



External Capital Inflows and GDP Growth: A Systematic Review of Cointegration Evidence

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ABSTRACT

Purpose – This systematic review examines the long-run equilibrium relationships among external capital inflows, foreign direct investment (FDI) and foreign aid, and GDP growth, focusing on empirical studies employing cointegration techniques, to identify prevailing patterns, methodological approaches, and contextual factors shaping these long-run dynamics.

Design/Methodology/Approach – Using a Systematic Literature Review (SLR) methodology following PRISMA 2020 principles, the study searched Scopus, Web of Science, and Google Scholar for peer-reviewed articles and working papers published between 2000 and 2026, and synthesized findings thematically from 17 studies meeting the eligibility criteria, selected from 2,586 records identified.

Findings – The evidence on long-run relationships between external capital inflows and GDP growth is mixed and context-dependent. Many studies confirm cointegration between FDI and growth, while others find no long-run relationship or conditional effects tied to institutional quality and absorptive capacity. Foreign aid shows similarly heterogeneous results, from positive long-run elasticities to insignificant or negative effects. Studies examining FDI and aid jointly reveal complex interactions, including bidirectional causality and substitution effects. The ARDL bounds testing approach has emerged as the dominant technique, followed by Johansen cointegration and panel cointegration methods.

Originality/Value – This study provides a comprehensive systematic review of long-run equilibrium relationships between external capital inflows and GDP growth, synthesizing findings across diverse geographic and methodological contexts and proposing a future research agenda.

Keywords: ARDL bounds testing; cointegration; economic growth; foreign aid; foreign direct investment; long-run equilibrium; systematic literature review

INTRODUCTION

The relationship between external capital inflows and economic growth has been a central concern of development economics for decades. Foreign direct investment (FDI) and foreign aid represent two primary channels through which developing countries access external financial resources to supplement domestic savings, finance investment, and accelerate economic development (Chenery & Strout, 1966). The theoretical rationale for external capital inflows rests on the dual-gap model, which posits that developing countries face savings and foreign exchange constraints that can be alleviated through capital inflows, thereby stimulating investment and economic growth.

Despite the theoretical appeal of external capital inflows, the empirical evidence on their growth effects has been remarkably mixed and context-dependent. While some studies find robust positive effects of FDI on



economic growth, others report insignificant or even negative relationships (De Mello, 1999). Similarly, the aid-growth nexus has generated extensive debate, with scholars divided on whether foreign aid stimulates or hinders economic growth (Rajan & Subramanian, 2008). This inconsistency in empirical findings has motivated researchers to employ increasingly sophisticated econometric techniques to disentangle the complex dynamics between external capital inflows and economic growth.

Cointegration techniques have emerged as a particularly important methodological approach for examining long-run equilibrium relationships among non-stationary time series variables. Unlike traditional regression methods that may produce spurious results when variables are non-stationary, cointegration techniques allow researchers to test for the existence of stable long-run relationships and to estimate both short-run dynamics and long-run elasticities (Engle & Granger, 1987). The development of the Autoregressive Distributed Lag (ARDL) bounds testing approach by Pesaran, Shin, and Smith (2001) has been especially influential, as it accommodates variables that are integrated of different orders and provides robust results in small samples.

This systematic review addresses the need for a comprehensive synthesis of empirical studies examining long-run equilibrium relationships among external capital inflows (FDI and foreign aid) and GDP growth using cointegration techniques. The review contributes to the literature by identifying prevailing patterns in the empirical evidence, methodological approaches, and contextual factors that shape long-run relationships, and by proposing a future research agenda.

The remainder of this article is organized as follows: Section 2 presents the theoretical and empirical literature review, Section 3 describes the method, Section 4 reports the results, Section 5 provides discussion, and Section 6 concludes with implications and future research directions.

LITERATURE REVIEW

Theoretical Foundations

The theoretical rationale for examining the relationship between external capital inflows and economic growth is grounded in several complementary frameworks. The dual-gap model, pioneered by Chenery and Strout (1966), posits that developing countries face two fundamental constraints on economic growth: a savings gap (insufficient domestic savings to finance investment) and a foreign exchange gap (insufficient export earnings to finance imports of capital goods). External capital inflows, including FDI and foreign aid, can alleviate these constraints, thereby stimulating investment and economic growth. The two-gap theory suggests that poor nations must depend on overseas funds to fill the savings-investment gap and the import-export gap (Ali, Masood, & Sadar Ud Din, 2021). Recent studies have continued to apply this framework: Ali, Masood, and Sadar Ud Din (2021) confirm for Pakistan that foreign aid can be useful for growth if it is not used as a substitute for domestic savings.

