely mirrors the ranking based on the absolute amount of

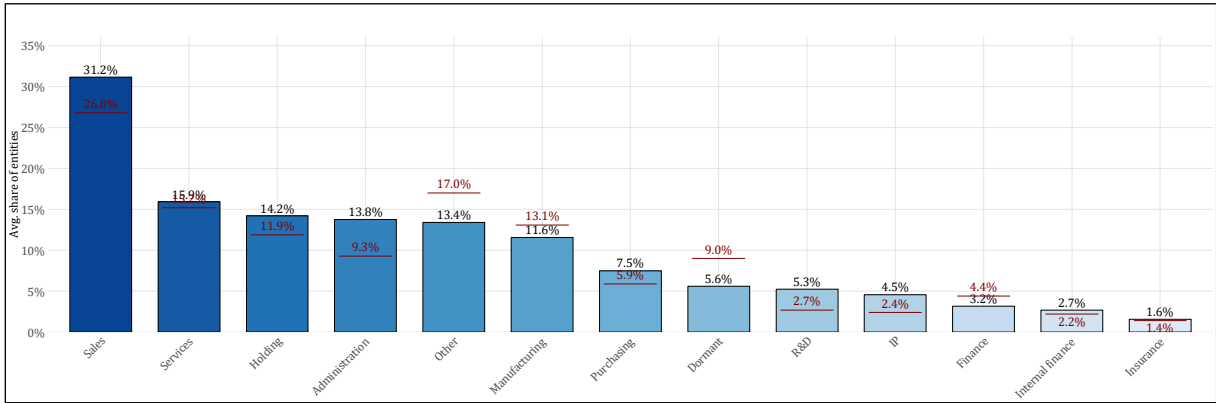
¹¹⁴ Reporting jurisdictions, where Switzerland is not among the fifteen highest-ranking counterparty jurisdictions by share of foreign profits, are not plotted.

profits allocated to Switzerland, as shown in Figure 28. Specifically, nine of the ten¹¹⁵ jurisdictions reporting the largest single absolute profit values in Switzerland also rank Switzerland among their top 15 counterparties by share of foreign profits, with Japan as the only exception, where Switzerland ranks as the 20th-largest single profits destination. Most notably, Switzerland is the most relevant destination for foreign profits of Danish, Luxembourgian, and US-headquartered MNEs. Furthermore, Switzerland is among the top five foreign profit destinations for Indonesian, German, Australian, Azerbaijani, and French MNEs. By contrast, the profitability per employee of foreign MNEs operating in Switzerland is generally well below the exceptionally high profitability levels observed in offshore tax havens. This suggests that profits reported in Switzerland are, to a considerably greater extent than those in high-profitability tax havens, attributable to real economic activities with third parties by respective MNE affiliates.

4.2.4 Foreign MNE business activities in Switzerland

Lastly, the business activities of foreign MNEs in Switzerland are illustrated, following Delpuech et al. (2025) and the I-O business activity analysis in Chapter 4.1.4. Following the I-O methodology, the blue bars in Figure 31 present the shares of foreign affiliates in Switzerland per business activity. Meanwhile, the red bars, as in the I-O perspective, indicate the global averages across all jurisdictions as a reference.

Figure 31: Business activities of foreign MNE affiliates in Switzerland



Note. Own depiction. The red bars refer to the average global share of respective business activity across all reporting jurisdictions. Click [here](#) to view and download the enlarged graphic.

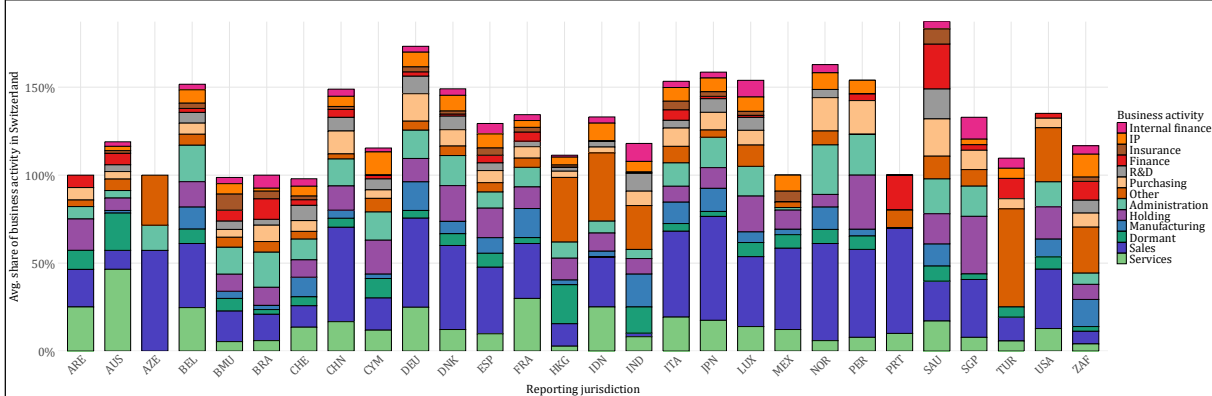
Business activities in Switzerland generally align with global averages, although there are notable exceptions. Sales affiliates constitute the largest share of foreign-controlled entities recorded in Switzerland (31.2%), followed by Services (15.9%) and Holding entities (14.2%). The share of

¹¹⁵ See Figure 28: USA, DEU, FRA, DNK, LUX, JPN, AUS, ESP, IDN, and BEL.

Manufacturing affiliates in Switzerland stands slightly below the global average, which can be expected given Switzerland's comparatively high wage level. Relatively speaking, R&D and IP affiliates are notably above the global averages, underlining Switzerland's role as a global knowledge hub (Switzerland Global Enterprise, 2020, p. 11), while Finance and Dormant activities are significantly below global averages. Note that, the shares of business activities add up to a total of 118.6%, indicating that some entities of foreign MNEs are classified under multiple activities in Switzerland (OECD, 2015, p. 35).

With only 33¹¹⁶ explicit reporting jurisdictions in the Swiss O-I perspective, it is possible to visually disaggregate the shares of business activities in Switzerland for each reporting jurisdiction individually. In this context, Figure 32 presents the business activity data of Figure 31, disaggregated by reporting jurisdiction. For completeness, the Cayman Islands, Bermuda, and domestic-based MNE activities are included in the Figure.

Figure 32: Business activities of MNE affiliates in Switzerland by reporting jurisdiction



Note. Own depiction. Shares exceeding the 100% mark among reporting jurisdictions reflect the possibility of assigning an entity to multiple business activities when filing the OECD CbCR template (OECD, 2015a, p. 35). Click [here](#) to view and download the enlarged graphic.

Sales entities, which constitute the highest average share among all reported activities in Switzerland, are predominantly present among industrialised trading partners, including Chinese, German, Italian, Japanese, Norwegian, and US-headquartered affiliates. In combination with Service entities, 15 of the 28 highlighted reporting jurisdictions exhibited a combined share of Service and Sales affiliates of 50% or more¹¹⁷. Moreover, the option of classifying entities into the “Other” category is widely used by MNEs headquartered in Azerbaijan, Hong Kong, Indonesia, India, Turkey, and South Africa, as indicated by the dark-orange bars, likely due to local privacy regulations. On a side note, Swiss MNE affiliates are relatively evenly represented across most

¹¹⁶ Note that only 28 reporting jurisdictions publish business activity data in Switzerland. These are presented in Figure 32.
¹¹⁷ Damgaard et al. (2019, p. 15) estimated that, though a comparatively small share of foreign entities in Switzerland is categorised as SPEs (i.e., Holding or Finance entities), they constitute a large share of the recorded inward FDI. However, these results are dependent on the definition of “SPE”.

business activities in the domestic market, although they appear underrepresented in Sales and Services entities. However, as discussed in 4.1.4, Switzerland seems to report each entity according to only one business activity, making comparisons to jurisdictions that assign multiple activities per entity challenging to interpret unambiguously.

5 Summary and potential domains for further research

With respect to the research question, Section 5.1 provides a brief outline of the overarching empirical findings from the I-O and O-I perspectives across the CbCR dimensions presented in Chapter 4. In line with the study's aim to provide an exploratory and broad analysis of the Swiss OECD CbCR sub-panels, the focus of this chapter, however, is set on discussing potential further research domains, as presented in Section 5.2.

5.1 Summary of results

The comprehensiveness of the OECD CbCR macro panel, as well as the lack of a prior systematic empirical analysis methodology in the context of GVC measurement, required the introduction of an analytical framework to analyse Switzerland's position in GVCs using OECD CbCR macro data. Utilising the methodologies of previous FDI and AMNE-based GVC assessments (Cadestin et al., 2018b, p. 27; SNB, 2025), this study separately assessed outward MNE affiliate activity of Swiss MNEs in the I-O, and inward foreign MNE affiliate activity in the O-I perspective, across MNE sub-groups, economic activity, profits, and business activities dimensions. Considering the data limitations outlined in Chapter 3.1.2, the most relevant findings within the I-O and O-I domains can be summarised as follows.

Regarding Swiss affiliate activity abroad in the I-O subchapter, this study benefited from Switzerland's highly disaggregated I-O CbCR dataset, which is a necessary prerequisite for utilising the CbCR's country-specific illustration of included variables. As a general observation, Switzerland, as approximated through Swiss MNE affiliate activity, is observed to be among the *most globalised reporting jurisdictions* in the CbCR panel. This is indicated by the comparisons of sub-groups and economic activity indicators in relation to economic output to other reporting jurisdictions (see Figures 5 and 14), supporting the assertion of Switzerland's integration into global markets being vital to support its high living standard (OECD, 2024d, pp. 92–93; Thakur-Weigold, 2018, pp. 9–10; Switzerland Global Enterprise, 2020, p. 34). Within Switzerland's globalised corporate structures, the Swiss DTA network, in particular, is observed to encompass the vast majority of sub-groups, economic activity, and profit values.

Moreover, the strong correlation between Total Revenues recorded by Swiss MNE affiliates and counterparty GDP supports the hypothesis that Swiss MNEs tend to focus on demand-side,

Location factors in their foreign operations (Dunning, 1980; Dunning, 2003; Cadestin et al., 2018a, p. 8). The business activity analysis aligns with this observation, as Sales and Services entities, which are business activities primarily related to economic activity with third parties, are also relatively prevalent among high-tax, high-income counterparty jurisdictions (see Figures 20 and 21), in line with the country-agnostic findings of Delpeuch et al. (2025). Swiss MNE sub-groups and economic activity indicators are also primarily located in high- and upper-middle-income countries, i.e., developed countries (see Figures 4, 13, and Figure A6 in Appendix A).

On a country-specific level, the USA and contiguous European countries stand out as the most dominant counterparty jurisdictions across the CbCR dimensions, mirroring existing trade and FDI statistics (Legge et al., 2024; SNB, 2024). That being said, the USA was found to be the single largest foreign market for Swiss MNE affiliates in terms of Total and Third-Party Revenues observed, Tangible Assets, Employees (FTE), and Profits. The US market alone thereby constitutes 20% - 25% of the total foreign (*WXD*) values of Swiss MNE affiliates across these CbCR dimensions.

Lastly, initial indicators of potential profit shifting activities were identified. Swiss MNE affiliates were thereby found to exhibit high shares of Related Party Revenues in low-ETR counterparties (see Figure 9), while per FTE profitability increases sharply as the counterparty jurisdictions' ETR decreases in the sub-5% ETR range (see Figure 16). Moreover, Swiss MNEs exhibit relatively high shares of Holding, Finance, Internal Group Finance, and Other classified entities, which are associated with profit shifting activities, in low-ETR and investment hub jurisdictions (Delpeuch et al., 2025, pp. 7, 17; Damgaard et al., 2019, p. 12).

By contrast, the O-I domain was found to be significantly more restricted in terms of data availability, highlighting a significant limitation of the OECD CbCR macro panel. As only 33 total (32 foreign) reporting jurisdictions publish their MNE activities in Switzerland, the O-I analysis focused directly on the activities of individual reporting jurisdictions, rather than on aggregation analyses, as the I-O view. US and neighbouring EU-country headquartered MNEs were thereby found to constitute the most dominant group of firms operating in the Swiss market, also reflecting previous trade-based and FDI GVC assessments (Legge et al., 2024; SNB, 2024). US MNEs, in particular, stand out as the most dominant group of firms, with an average of over 600 MNE sub-groups situated in Switzerland (see Figure 22). Additionally, Switzerland was identified as the largest single destination for foreign profits of US MNEs (see Figure 28). That being said, no apparent sensitivity of the reporting jurisdictions' ETR and per FTE profitability levels was identified, contrary to the hypothesis of Tørsløv et al. (2022, p. 1524). However, the limited availability of datapoints must be taken into account when drawing this conclusion.

To counteract the structural limitation of the O-I view, this study also modified an existing OECD (2020) extrapolation methodology to estimate missing CbCR economic activity values in Switzerland. The estimation highlights the UK, Austria, the Netherlands, and Poland as the largest

jurisdictions that do not explicitly publish CbCR data in Switzerland, which appears plausible given the I-O results and trade-based assessments (Legge et al., 2024). However, contrary to Total Revenues, estimates of Tangible Assets and Employee (FTE) are still significantly restricted using this specification. As further discussed in Chapter 5.2, developing an advanced extrapolation to precisely and comprehensively estimate missing CbCR values is one potential avenue for further research endeavours.

5.2 Discussion of potential further research domains

Based on the methodological and empirical results, potential areas for further research are discussed below. These refer to out-of-scope extensions to the *breadth* and *depth* of the methodology in this thesis, focusing on Switzerland or any other jurisdiction at a general level. Naturally, interested readers may identify their own methodological and/or empirical areas of interest within Chapter 4 and pursue further research in those domains.

Regarding the *breadth* of analyses conducted, the scope of this thesis may be expanded by including additional variables in subsequent assessments. While the CbCR dimensions considered in this thesis account for the most relevant GVC measures contained in the OECD CbCR data, the call to expand the breadth of this thesis specifically refers to the “auxiliary” variables. As outlined in Chapter 2, (macro) GVC measurements are problematic due to their multidimensional nature and, consequently, the omission of variables that may explain the observed effects. Incorporating more and/or different controls, for visual analyses or model-based approaches, is therefore a key consideration. Using FDI as a proxy for foreign affiliates, Borga et al. (2020, pp. 11–12; 19–20), Mistura & Roulet (2019, pp. 21–36)¹¹⁸, and Nielsen et al. (2016) provide a comprehensive overview of potential empirical controls that might also be used in combination with OECD CbCR data. The OLI dimensions might provide further theoretical guidance on which data could be used alongside the OECD CbCR panel. Noteworthy considerations, particularly for the Swiss I-O perspective, include exchange rate controls, de jure investment openness, and the wage level of the counterparty jurisdiction, which may all influence the location decisions of (Swiss) MNEs, and thus provide further insight into Switzerland’s positioning within GVCs.

