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Global trade, capital flows and deglobalization: a literature review

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Global trade, capital flows and deglobalization: a literature review

This literature review explores how trade and capital flows may interact and shape globalization and deglobalization. It aims at identifying key transmission channels through which trade and capital influence the global economic landscape and at reviewing empirical methods of (de)globalization analysis. It also assesses how shocks, financial frictions and geopolitical shifts may influence global integration and the structure of global value chains.

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The complexity of (de)globalization

(De)globalization is a multifaceted phenomenon. To understand it several theoretical and empirical strategies are needed. This paper presents gravity models, general equilibrium models and time series techniques used to simulate and analyze different types and aspects of (de)globalization scenarios.

The trade-capital nexus: mixed evidence

Trade and capital flows are deeply interconnected. Their roles may be substitutional or complementary, together they may reinforce or reverse globalization, especially through their impacts on global value chains. This review examines the mixed evidence concerning the relationship of trade and capital flows.

General information

This literature review is the outcome of a research project conducted at the OeNB within the scope of the Schuman Programme. As a possible starting point for future (de)globalization studies, it gives an overview of the current research landscape and points out where it remains inconclusive.

Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the Oesterreichische Nationalbank, Banca d'Italia or the Eurosystem.

Abstract[1]

This literature review connects trade and capital flows to (de)globalization, considering the main theoretical channels and empirical references to assess the current debate. The aim is to offer an integrated reference framework to study such a multifaceted global phenomenon. First, I investigate how trade and capital flows affect global integration and growth, identifying different transmission channels describing how trade and capital flows operate at the global level. Then, I examine the interplay of these driving factors of the global economy. This review is conducted both at theoretical and empirical levels, since both dimensions are necessary to understand the interplay of the economic driving forces. A range of possible quantitative instruments for future empirical analysis is reviewed. Empirically, many different approaches can be applied according to the research objective. To measure deglobalization, a longitudinal gravitational approach can be successfully used to explain global variable dynamics. Simulations of shocks or different scenarios for different blocks of countries can also be conducted as a complementary analysis with time series techniques.

1 Introduction

Periods of deglobalization often follow significant economic or financial crises. Deglobalization, as a shift away from globalization, can refer to the process of reducing interdependence between and integration among countries, typically in terms of trade, investment and migration. Policies that promote local industries, reduce reliance on foreign goods and services, and limit cross-border financial flows may affect the process. Historical examples of deglobalization include the Great Depression in the 1930s and recently, to some extent, the Great Recession (2009). During and after such periods, countries tend to focus more on national interests, supporting domestic industries and reducing reliance on international trade and foreign competition. A shift toward protectionism and inward-looking policies can lead to a fragmentation of global trade networks and to a slowdown in global growth. The motivation for this review stems from the need to identify the channels through which trade and capital flows operate at the global economic level, reinforcing a (de)globalization trend and reducing global growth.

This report aims at reviewing mainly empirical articles about how trade and capital flows operate in the global economy and, ultimately, about their potential effect on each other and on deglobalization. A deeper investigation will be conducted on their interactions, since they might operate systematically to either reinforce globalization or deglobalization. The approach followed in this review involves: (i) identifying single theoretical channels through which trade and capital flows operate in the global economy; (ii) analyzing the interactions among trade and capital flows as drivers of (de)globalization; and (iii) reviewing the main empirical strategies applied in this area of research, according to their applications and objectives.

[1] This work was conducted when I was visiting the Oesterreichische Nationalbank (OeNB) within the scope of the Schuman Programme. I would like to thank Ana Abelianski, Christian Alexander Belabed, Teresa Linzner, Julian Mayrhuber, Anna Katharina Raggl, Paul Ramskogler and Fabio Rumler from the OeNB for their helpful comments and valuable suggestions. All remaining errors are mine.

(De)globalization is a multifaceted phenomenon, but it is mainly linked to rapid growth in trade.[2] The period from the 1980s to 2008 has been often described as hyperglobalization (see among others Kessler and Submarian, 2013). More recently, the topic of regionalization of trade has emerged, characterized by the growing importance of the services trade. To sustain trade and meet its financial needs, support for globalization through capital flows is also essential. This support not only finances investments to boost trade but also helps manage economic risks and unexpected shocks by hedging export sales against foreign currency fluctuations. In standard economic theory, an increase in international trade volume is viewed as a sign of greater globalization. International trade can be measured in various ways, but it is commonly expressed as a ratio of trade to GDP. See figure 1 panel (a) and (b) for a dynamic perspective on global trade, capital flows and services. Both panels confirm the acceleration of globalization reported extensively in the relevant trade literature from the late 90s until the Great Recession. Migration has played a major parallel role. For instance, Fitter et al. (2024) find that migration continued to become more globalized during the last three decades, but the intensity of the upward trend has been decreasing since 2005.

Globalization is also characterized by the growing importance of Global Value Chains (GVCs). Cross-border production sharing across multiple countries has created intricate networks. This has allowed firms to optimize production by leveraging different countries' advantages, such as lower labor costs, favorable legal environments and proximity to suppliers or markets. At the same time, it has also raised the vulnerabilities of countries to exogenous shocks.

Currently, the global trade landscape is dominated by a debate on deglobalization and trade fragmentation. Taking the question by Goldberg (2023), "Is the global economy deglobalizing?", as a starting point, the key metrics of globalization so far include trade, capital flows and migration, which are interconnected and essential for assessing the risk of a reversal in global integration. Regarding capital flows and globalization, the peak of an upward trend is usually measured around 2010 (see figure 1 panel (c)). According to Abeliansky et al. (2024), the flows of capital decreased afterward and have not returned to their previous path. The global allocation of capital and investment has been changing ever since and geopolitical fragmentation, together with rising uncertainty, should be investigated to understand future worldwide dynamics.

Deglobalization and its ramifications could hit various industries and eventually redesign the economy of entire countries, with a potential to restrict production to regional blocks or even to the national level, thereby hitting costs and prices. According to different paradigms of GVC models of industrial organization, there might be a tendency toward nearshoring or reshoring[3] large portions of firms´ production function and/or toward regionalizing trade, i.e. intensifying the trade relationships between countries belonging to the same block of countries. The risk of fragmentation of GVCs is generally

[2] Economic globalization refers to the increasing interdependence of economies in the world. This dimension is characterized by capital that can flow across borders more freely than ever before. Investments, loans and remittances move globally. International production: Companies operate on a global scale, a product has components made in different countries and is assembled in yet another country. Global trade: Goods and services are exchanged across borders extensively (see also: Globalization a Brief overview by IMF for more details).

[3] Nearshoring is a geographical concept applying to countries that wish to redirect parts of the value chain closer to their domestic economy. Friendshoring is a concept that applies, if parts of the value chain are redirected toward geopolitically more aligned countries. These “friends” must not necessarily be in the close geographical vicinity of the domestic economy in question. Reshoring refers to the process of bringing manufacturing and other business operations back to a company's original country after having moved them abroad.

attributed to the Great Recession in 2008–2012 and, recently, to global shocks affecting the trade chains (COVID-19 pandemic, the war in Ukraine and now mainly to the US-China trade war escalation).

A preliminary reading of relevant literature has revealed the necessity of a robust theoretical framework as (de)globalization involves the interplay of various economic disciplines. Key areas include international trade and finance, industrial organization theory (focusing on GVCs and modifications in industrial structure), and growth theory (considering the saving, investment and trade nexus). Empirical studies often examine individual aspects of these theories.

Furthermore, I recognize that studying the multifaceted path to (de)globalization benefits from an integrated approach that incorporates classical theories and focuses on predictions relevant to various aspects of (de)globalization. Initially, it is useful to identify the distinct channels through which trade and capital flow spillovers operate independently at the global level. Trade is often linked to the investment cycle, with productivity gains subsequently boosting export volumes. Meanwhile, capital flows encompass financial trade facilitation, speculation and hedging activities.

After outlining their individual functions, the mechanisms through which the trade and capital flows nexus operates in the global economy will be examined in this article, using theoretical references and reviewing empirical tools commonly employed in modern research. There are fewer attempts in the literature to address the interplay between trade and capital flows, but understanding these interactions is crucial for policymakers and economists, given the new ties among traditional global economic drivers. By examining the nexus among key factors, one can gain insights into their systemic functioning and reinforcing effects.

This paper is structured as follows: In the next section I present a review of the relevant articles needed to identify single trade and capital flows' effects on the global economy. In section 3, I will deepen the analysis of their nexus. In section 4, there is an account of the directions of their interplay. In section 5, deglobalization is addressed in more detail. In section 6, I will compare the reviewed empirical work in a more schematic way. The conclusions follow.