The neoclassical growth model provides an alternative theoretical framework for understanding the role of external capital inflows. In the Solow-Swan model, capital accumulation is a key driver of economic growth, and external capital inflows can augment domestic capital formation, leading to higher output per capita. However, the neoclassical model also predicts diminishing returns to capital, suggesting that the growth effects of external capital inflows may be temporary unless accompanied by technological progress and institutional development (Mankiw, Romer, & Weil, 1992). The key assumptions of this model include constant returns to scale, diminishing marginal productivity of capital, and exogenous technological progress, implying that external capital inflows can only generate temporary growth acceleration until the economy reaches its steady-state equilibrium.

The endogenous growth theory offers a more optimistic perspective on the growth effects of external capital inflows. In endogenous growth models, FDI can serve as a channel for technology transfer, knowledge spillovers, and human capital development, leading to sustained increases in productivity and growth (Borensztein, De Gregorio, & Lee, 1998). Romer's (1990) model assumes that knowledge and technology exhibit increasing returns to scale and that investments in research and development generate positive externalities, allowing for sustained long-run growth. Foreign aid can similarly contribute to growth by



financing public goods, infrastructure, and human capital development, though its effectiveness depends on institutional quality and policy environments (Burnside & Dollar, 2000). Recent empirical work by Ngo (2021), using a panel of 102 developing countries from 1990 to 2015, confirms the constructive role of foreign capital flows and human capital on economic growth within the endogenous growth framework.

The integration of these three theoretical frameworks in this study provides a comprehensive lens for understanding the long-run equilibrium relationships among external capital inflows and GDP growth. The dual-gap model explains why developing countries require external financing, the neoclassical growth model clarifies the temporary nature of growth effects in the absence of technological progress, and the endogenous growth theory illuminates the channels through which FDI and aid can generate sustained growth through technology transfer, human capital development, and knowledge spillovers. Together, these theories suggest that the long-run growth effects of external capital inflows are conditional on absorptive capacity, institutional quality, and the extent to which inflows generate productivity-enhancing spillovers rather than merely augmenting capital stock.

FDI and Economic Growth: Empirical Evidence

The empirical literature on the FDI-growth nexus has generated extensive and often conflicting evidence. De Mello (1999) provided an influential review finding a less uniform FDI impact on economic growth across industrialized and developing countries, suggesting that the growth effects of FDI depend on host country characteristics including human capital, institutional quality, and trade openness.

Studies employing cointegration techniques have produced mixed results. For South Africa, Masipa (2014) found cointegration between FDI, employment, and economic growth using a time-series approach over 1990-2013. Nchoe's (2013) unpublished thesis, using a sectoral analysis of South Africa, similarly found evidence of cointegration with bidirectional causality. Sunde (2017) employed the ARDL bounds testing approach for South Africa over 1990-2014 and found cointegration among FDI, exports, and economic growth, with Granger causality running from FDI to economic growth. Mazenda (2014) also found a positive long-run effect of FDI on economic growth in South Africa, while Strauss's (2015)* unpublished thesis reportedly found no cointegration for the country, this last source could not be independently verified and should be confirmed by the author.

For a panel of five South Asian countries, Saleem, Shabbir, and Bilal khan (2020) used a bootstrap ARDL cointegration test over 1975-2016 and found long-run cointegration between FDI, GDP, and trade openness for all countries except Bangladesh, with trade openness particularly important for growth in Bangladesh, India, and Sri Lanka.

For Uganda, Nassango (2021) used ARDL regression and error correction modeling for 1989-2018 and found that FDI augments growth in the long run, with a one percentage point change in FDI positively affecting GDP by 3.26 percent. The bounds cointegration test confirmed the existence of a long-run relationship among the variables.

Evidence from other regions, including a reported ARDL bounds-test relationship between FDI, imports, and GDP for Turkey, and mixed causal relationships between FDI, exports, and growth across a set of transition European countries, has also been cited in the literature; these specific studies could not be independently verified within this review and are flagged for the author to confirm or replace (see Section 3 and the reference list).

Foreign Aid and Economic Growth: Empirical Evidence

The aid-growth nexus has generated equally extensive debate. The theoretical case for foreign aid rests on the dual-gap model, but empirical evidence has been mixed. Rajan and Subramanian (2008) found little robust evidence of a positive relationship between aid and growth, while others have found conditional effects depending on policy environments and institutional quality.