With respect to this thesis's intended contribution of presenting a high-level overview of Switzerland’s position within GVCs and the empirical results from Chapter 4, the focus of extending this work may, however, be on gaining further *depth* in the individual CbCR and auxiliary dimensions employed by the analytical framework.

¹¹⁸ See also OECDs [Working Papers on International Investment](#) series.

One major consideration for achieving this is obtaining access to CbCR micro data from the Federal Tax Authority (ESTV). MNE-level CbCR micro data has one key advantage over the aggregated version used in this thesis, which is that it allows for directly attributing the CbCR data to the filing MNE group. The implications of this are substantial. First, this allows for combining CbCR data within the panel, as done in Italy's GVC assessment using CbCR micro data by Santomarinio et al. (2022). For example, business activities can be combined with tangible assets, revenues, or profits through the individual MNE group, shedding light on key performance metrics on a per-country and industry-by-industry basis with unprecedented geographical reach and disaggregation. External "auxiliary" data could also be attributed directly to the MNE group. Second, micro CbCR data would allow for control for within-firm characteristics, such as governance, size, or industry, reducing unobserved heterogeneity at the macro level (Fuest et al., 2022, p. 455). Apart from these controls in model-based assessments of Switzerland's position within GVCs, aggregations of CbCR data based on within-firm characteristics would thus be feasible. Thirdly, due to its granularity, CbCR micro data provides considerably more observations per country, which can be used in model-based GVC assessments. The main disadvantage, however, is the substantial administrative burden of obtaining access to firm-level micro data due to confidentiality concerns, which highlights one major advantage of publicly available macro data. Moreover, while gaining access to the Swiss micro data would enhance granularity in the I-O perspective, the O-I perspective would still be significantly inferior in terms of jurisdictional coverage, given that, in theory, each counterparty's tax authority would need to provide its micro CbCR data¹¹⁹. Achieving greater detail of Swiss MNE activity using CbCR macro data may, however, also be conducted in combination with other databases that complement the structural limitations of the CbCR data. Bureau van Dijk's Orbis database is among the most frequently used GVC micro sources and has been successfully combined with CbCR data in previous studies, as seen in OECD (2020), Turban et al. (2020), Hugger et al. (2023), and Hugger et al. (2024).

The structural asymmetry between I-O and O-I reporting for the Swiss, or any other, sub-sample is another topic worth further attention. Chapter 4.2.2 introduced an extrapolation of missing CbCR values, indicating a further application of the data. A more sophisticated version, aimed at estimating continuous CbCR values with greater coverage of Tangible Assets and Employees, would add significant value by widening O-I coverage. Micro data and the combination with other micro-and macro-databases, such as Bureau van Dijk's Orbis or Eurostat FATS, could also support developing such extrapolation methodology (OECD, 2020; Turban et al., 2020)¹²⁰, for example, by including an explicit MNE density factor to control for high-GDP countries that headquarter relatively few MNEs that would, by their GDP, without controlling for MNE density, explain high

¹¹⁹ Or agree to the FTA forwarding the counterparty's micro CbCR data.

¹²⁰ See also Garcia Bernardo & Janský (2024, p. 16), who installed a Histogram-based Gradient Boosting Regression Tree machine learning algorithm to estimate missing CbCR revenues and employee values.

revenues in foreign jurisdictions and vice versa. Furthermore, greater depth might also be applied to the auxiliary variables used in this thesis. For example, DTAs were assumed to be binary, i.e., homogeneous and not differentiated among DTA categories¹²¹. Subsequent GVC assessments of Switzerland might consider different categories within the variables used, allowing for more differentiated aggregations and correlations.

Lastly, another conceptual focus can be set on spillover effects¹²² from Swiss MNEs abroad and vice versa, particularly with the USA. Chapter 4 presented the agglomerations of Swiss MNEs, including jurisdictions that were only sparsely covered in any previous GVC dataset, and, within the structural limitations of the O-I perspective, also relevant foreign MNE groups in Switzerland. Given that Swiss MNEs hold substantial FDI positions abroad and that Switzerland itself is classified among the major investment hubs, further research could focus on inward and outward MNE spillover effects specifically for Switzerland. The high disaggregation of the Swiss CbCR sub-panels provides a novel empirical basis for such analyses, as CbCR data offer jurisdiction-level numerical information that facilitates the quantification of such spillover effects more directly. The modularity of the framework presented in Section 3.2 allows such depth-related modifications.

6 Concluding remarks

This thesis sought to answer the combined question of how indicators of GVC integration can be systematically and comprehensively extracted and analysed from publicly available OECD CbCR macro data, and what picture such analysis will form about Switzerland's position within GVCs. Regarding the first part of the question, a modular, analytical framework was theoretically discussed to extract and (visually) present key GVC indicators from the OECD CbCR panel, averaged for the years 2018 – 2021, with Switzerland as the jurisdiction in focus. Such a framework was deemed necessary given the lack of a prior systematic empirical GVC analysis employing OECD CbCR macro data. Four overarching categories have been identified within the CbCR panel to capture the most relevant GVC indicators. First, MNE sub-groups, i.e., the agglomeration of entities of an MNE group within a specific jurisdiction, illustrating the concentration of Swiss MNE presence abroad and foreign MNE presence in the Swiss market. Second, economic activity indicators, in accordance with the definitions of economic activity used in previous (non-CbCR) GVC assessments, i.e., Total Revenues split by Related Party and Third-Party origin, Tangible Assets, and Employees on an FTE basis. Thirdly, profits before taxes were considered, including any misalignment in profitability ratios, leveraging a key value proposition of the OECD CbCR dataset. Lastly, business activities were included to present the composition of

¹²¹ Swiss DTAs, naturally, refer to different subject matters. See also [SIF](#).

¹²² Referring to externalities imposed by MNE affiliates on local firms in the form of unintended knowledge transfers, leading to greater productivity of domestic firms. Negative spillovers may also exist (OECD, 2019, pp. 8–9).

the economic and profit data by business function on a country-by-country basis. To support and complement analyses of the four CbCR dimensions, the framework comprises six categories of “auxiliary” variables (excluding the default ISO 3166-1 alpha-3 dimension) for analysing and aggregating results. This thesis also introduces a proprietary ETR specification based on CbCR data, as well as an extrapolation model to address the structurally lower jurisdictional coverage in the O-I economic activity perspective and to highlight additional use cases for OECD CbCR macro data. Meanwhile, Switzerland was found to be a particularly interesting case for applying such a framework and analysing CbCR data within the domain of GVC micro measurement methodologies, given its highly export-oriented, specialised economy, high MNE density, comparatively small domestic market, and low ETR, among other location factors.

The broad analysis of the Swiss OECD CbCR sub-panel in the I-O view, and the CbCR sub-panel with Switzerland as the counterparty jurisdiction in the O-I analysis, constitutes the second and main part of this study. The analysis is facilitated by Switzerland’s highly disaggregated (I-O) OECD CbCR sub-panel, which allows leveraging the core value proposition of the CbCR data, i.e., its geographical coverage of the included variables. With this in mind, the OECD’s CbCR panel was found to offer an underutilised micro-based data source for analysing Switzerland’s, and any other jurisdiction’s, integration into GVCs through a sufficiently disaggregated sub-panel. In summary, the CbCR data provide a picture of Switzerland that aligns with the findings of previous trade and FDI data. In the I-O perspective, Swiss MNEs are found to be present among all major trading partners, primarily contiguous EU countries, the UK, and the USA, across the sub-groups, economic activity, and to some extent, the profit dimension. In many instances, the USA was found to be the single most relevant foreign jurisdiction for Swiss MNE activity, underlining Switzerland’s strong economic ties with the USA and the necessity for informed foreign policy design. Across the four O-I dimensions, which are significantly more restricted regarding data availability, US-headquartered firms likewise stood out as the most dominant group of MNEs, also in the profit and profitability analyses, followed by contiguous EU jurisdictions. The extrapolation of missing O-I economic activity values estimated non-reporting EU jurisdictions to (theoretically) record the highest CbCR economic activity indicators in Switzerland. However, a different methodological extrapolation approach might be employed to yield continuous, comprehensive estimates, also beyond the economic activity dimension.

Within the scope of this study, which analyses OECD CbCR data for Switzerland at a descriptive level, each sub-chapter of the I-O and O-I reports aims to provide a basis for subsequent research, particularly regarding the depth of the CbCR dimensions covered, or as an informational basis for (Swiss) government officials. Regarding further research, accessing MNE-level CbCR micro data offers significantly greater granularity for performing sophisticated analyses, utilising the individual MNE as a focal point. However, CbCR macro data, as examined in this study, may also be used with other (micro) GVC databases and more sophisticated “auxiliary” variables to analyse

and aggregate the available data. Building on the results highlighted in this study, further research may use CbCR data, independently or in combination with other data sources, as a valuable source to extract insights for managers, economists, tax researchers, and policymakers alike about Switzerland's, or any other reporting jurisdiction's, integration into GVCs.

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Appendix A

Further Figures and Tables

based on the 2018 – 2021 vintages OECD CbCR panel

Table A1: Descriptive statistics of key CbCR variables for the Swiss I-O sub-panel

	2018	2019	2020	2021
Sub-groups				
Counterparty jur.	162	157	139	135
sum	4,302.0	4,884.0	4,953.0	4,653.0
mean	26.6	31.1	35.6	34.5
sd	26.7	30.9	32.6	30.0
q1	6.0	8.0	11.0	11.0
median	15.0	17.0	20.0	21.0
q3	40.8	50.0	57.5	55.0
max	113.0	129.0	138.0	130.0
Total Revenues (USD)				
Counterparty jur.	134	134	135	135
sum	1,132,843,602,542.0	1,354,938,193,953.0	1,217,808,942,199.0	1,406,128,384,685.0
mean	8,454,056,735.4	10,111,479,059.4	9,020,806,979.3	10,415,765,812.5
sd	27,363,241,554.5	33,636,391,368.6	30,758,614,828.0	33,910,319,348.2
q1	234,331,540.0	323,356,411.5	256,031,512.7	256,193,850.5
median	1,089,081,820.5	1,317,402,532.5	1,282,665,518.0	1,399,164,328.0
q3	5,153,431,398.0	6,018,226,741.8	5,820,180,322.0	6,259,136,033.5
max	254,592,000,000.0	327,422,000,000.0	311,570,000,000.0	334,000,000,000.0
Tangible Assets (USD)				
Counterparty jur.	134	134	135	135
sum	424,117,947,184.0	492,539,706,182.0	478,492,218,977.0	462,136,574,119.0
mean	3,165,059,307.3	3,675,669,449.1	3,544,386,807.2	3,423,233,882.4
sd	7,347,275,381.6	9,476,716,405.4	8,868,579,512.7	9,648,080,012.9
q1	99,004,382.5	104,731,510.2	97,223,075.2	76,134,030.0
median	542,722,972.0	636,207,277.0	667,293,505.8	577,847,945.0
q3	2,557,069,337.8	2,339,173,471.0	2,570,632,571.0	2,026,671,673.5
max	58,812,996,390.0	86,578,051,774.0	76,190,112,625.0	91,543,939,101.0
Employees (FTE)				
Counterparty jur.	133	134	135	135
sum	2,206,393.0	1,969,733.0	2,475,998.0	2,345,742.0
mean	16,589.4	14,699.5	18,340.7	17,375.9
sd	37,561.8	36,866.0	42,073.0	39,722.4
q1	991.0	749.5	837.0	765.0
median	3,457.0	2,765.0	3,914.0	3,526.0
q3	16,985.0	14,626.0	17,396.0	16,776.5
max	303,601.0	330,522.0	336,749.0	303,765.0
Profits (USD)				
Counterparty jur.	134	134	135	135
sum	67,474,220,969.0	74,589,572,256.0	42,096,574,245.7	77,325,075,790.0
mean	503,538,962.5	556,638,598.9	311,826,475.9	572,778,339.2
sd	1,858,827,084.2	1,741,641,587.8	1,348,603,894.1	2,291,520,879.1
q1	8,577,056.2	8,311,009.5	-592,612.6	12,210,238.0
median	71,520,042.5	69,432,023.5	43,928,649.8	83,048,550.0
q3	493,378,541.5	430,500,812.5	231,285,732.6	536,315,628.0
max	19,614,658,236.0	16,795,690,714.0	12,269,427,741.0	13,563,295,251.0

Table A2: Descriptive statistics of key CbCR variables for the Swiss O-I sub-panel

	2018	2019	2020	2021
Sub-groups				
Reporting jur. in CHE	21	25	27	29
sum	938.0	1,599.0	1,702.0	1,073.0
mean	44.7	64.0	63.0	38.3
sd	58.1	131.5	129.9	58.4
q1	10.0	9.0	8.0	5.8
median	18.0	19.0	20.0	14.0
q3	43.0	42.0	41.5	37.5
max	230.0	634.0	642.0	262.0
Total Revenues (USD)				
Reporting jur. in CHE	22	25	27	29
sum	1,109,235,437,392.4	1,132,261,965,078.8	1,144,002,839,260.6	1,390,571,472,388.0
mean	50,419,792,608.7	45,290,478,603.2	42,370,475,528.2	47,950,740,427.2
sd	111,635,658,531.2	111,097,256,907.3	106,254,678,193.5	115,283,029,872.4
q1	3,467,656,156.8	620,119,858.0	1,836,124,867.0	1,883,309,275.0
median	9,148,271,042.0	5,912,489,757.0	5,745,257,465.0	7,999,372,556.0
q3	39,027,761,936.8	38,315,728,480.0	40,329,220,953.5	35,550,890,574.0
max	514,969,000,000.0	541,237,000,000.0	546,306,000,000.0	591,000,000,000.0
Tangible Assets (USD)				
Reporting jur. in CHE	22	25	27	29
sum	141,046,065,633.8	131,830,834,354.9	143,959,556,641.1	144,634,863,953.0
mean	6,411,184,801.5	5,273,233,374.2	5,331,835,431.2	4,987,409,101.8
sd	13,357,784,386.6	13,531,079,179.3	12,192,784,085.2	12,476,090,520.5
q1	233,377,582.0	125,886,000.0	239,471,762.5	224,948,536.0
median	875,300,194.5	665,735,663.0	1,028,388,352.0	985,939,818.0
q3	6,281,643,908.5	3,132,019,002.0	4,155,638,888.0	2,303,863,745.0
max	60,204,600,692.0	63,836,059,124.0	56,714,679,279.0	60,630,851,250.0
Employees (FTE)				
Reporting jur. in CHE	22	25	27	29
sum	296,388.0	290,842.0	311,703.1	436,076.0
mean	13,472.2	11,633.7	11,544.6	15,037.1
sd	24,514.6	23,594.7	24,334.9	28,393.3
q1	526.5	263.0	282.5	352.0
median	3,201.5	1,716.0	2,338.0	1,739.0
q3	10,284.0	9,996.0	8,021.0	10,679.0
max	80,647.0	82,532.0	91,952.1	91,390.0
Profits (USD)				
Reporting jur. in CHE	22	25	27	29
sum	88,487,502,256.2	91,630,821,262.9	154,049,697,945.3	69,249,720,239.0
mean	4,022,159,193.5	3,665,232,850.5	5,705,544,368.3	2,387,921,387.6
sd	12,009,775,928.7	12,008,870,772.6	25,158,567,157.3	8,057,440,754.1
q1	193,372,864.8	55,443,666.0	33,411,457.9	43,823,177.0
median	416,553,402.6	452,220,240.0	379,060,563.0	363,032,408.0
q3	2,021,970,324.8	1,655,259,160.0	1,320,728,031.5	898,430,485.0
max	56,516,897,142.0	60,226,786,239.0	131,396,000,000.0	42,696,048,414.0