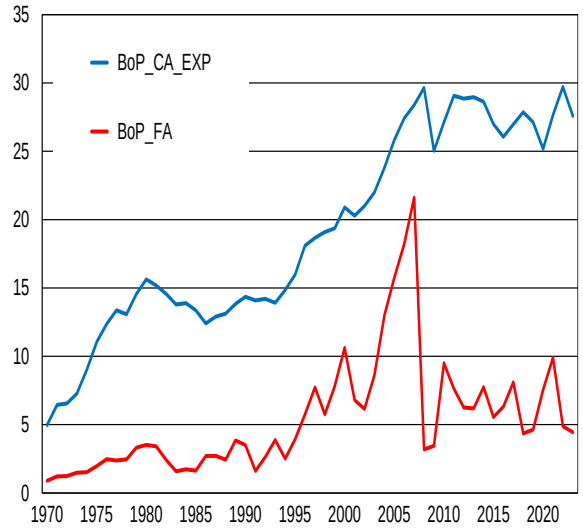
2 Trade and capital flows as drivers of (de)globalization

2.1 Trade

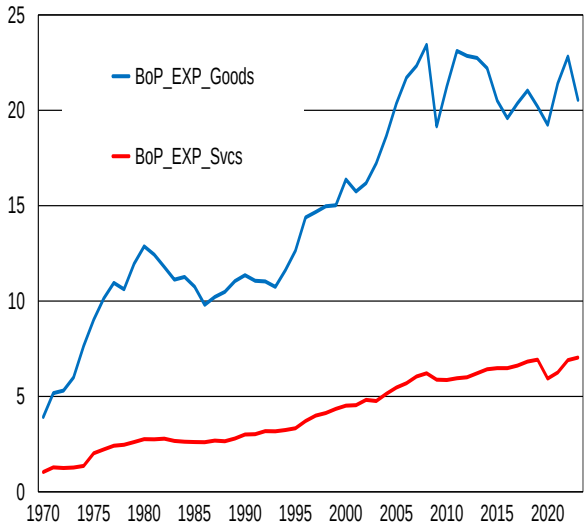
Trade is an economic activity that facilitates the efficient allocation of resources by allowing economic entities to specialize in producing goods or services and then exchanging them according to different types of comparative advantages. This report identifies a broad trade channel that impacts the global economy in three distinct ways: (i) the first is related to the comparative advantages; (ii) the second is fostered by investment; and (iii) the third operates via the GVCs. Trade can stimulate economic growth directly, attracting foreign capital necessary to finance domestic investment or, conversely, repay a net deficit of the current account. As economies grow, countries often require more imports for consumption and investment, which can be financed by capital inflows or by the profits of exports. Increases in international trade can stimulate economic growth by providing countries with opportunities to specialize in the production of new goods and services. This channel, through which trade operates by increasing the competitive hedge, also serves as a global transfer channel of technology. It is particularly beneficial for developing countries looking to modernize their industries. They can obtain new technological comparative advantages based on knowledge accumulation and network externalities of ideas or by clustering of tech districts.

Figure 1. Global balance of payments (BoP) and main economic variables (sample: 1970–2023) [1][2]

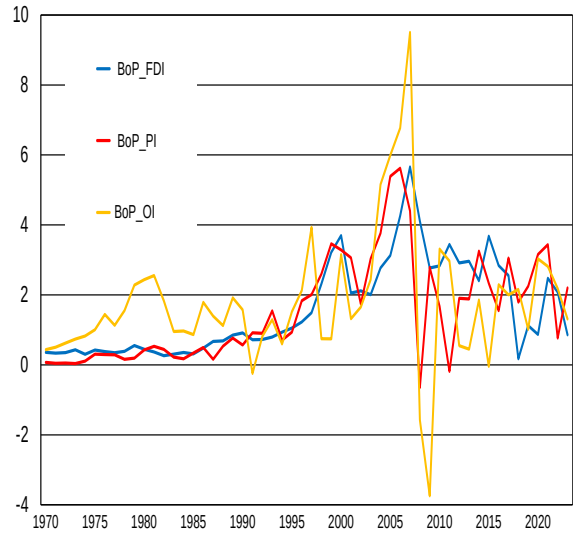
(a) Global BoP: total current account exports and financial assets



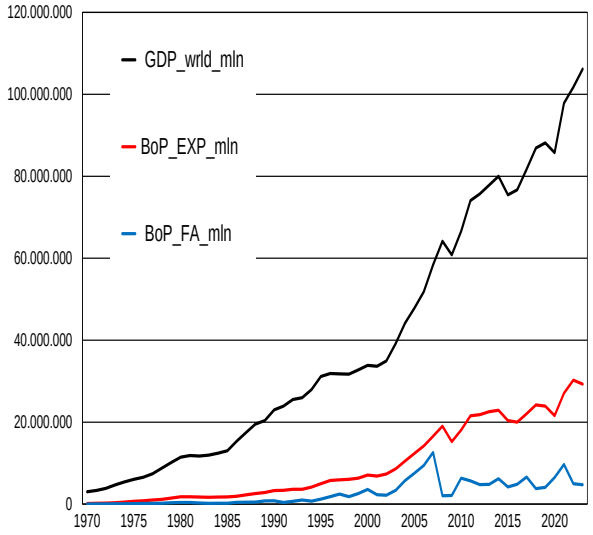
(b) Global BoP: current account exports of goods and of services



(c) Global BoP capital flows: FDI, PI, OI



(d) Global GDP and BoP: current account exports and total financial assets



Source: IMF (BoP data), World Bank (GDP data).

[1] Note: variables represent a percentage of GDP in panel (a), (b) and (c); USD million in panel (d)).
[2] Acronyms:

BoP_CA_EXP = balance of payments, total current account exports, % of GDP
BoP_FA = balance of payments, total financial account assets, % of GDP
BoP_EXP_Goods = balance of payments, current account exports of goods, % of GDP
BoP_EXP_Svcs = balance of payments, current account exports of services, % of GDP
BoP_FDI = balance of payments, foreign direct investment, % of GDP
BoP_PI = balance of payments, portfolio investments, % of GDP
BoP_OI = balance of payments, other investments, % of GDP
GDP_Wrld_mln = world gross domestic product, USD million
BoP_EXP_mln = balance of payments, total exports, USD million
BoP_FA_mln = balance of payments, financial assets, USD million

The fundamental theoretical reference for international trade is the Heckscher-Ohlin model (HOM), developed between 1920 and 1933 and updated by Mundell (1957). For an extensive treatment of the subject, among other scholars, one can read the review of Leamer (1995). HOM claims that countries will specialize in producing and exporting goods that use their abundant and less expensive factors of production and import goods that use the countries' scarce and more costly factors. Essentially, the theory emphasizes the role of a country's factor endowments in determining its comparative advantages and trade patterns. An important spillover of HOM is that it postulates that trade and financial capital are substitutes.

The HOM is a valid tool in explaining international trade, but it has some significant limitations because it relies on perfect factor mobility within a country, identical production technology across countries and the absence of trade frictions. These assumptions often oversimplify the complexity of the global economy. Tariffs, government regulations and technological disparities can be other factors heavily influencing trade. Various emerging and developed countries have used innovative technologies to increase export volumes, and this export-led growth strategy does not always align with their production factor endowments and the predictions of the HOM. Furthermore, the model cannot explain intra-industry trade. Intra-industry trade has become increasingly important during globalization phases and is key in ensuring the functioning of production in industries where complex value chains are at stake, for instance the automotive and electric industries.

In the late 1970s and early 1980s, Paul Krugman argued that, while the theory of comparative advantage and the HOM extension are still valuable, HOM needs to be complemented by other approaches to better capture the dynamics of international trade. The Dixit-Stiglitz-Krugman and Helpman-Krugman trade models form the basis of the New Trade Theory, which initially emerged in 1977, implying that policies promoting trade openness, education and innovation can significantly impact long-term economic growth. In his Nobel prize lecture, Krugman (2008) explains that he and other scholars gradually removed the hypothesis of perfect competition over the course of a research program to explain international trade. A special emphasis is imposed on the role of increasing returns to scale in the context of imperfect and monopolistic competition. Krugman has also linked international trade and its dynamics to the industrial organization theory and the related geographical industrial strategies. His research explains why countries might specialize in the production of certain goods even if they do not have a strong comparative advantage. Factors such as trade agreements, foreign direct investment (FDI) and market integration also need to be considered for a more holistic understanding of global trade.

In 1954, Isard introduced the Gravity Model of Trade to empirically estimate bilateral trade among nations. This model postulates that trade between two countries is proportional to their gross domestic products and inversely proportional to the distance between them. This model is very important because it has been empirically successful in explaining trade flows and is still broadly used, incorporating features of different successive theories of world trade (for a review of the gravity models see Capoani, 2023). As an empirical instrument, it is very flexible and can be enriched in different ways.

For instance, initially Melitz (2003), later Melitz and Helpmann (2007) and Melitz and Trefler (2012) developed pioneering models of international trade with heterogeneous firms. In 2003, Melitz introduced intra-industry effects of economic trade with monopolistic competition, showing how only the most productive firms engage in international trade, while less productive firms serve only the domestic market. Later, in 2007, a generalized gravity equation model was proposed, which accounts for the self-selection of firms into export markets and their impact on trade volumes. This model highlighted the gains from trade due to reallocations within industries. The impact of trade frictions on trade flows

is decomposed into two margins: (i) intensive margin is the trade volume per exporter and (ii) extensive margin is related to the number of exporters. The study shows that traditional estimates are biased, mainly due to the omission of the extensive margin. The effect of the number of exporting firms varies significantly across country pairs, especially between more and less developed countries. In Melitz and Trefler (2012), the increasing prominence of intra-industry trade is stressed. This type of trade allows consumers to enjoy a greater variety of goods, leading to "love-of-variety" gains. The authors provide empirical evidence from Canada's economic integration with the United States in 1989 (referring to the Canadian-US free trade agreement CUSFTA), explaining the significant gains from trade due to global trade mechanisms. These models describe reallocation and intra-industry implications by displaying the fragmentation of production processes across different countries as a result of companies' efforts to maximize GVC-related efficiency.