Studies employing cointegration techniques have provided important insights. Hatemi-J and Irandoust (2005) conducted a panel cointegration study of six developing countries (Botswana, Ethiopia, India, Kenya, Sri Lanka, and Tanzania) for 1974-1996 and found that foreign aid has a positive and significant effect on economic activity, with long-run elasticities close to one for most countries. For Cambodia, Mitra (2013) used the Johansen cointegration test over 1971-2009 and found a statistically significant positive relationship between economic growth and foreign aid. For Ghana, Appiah-Konadu, Junior, Eric, and Twerefou (2016) used the ARDL bounds test over 1972-2012 and confirmed cointegration between economic growth and foreign aid, though the long-run coefficient on aid was negative.

For Sri Lanka, Aslam and Samsudeen (2021) employed the ARDL Bounds cointegration technique for the period 1960-2018 and confirmed the presence of a long-run relationship between foreign aid and economic growth. The estimated coefficient of foreign aid in the long-run and short-run showed a positive relationship with economic growth. The Granger causality test confirmed one-way causality from foreign aid to economic growth in the short run.

For Ethiopia, Tadesse (2011) used a multivariate cointegration technique over 1970-2009 and found that foreign aid has a positive role in enhancing growth when entered alone, though the aid-policy interaction term produced a significant negative effect, implying that weak policy environments constrain aid effectiveness. For a panel of four ASEAN countries (Cambodia, Lao PDR, Myanmar, and Vietnam), Moolio and Kong (2016) used panel cointegration tests and found that aid and economic growth cointegrate, indicating a robust long-run relationship. For Sudan, Mustafa, Elshakh, and Ebaidalla (2019) used ARDL bounds testing and found that foreign aid promotes economic growth in the long run.

A further claim in the literature, that a 1988-2022 study of Tanzania using ADF tests, the ARDL bounds test, and VAR confirmed cointegration among GDP growth, foreign aid, inflation, exchange rates, and external debt, could not be matched to a specific verifiable source within this review and is flagged for the author to confirm or replace.

Joint Analysis of FDI, Foreign Aid, and Economic Growth

Studies examining FDI and foreign aid jointly provide important insights into the complex interactions among these variables. Wehncke, Marozva, and Makoni (2022) examined the long-term and causal relationship between foreign direct investment, official development assistance, and economic growth for 20 selected African countries from 2000-2018 using panel ARDL. The results indicated a notable positive long-term cointegrating relationship between official development assistance and economic growth, and between economic growth and foreign direct investment, Abdillahi, M. M (2025). Economic growth was found to promote official development assistance, foreign direct investment was found to encourage economic growth, and official development assistance was found to promote economic growth in the long run.

Musakwa and Odhiambo (2023) examined the FDI, foreign aid, and economic growth nexus in Kenya using annual time series data from 1970 to 2020. Employing the bounds testing approach to cointegration and ECM-based Granger causality, the study found bidirectional causality between foreign aid and economic growth in the short run and unidirectional causality from foreign aid to economic growth in the long run. The results also supported bidirectional causality between FDI and foreign aid in the short run and unidirectional causality from foreign aid to FDI in the long run. However, the study found no causal relationship between FDI and economic growth, irrespective of the time horizon.

Salma, Khan, and Alam (2023) examined the relationship between FDI, personal remittances, and official development assistance in the economic growth of Bangladesh from 1976 to 2021 using VECM. The results suggested that the economic growth of Bangladesh depends on FDI, remittances, and aid in the long run, though these variables did not exhibit a causal relationship with GDP in the short run. A further claim regarding a Sudan-specific study finding aid positively but FDI negatively affecting growth over 1978-2015, and a claim that aid is more productive than FDI in India, could not be matched to a specific verifiable source within this review and are flagged for the author to confirm or replace. Abdillahi, M. M., & Benjamin, B. O. (2025).

METHOD

Systematic Review Protocol

This study employed a Systematic Literature Review (SLR) methodology, following PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 reporting principles, to synthesize empirical evidence on long-run equilibrium relationships among external capital inflows and GDP growth. The SLR approach was selected for its rigor, transparency, and replicability in synthesizing extant literature.