Table A3: Average Swiss MNE sub-groups by counterparty jurisdiction

	ISO	Avg. sub-groups		ISO	Avg. sub-groups		ISO	Avg. sub-groups
1	W XD	4,802.8	61	MAR	28.5	121	ALB	8.5
2	CHE	148.2	62	SAU	27.2	122	AGO	8.0
3	DEU	127.5	63	KEN	27.0	123	KWT	7.8
4	FRA	113.8	64	NGA	26.2	124	ZWE	7.5
5	GBR	113.5	65	EGY	26.0	125	E_O	7.2
6	USA	110.5	66	LIE	25.5	126	MDA	7.0
7	ITA	109.5	67	KAZ	25.0	127	BRB	6.8
8	ESP	100.8	68	A_O	24.8	128	GIB	6.8
9	NLD	97.8	69	VEN	24.8	129	BFA	6.5
10	CHN	94.2	70	LTU	22.8	130	IRQ	6.5
11	AUT	92.5	71	BMU	22.0	131	COD	5.8
12	SGP	92.5	72	MUS	22.0	132	MLI	5.8
13	POL	81.8	73	TUN	22.0	133	MNE	5.8
14	BRA	81.2	74	CRI	21.5	134	CUW	5.7
15	BEL	80.0	75	EST	20.2	135	UZB	5.5
16	IND	79.8	76	LVA	19.8	136	BRN	5.2
17	HKG	78.2	77	PAK	19.8	137	GAB	5.2
18	CAN	77.0	78	CYM	19.0	138	JAM	5.2
19	CZE	77.0	79	JEY	18.5	139	BWA	4.8
20	AUS	76.2	80	QAT	17.5	140	MDG	4.8
21	MEX	75.2	81	GHA	17.2	141	RWA	4.8
22	RUS	74.2	82	CIV	17.0	142	ISL	4.7
23	JPN	73.5	83	GTM	16.8	143	LBY	4.5
24	SWE	69.5	84	VGB	16.8	144	PNG	4.5
25	TUR	65.2	85	CYP	15.8	145	IMN	4.0
26	HUN	64.2	86	TZA	15.8	146	LAO	4.0
27	MYS	62.8	87	BOL	15.5	147	MWI	4.0
28	ROU	61.8	88	BHR	15.2	148	NCL	4.0
29	LUX	61.5	89	MMR	14.8	149	ARM	3.5
30	ARE	61.2	90	DOM	14.5	150	COG	3.5
31	DNK	61.0	91	DZA	14.5	151	ETH	3.5
32	THA	58.5	92	BIH	14.2	152	GNQ	3.5
33	ZAF	55.5	93	MAC	14.2	153	LBR	3.5
34	ARG	55.2	94	MOZ	14.2	154	TGO	3.2
35	PRT	55.0	95	PRI	14.2	155	AFG	3.0
36	SVK	55.0	96	SLV	14.2	156	BEN	3.0
37	KOR	54.8	97	GGY	14.0	157	GIN	3.0
38	NOR	54.2	98	BLR	13.8	158	KGZ	3.0
39	FIN	53.8	99	MLT	12.8	159	MHL	3.0
40	TWN	53.0	100	LBN	12.2	160	MNG	3.0
41	CHL	50.5	101	BGD	12.0	161	NPL	3.0
42	IRL	48.5	102	CMR	12.0	162	SLE	3.0
43	IDN	46.5	103	IRN	11.8	163	SYC	3.0
44	COL	45.5	104	KHM	11.8	164	TCO	3.0
45	NZL	42.8	105	LKA	11.8	165	MRT	2.5
46	UKR	42.8	106	MKD	11.8	166	TKM	2.5
47	GRC	39.0	107	GEO	11.5	167	GMB	2.0
48	PHL	38.0	108	HND	11.5	168	LSO	1.0
49	VNM	38.0	109	BHS	11.0	169	NER	1.0
50	F_O	35.2	110	ZMB	11.0	170	SDN	1.0
51	HRV	34.2	111	AZE	10.8	171	SWZ	1.0
52	PAN	34.2	112	SEN	10.8			
53	PER	34.2	113	UGA	10.5			
54	S_O	32.5	114	JOR	10.2			
55	SRB	31.5	115	NIC	9.2			
56	SVN	31.5	116	OMN	9.2			
57	URY	31.0	117	PRY	9.2			
58	ISR	30.5	118	TTO	9.2			
59	ECU	30.2	119	NAM	9.0			
60	BGR	29.0	120	MCO	8.8			

Table A4: Average Total Revenues of Swiss MNE affiliates by counterparty jurisdiction

	ISO	Avg. Tot. Revenues (USD)		ISO	Avg. Tot. Revenues (USD)		ISO	Avg. Tot. Revenues (USD)
1	WXd	1,281,217,500,000.0	61	ECU	1,992,804,950.5	121	ISL	128,166,019.7
2	CHE	590,477,250,000.0	62	TTO	1,899,877,857.0	122	ZWE	111,079,868.1
3	USA	306,896,000,000.0	63	SRB	1,784,126,514.2	123	AZE	108,890,990.4
4	DEU	124,060,000,000.0	64	NZL	1,746,121,309.2	124	MDA	107,925,107.0
5	GBR	121,898,945,505.5	65	CIV	1,628,073,642.5	125	VEN	102,478,954.8
6	FRA	60,545,477,030.0	66	KEN	1,613,867,198.8	126	VGB	95,992,379.8
7	CHN	59,302,486,150.5	67	BGR	1,513,265,141.5	127	PRY	90,517,469.0
8	SGP	54,255,362,189.2	68	HRV	1,492,334,232.0	128	JAM	84,750,964.3
9	ITA	35,871,845,023.8	69	PAN	1,258,041,953.8	129	MOZ	81,565,204.7
10	AUS	33,605,880,324.2	70	LIE	1,142,630,478.5	130	GIB	77,974,376.2
11	JPN	28,105,066,295.0	71	URY	1,064,635,262.1	131	BWA	73,949,746.6
12	CAN	23,519,131,170.8	72	GHA	955,086,123.5	132	GEO	70,104,250.2
13	ESP	22,981,931,282.0	73	CYM	930,610,601.8	133	MKD	66,492,317.1
14	BRA	20,570,008,149.8	74	DZA	928,840,398.4	134	MDG	54,775,459.0
15	NLD	19,715,708,102.5	75	MAR	860,701,664.8	135	GAB	44,824,749.5
16	RUS	16,880,634,001.0	76	JEY	810,946,801.5	136	ALB	38,056,862.3
17	AUT	16,084,704,559.5	77	E_O	747,400,787.8	137	MNE	33,782,491.1
18	HKG	15,815,531,384.0	78	CRI	720,249,303.5	138	MLI	28,212,137.4
19	IND	15,525,219,219.5	79	LTU	708,292,717.8	139	UZB	27,394,617.5
20	MEX	15,164,534,460.0	80	PRI	692,633,940.1	140	TGO	26,565,684.0
21	BEL	15,083,384,469.5	81	GTM	637,371,066.4	141	NAM	19,069,074.4
22	UKR	13,014,474,137.8	82	S_O	630,879,141.9	142	BRN	11,747,887.6
23	POL	12,534,847,005.2	83	BHS	630,238,040.5	143	RWA	10,145,115.5
24	BMU	12,279,251,207.0	84	ZMB	613,266,555.2	144	LBY	9,912,639.0
25	ZAF	12,044,406,287.8	85	MAC	565,533,516.7	145	CUW	4,216,915.5
26	LUX	11,505,107,066.8	86	MCO	541,075,860.1			
27	SWE	10,328,616,928.0	87	BGD	539,462,691.5			
28	IRL	9,832,098,777.5	88	QAT	513,506,688.8			
29	ARE	9,612,257,640.0	89	UGA	491,610,232.4			
30	CYP	9,340,479,596.0	90	MLT	469,077,908.3			
31	CHL	8,794,223,146.0	91	JOR	457,462,890.1			
32	THA	8,356,090,722.8	92	LVA	449,399,480.4			
33	PHL	6,670,465,867.0	93	SLV	440,908,496.0			
34	CZE	6,653,460,356.2	94	BOL	438,070,590.2			
35	KOR	6,499,975,078.0	95	DOM	427,137,433.1			
36	MYS	6,395,701,009.8	96	BRB	414,674,819.5			
37	TWN	5,851,705,701.5	97	EST	387,601,301.2			
38	PER	5,739,714,383.8	98	KWT	375,840,011.5			
39	TUR	5,350,001,467.5	99	IRQ	366,904,054.3			
40	FIN	5,161,580,579.5	100	NIC	338,870,945.6			
41	ROU	5,141,285,945.8	101	LBN	332,662,500.3			
42	HUN	4,828,402,854.0	102	TZA	323,197,695.7			
43	NOR	4,702,992,717.2	103	CMR	318,401,230.5			
44	ARG	4,604,014,606.0	104	TUN	315,930,993.3			
45	DNK	4,578,626,801.8	105	KHM	313,213,831.6			
46	IDN	4,147,939,639.2	106	AGO	275,665,282.9			
47	COL	4,034,469,654.8	107	LKA	272,838,216.0			
48	PAK	3,576,669,927.8	108	A_O	268,853,556.2			
49	KAZ	3,411,456,790.0	109	BLR	250,675,155.1			
50	COD	3,245,005,400.5	110	MMR	248,363,189.2			
51	GRC	3,003,425,757.5	111	BFA	244,995,509.8			
52	PRT	2,917,088,932.5	112	OMN	233,933,558.9			
53	SAU	2,768,207,716.2	113	MUS	226,822,200.0			
54	ISR	2,606,096,207.2	114	BHR	211,411,623.0			
55	VNM	2,569,213,864.0	115	F_O	203,245,870.3			
56	SVK	2,499,857,965.8	116	HND	194,893,022.3			
57	NGA	2,322,005,249.0	117	IRN	178,929,796.8			
58	SVN	2,254,932,947.5	118	SEN	176,646,561.8			
59	EGY	2,203,002,953.8	119	BIH	150,198,480.0			
60	GGY	2,158,316,391.0	120	PNG	141,546,384.0			

Table A5: Average Tangible Assets of Swiss MNE affiliates by counterparty jurisdiction

	ISO	Avg. Tang. Assets (USD)		ISO	Avg. Tang. Assets (USD)		ISO	Avg. Tang. Assets (USD)
1	WXD	467,835,250,000.0	61	PRT	983,676,401.0	121	KHM	55,948,664.4
2	CHE	283,042,250,000.0	62	ECU	942,231,879.8	122	E_O	53,283,142.4
3	USA	78,281,274,972.5	63	CIV	898,899,515.5	123	BHR	53,202,447.4
4	DEU	42,935,125,673.8	64	VNM	893,805,377.0	124	BIH	45,495,883.6
5	GBR	24,684,111,817.8	65	ISR	801,617,433.9	125	HND	40,127,089.5
6	AUS	24,254,316,236.5	66	MCO	774,075,986.2	126	ZWE	35,752,663.6
7	FRA	22,963,700,980.5	67	SRB	639,460,918.2	127	MLI	24,945,549.5
8	CHN	21,656,538,561.2	68	SVK	598,566,051.5	128	MDG	22,247,012.7
9	ITA	14,286,464,065.8	69	BGR	591,834,805.5	129	UZB	18,891,017.5
10	CAN	12,344,163,545.2	70	NZL	588,630,299.5	130	MKD	17,639,488.7
11	IND	12,161,645,358.5	71	LIE	575,220,619.8	131	PRY	16,139,768.2
12	UKR	11,583,037,522.5	72	MUS	573,873,424.8	132	JAM	14,668,131.9
13	NLD	10,054,601,377.5	73	HRV	517,285,733.0	133	ISL	13,842,065.0
14	RUS	8,458,336,233.0	74	MAR	472,439,236.7	134	RWA	13,566,995.6
15	JPN	8,290,361,549.0	75	IRQ	468,479,896.2	135	ALB	11,942,097.7
16	SGP	7,648,758,439.2	76	BGD	461,908,535.7	136	GAB	9,722,589.9
17	BEL	7,608,476,708.0	77	S_O	441,927,538.2	137	NAM	9,203,677.3
18	COD	7,520,066,981.0	78	TZA	385,364,517.5	138	BWA	7,584,326.2
19	ESP	7,517,224,125.0	79	F_O	384,295,783.4	139	BRN	6,977,646.1
20	LUX	7,433,320,668.5	80	PAN	383,540,979.6	140	GEO	6,519,154.2
21	CYM	7,223,170,907.0	81	BHS	370,694,407.2	141	TGO	4,820,486.0
22	AUT	7,147,417,589.2	82	JOR	369,331,209.7	142	CUW	4,611,838.6
23	BRA	6,593,596,558.2	83	CYP	338,861,202.5	143	LBY	4,609,015.0
24	PER	6,585,229,410.0	84	PRI	313,066,401.8	144	MNE	1,981,667.9
25	ZAF	6,536,535,406.2	85	BOL	296,838,670.8	145	GIB	1,211,699.8
26	ARE	5,323,961,669.0	86	CRI	254,360,994.3			
27	MEX	5,295,489,810.2	87	GHA	244,362,979.4			
28	POL	5,097,615,291.5	88	CMR	229,035,780.0			
29	KAZ	4,427,898,824.0	89	LTU	222,971,190.5			
30	SWE	4,153,636,219.0	90	MAC	203,470,142.5			
31	HKG	3,733,050,411.0	91	URY	198,008,799.5			
32	PHL	3,379,903,076.0	92	QAT	192,496,973.2			
33	HUN	3,215,661,829.8	93	SLV	184,587,607.2			
34	NOR	3,179,065,186.0	94	VEN	170,677,130.0			
35	CHL	2,908,066,473.8	95	AGO	170,660,718.8			
36	ROU	2,701,541,302.8	96	AZE	160,948,876.0			
37	CZE	2,480,574,200.0	97	JEY	160,726,570.4			
38	NGA	2,159,753,837.5	98	KWT	157,183,260.2			
39	TTO	2,075,901,091.5	99	LVA	138,549,293.1			
40	IRL	2,062,726,856.2	100	EST	136,789,394.8			
41	FIN	1,963,239,154.0	101	A_O	136,425,867.8			
42	THA	1,899,038,387.0	102	GTM	131,686,245.9			
43	GGY	1,842,288,549.5	103	IRN	125,213,180.3			
44	COL	1,836,160,634.8	104	VGB	125,068,814.8			
45	MYS	1,682,093,817.5	105	DOM	124,610,117.1			
46	KOR	1,665,235,366.5	106	NIC	121,058,773.0			
47	IDN	1,647,361,197.8	107	LKA	109,847,671.5			
48	KEN	1,584,835,663.8	108	BLR	102,505,550.3			
49	DNK	1,569,801,276.2	109	LBN	101,606,424.8			
50	DZA	1,547,261,482.0	110	BMU	90,427,849.0			
51	TUR	1,454,086,692.8	111	BFA	89,093,634.7			
52	ARG	1,437,885,210.2	112	TUN	77,508,974.9			
53	TWN	1,433,797,114.8	113	MDA	75,678,276.5			
54	UGA	1,433,155,604.5	114	SEN	75,490,836.4			
55	PAK	1,398,392,039.8	115	MOZ	74,617,210.8			
56	SAU	1,332,547,999.0	116	OMN	73,288,105.2			
57	ZMB	1,209,020,857.5	117	MMR	62,351,376.1			
58	SVN	1,171,178,429.0	118	MLT	58,485,192.6			
59	GRC	1,055,711,204.8	119	PNG	58,175,370.0			
60	EGY	1,038,395,287.5	120	BRB	57,371,575.2			