It is important to keep in mind that GVCs play a key role in international trade and that they can be affected by both trade and capital flows' patterns and shocks. Trade and capital flows have a continuous impact on firms´ industrial organization and market structure, reshaping the geographical and logistical network of an industry. A value chain can be broken down into primary activities related to inbound logistics (raw materials, warehousing and managing inventory), operations, sales and post-sale services. For an overview of trade and GVCs see, among others, Jones et al. (2019). This and other articles review the rapidly growing field of GVC research, connecting studies published in various disciplines such as international business, supply chain management and even economic geography.

2.2 Capital flows

Capital flows refer to the movements of money, investments and assets among countries, regions or financial markets. These flows may occur as FDI (greenfield or brownfield), portfolio investment (PI), loans or in the form of other financial instruments. Capital flows are crucial in the global economy, influencing exchange rates, interest rates, and, more generally, economic growth and stability. Capital flows are driven by interest rate differentials, economic growth prospects, geopolitical factors and market conditions. While capital flows can contribute to economic development by providing funds for investment and eventually boost productivity, they can also pose challenges, such as financial volatility and the risk of sudden reversals in capital movement, which may impact the stability of financial markets.

In the BoP, the financial account items reflect changes in a country's ownership of international assets. An increase in exports is often anticipated or accompanied by higher levels of capital inflows, as exporters require these funds to finance new investments, to innovate and to expand their market shares. Capital flows, through the BoP channels, help redistribute local profits to global markets, thereby facilitating international economic integration and growth. Often, international capital flows are also considered as a means to facilitate risk diversification and intertemporal exchange of resources. Other prospective gains from their dynamics may result from their facilitation of returns to scale in production and from their induction of positive production and network externalities. Yet, there are in general two opposite views regarding capital flows' unrestricted movements. Given firms' and agents' strategic behavior, one view can be characterized as stressing positive effects, such as efficiency and allocation gains, while the other position in this debate points at the risk of higher financial market volatility and the possibility of creating large macroeconomic imbalances.

Milne (2014) and, more recently, Guishard (2017) explore the dynamics of international capital flows and their relationship with globalization. In their view, capital flows are integral to globalization, reflecting

and facilitating processes by balancing out commercial surpluses and deficits via capital movements across different countries. Moreover, thanks to capital flows' intrinsic capabilities of smoothing over firms' financial needs over time, they facilitate the intertemporal exchange of resources along the GVCs. Capital flows might also contribute to creating a more homogeneous international interest rate structure thanks to arbitrage positions over related markets.

Regarding the different types of capital required for productive investments, many scholars support the idea that, compared to PIs, FDI is more effective in disseminating technology and fostering financial innovation. For a comprehensive analysis of components and definitions of capital flows see Duce (2003). FDI typically involves direct control and management of assets in the host country which facilitates the transfer of technology, expertise and innovative practices. This direct involvement allows for deeper integration and adaptation of new technologies. Javorcik's research (2004) highlights that FDI can lead to productivity spillover effects on domestic firms, particularly through backward linkages. This means that local suppliers benefit from the knowledge and technology brought by foreign affiliates. On the other hand, PIs, which include investments in stocks, bonds and other financial instruments, are more passive. Since they mostly help with financing, they do not usually involve direct control or management, making them less effective in transferring technology and innovation. Yet, PIs can still have positive financial spins, lowering the cost of capital in receiving countries.

When considering FDI, profitable firms often face the choice to reinvest profits domestically or abroad. Reinvesting funds internationally can improve the risk diversification for supply and production, allowing risks to be spread across global markets rather than being concentrated domestically. This is particularly relevant in the context of natural disasters such as earthquakes, pandemics or tropical storms. Similarly, according to Saggi (2002), FDI can sustain technological transfers and spread innovation among different markets. At the same time, entry of foreign firms may lead to increased competition, which can sometimes hinder the innovation efforts of local companies. Saggi (2002) uses a two-period duopoly model to analyze impact of foreign firms' choices between licensing and FDI on innovation incentives. This model helps to understand how technology transfers affect both foreign firms and their domestic rivals.

In the context of globalization, both mergers and acquisitions (M&A), and greenfield investments also play crucial roles in enabling companies to expand, diversify risks and enhance their competitive advantage. Raza et al. (2021) examine the impact of various types of capital inflows, primarily non-speculative, on economic growth in developing countries, including greenfield. The analysis utilizes annual data from 1995 to 2017, covering 14 low-income countries. The study categorizes capital flows into four main components: FDI, exports, remittances and external debt. Using a panel cointegration approach, the authors found that all four components positively influence economic growth in both developed and developing countries. While M&A can offer quicker market entry, greenfield investments provide the opportunity to establish a strong presence in new markets. The implications of financial claims for free international trade can sometimes be ambiguous. M&A is a common strategy used by firms to expand or protect their corporate activities in international markets. This approach can provide immediate access to new markets, technologies and resources, but it also comes with integration challenges and potential regulatory hurdles.

Borodin et al. (2020), Chernenko et al. (2020) and Bradley et al. (2020) explore the various factors influencing M&A activities. The articles investigate the strategic, financial and operational aspects of M&A, highlighting the importance of market conditions, regulatory and tax environments and corporate governance. Dunning's eclectic paradigm (OLI) has long been regarded as the key framework for

explaining why multinational enterprises (MNEs) expand their foreign production and activities. The paradigm posits that the benefits of FDI arise from firm-specific ownership as well as in the form of location and internalization advantages. Location advantages include factors such as access to resources, favorable tax and licensing conditions, technology and patent systems and other aspects of the business environment that enhance MNE efficiency. An interesting empirical application that incorporates the institutional environment in Greece is presented by Filippaios and Stoian (2008).

In this context, greenfield investments represent a different type of capital flow. Greenfield investment means that a company directly invests financial capital in a foreign country to create new facilities from the ground up, such as new plants, offices or distribution centers. This method allows the investing company to maintain greater control over operations and tailor the new facilities to its specific needs. However, greenfield investments typically require a larger commitment in terms of time and capital compared to M&A. Ha et al. (2021) examine how greenfield investments influence entrepreneurship in host countries. Using panel data from 110 countries between 2001 and 2018, they find that M&A can either boost or hinder innovation activities, depending on the technological compatibility of the merging entities. As expected, multinational corporations play a significant role in driving economic growth through M&A. Performing a panel Granger causality test analysis, Antonietti and Franco (2021) found a causal linkage from greenfield investments to economic complexity, defined as the ability of a country to produce a diverse range of sophisticated products.

Box 1. Portfolio investments: speculative channel and crises

Two perspectives are often discussed regarding higher and unrestricted levels of financial capital flows. The first perspective highlights the positive effects of free capital flows in facilitating fruitful investments and completing markets by introducing all potential products, investments and opportunities. Additionally, capital flows can drive efficiency gains through various financial activities such as financing innovative products, calibrated speculation, and currency and export hedging. PIs contribute to the diversification of financial market products and help manage asset price risk. This, in turn, allows for a greater share of savings and facilitates better allocation of resources for productive investments.

Overall, financial interdependence has generally been considered as inducing the positive externalities stemming from matching the needs of the agents in deficit and surplus. More recently, however, after various crises and subsequent global financial distress related to vulnerabilities and macroinstability, negative externalities related to the global integration of financial markets, deregulation and volatility have been widely investigated (Miller and Zhang, 2019). Some capital movements, which often create imbalances, can be particularly dangerous for emerging countries that frequently receive substantial funding. If these capital flows reverse suddenly, these countries may struggle to cover structural, commercial or governmental deficits. A sudden halt in speculative capital flows can ultimately discourage cross-border investment and potentially contribute to a broader phase of deglobalization.

The second short-term perspective, indeed, underlines the risks of free capital flows for financial stability. Free capital flows can increase volatility and contribute to creating macroeconomic imbalances when feeding dangerous speculative bubbles. A significant portion of capital flows is driven by speculative searches for higher payoffs across countries, particularly through PIs. This speculative behavior is

primarily relevant in the short-term, with financial capital being directed toward treasury bills, financial instrument, assets or bonds rather than real investments (Bessenbinder, 2018). Speculative investors often seek to capitalize on price fluctuations rather than focusing on fundamental long-term variables related to corporate production investment strategies, such as M&A or FDI. This behavior is driven by an attitude to capitalize on financial products´ price fluctuations and not related to corporate production or long-term strategies like M&A or FDI.