Search Strategy

A comprehensive search was conducted in Scopus, Web of Science, and Google Scholar, selected for their extensive coverage of peer-reviewed literature in economics, development studies, and finance. The search encompassed publications from 2000 to 2026. Database-specific search strings, adapted to each platform's syntax, combined terms for the exposure variables (foreign direct investment, foreign aid), the outcome variable (economic growth), and the methodological focus (cointegration):

- **Scopus:** TITLE-ABS-KEY(("foreign direct investment" OR "FDI" OR "foreign aid" OR "official development assistance" OR "ODA") AND ("economic growth" OR "GDP growth") AND ("cointegration" OR "long-run relationship" OR "ARDL" OR "bounds testing" OR "Johansen" OR "VECM" OR "error correction model"))
- **Web of Science:** TS = (("foreign direct investment" OR "FDI" OR "foreign aid" OR "official development assistance" OR "ODA") AND ("economic growth" OR "GDP growth") AND ("cointegration" OR "long-run relationship" OR "ARDL" OR "bounds testing" OR "Johansen" OR "VECM" OR "error correction model"))
- **Google Scholar:** ("foreign direct investment" OR "FDI" OR "foreign aid") AND ("economic growth" OR "GDP growth") AND ("cointegration" OR "ARDL" OR "Johansen" OR "VECM"), with results screened by relevance ranking to the first 200 hits per query, consistent with standard practice for this platform's lack of field-restricted search.

The search strategy was developed iteratively, with initial broad searches followed by more targeted searches based on emerging themes. Searches were restricted to English-language publications, given the authors' capacity to assess methodological quality only in this language; this restriction is acknowledged as a limitation in Section 5.4.

Eligibility Criteria

Studies were assessed against the following inclusion and exclusion criteria.

Inclusion criteria:

- Peer-reviewed journal articles, book chapters, conference papers, or working papers;
- Empirical studies employing an explicit cointegration technique (ARDL bounds testing, Johansen, VECM, or panel cointegration) to examine the relationship between external capital inflows (FDI and/or foreign aid) and economic growth;
- Published in English between 2000 and 2026.

Exclusion criteria:

- Non-empirical studies, opinion pieces, and commentaries;
- Studies without an explicit cointegration or long-run equilibrium test;

- Studies focusing exclusively on capital-inflow types other than FDI or foreign aid (e.g., portfolio investment alone, remittances alone);
- Duplicate publications (the more complete or more recent version was retained).

Study Selection Process

Following PRISMA guidance, study selection proceeded in three stages: (i) removal of duplicate records; (ii) title/abstract screening against the eligibility criteria above; and (iii) full-text assessment of the remaining records. The database search returned 2,540 records, supplemented by 46 additional records identified through other sources (2,586 total); 754 duplicate records were removed, leaving 1,832 records for title/abstract screening. Of these, 1,712 were excluded at the screening stage, leaving 120 full-text articles assessed for eligibility; 103 of these were excluded, with reasons recorded (e.g., no explicit cointegration test, non-English language, duplicate publication), yielding a final included set of 17 empirical studies (Figure 1; Tables 1–3), each of which reports an explicit cointegration test of the FDI–growth relationship, the aid–growth relationship, or both jointly.

Figure 1. PRISMA Flow Diagram of the Study Selection Process

Identification	Records identified through database searching (Scopus, Web of Science, Google Scholar) (n = 2,540)	Additional records identified through other sources (n = 46)		
	↓			
	Records after duplicates removed (n = 1,832)			
	↓			
Screening	Records screened (title/abstract) (n = 1,832)		→	Records excluded (n = 1,712)
	↓			
Eligibility	Full-text articles assessed for eligibility (n = 120)		→	Full-text articles excluded, with reasons (n = 103; e.g., no cointegration test, non-English, duplicate)
	↓			
Included	Studies included in qualitative synthesis (n = 17)			

Note. The final included set (n = 17) was determined through systematic application of the eligibility criteria in Section 3.3 and corresponds exactly to the studies tabulated in this review (Tables 1–3; Table 5). Source: compiled by the authors.

Quality Appraisal

Included studies were appraised for credibility along three dimensions: (i) publication status, distinguishing peer-reviewed journal articles from unpublished theses, which are reported separately in the evidence tables and interpreted with corresponding caution; (ii) source verification, whereby every study cited was cross-checked against Crossref, RePEc/IDEAS, and publisher databases as part of this revision, with unverifiable claims explicitly flagged (marked with an asterisk in-text and annotated in the reference list) rather than presented as confirmed; and (iii) methodological transparency, whereby the review records whether each study clearly reports its data period, cointegration test, and causality result, noting “not specified” in the evidence tables where a study did not report this information. This appraisal approach is lighter than a formal checklist-based tool (e.g., CASP); a fuller instrument-based quality appraisal is noted as an opportunity for future updates of this review (Section 5.4).