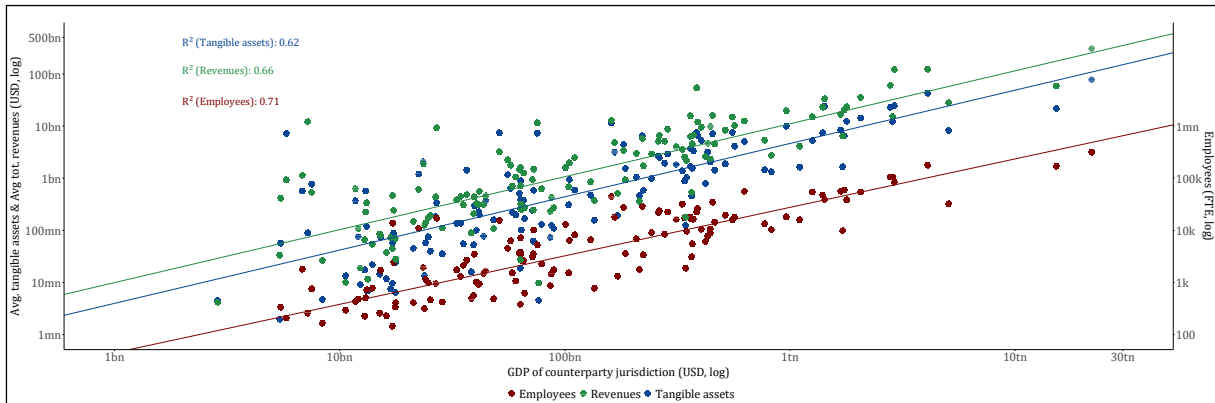
Table A6: Average Employees (FTE) of Swiss MNE affiliates by counterparty jurisdiction

	ISO	Avg. Employees (FTE)		ISO	Avg. Employees (FTE)		ISO	Avg. Employees (FTE)
1	W XD	2,399,241.5	61	ECU	6,485.0	121	ZWE	424.0
2	CHE	495,041.2	62	SRB	6,320.8	122	BIH	415.2
3	USA	318,659.2	63	ISR	6,173.8	123	MLI	413.8
4	DEU	179,148.8	64	DNK	5,597.2	124	UZB	387.5
5	CHN	171,710.2	65	LUX	5,367.0	125	GEO	345.2
6	IND	106,673.5	66	S_O	5,237.2	126	BRB	339.8
7	FRA	106,213.0	67	SVN	4,535.8	127	ISL	322.0
8	GBR	84,097.0	68	CRI	3,812.2	128	RWA	298.0
9	BRA	59,562.2	69	HRV	3,725.8	129	JEY	291.8
10	RUS	56,525.0	70	DZA	3,642.5	130	GGY	277.0
11	POL	56,243.8	71	TZA	3,595.5	131	JAM	262.8
12	MEX	55,124.2	72	MMR	3,551.8	132	BMU	261.5
13	ITA	54,999.0	73	BOL	3,521.5	133	ALB	233.2
14	ESP	47,198.0	74	NZL	3,430.5	134	MKD	230.2
15	UKR	44,538.0	75	BGD	3,122.8	135	CYM	209.0
16	AUS	39,022.2	76	GHA	3,120.8	136	TGO	167.0
17	CAN	38,706.0	77	VEN	2,831.2	137	GAB	146.2
18	AUT	34,883.2	78	UGA	2,714.5	138	VGB	146.0
19	JPN	32,765.8	79	BLR	2,661.2	139	BRN	88.0
20	PAK	31,904.2	80	PAN	2,640.2	140	MNE	65.8
21	PER	28,919.2	81	BFA	2,451.5	141	NAM	57.5
22	KAZ	27,982.2	82	GTM	2,291.5	142	CUW	44.3
23	ZAF	26,524.8	83	KHM	2,154.5	143	BWA	39.3
24	CZE	24,076.0	84	TTO	1,956.8	144	LBY	24.0
25	SGP	22,847.0	85	IRN	1,880.8	145	GIB	7.5
26	CHL	22,710.5	86	LIE	1,822.2			
27	ROU	21,897.2	87	IRQ	1,789.8			
28	THA	19,572.5	88	EST	1,765.5			
29	NLD	18,379.8	89	LKA	1,759.0			
30	SWE	18,071.0	90	MOZ	1,727.8			
31	MYS	17,955.5	91	JOR	1,687.2			
32	HUN	17,928.8	92	LTU	1,555.0			
33	VNM	17,450.8	93	PRI	1,550.5			
34	CYP	17,124.2	94	TUN	1,508.2			
35	HKG	16,982.2	95	DOM	1,482.0			
36	PHL	16,495.8	96	QAT	1,343.8			
37	COL	16,301.0	97	LVA	1,323.2			
38	IDN	16,127.0	98	PNG	1,162.0			
39	TWN	16,083.5	99	URY	1,078.5			
40	BEL	16,000.2	100	LBN	1,032.2			
41	COD	15,513.8	101	SEN	1,006.8			
42	ARG	14,493.5	102	SLV	964.2			
43	MLT	13,818.0	103	MAC	955.2			
44	TUR	13,446.5	104	CMR	921.5			
45	KEN	13,176.5	105	OMN	880.2			
46	ZMB	11,021.2	106	KWT	789.0			
47	NGA	10,673.0	107	MDG	782.7			
48	ARE	10,497.5	108	F_O	765.5			
49	SAU	10,367.2	109	MCO	761.0			
50	BGR	10,257.0	110	NIC	729.0			
51	KOR	9,964.2	111	AGO	632.8			
52	EGY	9,667.2	112	BHR	573.2			
53	PRT	9,109.8	113	A_O	572.2			
54	IRL	8,938.5	114	E_O	566.0			
55	FIN	8,485.8	115	MUS	515.8			
56	SVK	8,276.5	116	PRY	497.2			
57	NOR	7,763.8	117	AZE	491.5			
58	CIV	7,225.0	118	MDA	487.2			
59	GRC	6,950.8	119	HND	473.2			
60	MAR	6,628.5	120	BHS	431.8			

Table A7: Average Related- to Total Revenues of Swiss MNE affiliates by counterparty jurisdiction

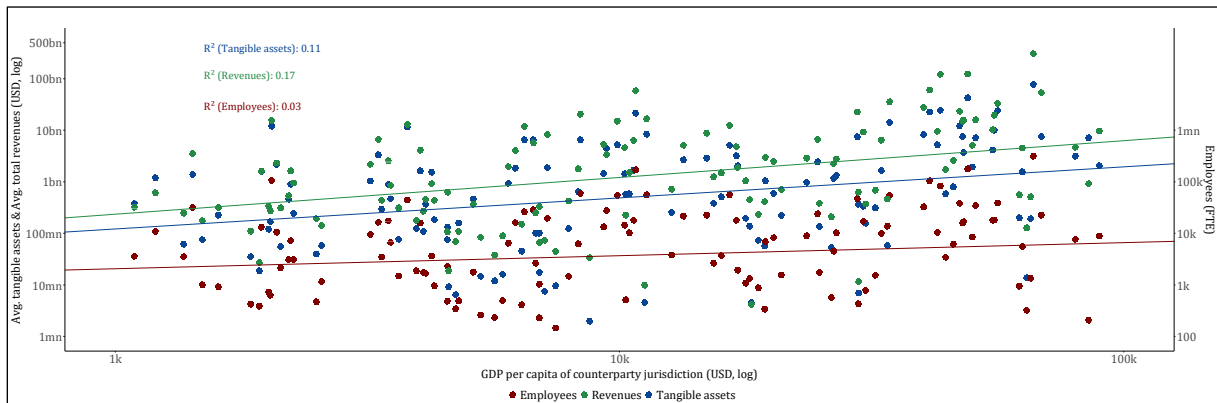
	ISO	Related (USD)	Share		ISO	Related (USD)	Share		ISO	Related (USD)	Share
1	CYP	9,182,689,991.0	98.3%	61	ECU	476,939,099.8	23.9%	121	PAK	218,036,099.7	6.1%
2	MLT	397,589,204.5	84.8%	62	CHN	13,596,482,198.5	22.9%	122	TTO	105,909,186.8	5.6%
3	BRB	323,725,738.7	78.1%	63	EGY	504,933,199.9	22.9%	123	DOM	20,799,419.1	4.9%
4	CYM	664,063,462.5	71.4%	64	HRV	338,470,365.6	22.7%	124	VEN	4,556,017.9	4.4%
5	BMU	8,537,492,536.2	69.5%	65	CAN	5,327,840,887.8	22.7%	125	TUN	13,435,696.3	4.3%
6	URY	718,625,909.6	67.5%	66	FRA	13,182,658,089.0	21.8%	126	KOR	271,886,990.1	4.2%
7	ZMB	408,863,904.2	66.7%	67	GHA	207,238,868.1	21.7%	127	KWT	11,921,710.8	3.2%
8	GIB	51,222,206.0	65.7%	68	E_O	160,516,287.6	21.5%	128	MDG	1,723,788.5	3.1%
9	VGB	60,963,811.4	63.5%	69	NOR	1,010,035,921.8	21.5%	129	GAB	1,289,271.1	2.9%
10	PER	3,584,325,817.8	62.4%	70	BEL	3,137,878,477.8	20.8%	130	MMR	6,989,967.0	2.8%
11	GGY	1,240,985,263.6	57.5%	71	LUX	2,386,374,705.0	20.7%	131	MDA	2,963,524.1	2.7%
12	F_O	113,018,726.6	55.6%	72	CRI	149,338,148.0	20.7%	132	IRQ	9,739,944.6	2.7%
13	PRI	384,315,074.9	55.5%	73	ZAF	2,461,571,534.0	20.4%	133	BFA	6,232,768.0	2.5%
14	BOL	235,697,509.5	53.8%	74	TZA	64,529,947.3	20.0%	134	LBY	231,024.0	2.3%
15	CIV	842,187,972.8	51.7%	75	MYS	1,276,365,854.8	20.0%	135	MAC	11,868,298.7	2.1%
16	SVN	1,137,630,780.5	50.5%	76	PRT	581,278,214.8	19.9%	136	MLI	518,919.3	1.8%
17	RWA	4,930,196.5	48.6%	77	MCO	101,604,583.8	18.8%	137	ZWE	1,782,837.8	1.6%
18	JEY	391,553,478.6	48.3%	78	USA	56,942,678,218.2	18.6%	138	AZE	1,687,741.3	1.5%
19	SWE	4,939,623,999.2	47.8%	79	GBR	22,430,040,776.0	18.4%	139	MNE	387,642.0	1.1%
20	KAZ	1,554,073,266.5	45.6%	80	TUR	973,761,628.0	18.2%	140	JAM	483,789.5	0.6%
21	SVK	1,116,633,470.5	44.7%	81	IND	2,825,582,098.8	18.2%	141	BWA	308,343.7	0.4%
22	CHE	257,884,250,000.0	43.7%	82	ITA	6,507,722,651.2	18.1%				
23	EST	167,874,913.0	43.3%	83	LTU	125,579,499.7	17.7%				
24	NIC	146,158,035.8	43.1%	84	ESP	3,819,084,885.0	16.6%				
25	FIN	2,136,790,786.5	41.4%	85	BIH	24,187,500.8	16.1%				
26	BGR	625,823,501.5	41.4%	86	COL	642,960,762.0	15.9%				
27	CMR	130,513,300.0	41.0%	87	S_O	98,689,944.4	15.6%				
28	BHS	246,906,072.4	39.2%	88	UGA	73,718,988.4	15.0%				
29	AUT	6,278,573,497.0	39.0%	89	TGO	3,887,133.0	14.6%				
30	UKR	4,936,936,379.8	37.9%	90	RUS	2,397,333,271.2	14.2%				
31	CZE	2,433,228,941.2	36.6%	91	IDN	576,240,881.0	13.9%				
32	HUN	1,744,448,503.5	36.1%	92	GEO	9,706,019.6	13.8%				
33	BHR	74,752,517.0	35.4%	93	ISR	353,672,972.6	13.6%				
34	ARE	3,366,064,280.0	35.0%	94	ALB	5,160,859.7	13.6%				
35	IRL	3,383,645,848.8	34.4%	95	MUS	30,601,269.6	13.5%				
36	GTM	213,153,211.9	33.4%	96	MKD	8,967,666.3	13.5%				
37	AUS	11,094,379,535.2	33.0%	97	SAU	367,816,702.5	13.3%				
38	SRB	580,229,081.3	32.5%	98	SEN	22,522,760.8	12.8%				
39	POL	4,020,672,722.8	32.1%	99	MOZ	10,146,428.5	12.4%				
40	SGP	17,091,559,692.2	31.5%	100	GRC	371,080,251.9	12.4%				
41	HKG	4,860,236,392.8	30.7%	101	KEN	197,171,413.6	12.2%				
42	PAN	383,621,106.4	30.5%	102	IRN	21,031,296.1	11.8%				
43	DEU	37,633,684,283.0	30.3%	103	ARG	523,820,001.6	11.4%				
44	DNK	1,348,302,938.5	29.4%	104	QAT	55,499,958.1	10.8%				
45	PNG	40,790,223.0	28.8%	105	JOR	48,646,883.6	10.6%				
46	NLD	5,657,865,460.5	28.7%	106	LKA	28,803,214.7	10.6%				
47	NAM	5,406,817.4	28.4%	107	A_O	27,913,267.7	10.4%				
48	CHL	2,451,355,047.2	27.9%	108	AGO	27,700,984.5	10.0%				
49	HND	52,648,008.8	27.0%	109	DZA	89,888,677.0	9.7%				
50	BLR	67,136,385.9	26.8%	110	LBN	32,104,008.8	9.7%				
51	PHL	1,769,271,658.2	26.5%	111	SLV	39,689,401.9	9.0%				
52	LIE	301,742,763.1	26.4%	112	OMN	20,413,536.1	8.7%				
53	TWN	1,543,093,446.0	26.4%	113	BRA	1,794,838,678.0	8.7%				
54	ROU	1,351,471,949.0	26.3%	114	PRY	7,169,413.6	7.9%				
55	VNM	673,935,642.5	26.2%	115	KHM	24,690,680.6	7.9%				
56	JPN	6,914,757,483.5	24.6%	116	THA	629,939,199.9	7.5%				
57	WXD	315,134,000,000.0	24.6%	117	UZB	1,843,188.5	6.7%				
58	MEX	3,705,920,123.0	24.4%	118	BGD	34,821,112.5	6.5%				
59	LVA	109,221,595.8	24.3%	119	NGA	148,331,120.4	6.4%				
60	MAR	206,176,584.3	24.0%	120	BRN	726,773.6	6.2%				