There is a large body of literature from the late 1990s and 2000s, discussing economic growth, productivity gains, exchange rate and BoP adjustments while also considering the effects of the globalization of capital movements. A part of the literature is referring to the possibility of a sudden stop in the flux of capital to an emergent country (or even a more advanced economy). Krugman (1999) outlined that in the presence of asymmetric information, moral hazard and poorly supervised banks in rather shallow financial markets, a contagion effect could result in market failure and produce a "boom and bust cycle." In his seminal papers, Calvo (1998, 2005, 2013) studies the determinants of sudden stops in international credit flows and their impact on financial and BoP crises. Considering the degree of exchange rate flexibility, he discusses the extent to which a large current account deficit alone can contribute to a financial crisis, given higher volatility of capital flows and contagion. He shows that the larger the propensity of consumption and the shorter the maturity of a country's debt, the higher is the risk of a sudden capital stop crisis. Gosh et al. (2016) explore the risks for the most vulnerable emergent economies related to a higher degree of volatility of capital flows, especially after a financial crisis.

Digging deeper into the topic, we see the transmission from the financial to the real economy. An initial external shock, like a financial crisis, can produce a shift in the marginal productivity of production factors: for instance, workers might become less productive due to layoffs, reduced working hours or decreased morale; or capital machinery and equipment might be underutilized or become obsolete faster due to changing economic conditions. Hence, the initial external shock disrupts the efficiency and productivity of key economic factors, leading to a cascade of negative effects on the economy associated with bankruptcy and social costs (destruction of human and physical capital).

Eventually, the slowdown in capital flows can also destroy output accumulation feeding a negative-financial-sector-to-real-sector spiral. This negative effect tends to be greater especially in emerging economies where national industries are heavily dependent on banks' funds. In Calvo (2005), the analysis was already extended to domestic financial vulnerabilities to explain the systemic collapse in capital flows in Latin America (LA). He documents the boom cycle of the huge waves of capital inflows from the US to LA in the first half of the 90s and then the bust cycle occurring in LA with the unexpected interruption in external capital flows due to the Mexico's Tequila crisis (1994–1995), as well as the Asian (1997) and the Russian default (1998), representing the fatal blow for LA.

The lesson is that if a critical mass of investors refuses to roll over short-term bonds (Mexico) or bank deposits (Argentina) or orchestrates a run on LA securities, a crisis will occur. The collapse in asset prices, the increase in the cost of external financing and the drop of domestic banks' credit flows were large and

persistent (so-called financial deleveraging). A sudden stop of flows had its counterpart in large current account adjustments and currency devaluation and induced a severe contraction of investments and growth, determining an evil nexus interplay.

For a recent update of the debate on financial crises and capital flows, a good reference is published in the BIS Bulletin by Ehlers et al. (2025). The authors use BIS statistics to disentangle the various international dimensions of credit to borrower economies and describe the role of foreign banks and international bond markets in the credit provision process. The paper highlights how international sources of credit can both benefit and destabilize borrower countries. Before the global financial crisis, international banks drove credit growth by lending across borders and locally in host countries. The paper emphasizes that international credit growth can enable domestic credit booms, which can be destabilizing. This was evident before global financial crises, when direct cross-border credit inflated asset prices and amplified credit growth.

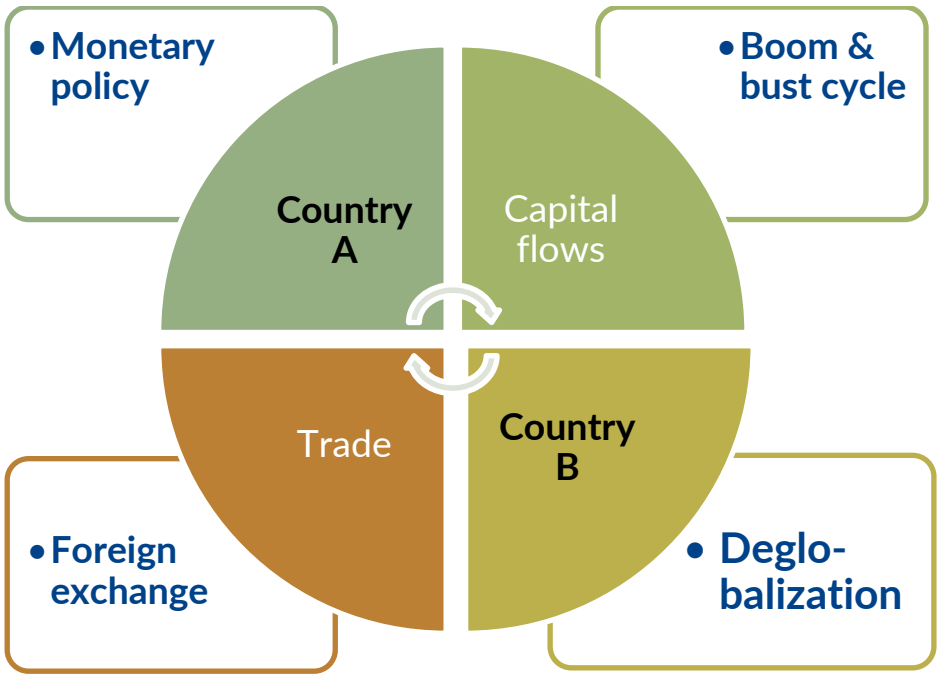
3 Nexus between trade, capital flows and globalization

After describing the main ways by which trade and capital flows can influence (de)globalization, a special emphasis is put here on their interplay and their impact on GVCs. At first glance, this symbiotic relationship is reflected in the BoP, which comprises sections for trade and capital flows. Historically, Taylor and Wilson (2019) have identified a strong connection between these two components. Figure 2 depicts a simplified account of the fundamental relationships among capital flows, trade and external shocks in a two-country scheme. The nexus, mirrored by the two BoP items, works on many different levels, through different spillover channels among countries. In short, the channels through which trade and capital flows interact globally can be summarized as the following: (i) FDI, trade and GVCs; (ii) exchange rate; and (iii) financial interactions.

3.1 The primary BoP interactions

The accounting relationship between trade and capital flows can be traced considering the outcome of a surplus or a deficit of the BoP and its items. The complementary relationship of trade and capital flows determines reciprocal movements of goods and financial funds across countries. In many respects trade and capital flows can be considered as two sides of the same coin. By definition, (i) a trade surplus happens when a country exports more goods and services than it imports, resulting in a positive current account balance. This surplus translates into an influx of foreign currency as payments from abroad exceed the outflow representing the costs of imports. As a result, countries experiencing trade surpluses may have frequent capital outflows, using their excess funds to invest abroad. Consequently, the country experiencing a BoP surplus becomes a source of financial capital for other nations. (ii) To offset a trade deficit, the importing country may attract capital inflows from abroad in the form of FDI or PIs, like loans, or the acquisition of domestic assets by foreign agents and institutions. Kandil (2009) extends the analysis of the fluctuations in trade and financial balance to a broad panel of developing countries, finding significant, but not conclusive, evidence of the standard inverse relationship of trade and the financial flows of the BoP.

Figure 2. Global trade and capital flows: systemic patterns and external shocks



3.2 FDI, trade and GVCs

The economic connection among the BoP items implies that inflows of capital help finance the trade deficit, allowing the importing country to sustain its consumption levels and economic activities. This link from FDI to trade, according to the standard beneficial interpretation, may create a positive feedback cycle where trade and capital flows reinforce each other and sustain investment. In an open economy, this process induces a more integrated relation from trade to financial markets and vice versa. FDI and trade expand beyond financial transactions, as injected resources and expertise foster the host country's investment and productive capabilities via knowledge transfer. The related literature from the 1990s onward has shown that factors like skilled work force, institutional quality and access to markets and infrastructures collectively contribute to making FDI a catalyst for economic growth. The interplay between these elements determines the extent to which FDI can positively impact a host country's economy. Figure 1 panel (d) depicts the global dynamic of total financial assets, exports and GDP. The time series variables displayed in the graph (world GDP, world export and total financial assets) appear to be positively correlated.

Hence, the interconnected nature of capital flows and trade offers countries opportunities for diversification and advancement. Moreover, thanks to globalization, both free trade between countries and unrestricted capital flows are considered indispensable components of GVCs as companies strategically invest and trade across borders to optimize production processes, to reduce global supply risk and to specialize in the production of certain goods and/or services (Jones et al., 2019; Antràs and Chor, 2022). This interrelation has complex theoretical and related empirical effects, and the authors claim that more investigation is needed since the evidence is mixed. Baqaee and Farhi (2024) also study trade models, adding international production networks and arbitrary wedge-like distortions like

markups, tariffs or nominal rigidities. Their results provide an analytical framework for simulating trade shocks and examining large-scale trade models, adding microeconomic details and input-output linkages.

Empirical evidence of FDI allowing companies to expand their exports is connected to growth theory. This literature is interesting because it often uses alternative time series as an empirical strategy to measure the impact of FDI on trade and growth and introduces the role of GVCs. For instance, among similar empirical studies for emerging economies, Ünalmis (2002) used a Granger causality test to analyze data from Türkiye to examine the effect of FDI on growth. The author specifies a Vector Autoregressive (VAR) model and a Vector Error Correction Model (VECM) that include lagged values of both financial developments data and GDP. This quantitative analysis allows to test by Granger causality whether past values of FDI can predict future values of GDP per capita and vice versa. The result shows a positive correlation between FDI and growth.