Figure A1: Average economic activity indicators of Swiss MNEs to GDP of counterparty jurisdiction



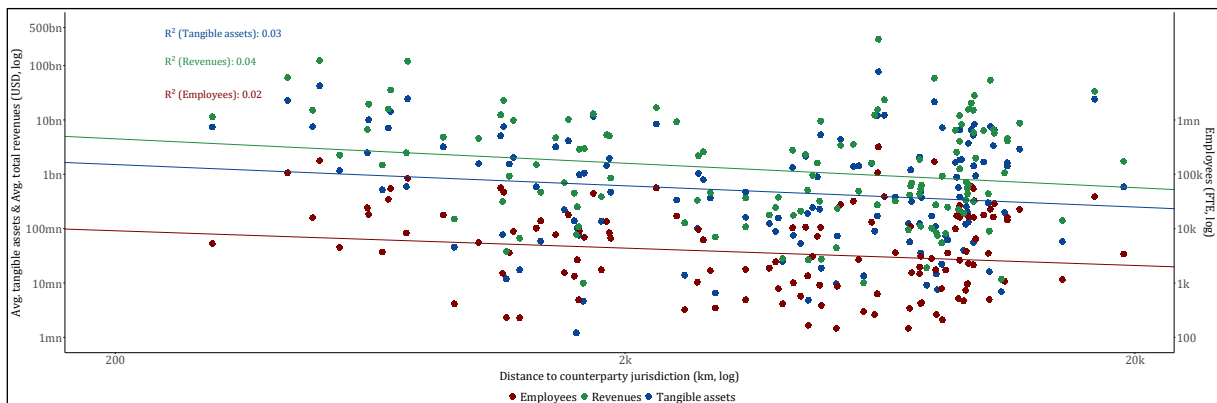
Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

Figure A2: Average economic activity indicators of Swiss MNEs to GDP per capita of counterparty jurisdiction



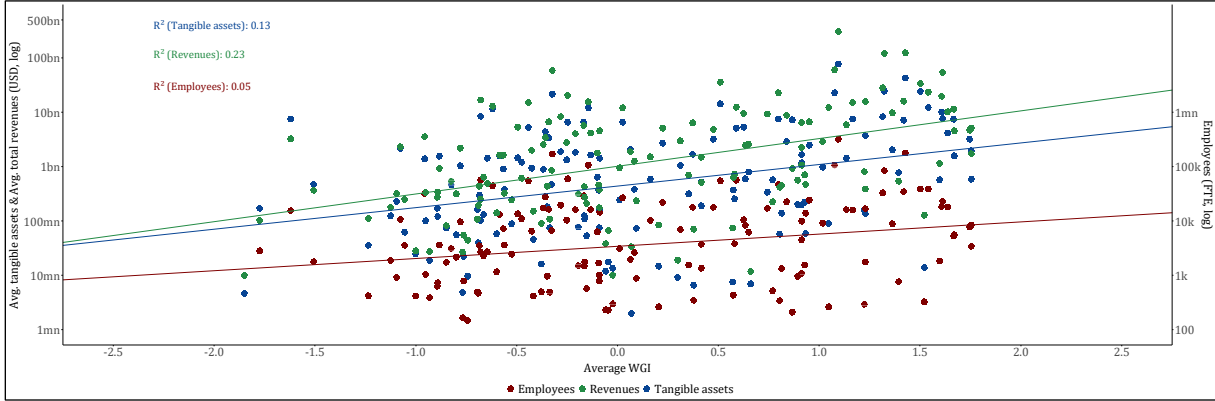
Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

Figure A3: Average economic activity indicators of Swiss MNEs to distance to counterparty jurisdiction



Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

Figure A4: Average economic activity indicators of Swiss MNEs to WGI to counterparty jurisdiction

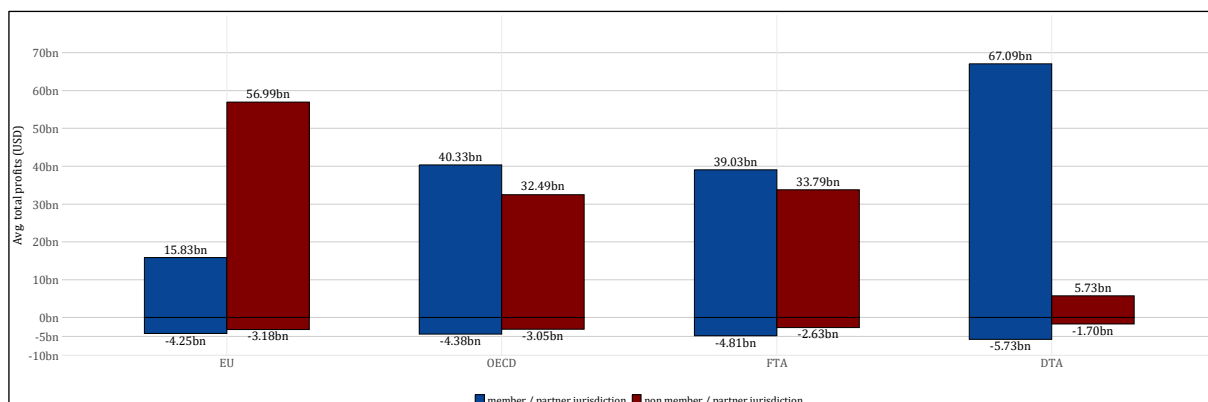


Note. Own depiction. Click [here](#) to view and download the enlarged graphic.

Table A8: Average profits of Swiss MNE affiliates by counterparty jurisdiction

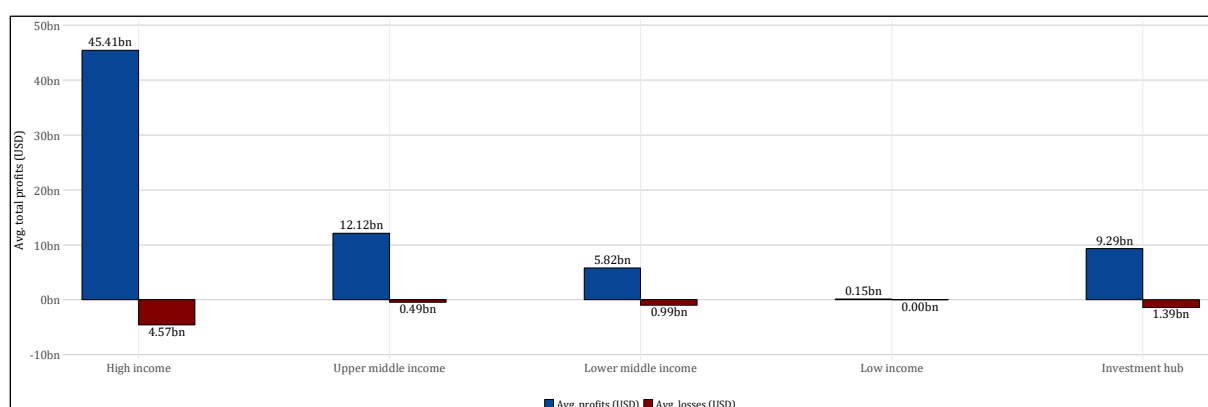
	ISO	Avg. Profits (USD)		ISO	Avg. Profits (USD)		ISO	Avg. Profits (USD)
1	WXD	63,456,344,033.2	61	MCO	115,615,058.5	121	MLI	403,007.9
2	USA	15,560,767,985.5	62	SLV	114,016,375.2	122	MLT	295,981.6
3	CHN	4,370,525,338.2	63	LIE	105,970,738.0	123	SEN	-246,776.4
4	BMU	3,896,254,173.8	64	BGR	105,023,993.0	124	NAM	-1,062,082.4
5	DEU	3,760,580,494.0	65	EGY	94,558,207.7	125	MMR	-1,092,328.3
6	JPN	3,456,422,571.5	66	UGA	87,981,027.0	126	RWA	-2,369,624.7
7	SGP	3,247,373,043.8	67	SVK	87,450,372.6	127	BOL	-4,087,412.4
8	AUS	2,664,826,689.2	68	BGD	82,070,972.7	128	ISL	-18,086,990.6
9	ARE	2,388,473,654.1	69	CRI	75,914,977.0	129	VEN	-28,853,895.6
10	HKG	2,358,379,951.0	70	S_O	74,577,918.3	130	AGO	-30,624,948.0
11	IND	1,857,014,346.0	71	HRV	62,600,529.4	131	IRQ	-35,924,157.1
12	ESP	1,841,422,825.8	72	DOM	54,663,061.9	132	MUS	-46,477,751.5
13	FRA	1,684,582,600.2	73	QAT	44,523,107.2	133	ZWE	-61,904,474.2
14	CYP	1,500,452,225.8	74	MAC	42,127,051.7	134	PER	-88,294,610.2
15	CAN	1,452,684,347.5	75	GHA	37,559,525.3	135	HUN	-93,662,465.2
16	RUS	1,315,005,285.1	76	GTM	37,509,320.4	136	NOR	-113,783,224.1
17	UKR	1,261,682,440.7	77	NIC	31,088,055.0	137	F_O	-200,303,938.6
18	BRA	1,184,762,773.9	78	BLR	30,707,439.5	138	COL	-331,311,771.6
19	ITA	1,118,228,410.0	79	COD	28,569,007.4	139	IRL	-510,917,983.6
20	MEX	1,093,111,344.0	80	GIB	25,526,060.6	140	GGY	-735,600,786.6
21	AUT	888,145,993.0	81	LTU	25,288,594.9	141	CYM	-786,255,175.9
22	BEL	784,958,336.6	82	LKA	25,245,097.0	142	ZMB	-894,893,732.5
23	PHL	784,026,009.4	83	BIH	22,398,179.9	143	E_O	-2,602,509,375.0
24	CHL	768,446,805.6	84	URY	21,923,488.6	144	GBR	-3,648,275,396.8
25	LUX	761,373,285.2	85	PNG	21,625,234.0			
26	KAZ	756,501,092.8	86	MAR	19,915,320.6			
27	KOR	668,012,841.8	87	HND	19,825,913.3			
28	SWE	584,981,226.2	88	BHR	19,422,637.0			
29	THA	561,077,858.0	89	KHM	18,735,198.0			
30	NLD	555,347,997.0	90	SAU	17,874,873.9			
31	TWN	553,068,198.8	91	CMR	17,426,978.4			
32	PAK	528,388,451.7	92	PRY	15,984,651.6			
33	ZAF	528,329,730.8	93	LVA	15,924,491.0			
34	POL	517,713,048.6	94	MDA	13,234,829.8			
35	MYS	477,315,522.3	95	TUN	13,022,830.8			
36	TUR	473,635,425.8	96	MOZ	12,960,445.4			
37	FIN	452,224,071.7	97	IRN	12,597,109.6			
38	IDN	363,439,180.3	98	GEO	11,882,999.2			
39	ROU	280,799,988.5	99	OMN	10,977,986.1			
40	BRB	258,185,348.3	100	A_O	10,779,312.2			
41	PAN	256,817,748.5	101	JAM	10,323,868.2			
42	ECU	251,061,214.7	102	KWT	9,971,053.5			
43	CZE	241,458,304.6	103	BFA	9,760,294.4			
44	NGA	238,266,441.5	104	AZE	8,865,955.4			
45	VNM	224,422,047.9	105	VGB	7,778,062.3			
46	JEY	212,410,500.2	106	EST	7,545,015.4			
47	BHS	210,664,659.6	107	CUW	7,429,226.2			
48	ISR	189,364,347.6	108	LBN	6,461,492.8			
49	KEN	169,271,627.6	109	ALB	6,414,519.6			
50	ARG	167,304,062.6	110	JOR	6,346,505.5			
51	SRB	163,973,402.1	111	TGO	5,679,193.0			
52	SVN	159,968,095.5	112	MKD	4,754,755.8			
53	PRI	157,500,075.2	113	MDG	3,543,182.3			
54	GRC	144,297,670.8	114	LBY	3,305,308.0			
55	DZA	139,307,678.2	115	GAB	2,606,321.7			
56	PRT	131,236,731.4	116	TZA	2,563,704.7			
57	CIV	128,840,206.2	117	BRN	1,606,895.6			
58	TTO	125,836,265.4	118	BWA	1,260,722.8			
59	NZL	121,969,482.6	119	MNE	1,035,360.7			
60	DNK	120,270,779.3	120	UZB	838,518.5			

Figure A5: Average profits of Swiss MNE affiliates grouped by selected international agreements



Note. Own depiction. This figure excludes domestic profits. Click [here](#) to view and download the enlarged graphic.