Bénétrix et al. (2023) examine the positive relationship between FDI and economic growth. On the theoretical side, their work connects the discussion to the endogenous theory of growth. The study considers local conditions, such as human capital and financial deepness, to be crucial for the positive impact of FDI on growth. The authors address the endogeneity of FDI inflows to ensure that the results are not driven by reverse causality. Their findings also suggest that the relationship between FDI and economic growth is positive and statistically significant for countries with developed financial sectors or high levels of human capital accumulations. The study uses panel data from a large set of emerging economies over multiple decades. The empirical strategy allows for a comprehensive analysis of how the relationship between FDI, trade and economic growth has evolved over time. The authors employ rolling window regressions to analyze the stability of the FDI-to-growth relationship over different time periods. This method is helpful in identifying how the impact of FDI on growth changes over time and under varying local conditions. Both Ordinary Least Square Regressions (OLS) and Instrumental Variable (IV) estimates are used to ensure robustness checking. The similarity in results between these methods suggests that the findings are unlikely to be driven by endogeneity.

Bénétrix et al. (2023) also consider the impact of GVCs' modifications starting from the 90s, claiming that it transformed the value-added industrial process, adding value at each step of the production activity where different steps may take place in different countries. Since then, GVCs have facilitated the international flow of know-how between lead firms and suppliers, making production more efficient and cost effective. This exchange of expertise and technology is crucial for enhancing productivity and innovation. Countries like China and India have increased economic growth by importing skills and technology through their participation in GVCs.[4]

Wang and Liu (2022) also dig into the dynamics of trade and capital flows, particularly in the context of GVCs. Their study highlights how conventional indicators of international trade, based on gross exports and imports, can distort the actual flows of goods and services along GVCs. The study scrutinizes the export activities of G20 economies, revealing significant differences between their proposed country residence-based approach and traditional trade in value-added measures. Their findings indicate that

[4] In part contrary to this view, Joe and Shawl (2023) focus on FDI and growth, addressing the link between FDI inflows and economic growth. The authors use a dynamic panel Autoregressive Distributed Lag (ARDL) model to analyze the short- and long-term relationships between FDI inflows and economic growth in the BRICS countries (Brazil, Russia, India, China and South Africa). The dataset spans from 1987 to 2018 and includes variables such as GDP growth, FDI inflows, inflation, human capital, financial development and trade openness. The results, using the cointegration technique to disentangle short and long-term dynamics, indicate that FDI inflows have a negative impact on economic growth in the short term. This could be due to initial adjustment costs or inefficiencies in the allocation of FDI. In the long run, indeed, FDI inflows affect positively economic growth, suggesting that the benefits of FDI, such as technology transfer and increased productivity, materialize only over time.

only developed G20 economies consistently gain in residence-based domestic value-added exports, while developing G20 economies show reduced surpluses based on their approach. Wang and Liu (2022) underscore the importance of re-evaluating traditional trade indicators to better understand the dynamics of GVCs. Thus, investment financing, particularly through FDI, emerges as a catalyst for economic growth and deeper integration into the global trade landscape.

A reference by Sposi et al. (2021) builds on this approach. Their article uses a dynamic two-country model featuring sequential multi-stage production and capital accumulation to address complexities of trade and capital flows over the globalization cycle. The authors found that, via HOM driving forces, trade along GVCs can generate a back and forth feedback loop between comparative advantages and capital accumulation, affecting trade and growth. The expansion of GVCs trade increases both the steady state level of the economy and the dynamic gains from trade. This implies that countries involved in GVCs experience higher long-term economic growth and benefit more from trade over time. Also, in this context, note that any attempt to exploit smaller welfare gains, achievable via protectionist foreign policy interventions, will imply a risk of reducing mutually beneficial free trade agreements and lead to counterproductive trade wars, affecting the GVCs' reorganization.

3.3 Exchange rate

Capital flows influence exchange rates parities, which in turn affect firms´ competitiveness and trade current account balances. For example, a surplus with an influx of foreign capital tends to appreciate a country's currency, making its exports more expensive and decreasing the price of imports. In so doing, it has eventually feedback on trade net volumes reducing the current account surplus in the medium term. This fundamental relation works in both directions and has been broadly discussed. In a survey, Auboin and Ruta (2011) explore its effects on trade in detail. They found that, on average, exchange rate short-term volatility has a negative impact on trade flows, given the extent to which the impact is mitigated by hedging instruments and by the structure of the firm´s global production function and network. They add theoretical and technical issues of misalignment of exchange rates. It is worth noting that generally, capital flows have the strongest and a more immediate effect on exchange rates, often causing significant short-term fluctuations and volatility. In contrast, the trade balance impacts currency levels over a longer period, providing more stability once established. Ultimately, the heightened demand for the surplus country's currency in the foreign exchange market always tends to increase its value and results in capital inflows through some forms of investments. Conversely, trade deficits may lead to currency depreciation as the demand for the importing country's currency decreases, resulting in capital outflows. Adjustments in currency exchange rates act as mechanisms to balance trade disparities, influencing the competitiveness of exports and the cost of imports globally. The impact of capital flows and trade on exchange rates varies in magnitude and timing.

This effect can vary also according to the structure of GVCs because different chains of the production function network can be in different countries and compensate the effects on trade of currency fluctuations. The impact can act in reverse, as shown by Leigh et al. 2017. They claim that there is limited evidence that participation in GVCs has significantly changed the exchange rate trade relationship over time. The relationship between trade and currency exchange rates is, indeed, often more intricate, as a trade surplus results in an appreciation of the exporting country's currency but with important lags in the

process of exchange rate adjustment, which also depends on the exchange regimes and relative exchange policies.[5]

3.4 Financial facilitation for trade

Capital flows contribute significantly to the globalization of financial markets. The trading of financial assets on a global scale links economies, creating a highly interconnected financial landscape. This globalization involves mainly the movement of capital but is again deeply intertwined with international trade dynamics. Financial instruments such as stocks, bonds and derivatives, which are traded globally, often facilitate the economic activities and performance of countries involved in international trade. The financial instruments are often created to hedge trade transactions, becoming later tradable assets. Import and export financing, currency hedging and other trade-related financial products add to the complex set of financial instruments circulating globally. Hassan (2024) provides a synthetic overview of financial markets, exploring the diverse array of institutions, instruments and economic ramifications that define modern finance. She discusses how financial markets facilitate global trade and economic growth. The study underscores the interconnected nature of financial markets and their critical role in supporting global trade and economic growth. The global financial system is described as a network of financial institutions and markets that facilitate the flow of capital across borders. This system includes commercial banks, investment banks, hedge funds, mutual funds, insurance companies and central banks.

These institutions play a crucial role in converting savings into investments, thereby supporting trade. According to Misztal (2011) and Ribaj and Fitim (2021), the relationship between economic savings and trade is fundamental in both advanced and developing economies and adequate saving is confirmed to be a fundamental condition required to foster investment and trade. Misztal's paper examines the relationship between savings and economic growth across countries with varying levels of economic development. Using time series econometric methods and testing for cointegration in VAR models and using Granger's causality test, the study finds a one-way causal relationship between gross domestic savings and GDP in both developed and developing countries.[6]

4 Directions of trade-capital flow dynamics

When supplemented by free movements of capital and trade, the fundamental (HOM) model of comparative advantages, which builds on the classical theory of international trade, suggests that trade and capital flows can be perfect substitutes, showing a negative correlation between capital abundance and returns on capital. Then, in principle countries tend to specialize in the production of different goods, inducing financial capital to flow from advanced capital abundant countries to emergent and capital scarce countries. According to that conventional view in a setting of free trade and unrestricted capital flows, the substitution dynamic reinforces integration among countries. This should occur because the higher return on capital in emerging economies acts as a pull factor, attracting capital flows needed to finance the production of labor-intensive goods at lower costs. In other words, the lower supply of capital

[5] National savings and investment propensity rates play a crucial role for exchange rates besides facilitating growth. Countries with higher savings rates, due for instance to a lower propensity to consume imported goods, often have capital surpluses which they invest abroad, contributing to a depreciation of their currency. Conversely, as already seen, countries with high investment rates and low saving rates or current account deficits need to attract foreign capital to finance a steady path of growth.

[6] Ribaj and Fitim's study focuses on Kosovo, analyzing the impact of savings on economic growth from 2010 to 2017. The research also employs augmented Dickey-Fuller tests, Johansen cointegration tests and Granger causality tests and confirms that savings have a positive impact on growth.

in the emergent countries relative to labor increases the marginal productivity of capital. The capital inflow enhances and reinforces a comparative advantage of developing countries in producing labor-intensive goods. As capital becomes more accessible and positive externalities in production benefit emerging economies, these countries can produce more efficiently, leading to a gradual decrease in the return on capital. Over time, positive technological externalities in production can foster economic convergence in product quality between advanced and emerging countries.[7]

However, real-world complexities and empirical evidence may show variations in this relationship. The debate about either complementary or substitutional roles of trade and capital flows in the HOM model revolves around whether capital flows enhance or replace the benefits of trade. Complementary roles suggest that capital flows support and amplify trade benefits, while substitutionary roles imply that capital flows can replace the need for extensive trade by directly financing deficits and local investments. Yet, theoretical reasons on the limitations of the standard classical model were already brought about by Lucas in 1990. He showed in theory how rent seeking monopolistic behavior and various frictions can limit the convergence and income equalization of international capital flows. Empirical evidence on factor endowments, substitution and complementarity is quite mixed, as seen for instance by Leamer (1995). The majority of studies suggest, indeed, that complementarity is more prevalent and that it can somewhat mitigate the vulnerability of a country to an external shock.[8]

In this context, Jones (2008) extends theoretical considerations to the nexus of production factors and their complementary roles. He discusses how differences in factor endowments between countries influence trade patterns and ultimately affect income distribution. He claims as well that the nexus between financial capital and trade flows can also be opposite to that from advanced economies in surplus to emergent economies in deficit. One typical case is when capital flows escape after a financial crisis and trade still functions. In this case, trade can provide a steady inflow of foreign currency, which can mitigate the impact of capital outflows, being crucial for countries heavily reliant on exports to compensate for their vulnerability to financial flows. Conversely, strong capital inflows can sometimes offset a decline in trade, providing funds for growth of domestic consumption or targeted investment in key industries.

In a seminal article, Antràs and Caballero (2009) highlight how trade and capital flows can be mutually complementary due to heterogeneous financial conditions. They challenge the classical HOM substitution paradigm by emphasizing the role of financial frictions, which limit capital allocation to certain sectors. In countries with less developed financial markets, the rental rate of capital tends to be higher under free trade. Entrepreneurs in these regions can only borrow limited capital, leading to asymmetric effects across sectors. Trade integration raises the rental rate of capital in underdeveloped countries rather than equalizing it globally. In other words, it discusses how trade and capital mobility are complements in economies with a less developed financial sector because trade integration increases the return to capital, thereby incentivizing capital flows. The authors also show that factor price equalization does not occur even with trade integration and free mobility of physical capital. They argue that in a world with heterogeneous financial development, the classical HOM conclusion does not hold.

[7] A classic example of the HOM theorem in action is the capital flows-trade pattern between the United States and China. For decades, the United States have exported capital-intensive goods while China has exported labor-intensive goods. Over time, China caught up in terms of innovation and product quality.

[8] In case of hyperglobalization, however, as pointed out by recent facts and historical experience and by Subramanian and Kesler (2013) the substitution role can prevail and reinforce integration among emerging and developing countries.

In a framework that integrates trade proportional to production factors and financial capital flows, Jin et al. (2012) identify a novel force: Capital tends to flow toward countries that become more specialized in capital-intensive industries, a phenomenon they call the "composition effect." The authors employ a general equilibrium model (GEM) to isolate the impacts of trade and specialization driven by endowment and productivity. These two factors are the primary drivers of capital flows, rather than market and financial frictions. The theoretical mechanism suggests that if a country begins to specialize in industries requiring significant capital investment (such as high-tech sectors), it will subsequently attract more capital inflows. Note that this composition effect competes with the standard HOM one, too. The article recalls that few studies have empirically tested the HOM paradigm and also provides empirical evidence using industrial data and calibrations, showing again that trade and capital flows are not always substitutes. In other words, in this model, trade and financial liberalization cause financial capital to flow from a poor country with a low capital effective labor ratio to a rich country with a high capital effective labor ratio.

Furthermore, when focusing on the relationship between saving and investment, the equivalence between free trade in goods and capital market integration becomes increasingly complex. Capital flows can finance trade deficits while simultaneously enhancing productivity. According to Milne (2014), macrofinancial policy is no longer neutral, contradicting the HOM which assumed physical capital as a fixed resource. In this context, the dynamics of saving and investment for international trade reveal that free trade in goods is not equivalent to capital market integration, particularly when importing financial capital to finance a trade deficit. Milne concludes that there exists an international foreign policy trilemma involving international capital market integration, independent macroeconomic policies and financial stability goals. Regarding foreign policy measures, a second article by Hunt et al.(2020) investigates the macroeconomic impact of import tariffs using two large-scale models: a computational CGE model and a multi-country dynamic stochastic general equilibrium (DSGE) model. The analysis highlights the broader implications of trade tensions on global trade dynamics. By comparing the two models, the paper provides insights into how tariffs can disrupt GVCs and trade flows, leading to changes in trade patterns and economic relationships between countries. The findings also underline the importance of considering both sectoral and dynamic adjustments when assessing the impact of trade policies.

Belke and Dominike (2021) examine the empirical linkages between the trade of goods and financial asset flows. They investigate under which circumstances these flows act as complements (showing a positive correlation) or as substitutes (showing a negative correlation). The authors test the sign of this correlation for the euro area, using a comprehensive dataset that focuses on financial flows for 42 countries from 2002 to 2012. They employ a gravity regression model to analyze the so-called trade-finance nexus. They introduce a novel time varying instrumental variable, based on capital control restrictions, with the aim of estimating a causal effect while avoiding endogeneity. The estimates are in favor of complementarity effects between exports and capital flows. The results suggest that real exports and financial flows move systematically together with a potential causality effect from capital flows to exports. The evidence is confirmed with a variety of different significant positive coefficients. Furthermore, they run different regressions of the interplay of capital flows and trade for different types of financial items. The most noticeable coefficient is for FDI, in line with theories stressing informational frictions. Interestingly, they attribute this to the fact that since FDI requires more interaction and deeper knowledge of the market than other forms of investment, it also has the biggest impact on exports.

Theoretical and empirical analyses suggest that the HOM process can originate and develop in various ways. The causality between trade and capital flows can be bidirectional, and the gains from trade are significantly influenced by foreign policies that facilitate capital flows and address various frictions. As seen, on the one hand, empirical evidence indicates that capital flows and trade often play complementary roles. This interplay is particularly crucial in the context of deglobalization shocks. On the other hand, a high degree of substitution can become unsustainable for a country, posing a vulnerability during GVC fragmentation and potentially triggering trade wars. Globally, protectionist policies aimed at reducing imbalances may be counterproductive. Tariffs and trade barriers can exacerbate financial frictions and disrupt supply chains, leading to retaliatory actions, higher consumer prices and weakened economic growth.

5 Deglobalization

Given the intricate channels through which trade and capital flows operate in the global economy, it is challenging to empirically determine whether deglobalization is an established trend or merely a temporary phenomenon. On the one hand, a growing body of research indicates a clear shift toward deglobalization, affecting both trade integration and capital flows. Many recent studies and policy reports suggest a turning point in globalization, impacting not only trade integration but also capital flows and GVCs.[9] On the other hand, other studies suggest that globalization is merely undergoing a reshaping phase.

The interaction between trade and capital flows is crucial in understanding these dynamics. As seen, trade and capital flows are deeply interconnected and their forces may strive toward a global equilibrium where they either complement (more likely) or substitute each other across different industries and countries. Extreme solutions of substitution can reinforce a tendency toward fragmentation as a response to a shock, like when sudden changes in trade policies and practices can significantly influence capital movements and vice versa.[10]

In this context, I review recent literature on deglobalization and its measurement, which mainly uses gravitational models. Articles with theoretical reference models frequently refer to GEMs, and recently, more of an emphasis has been put on the effects of different variables on GVCs. Despite their limitations, extensions of GEMs or DSGE models, incorporating various market frictions, have been used to study the international transmission of business cycles in the context of (de)globalization

These models are, indeed, useful for understanding global market interactions. When realistic frictions are included, GEM simulations provide insights into the justification and limitations of free trade policies. However, GEMs often fail to generate the fluctuations observed in real-world data. To address this topic, Ambler et al. (2002) employed a modified version of a GEM to study the transmission of business cycles related to trade and capital flows. Their complementary analysis of (de)globalization incorporates multiple sectors, trade in intermediate goods and imperfect substitution of goods within a two-country framework to better capture the interconnections of business cycles among countries. They underline that including

[9] For instance, Herrero Bruegel report (2020) claims that after decades of increasing globalization in trade, capital flows and people movements, in the last decade the trend has shifted toward deglobalization. This shift is evidenced by a decrease in merchandise trade and capital flows.

[10] For example, trade protectionism can lead to reduced FDI, while liberalized trade policies can enhance capital flows by creating more investment opportunities.

capital adjustment costs and linking multiple sectors, which are outcomes of globalization, enhance the accuracy of capturing real international transmission phases.

A more recent article with a GEM approach by Mkrtchyan and Hugot (2022) is very interesting because it brings data to the theory, considering also a deglobalization driver induced by potential tariff escalations. Their article introduces two empirical methods to quantify the impact of tariff changes on trade and welfare which are rooted in a structural gravity model, a key component of this GEM application. The first technique estimates the impact of tariff changes on bilateral trade within a partial equilibrium framework, focusing on specific trade flows at product level. The second part of the analysis quantifies the general equilibrium impact on bilateral aggregate trade. This allows for the estimation of trade reallocation and welfare changes, considering the broader economic interactions and adjustments. The quantitative analysis involves estimating trade elasticities at product level, which helps in understanding how sensitive trade flows are to changes in tariffs. This empirical strategy is applied to Armenia.