Figure A6: Average profits of Swiss MNE affiliates by income group



Note. Own depiction. This figure excludes domestic profits. Click [here](#) to view and download the enlarged graphic.

Table A9: Average CbCR-based economic indicators of MNE affiliates in Switzerland by reporting jurisdiction

Avg. CbCR Total Revenues (USD)			Avg. CbCR Tangible Assets (USD)			Avg. CbCR Employees (FTE)		
1	USA	548,378,000,000	1	USA	60,346,547,586	1	USA	85,273.0
2	LUX	150,786,250,000	2	DEU	29,385,205,750	2	DEU	82,637.0
3	FRA	124,301,045,943	3	FRA	10,537,948,120	3	FRA	54,742.2
4	DEU	106,292,347,500	4	CHN	6,221,524,392	4	ZAF	31,985.0
5	CHN	47,614,681,789	5	JPN	5,906,831,237	5	DNK	17,026.5
6	BRA	42,615,716,451	6	BRA	5,430,718,932	6	LUX	16,970.0
7	JPN	41,930,473,634	7	HKG	4,588,617,632	7	JPN	14,145.0
8	SGP	34,006,128,850	8	LUX	4,022,925,806	8	PER	10,458.0
9	BMU	28,708,749,207	9	SGP	3,534,070,692	9	ITA	10,221.8
10	AZE	23,145,279,794	10	BMU	2,813,580,678	10	CHN	4,516.2
11	ESP	14,382,394,867	11	AUS	2,383,561,498	11	AUS	3,406.2
12	ITA	12,232,784,228	12	BEL	1,779,566,667	12	ESP	3,326.2
13	DNK	9,348,343,127	13	ZAF	1,090,863,500	13	HKG	2,796.0
14	CYM	8,778,795,718	14	ITA	959,132,438	14	BMU	2,791.5
15	HKG	8,131,857,709	15	CYM	882,205,462	15	IND	2,297.8
16	NOR	7,512,961,000	16	DNK	749,413,832	16	CYM	1,949.2
17	AUS	5,299,636,306	17	ESP	686,463,932	17	BEL	1,900.0
18	PRT	3,887,328,003	18	AZE	605,323,577	18	IDN	1,645.3

Avg. CbCR Total Revenues (USD)			Avg. CbCR Tangible Assets (USD)			Avg. CbCR Employees (FTE)		
19	IND	3,209,154,707	19	IDN	443,868,917	19	ARE	1,581.0
20	ZAF	2,998,530,023	20	IND	360,679,539	20	AZE	717.0
21	BEL	2,822,200,000	21	PER	329,360,004	21	SGP	422.5
22	IDN	1,416,068,608	22	ARE	224,948,536	22	TUR	400.0
23	ARE	1,301,024,377	23	NOR	208,556,250	23	BRA	278.0
24	PER	1,294,003,983	24	TUR	191,995,322	24	ROU	274.8
25	TUR	892,492,187	25	SAU	92,068,560	25	SAU	267.2
26	SAU	838,628,467	26	ROU	70,479,258	26	NOR	215.0
27	ROU	519,348,734	27	PAN	36,974,267	27	MEX	189.5
28	MEX	437,558,531	28	PRT	6,288,606	28	PRT	71.3
29	PAN	330,982,655	29	MEX	2,247,592	29	PAN	34.7
30	BHR	1,384,485	30	BHR	41,264	30	BHR	6.0

Table A10: Average extrapolated bins of Total Revenues of MNE affiliates in Switzerland by reporting jurisdiction

	ISO	Revenue Bin (USD)	ISO	Revenue Bin (USD)	ISO	Revenue Bin (USD)		
1	AUT	50bn+	61	ARG	2bn-5bn	121	MHL	0-100mn
2	GBR	50bn+	62	CMR	2bn-5bn			
3	NLD	50bn+	63	CRI	2bn-5bn			
4	POL	50bn+	64	DOM	2bn-5bn			
5	CAN	20bn-50bn	65	GIN	2bn-5bn			
6	CZE	20bn-50bn	66	IRQ	2bn-5bn			
7	DZA	20bn-50bn	67	KAZ	2bn-5bn			
8	EGY	20bn-50bn	68	KHM	2bn-5bn			
9	HUN	20bn-50bn	69	KWT	2bn-5bn			
10	MAR	20bn-50bn	70	LBR	2bn-5bn			
11	NGA	20bn-50bn	71	LBY	2bn-5bn			
12	PAK	20bn-50bn	72	MDA	2bn-5bn			
13	RUS	20bn-50bn	73	MKD	2bn-5bn			
14	SWE	20bn-50bn	74	MOZ	2bn-5bn			
15	UKR	20bn-50bn	75	NPL	2bn-5bn			
16	BEN	10bn-20bn	76	NZL	2bn-5bn			
17	BFA	10bn-20bn	77	TGO	2bn-5bn			
18	BGD	10bn-20bn	78	TJK	2bn-5bn			
19	BGR	10bn-20bn	79	URY	2bn-5bn			
20	ETH	10bn-20bn	80	ZMB	2bn-5bn			
21	FIN	10bn-20bn	81	BOL	1bn-2bn			
22	GHA	10bn-20bn	82	BWA	1bn-2bn			
23	HRV	10bn-20bn	83	COG	1bn-2bn			
24	IRL	10bn-20bn	84	CPV	1bn-2bn			
25	IRN	10bn-20bn	85	CYP	1bn-2bn			
26	ISR	10bn-20bn	86	ECU	1bn-2bn			
27	KOR	10bn-20bn	87	GTM	1bn-2bn			
28	PHL	10bn-20bn	88	HND	1bn-2bn			
29	SVK	10bn-20bn	89	ISL	1bn-2bn			
30	SVN	10bn-20bn	90	JAM	1bn-2bn			
31	TUN	10bn-20bn	91	LAO	1bn-2bn			
32	VNM	10bn-20bn	92	LBN	1bn-2bn			
33	ALB	5bn-10bn	93	MLT	1bn-2bn			
34	BIH	5bn-10bn	94	MNG	1bn-2bn			
35	BLR	5bn-10bn	95	MUS	1bn-2bn			
36	CHL	5bn-10bn	96	NAM	1bn-2bn			
37	CIV	5bn-10bn	97	OMN	1bn-2bn			
38	COL	5bn-10bn	98	PNG	1bn-2bn			
39	EST	5bn-10bn	99	PRI	1bn-2bn			
40	GEO	5bn-10bn	100	PRY	1bn-2bn			
41	JOR	5bn-10bn	101	QAT	1bn-2bn			
42	KEN	5bn-10bn	102	SLV	1bn-2bn			
43	LKA	5bn-10bn	103	ZWE	1bn-2bn			
44	LTU	5bn-10bn	104	BHS	500mn-1bn			

	ISO	Revenue Bin (USD)		ISO	Revenue Bin (USD)		ISO	Revenue Bin (USD)
45	LVA	5bn-10bn	105	BRB	500mn-1bn			
46	MDG	5bn-10bn	106	BTN	500mn-1bn			
47	MLI	5bn-10bn	107	GAB	500mn-1bn			
48	MMR	5bn-10bn	108	LSO	500mn-1bn			
49	MWI	5bn-10bn	109	NIC	500mn-1bn			
50	MYS	5bn-10bn	110	BRN	200mn-500mn			
51	NER	5bn-10bn	111	FJI	200mn-500mn			
52	RWA	5bn-10bn	112	GRL	200mn-500mn			
53	SDN	5bn-10bn	113	LCA	200mn-500mn			
54	SEN	5bn-10bn	114	MAC	200mn-500mn			
55	THA	5bn-10bn	115	SLB	200mn-500mn			
56	TZA	5bn-10bn	116	SWZ	200mn-500mn			
57	UGA	5bn-10bn	117	TTO	200mn-500mn			
58	UZB	5bn-10bn	118	WSM	200mn-500mn			
59	AFG	2bn-5bn	119	ABW	100mn-200mn			
60	AGO	2bn-5bn	120	FSM	100mn-200mn			

Table A11: Average extrapolated bins of Tangible Assets and Employees (FTE) of MNE affiliates in Switzerland by reporting jurisdiction

	ISO	Tangible Assets (USD)		ISO	Employees (FTE)
1	GBR	20bn+	1	GBR	100000+
2	AUT	10bn-20bn	2	POL	50000-100000
3	BGR	10bn-20bn	3	AUT	20000-50000
4	CAN	10bn-20bn	4	CHL	20000-50000
5	MAR	10bn-20bn	5	IRL	20000-50000
6	POL	10bn-20bn	6	MAR	20000-50000
7	TUN	10bn-20bn	7	SWE	20000-50000
8	ARG	5bn-10bn	8	TUN	20000-50000
9	CHL	5bn-10bn	9	CAN	10000-20000
10	MYS	5bn-10bn	10	HUN	10000-20000
11	KOR	2bn-5bn	11	LTU	10000-20000
12	LTU	2bn-5bn	12	MYS	10000-20000
13	LVA	2bn-5bn	13	ARG	5000-10000
14	MAC	1bn-2bn	14	BGR	5000-10000
15	SWE	1bn-2bn	15	CZE	5000-10000
16	HUN	500mn-1bn	16	MAC	2000-5000
17	NZL	500mn-1bn	17	SVN	2000-5000
18	MUS	200mn-500mn	18	LVA	1000-2000
19	NLD	200mn-500mn	19	FIN	0-1000
20	IRL	100mn-200mn	20	KOR	0-1000
21	CZE	0-100mn	21	MUS	0-1000
22	FIN	0-100mn	22	NLD	0-1000
23	SVN	0-100mn	23	NZL	0-1000

Appendix B

CbCR Sample and Computation of ETR

The tax specification of this thesis is a backwards-looking¹²³, profit-weighted, and year-averaged jurisdictional ETR, following a blended computation of Garcia Bernardo & Janský (2024), Boukal (2024) and Hugger et al. (2023). Backward-looking, i.e., the realised ETRs are used as they reflect the closest estimates to the actual jurisdictional tax burden, given they are based on the actual Income Taxes Accrued¹²⁴ (Casella, 2022, p. 119; Boukal, 2024; Garcia Bernardo & Janský, 2024). Meanwhile, averaging the profit-weighted year-specific ETRs offers a representative estimate of the average tax burden over the considered time period.

The base sample used to compute the jurisdictional ETR estimates consists of the Income Taxes Accrued (*Income tax accrued - current year*) and Profits (*Profit (loss) before income tax*) observations from the 2017 – 2021 OECD CbCR vintages. The 2017 vintage is included to increase the number of observations. So-called “Stateless” entities are ignored, as they might facilitate double-counting of intracompany dividends, biasing ETRs downwards (Garcia Bernardo & Janský, 2024, pp. 6, 14). Non-explicit remainder jurisdictions are ignored as well, as their observations cannot be attributed to any specific jurisdiction. In contrast to the variables observed in the main section, only observations grouped by sub-groups reporting positive profits (Panel AI of Table I of the OECD CbCR dataset) were considered, as it allows for more accurate ETR estimates (Hugger et al, 2023, p. 53; Garcia Bernardo & Janský, 2024, p. 6). The resulting base panel, which can be directly specified and downloaded from OECD’s data explorer, contains 19,838 jurisdiction-pair year observations.

In the panel, domestic profit observations were ignored to mitigate the inclusion of double-counted intragroup dividends into the profit figures, as elaborated in Chapter 3.1.2, following Boukal (2024, p. 6). To minimise the impact of individual MNE sub-groups’ jurisdictional tax benefits distorting the ETR computation, only observations of reporting jurisdictions with at least three MNE sub-groups present in respective counterparty jurisdictions are considered¹²⁵. Although this reduces the base sample by around 18%, the between-year variation in ETR estimates can be significantly reduced compared to including jurisdictional observations represented by one or two sub-groups, i.e., only one or two MNEs being present in the respective

¹²³ Vs. Forward-looking rates, referring to „synthetic tax policy indicators calculated using information about specific tax policy rules to assess the impact of taxation on returns to a hypothetical investment project” (OECD, 2024b, pp. 34–47). The OECD publishes their estimations [here](#).

¹²⁴ See also Casella & Suillard (2022, pp. 108–109) for a discussion on tax rate specifications.

¹²⁵ Hugger et al. (2023, p. 16) use at least 20 subgroups as a threshold. However, this was found to reduce the sample size to an insufficient level for robust computations, given that this specification uses OECD CbCR macro data only.

counterparty jurisdiction¹²⁶. Meanwhile, loss carry-forward adjustments between years are ignored for simplicity. The resulting sample consists of 16,168 country-year observations, which contains income tax and profit data of 56 reporting jurisdictions in 177 explicit counterparty jurisdictions.

Conceptually, the ETR of country_j (counterparty jurisdiction) is estimated by considering the profit-weighted ratios of Income Tax Accrued to Profits paid by MNEs headquartered across countries_i (reporting jurisdictions) in year_t. Accordingly, the ratio of Income Tax Accrued over Profits recorded by MNEs headquartered in country_i in counterparty country_j in year_t (referred to as the bilateral ETR) serves as the base computation for the jurisdictional ETR of country_j:

$$\text{Bilateral ETR}_{i,j,t} = \frac{\text{Tax Accrued}_{i,j,t}}{\text{Profits}_{i,j,t}} \quad 9)$$

Though Taxes Accrued are intended to take on positive value only, some values are reported as negative, resulting in negative bilateral ETRs. These are ignored, i.e., the bilateral ETRs must be strictly positive. Also, the highest 5% bilateral ETRs are categorised as outliers and were removed, similar to Hugger et al. (2023)¹²⁷. The remaining bilateral ETR observations are summed up across reporting countries_i in country_j in year_t and averaged by the profits π recorded of the respective country_i in country_j, resulting in the profit-weighted average ETR of counterparty country_j in year_t:

$$\text{Profit weighted ETR}_{j,t} = \frac{\sum_{i=1}^I \text{Bilateral ETR}_{i,j,t} \times \pi_{i,j,t}}{\sum_{i=1}^I \pi_{i,j,t}} \quad 10)$$

The yearly average ETRs of counterparty country_j were subsequently averaged over the 2017 – 2021 vintages considered to arrive at the year-averaged specification used in this thesis:

$$\text{Average profit weighted ETR}_j = \frac{1}{T} \sum_{t=2017}^{2021} \text{Profit weighted ETR}_{j,t} \quad 11)$$

Table B1 presents the year-averaged ETRs.

¹²⁶ The author happily forwards the visualisations of the different sub-group ETR specifications via email [here](#).

¹²⁷ Hugger et al. (2023) employed winsorisation at the 5th and 95th percentiles as a general approach.

Table B1: Effective Tax Rate (ETR) per jurisdiction

ISO	Eff. Tax Rate (%)	ISO	Eff. Tax Rate (%)	ISO	Eff. Tax Rate (%)
1 ABW	24.2	61 GIN	9.1	121 NGA	16.7
2 AFG	38.4	62 GRC	21.0	122 NIC	29.1
3 AGO	25.9	63 GRL	10.8	123 NLD	5.5
4 ALB	12.1	64 GTM	20.4	124 NLD	5.5
5 ARE	7.0	65 GUM	4.9	125 NLD	5.5
6 ARG	27.2	66 HKG	6.9	126 NOR	28.6
7 AUS	18.2	67 HND	21.5	127 NPL	26.6
8 AUT	9.3	68 HRV	17.4	128 NZL	24.6
9 AZE	15.2	69 HUN	9.6	129 OMN	20.8
10 BEL	16.1	70 IDN	22.8	130 PAK	24.6
11 BEN	2.3	71 IMN	3.9	131 PAN	8.6
12 BFA	10.2	72 IND	29.1	132 PER	24.7
13 BGD	28.0	73 IRL	10.0	133 PHL	17.3
14 BGR	8.0	74 IRN	9.8	134 PNG	11.2
15 BHR	2.9	75 IRQ	29.7	135 POL	18.5
16 BHS	0.0	76 ISL	17.4	136 PRI	7.0
17 BIH	10.2	77 ISR	15.5	137 PRK	22.7
18 BLR	18.0	78 ITA	23.0	138 PRT	18.0
19 BMU	1.2	79 JAM	18.8	139 PRY	6.4
20 BOL	13.1	80 JEY	1.6	140 QAT	15.2
21 BRA	24.4	81 JOR	9.8	141 ROU	14.6
22 BRB	2.4	82 JPN	24.8	142 RUS	20.7
23 BRN	7.0	83 KAZ	20.4	143 RWA	16.3
24 BTN	22.0	84 KEN	30.1	144 SAU	16.0
25 BWA	19.4	85 KHM	13.0	145 SDN	15.3
26 CAN	17.4	86 KOR	22.4	146 SEN	19.0
27 CHE	6.6	87 KWT	6.4	147 SGP	6.4
28 CHL	14.7	88 LAO	13.1	148 SLB	14.6
29 CHN	20.5	89 LBN	21.4	149 SLV	26.6
30 CIV	22.6	90 LBR	0.1	150 SRB	9.6
31 CMR	27.4	91 LBY	1.6	151 SVK	21.2
32 COD	28.4	92 LCA	17.2	152 SVN	14.1
33 COG	3.2	93 LIE	3.7	153 SWE	9.3
34 COL	24.8	94 LKA	14.2	154 SWZ	23.7
35 CPV	11.6	95 LSO	25.6	155 TGO	11.0
36 CRI	15.4	96 LTU	12.1	156 THA	17.3
37 CUW	2.8	97 LUX	3.8	157 TJK	16.0
38 CYM	0.9	98 LVA	8.1	158 TLS	10.4
39 CYP	3.6	99 MAC	19.9	159 TTO	28.8
40 CZE	15.9	100 MAR	22.3	160 TUN	14.8
41 DEU	19.2	101 MCO	12.0	161 TUR	19.4
42 DNK	14.8	102 MDA	13.9	162 TWN	14.3
43 DOM	18.0	103 MDG	16.7	163 TZA	29.0
44 DZA	18.7	104 MEX	26.3	164 UGA	20.2
45 ECU	27.5	105 MHL	11.3	165 UKR	19.0
46 EGY	24.6	106 MKD	12.1	166 URY	10.0
47 ESP	13.2	107 MLI	15.4	167 USA	13.9
48 EST	6.5	108 MLT	10.7	168 UZB	4.8
49 ETH	22.2	109 MMR	9.4	169 VEN	7.3
50 FIN	16.5	110 MNE	7.0	170 VGB	0.8
51 FJI	20.7	111 MNE	7.0	171 VIR	9.6
52 FRA	20.5	112 MNG	14.8	172 VNM	14.7
53 FRO	1.8	113 MNP	3.4	173 WSM	7.5
54 FSM	14.6	114 MOZ	25.4	174 XKV	6.9
55 GAB	13.3	115 MUS	3.0	175 ZAF	22.5
56 GBR	9.1	116 MWI	23.9	176 ZMB	22.3
57 GEO	5.2	117 MYS	17.4	177 ZWE	19.6
58 GGY	3.8	118 NAM	18.6		
59 GHA	22.7	119 NCL	30.1		
60 GIB	5.4	120 NER	32.3		

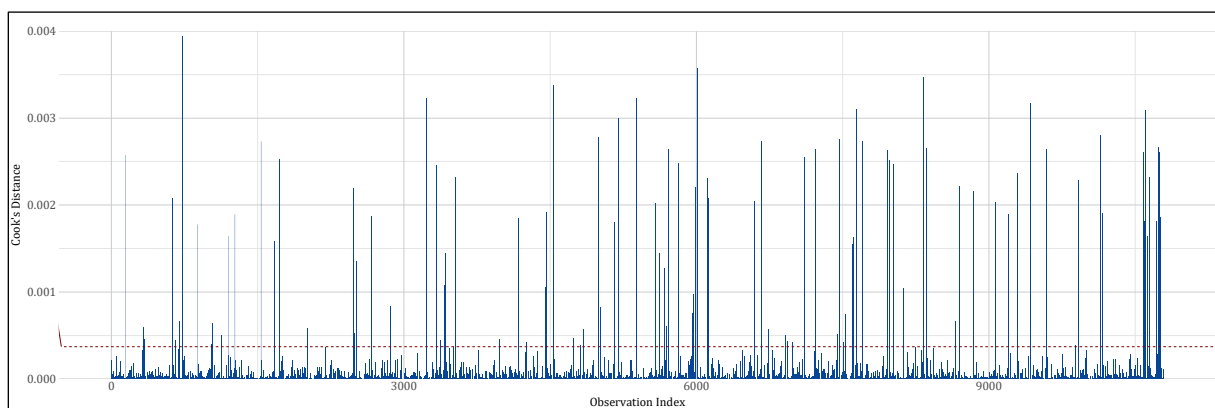
Appendix C

Sample(s), Cleaning, and Results of the Extrapolation Model

The following section discusses the cleaning of the base sample of OECD CbCR data employed for the GPML extrapolation model, the selection of the five different sub-samples used to derive the model coefficients, the coefficient estimates, and the results for the δ_1 and δ_2 correctional factor segments.

The base OECD CbCR sample comprises the Total Revenues between all jurisdiction pairs (including domestic observations, such as Total Revenues recorded by Swiss MNEs in Switzerland) for the 2017 – 2021 vintages, grouped by Total sub-groups, serving as the dependent variable observations. In line with the procedure applied by the OECD (2020) and Turban et al. (2020), the cleaning of the base CbCR sample was performed via the Ordinary Least Squares (OLS) version of Equation (3). Using this specification, influential outlier observations in the base CbCR sample were identified based on Cook's distance, with a cutoff criterion of $4/N$, where N represents the number of observations. Note that the natural logarithm of Total Revenues was used for the initial data cleaning using the OLS specification, following the OECD (2020) and Turban et al. (2020). Consequently, only Total Revenue observations strictly greater than 0 were considered. The resulting base panel consists of $N = 10,872$ jurisdiction-pair year observations. Applying Cook's distance in the OLS specification of Equation 3, the base sample was reduced to a total of $N = 10,420$ jurisdiction-pair year observations. Figure C1 visually presents the cutoff criterion for removing influential outliers that would distort the coefficient estimates.

Figure C1: Cleaning of base CbCR Total Revenues sample using Cook's Distance



Subsequently, five sub-panels were gradually defined from the cleaned base panel. The selection of subsamples was guided by the degree of imbalance observed in the relationship between the model's regressors and the observed Total Revenues in the Gamma-PML specification of Equation (3). Smaller investment hubs, in particular, tend to exhibit disproportionately high Total Revenues

relative to their economic fundamentals, such as GDP. Although the inclusion of taxation variables may partially control for this effect, defining separate samples with varying exposure to such jurisdictions was intended to mitigate distortions in the coefficient estimates and to identify the sample with the best overall model fit, i.e., a comparatively high Adjusted Pseudo R^2 value. Guided by this principle, observations were filtered until further exclusions would have reduced the sample size to a level insufficient to ensure statistical significance, representativeness, and the variation required for reliable estimation under the Gamma-PML specification. The resulting five sub-samples are discussed below.

- **Sample 1:** Exclusion of any Total Revenue observations of jurisdictions SAU, MEX, BMU, CYM, IND, IDN, BHS, LUX, and BRB, both from a reporting and counterparty jurisdictions perspective. This sample excludes particularly small jurisdictions that attract disproportionate Total Revenues in relation to standard economic indicators. **$N = 7,306$**
- **Sample 2:** Exclusion of any Total Revenue observations of jurisdictions SAU, MEX, BMU, CYM, IND, IDN, BHS, LUX, BRB, and GRC, both from a reporting and counterparty jurisdictions perspective. This sample further excludes particularly small jurisdictions that attract disproportionate Total Revenues in relation to standard economic indicators. **$N = 7,037$**
- **Sample 3:** Exclusion of any Total Revenue observations of jurisdictions SAU, MEX, BMU, CYM, IND, IDN, BHS, LUX, BRB, GRC, BHR, DEU, USA, and CHN, both from a reporting and counterparty jurisdictions perspective. This sample excludes particularly small jurisdictions that attract disproportionate Total Revenues in relation to standard economic indicators, as well as large economies that would potentially dominate the remaining sample. **$N = 5,027$**
- **Sample 4:** The initial cleaned base sample, with Total Revenue values winsorised at the 5th and 95th percentiles to reduce extreme outliers while keeping all observations. **$N = 10,420$**
- **Sample 5:** Sample 2 but excluding domestic observations, i.e., where reporting and counterparty jurisdiction match. **$N = 6,853$**

Having defined the sub-panels, the Gamma-PML Equation (3) was run with each sample. The results are presented in Table C1.

Table C1: Coefficients of the Gamma-PML extrapolation model

Gamma-PML specification					
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
<i>(Intercept)</i>	-2.844*** (0.989)	-2.906*** (0.983)	-1.989 (1.230)	-6.472*** (0.692)	-5.514*** (0.988)
<i>Log GDP_i</i>	0.779*** (0.021)	0.767*** (0.022)	0.944*** (0.036)	0.361*** (0.013)	0.746*** (0.021)
<i>Log GDP_j</i>	0.834*** (0.018)	0.838*** (0.018)	0.805*** (0.023)	0.663*** (0.013)	0.791*** (0.017)
<i>Log GDP per capita_i</i>	-1.032*** (0.103)	-1.023*** (0.104)	-1.462*** (0.112)	0.528*** (0.046)	-0.938*** (0.102)
<i>Log GDP per capita_j</i>	-0.083** (0.042)	-0.080* (0.043)	-0.123** (0.051)	0.158*** (0.031)	-0.031 (0.041)
<i>Log dist_{ij}</i>	-0.888*** (0.027)	-0.862*** (0.027)	-0.886*** (0.029)	-0.605*** (0.021)	-0.510*** (0.032)
<i>contig_{ij}</i>	-0.097 (0.111)	-0.060 (0.112)	-0.344*** (0.130)	0.225** (0.094)	0.657*** (0.113)
<i>ETR_i</i>	-3.195*** (0.509)	-3.214*** (0.507)	-3.668*** (0.550)	-0.585 (0.442)	-3.311*** (0.496)
<i>ETR_j</i>	-0.843** (0.395)	-0.996** (0.399)	-0.446 (0.469)	-1.195*** (0.327)	-1.843*** (0.386)
<i>Avg. WGI_i</i>	1.024*** (0.106)	0.998*** (0.110)	1.503*** (0.126)	-0.084 (0.053)	1.011*** (0.107)
<i>Avg. WGI_j</i>	0.898*** (0.063)	0.891*** (0.065)	0.859*** (0.076)	0.575*** (0.049)	0.743*** (0.063)
<i>EU membership_i</i>	-0.404*** (0.060)	-0.398*** (0.060)	-0.072 (0.072)	-0.233*** (0.051)	-0.289*** (0.059)
<i>EU membership_j</i>	-0.503*** (0.074)	-0.543*** (0.075)	-0.622*** (0.085)	-0.715*** (0.059)	-0.383*** (0.074)
<i>OECD membership_i</i>	0.183* (0.094)	0.213** (0.095)	-0.327*** (0.109)	-0.214*** (0.070)	0.204** (0.092)
<i>OECD membership_j</i>	-0.660*** (0.088)	-0.638*** (0.089)	-0.568*** (0.102)	-0.383*** (0.069)	-0.559*** (0.086)
<i>Year Fixed Effects</i>	✓	✓	✓	✓	✓
Observations	7306	7037	5027	10420	6853
Adj. Pseudo R²	0.708	0.716	0.684	0.48	0.635

Note. Standard errors are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. *N* denotes the number of reporting-counterparty-year observations. The adjusted pseudo-R² indicates the model's goodness of fit, adjusted for the number of estimated parameters.