A branch of empirical literature extends gravity models to analyze the relationship between geopolitical dealignment and cross-border investment. These same geopolitical variables can also explain international trade and (de)globalization. Bailey et al. (2017) introduced the geopolitical variable in their article, which proposes a dynamic ordinal spatial model to estimate state preferences from United Nations General Assembly voting data spanning 1946 to 2012. This model aims to capture countries' positions relative to the US-promoted liberal international order by analyzing their voting behavior. Resolutions that remain consistent across years serve as bridge observations, ensuring that preference estimates are comparable over time. The ideal distance points (IDPs) represent states' positions vis-à-vis the US-led liberal order. These points are estimated using statistical techniques that distinguish signal from noise, facilitating better intertemporal comparisons. The article demonstrates the effectiveness of the IDPs technique in capturing dynamic state preferences and enhancing the accuracy of foreign policy analysis.

Building on this approach, Abeliansky et al. (2024) use data on voting behavior at the United Nations General Assembly to measure geopolitical lack of alignment among countries and its effect on investments and capital flows. They employ the IDPs technique to capture dynamic state preferences and analyze their impact on cross-border investment. The study finds that an increase in geopolitical misalignment is associated with a decline in both FDI and PI, with a more pronounced decline observed for FDI. The article suggests that continued geopolitical fragmentation is likely to result in decreased cross-border investment. Geopolitical differences between "friendly" countries do not lead to a significant reduction in bilateral investment, whereas "nonfriendly" country pairs experience a notable decline. In a related empirical study, Abeliansky et al. (2024) focus on developments in global and bilateral capital flows and cross-border investment. The study distinguishes four different phases from 1995 to 2023, highlighting that global capital flows have not fully recovered since the financial crisis. Notable trends include nearshoring, particularly in China's FDI and PIs within Asian countries. While global capital flows, measured relative to global GDP, increased substantially before the financial crisis, they decreased afterward and have yet to recover. Measures of capital flow concentration indicate that capital is moving to fewer destinations, albeit on a small scale.

Contrastingly, Altman et al. (2024) argue that global flows, including financial capital, have remained resilient despite various shocks, and there is no clear evidence of a significant shift from global to regional business. Using the DHL Global Connectedness Index, they found that international business activity has proven remarkably resilient in the face of recent geopolitical tensions and an increasingly adverse public

policy environment. This interpretation suggests that while some regions may be experiencing changes in capital flow patterns, the overall trend does not uniformly support the deglobalization narrative. In this context, deglobalization could still be a risk rather than a likely reality.

Considering the link between deglobalization and the complexity of GVCs, an increasing risk of supplier unavailability due to GVC fragmentation emerges. Overall, the potential fragmentation of GVCs is seen as leading to higher costs and prices, reduced availability of goods and services, and consequently, the reshoring or friendshoring of GVCs. A notable example is the recent rise in protectionism between the US and China, and its spillover effects on other countries connected through GVCs. In the same vein, Witt (2019) points to a reversal of globalization. In his analysis, deglobalization could lead to significant changes in GVCs. GVCs might become shorter and more regionalized but not necessarily geographically, with companies opting to locate their production closer to their main markets (nearshoring) to mitigate risks associated with political instability and trade barriers (friendshoring). This shift could also lead to changes in the specialization and organizational forms of GVCs. The article also highlights how countries with strong economic and military power might be better positioned to maintain their global influence and economic linkages. This tactic could result in a more fragmented global economy, with economic regionalization and blocks forming around major powers.

After reviewing the evolution of international trade and confirming the peak of globalization around 2008, Giovannetti et al. (2023) analyze the impact of the slowdown of globalization on GVCs. Globalization occurred mainly due to the decrease of transport costs, and gradual implementation of free trade policies before the global shocks and was interrupted only by the trade collapse of 2009. They apply two econometric strategies, namely a Difference-in-Differences (DiD) and a Regression Discontinuity Design (RDD) approach to test this hypothesis. These statistical approaches allow them to isolate the effects of regionalization and protectionist policies by comparing changes over time between treated and control groups. The analysis aims at identifying relationships between trade policies, regionalization and economic outcomes. Considering the recent literature on the GVCs reorganization, the authors indicate a case for a loss of welfare in case of extreme regionalization and heterogenous effects for winners and losers according to industrial sectors, countries and the extent of the potential escalation of protectionist policies.

According to Baldwin and Freeman (2022) and Bedoya (2023), recent supply disruptions put the risk of GVCs' fragmentation as a main priority on the global agenda. The authors also found that the shortages were less severe where GVCs were relying on the home country or being more diversified. However, they argue that globalization has, indeed, not ended but simply evolved. In their view, while the global goods trade to GDP ratio peaked about 15 years ago, trade in services has continued to grow and now represents a significant portion of international commerce. Hence, the article considers globalization as persistent, as long as international arbitrage among countries remains profitable. Campos et al. (2023), measuring reduction of trade due to fragmentation with a gravity equation approach, indicate how this can have heavy effects on the definition of new trade blocks.

Finally, in 2024, Attinasi et al. and Fernandez et al. show empirically how fragmentation can negatively impact global trade, focusing again on the cost of supply chain disconnections. In the first study, the analysis is conducted using input-output and a calibration approach to a multi-country model, while in the second article, a time series methodology with panel SVAR and LPs is adopted.

6 The empirical strategies

In this review, we have seen how econometric models are often employed to assess the impact of many variables related to (de)globalization analysis. International trade and finance theory are always relevant, as a theoretical background to refer to is advisable to depict deglobalization. Gravitational equations or longitudinal data approaches and, to a lesser extent, time series techniques have been used for answering a variety of research questions related to (de)globalization.

All in all, it is noteworthy that capital flows and trade variables are highly endogenous to each other, influenced by a wide set of interrelated pull and push drivers. In other words, the endogeneity of capital flows and trade variables means that these flows have an influence on each other as well as on other economic variables that influence them in return. This circular process creates a feedback loop that complicates the quantitative analysis of their impacts. This problem, which is relevant in longitudinal regressions, has been addressed with an instrumental variable approach in some studies.[11]

To better identify and verify the functioning channels through which trade and capital operate a selection of the empirical literature reviewed will now be discussed. Table 1 is used to present a comparison of key empirical studies, their datasets, empirical strategies and their findings. According to the articles and the techniques reported in the table, the following very general conclusions can be drawn:

- Gravity models have been empirically validated across numerous studies and contexts. They consistently explain a significant portion of the variation in bilateral trade flows, making them a reliable tool for trade and globalization analysis. They can be augmented with ad hoc built indexes to capture (de)globalization or fragmentation.
- Many applied studies in trade and globalization start successfully from general equilibrium models (GEMs or DSGEs), as a comprehensive theoretical frame is a useful reference point from which to start drawing conclusions about the welfare implications of shocks and simulating policy scenarios. They can be calibrated and used for simulations of the impact of shocks to key variables of deglobalization.
- GEMs and DSGEs work well to represent the complexity of all agents' interactions but rely on perfect competition assumptions that are too clear-cut. Hence, in many cases, they need to be updated, adding limitations and frictions related to more realistic theories to current circumstances and countries' characteristics.
- In one case, DiD and RDD techniques were also used for deglobalization analysis, related also to GVCs' changes.[12]

[11] Among the reviewed studies, several include composite or synthetic indexes related to trade and geopolitical factors to better capture uncertainty and unobservable components affecting the dynamic of global variables. These indexes can be built from primary variables to assess the current phase of deglobalization. The construction of a similar index should be very accurate, balancing orthogonality of the single components with expert judgment. This can be done via preliminary principal component or cluster analysis. It is advisable to run a robustness check of different indicators and an index competition to choose the best indicator among a set of potential candidates.

[12] The first is useful for evaluating the causal impact of a foreign policy or of an event by comparing the changes in outcomes over time. It requires finding a treatment group and a control group. The second can be used when there is a clear cut-off or threshold that determines treatment assignment, like a specific new tariff rate.

Time series analysis, only as a complement to gravitational models, can also be used in various ways to investigate the current global state of affairs, but on a very parsimonious number of variables and countries:

- The analysis of capital flows often identifies the so-called pull and push factors in linear multivariate regressions as key drivers of capital flows across international markets. They are mainly represented by variables like domestic and global interest rates spreads, growth prospects, exchange rate dynamics and their expectations.
- Vector Autoregressive Models (VAR) and Structural VAR Models (SVAR) can be used to capture the short-term dynamic relationships among few time series variables. In this context, (S)VAR can be used to analyze the interdependencies between trade and capital flows and to forecast their interactions and simulate sudden stop of capital flows or other shocks (trade, climate, tariffs etc.).
- VECMs are used to analyze the long-term equilibrium relationship between trade and capital flows and their short-term dynamics. Cointegration tests can determine whether a long-term relationship exists, while VECMs can model the adjustments toward equilibrium of the variables at play.
- Bayesian VAR (BVAR) and more modern multivariate machine learning approaches, which were originally used to model monetary policy scenarios, are more flexible instruments to simulate an uncertain environment. They could be apt to simulate asymmetric changes in variables, representing fragmentation conditions for blocks of different countries, and to simulate tale risk events, like a tariff escalation or a sudden stop of capital flows.