This thesis proceeds to utilise the GPML specification by **Sample 2** for the binned extrapolation estimates presented in Chapter 4.2.2, as it offers the best balance of explanatory power in terms of Adjusted Pseudo R² (0.716) between model and sample (and AIC and F-statistic between model configurations). The coefficient estimates for the log of GDP and average WGI of both reporting and counterparty suggest that increases in economic size and governance are associated with an increase in Total Revenues of country_i reported in country_j. This aligns with intuition and the estimates of the OECD (2020), Turban et al. (2020), and Boukal (2024), with respective coefficients being significant at the 1% level across the five samples. The same holds for the negative relationship between the log of distance and Total Revenues. Moreover, it can be observed

that when considering Sample 2, a higher ETR of both the reporting country_i and counterparty country_j is associated with lower Total Revenues. Interestingly, the log of the GDP per capita, the EU-, and OECD dummies, both for reporting and counterpart, are negatively associated with Total Revenues reported. Contrary to intuition and the findings of OECD (2020), this likely reflects some degree of multicollinearity and coefficient conditioning within the GPML equation, whereby the inclusion of correlated controls influences the individual coefficients. However, since the equation serves for the extrapolation of missing jurisdiction values only and is hence optimised for the best fit, rather than the interpretation of individual regressors, these β -coefficients are tolerated for the purpose of this thesis.

Lastly, the results for the Global Average Ratio_a, $\delta_{1,a}$, and $\delta_{2,a}$ correctional factor segments for $a \in \{\text{Tangible Assets, Employees (FTE)}\}$ are presented. The Global Average Ratio_a and $\delta_{1,a}$ adjustments are constant (dependent on the sample considered) across all reporting jurisdictions. With Sample 2 used for the extrapolation in this thesis, the Global Average Ratio_{Tangible Assets} = 49.9% (vs. 33% by the OECD, 2020) and $\delta_{1,Tangible Assets} = 22.8\%$, with the difference in the Global Average Ratio estimation of this thesis and the OECD likely stemming from the different country samples and vintages considered. Regarding Employees (FTE) estimates, Global Average Ratio_{Employees} = 0.0002% and $\delta_{1,Employees} = 0.00004\%$. Note that the small values result from the fact that the model derives FTEs based on Total Revenues in USD, rather than Payroll, as seen in OECD (2020) and Turban et al. (2020).

The $\delta_{2,a}$ estimates, naturally, require the Tangible Assets and Employees (FTE) data of each reporting country_i across all counterparty countries_j and thus vary among the reporting jurisdictions of the OECD CbCR panel. Table 16 presents the results of the $\delta_{2,a}$ factors for $a \in \{\text{Tangible Assets, Employees (FTE)}\}$ for each reporting country_i, which were used for extrapolating the missing Tangible Assets and Employees values in Chapter 4.2.2.

Table C2: Delta 2 factors for Tangible Assets and Employees estimates

	ISO	$\delta_{2,Tangible Assets}$	$\delta_{2,Employees}$		ISO	$\delta_{2,Tangible Assets}$	$\delta_{2,Employees}$
1	ARE	110,05%	0,00030%	29	IRL	28,12%	0,00030%
2	ARG	254,72%	0,00030%	30	ITA	41,70%	0,00020%
3	AUS	72,83%	0,00020%	31	JPN	35,29%	0,00020%
4	AUT	48,58%	0,00020%	32	KOR	53,19%	0,00010%
5	AZE	56,86%	0,00010%	33	LTU	53,31%	0,00030%
6	BEL	45,84%	0,00020%	34	LUX	31,07%	0,00030%
7	BGR	130,00%	0,00020%	35	LVA	86,29%	0,00020%
8	BHR	76,09%	0,00040%	36	MAC	322,56%	0,00060%
9	BMU	69,85%	0,00020%	37	MAR	91,54%	0,00020%

	ISO	$\delta_{2,Tangible Assets}$	$\delta_{2,Employees}$		ISO	$\delta_{2,Tangible Assets}$	$\delta_{2,Employees}$
10	BRA	57,59%	0,00010%	38	MEX	58,20%	0,00030%
11	CAN	77,97%	0,00020%	39	MUS	39,48%	0,00007%
12	CHE	39,93%	0,00020%	40	MYS	139,28%	0,00030%
13	CHL	112,45%	0,00040%	41	NLD	27,32%	0,00010%
14	CHN	67,36%	0,00020%	42	NOR	66,65%	0,00010%
15	CYM	62,35%	0,00020%	43	NZL	55,37%	0,00010%
16	CZE	18,42%	0,00020%	44	PAN	265,91%	0,00070%
17	DEU	40,04%	0,00020%	45	PER	31,81%	0,00020%
18	DNK	39,19%	0,00020%	46	POL	56,69%	0,00030%
19	ESP	63,91%	0,00030%	47	PRT	42,19%	0,00030%
20	FIN	24,33%	0,00010%	48	ROU	19,26%	0,00010%
21	FRA	36,30%	0,00020%	49	SAU	91,52%	0,00006%
22	GBR	51,15%	0,00020%	50	SGP	54,77%	0,00010%
23	GRC	46,21%	0,00020%	50	SVN	27,51%	0,00020%
24	HKG	107,29%	0,00020%	51	SWE	31,07%	0,00020%
25	HUN	30,12%	0,00020%	52	TUN	92,98%	0,00040%
26	IDN	535,86%	0,00050%	53	TUR	34,46%	0,00030%
27	IMN	39,59%	0,00030%	54	USA	36,84%	0,00020%
28	IND	117,68%	0,00060%	55	ZAF	56,74%	0,00050%

Appendix D

OECD CbCR filing templates and ISO 3166-1 alpha-3 country codes

Figure D1: Allocation of income, taxes, capital and employees filing template

Name of the MNE group: Fiscal year concerned: Currency used:										
Tax Jurisdiction	Revenues			Profit (Loss) before Income Tax	Income Tax Paid (on Cash Basis)	Income Tax Accrued – Current Year	Stated Capital	Accumulated Earnings	Number of Employees	Tangible Assets other than Cash and Cash Equivalents
	Unrelated Party	Related Party	Total							

Note. Adapted from OECD (2015a, p. 29)

Figure D2: Constituent entities and main business activities filing template

Name of the MNE group: Fiscal year concerned:															
Tax Jurisdiction	Constituent Entities Resident in the Tax Jurisdiction	Tax Jurisdiction of Organisation or Incorporation if Different from Tax Jurisdiction of Residence	Main Business Activity(ies)												
			Research and Development	Holding or Managing Intellectual Property	Purchasing or Procurement	Manufacturing or Production	Sales, Marketing or Distribution	Administrative, Management or Support Services	Provision of Services to Unrelated Parties	Internal Group Finance	Regulated Financial Services	Insurance	Holding Shares or Other Equity Instruments	Dormant	Other ¹
	1.														
	2.														
	3.														
	1.														
	2.														
	3.														

Note. Adapted from OECD (2015a, p. 30)

Table D1: ISO 3166-1 alpha-3 (ISO 3) country classifications

	ISO 3 Code	Country		ISO 3 Code	Country		ISO 3 Code	Country
1	ABW	Aruba	29	BLR	Belarus	57	CYM	Cayman Islands
2	AFG	Afghanistan	30	BLZ	Belize	58	CYP	Cyprus
3	AGO	Angola	31	BMU	Bermuda	59	CZE	Czechia
4	AIA	Anguilla	32	BOL	Bolivia, Plurinational State of	60	DEU	Germany
5	ALA	Åland Islands	33	BRA	Brazil	61	DJI	Djibouti
6	ALB	Albania	34	BRB	Barbados	62	DMA	Dominica
7	AND	Andorra	35	BRN	Brunei Darussalam	63	DNK	Denmark
8	ARE	United Arab Emirates	36	BTN	Bhutan	64	DOM	Dominican Republic
9	ARG	Argentina	37	BVT	Bouvet Island	65	DZA	Algeria
10	ARM	Armenia	38	BWA	Botswana	66	ECU	Ecuador
11	ASM	American Samoa	39	CAF	Central African Republic	67	EGY	Egypt
12	ATA	Antarctica	40	CAN	Canada	68	ERI	Eritrea
13	ATF	French Southern Territories	41	CCK	Cocos (Keeling) Islands	69	ESH	Western Sahara
14	ATG	Antigua and Barbuda	42	CHE	Switzerland	70	ESP	Spain
15	AUS	Australia	43	CHL	Chile	71	EST	Estonia
16	AUT	Austria	44	CHN	China	72	ETH	Ethiopia
17	AZE	Azerbaijan	45	CIV	Côte d'Ivoire	73	FIN	Finland
18	BDI	Burundi	46	CMR	Cameroon	74	FJI	Fiji
19	BEL	Belgium	47	COD	Congo, The Democratic Republic of the	75	FLK	Falkland Islands (Malvinas)
20	BEN	Benin	48	COG	Congo	76	FRA	France
21	BES	Bonaire, Sint Eustatius and Saba	49	COK	Cook Islands	77	FRO	Faroe Islands
22	BFA	Burkina Faso	50	COL	Colombia	78	FSM	Micronesia, Federated States of
23	BGD	Bangladesh	51	COM	Comoros	79	GAB	Gabon
24	BGR	Bulgaria	52	CPV	Cabo Verde	80	GBR	United Kingdom
25	BHR	Bahrain	53	CRI	Costa Rica	81	GEO	Georgia
26	BHS	Bahamas	54	CUB	Cuba	82	GGY	Guernsey
27	BIH	Bosnia and Herzegovina	55	CUW	Curaçao	83	GHA	Ghana
28	BLM	Saint Barthélemy	56	CXR	Christmas Island	84	GIB	Gibraltar

	ISO 3 Code	Country		ISO 3 Code	Country		ISO 3 Code	Country
85	GIN	Guinea	113	JAM	Jamaica	141	MDG	Madagascar
86	GLP	Guadeloupe	114	JEY	Jersey	142	MDV	Maldives
87	GMB	Gambia	115	JOR	Jordan	143	MEX	Mexico
88	GNB	Guinea-Bissau	116	JPN	Japan	144	MHL	Marshall Islands
89	GNQ	Equatorial Guinea	117	KAZ	Kazakhstan	145	MKD	North Macedonia
90	GRC	Greece	118	KEN	Kenya	146	MLI	Mali
91	GRD	Grenada	119	KGZ	Kyrgyzstan	147	MLT	Malta
92	GRL	Greenland	120	KHM	Cambodia	148	MMR	Myanmar
93	GTM	Guatemala	121	KIR	Kiribati	149	MNE	Montenegro
94	GUF	French Guiana	122	KNA	Saint Kitts and Nevis	150	MNG	Mongolia
95	GUM	Guam	123	KOR	Korea, Republic of	151	MNP	Northern Mariana Islands
96	GUY	Guyana	124	KWT	Kuwait	152	MOZ	Mozambique
97	HKG	Hong Kong	125	LAO	Lao People's Democratic Republic	153	MRT	Mauritania
98	HMD	Heard Island and McDonald Islands	126	LBN	Lebanon	154	MSR	Montserrat
99	HND	Honduras	127	LBR	Liberia	155	MTQ	Martinique
100	HRV	Croatia	128	LBY	Libya	156	MUS	Mauritius
101	HTI	Haiti	129	LCA	Saint Lucia	157	MWI	Malawi
102	HUN	Hungary	130	LIE	Liechtenstein	158	MYS	Malaysia
103	IDN	Indonesia	131	LKA	Sri Lanka	159	MYT	Mayotte
104	IMN	Isle of Man	132	LSO	Lesotho	160	NAM	Namibia
105	IND	India	133	LTU	Lithuania	161	NCL	New Caledonia
106	IOT	British Indian Ocean Territory	134	LUX	Luxembourg	162	NER	Niger
107	IRL	Ireland	135	LVA	Latvia	163	NFK	Norfolk Island
108	IRN	Iran, Islamic Republic of	136	MAC	Macao	164	NGA	Nigeria
109	IRQ	Iraq	137	MAF	Saint Martin (French part)	165	NIC	Nicaragua
110	ISL	Iceland	138	MAR	Morocco	166	NIU	Niue
111	ISR	Israel	139	MCO	Monaco	167	NLD	Netherlands
112	ITA	Italy	140	MDA	Moldova, Republic of	168	NOR	Norway

	ISO 3 Code	Country		ISO 3 Code	Country		ISO 3 Code	Country
169	NPL	Nepal	197	SHN	Saint Helena, Ascension and Tristan da Cunha	225	TTO	Trinidad and Tobago
170	NRU	Nauru	198	SJM	Svalbard and Jan Mayen	226	TUN	Tunisia
171	NZL	New Zealand	199	SLB	Solomon Islands	227	TUR	Turkey
172	OMN	Oman	200	SLE	Sierra Leone	228	TUV	Tuvalu
173	PAK	Pakistan	201	SLV	El Salvador	229	TWN	Taiwan, Province of China
174	PAN	Panama	202	SMR	San Marino	230	TZA	Tanzania, United Republic of
175	PCN	Pitcairn	203	SOM	Somalia	231	UGA	Uganda
176	PER	Peru	204	SPM	Saint Pierre and Miquelon	232	UKR	Ukraine
177	PHL	Philippines	205	SRB	Serbia	233	UMI	United States Minor Outlying Islands
178	PLW	Palau	206	SSD	South Sudan	234	URY	Uruguay
179	PNG	Papua New Guinea	207	STP	São Tomé and Príncipe	235	USA	United States
180	POL	Poland	208	SUR	Suriname	236	UZB	Uzbekistan
181	PRI	Puerto Rico	209	SVK	Slovakia	237	VAT	Holy See (Vatican City State)
182	PRK	Korea, Democratic People's Republic of	210	SVN	Slovenia	238	VCT	Saint Vincent and the Grenadines
183	PRT	Portugal	211	SWE	Sweden	239	VEN	Venezuela, Bolivarian Republic of
184	PRY	Paraguay	212	SWZ	Eswatini	240	VGB	Virgin Islands, British
185	PSE	Palestine, State of	213	SXM	Sint Maarten (Dutch part)	241	VIR	Virgin Islands, U.S.
186	PYF	French Polynesia	214	SYC	Seychelles	242	VNM	Viet Nam
187	QAT	Qatar	215	SYR	Syrian Arab Republic	243	VUT	Vanuatu
188	REU	Réunion	216	TCA	Turks and Caicos Islands	244	WLF	Wallis and Futuna
189	ROU	Romania	217	TCD	Chad	245	WSM	Samoa
190	RUS	Russian Federation	218	TGO	Togo	246	YEM	Yemen
191	RWA	Rwanda	219	THA	Thailand	247	ZAF	South Africa
192	SAU	Saudi Arabia	220	TJK	Tajikistan	248	ZMB	Zambia
193	SDN	Sudan	221	TKL	Tokelau	249	ZWE	Zimbabwe
194	SEN	Senegal	222	TKM	Turkmenistan			
195	SGP	Singapore	223	TLS	Timor-Leste			
196	SGS	South Georgia and the South Sandwich Islands	224	TON	Tonga			