Pros and cons of different approaches discussed in this report:

- For the first, longitudinal approach using the gravitational equation, a theoretical reference from international trade theory, nested within a comprehensive GEM approach, can be also adopted. This method is suitable for considering the full sample of all countries in the world together.
- In the context of globalization and deglobalization, gravity models help analyze how changes in global economic integration affect trade patterns. They can be used to study the effects of GVCs, FDI and other aspects on economic globalization.
- For assessing the welfare implications of deglobalization at the global level or identifying the key drivers of and their contribution to (de)globalization, a gravitational approach referring to a GEM or DSGE modified model can be adapted according to different calibrations.
- The second, time series-oriented approach can exploit endogeneity to simulate dynamic scenarios. This method is suitable for analyzing bilateral responses to shocks between pairs or blocks of countries. Despite their well-known limitations, VAR Granger causality tests can be used to indicate the potential direction of causality in the transmission of trade or capital flow shocks.

- The size of and comparability among the elements in a given sample can be a significant issue, limiting time series investigations. In such cases, a Bayesian approach, based on parametric distribution or a more flexible non-linear one, could be employed.

Table 1. A selection of empirical studies for (de)globalization analysis

Authors	Year	Subject	Channel	Dataset	Empirical strategy	Finding	Country
Abelianski et al.	2024	(De)globalization and investment	Nexus FDI flows	GLOMO	GRAVITY Equation	Investments	World
Ambler et al.	2002	Transmission of business cycle	Nexus trade flows	OECD	VAR calibration	Costs drive	World
Antonietti and Franco	2021	From FDI to economic complexity	Complex nexus FDI	UNGA	PANEL, Granger causality	Causality FDI	World
Attinasi et al.	2024	Costs of supply chain decoupling	Trade GVCs	ADB-MRIO	Multi-Input-Output	Trade decoupling	World
Bailey et al.	2017	State preferences from UN voting data	Geopolitics	UNGA voting	Dynamic spatial model	Vote references	World
Baldwin and Freeman	2022	Risks and global supply chain	Globalization	OECD, TiVA	Input-Output	Reshape GVCs	World
Basco et al.	2024	Crises and the global supply network	Financial crises	AMADEUS	Network shocks	Firms' micro	Europe
Belke and Dominique	2021	Trade-capital flows complementarity	Trade	Hobza ad hoc	PANEL	Uncertain effects	World
Bénétrix et al.	2023	Link between FDI and growth	FDI – growth	World Bank WB	Cross section, PANEL	Education -Growth	EMEs
Benguria, Saffie	2024	Trade war finance and GVCs	Trade GVCs	Ad hoc	PANEL with tariffs	Trade war effect	US-China
Campos et al.	2023	Geopolitical fragmentation and trade	Global trade	CEPII – DOTS	GRAVITY Equation	Trade blocks	World
Chernenko et al.	2020	Analysis of M&A 2009–2020	Capital flows	IMAA, Deloitte	Regression Pharmaceutics	M&A results	World
Ersahin et al.	2024	Supply chain risk changes	GVCs	NETS	PANEL	Uncertain GVCs	World
Fernandez	2020	Composite indicators for trade	Trade	WB, UNESCO	Indexes comparison	Indicators need	OECD
Fernandez et al.	2024	Industries' geopolitical fragmentation	Trade	IFS, WEO, GTA	PANEL SVARs	Global impact	World
Fitter et al.	2024	Deglobalization and migration	Trade	GLOMO, UNPD	GRAVITY Equation	Global slow	World
Ha et al.	2021	Impact greenfield on firm activity	Capital flows	UNCTAD	PANEL models	Greenfield effect	World
Helpman and Melitz	2007	Estimating trading flows	Trade	Survey ad hoc	GRAVITY Equation	Trade effects	World

Hunt et al.	2020	Modeling trade tensions	Trade	GTAP	Gen Eq. DSGE	Sectoral effects	World
Joo and Shawl	2023	Relations FDI-trade-growth	Growth	UNCTAD	PANEL ARDL model	Short-/long-term	BRICs
Kandil	2009	Relation trade-financial flows	Nexus trade flows	IFS	Multivariate Time Series	Nexus effects	EMEs
Leigh et al.	2017	Exchange rate and trade	FX trade	WEO, TiVA, OECD	ARDL models	Still connection	World
Murdipi et al.	2023	Capital flows and economic growth	Capital flows	US Treasury Dpt	PANEL	Institutions' role	World
Raza et al.	2021	Investigation of greenfield FDI	Capital flows	WPI, UNCTAD	Multivariate Time -Series	Greenfields' role	World
Rezza and Farhi	2024	Trade networks and barriers	Trade	WIOD	Gen Eq. CGE-calibration	Models' toolbox	World
Ribaj and Fitim	2021	Saving and growth in EMEs	Capital flows	CEIC	VECM	Savings' role	EMEs
Robinson	2020	Capital flows and innovation	Capital flows	Van Dijk	PANEL, DiD, RDD	Tax incentives	Kosovo
Samini and Jenatabati	2014	Globalization and growth	Trade	KOF index	Dynamic PANEL	High/low income	OIC
Taylor and Wilson	2011	Trade and finance complementarities	Trade	Historical	PANEL, GRAVITY, IV	Variable effects	World
Ünalmis	2002	Causality FDI – development	Capital Flows	National Statistics	VAR, VECM	FDI, PI>>growth	Türkiye
Villaverde et al.	2023	Measuring fragmentation	Globalization	IFS, UN	Factor Model, SVAR	Global impact	World
Vujacovic	2010	Measuring globalization	Globalization	UN, COMTRADE	PCA indexes	New index	World
Zeng et al.	2024	Trade war	Trade	US Census	Test structural breaks	Bilateral tension	US-China

7 Conclusions

This review has considered trade and capital flows' patterns and their interplay, with a focus on the current deglobalization debate. Deglobalization is a multifaceted potential reversal trend and needs an integrated theoretical and empirical approach to be addressed, monitored and analyzed. Knowing a minimum about theories of international trade, international finance and industrial organization has emerged as a useful reference to make a preliminary step toward understanding the functioning of deglobalization.

Recent crises have exposed the vulnerabilities of globally fragmented supply chains and their impacts on growth and inflation. The fragmentation of GVCs is associated with higher costs and prices, limited availability of goods and services, and could lead to their reshoring or friendshoring, thereby affecting global trade.

There are no clear-cut theoretical or empirical conclusions on deglobalization; more analyses are needed. Various empirical strategies have been employed by scholars according to different research goals. Different potential channels of transmission and nexus, embodied in the BoP items and related to the interplay of global trade and capital flows, have been discussed. In summary, I found that:

- The single channel through which international trade has an impact on the global economy can operate through various comparative advantages driven by investment, human capital accumulation, productivity improvements and GVC systems, according to modern trade theory. Geographic reallocations of plants and network-related economies of scale are highly significant. These factors drive the reshaping and potential fragmentation or regionalization of GVCs.
- The symmetric single channel by which capital flows operate is crucial for maintaining the saving and investment equilibrium. Different types of capital flows, such as (i) short-term speculative flows (PI) and (ii) long-term entrepreneurial investments (FDI, M&A, and greenfield investments), can significantly impact deglobalization effects. These flows are essential for financing investment but also contribute to speculative boom and bust cycles.
- In the context of the deglobalization nexus between international trade and international finance, assessing the substitution or complementary roles of these variables is crucial for determining feedback patterns and countries' vulnerabilities. The interplay between trade and finance can generate positive and negative spirals for (de)globalization, leading to new forms of GVCs or regional fragmentations into blocks.
- The interaction between trade and capital flows can create reinforcing feedback effects, influenced by trade and financial frictions as well as changes in industrial structure. For instance, capital often flows toward countries that specialize in capital-intensive industries, further enhancing their trade patterns. FDI frequently complements trade by boosting production and financial capabilities in host countries.
- Financial markets play a crucial role in this feedback loop. Market reactions to trade policies and economic conditions influence capital flows, which in turn affect trade patterns and

capital flow decisions. Capital tends to flow toward countries with favorable trade conditions, reinforcing their economic strengths. Conversely, adverse trade market conditions or reactions can lead to capital flight, destabilizing economies.

To advance research on these topics, a comprehensive deglobalization assessment and monitoring exercise is a good starting point. Additionally, a broader theoretical framework, such as GEMs or DSGE models, can be useful for capturing the multifaceted interplay. This can be complemented by targeted empirical time series investigations among groups of countries or specific transmission channels of shocks. A list of reviewed matches instruments-objectives has been provided in table 1.

To sum up, the empirical research review has shown that usable techniques are the following:

- Longitudinal regression and gravitational analysis, incorporating new indicators of (de)globalization and fragmentation, are successfully used to evaluate trade and test the chance of significant deglobalization or regionalization trends. Simulating different scenarios can help measure potential welfare implications and the effects of the interplay between trade and capital flows.
- Advanced time series regression techniques ((S)VAR, VECM, and BVAR) can be employed as a limited complement to: (i) verify the functioning of individual shock transmission channels between selected countries and regional blocks, (ii) investigate potential causal links among key variables and their equilibrium properties, and (iii) simulate a sector's actual response to financial shocks (and vice versa).

In this regard, it is advisable to conduct more empirical research on the interplay between trade and capital flows and their reinforcing feedback effects. Additionally, exploring the responses to monetary policy and climate change shocks is beneficial. Furthermore, it is essential to study the differences between advanced and emerging countries, while identifying theoretical hypotheses that align with available data.

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