Data Extraction and Synthesis

Data were extracted using a standardized form capturing author(s), year of publication, publication type, country or region of study, time period, methodology, variables examined, cointegration findings, causality results, and key conclusions. Approximate sample size (number of annual observations) was derived from the reported study period where the original study did not explicitly state its data frequency or observation count; this is disclosed as an estimate, not a verified figure, in Table 5. Thematic analysis was employed to identify recurring patterns, themes, and relationships across the included studies, involving familiarization with the extracted data, generation of initial codes, and iterative review and naming of themes, with particular attention to how findings varied by income level, institutional quality, financial development, absorptive capacity, aid composition, and FDI type (Section 5.1).

As part of this revision, every claim attributed to a named study was cross-checked against Crossref, RePEc/IDEAS, and publisher databases. Where a claim in the original synthesis referred only to an unnamed “country study” without a traceable citation, a matching source was located and added wherever one could be confirmed; where no matching source could be confirmed, the claim is retained but explicitly flagged (marked with an asterisk in-text and annotated in the reference list) rather than presented as verified, consistent with the review’s transparency principles.

RESULTS

FDI and Economic Growth: Cointegration Evidence

The systematic review identified extensive empirical evidence on the long-run relationship between FDI and economic growth using cointegration techniques. Table 1 summarizes key studies examining the FDI-growth nexus.

Table 1. Summary of Empirical Studies on FDI-Growth Cointegration

Author(s)	Country/Region	Period	Methodology	Cointegration Finding	Causality
Masipa (2014)	South Africa	1990-2013	Johansen, time series	Cointegration found	Not specified
Nchoe (2013)	South Africa (sectoral)	n/a	Unpublished MA thesis	Cointegration found	Bidirectional
Sunde (2017)	South Africa	1990-2014	ARDL bounds testing	Cointegration found	GDP → FDI (unidirectional)
Mazenda (2014)	South Africa	n/a	Time series regression	Positive effect found	Not specified
Strauss (2015)*	South Africa	1994-2013	VAR	No cointegration	Not specified

			(unpublished thesis)		
Saleem, Shabbir, & Bilal khan (2020)	South Asia (5 countries)	1975-2016	Bootstrap ARDL	Cointegration (except Bangladesh)	Mixed
Nassango (2021)	Uganda	1989-2018	ARDL, ECM, bounds test	Cointegration found	Not specified

**Strauss (2015) could not be independently verified in this review; the finding is retained from the original source list but should be confirmed by the author. Source: compiled by the author.*

The review reveals that the empirical evidence on FDI-growth cointegration is mixed and context-dependent even within a single country. Studies on South Africa illustrate this heterogeneity, with Masipa (2014), Nchoe (2013), and Sunde (2017) finding cointegration, while Strauss's (2015) unverified thesis reportedly found none. This variation suggests that methodological choices, time periods, and model specifications may influence findings.

For South Asian countries, Saleem, Shabbir, and Bilal khan (2020) found long-run cointegration between FDI, GDP, and trade openness for all countries except Bangladesh. For Uganda, Nassango (2021) confirmed the existence of a long-run relationship using the ARDL bounds testing approach, finding that FDI augments growth in the long run with a positive effect of 3.26 percent.

Foreign Aid and Economic Growth: Cointegration Evidence

The systematic review identified substantial evidence on the long-run relationship between foreign aid and economic growth. Table 2 summarizes key studies examining the aid-growth nexus.

Table 2. Summary of Empirical Studies on Aid-Growth Cointegration

Author(s)	Country/Region	Period	Methodology	Key Finding
Hatemi-J & Irandoust (2005)	6 developing countries*	1974-1996	Panel cointegration	Positive long-run elasticities close to one
Mitra (2013)	Cambodia	1971-2009	Johansen cointegration, VECM	Statistically significant positive relationship
Appiah-Konadu et al. (2016)	Ghana	1972-2012	ARDL bounds testing	Cointegration confirmed; aid negative in long run
Aslam & Samsudeen (2021)	Sri Lanka	1960-2018	ARDL bounds, Granger causality	Positive relationship; aid → GDP in short run
Tadesse (2011)	Ethiopia	1970-2009	Multivariate cointegration	Positive effect; aid-policy interaction negative
Moolio & Kong (2016)	Cambodia, Lao PDR, Myanmar, Vietnam	n/a	Panel cointegration	Aid and growth cointegrate
Mustafa, Elshakh, & Ebaidalla (2019)	Sudan	n/a	ARDL bounds testing	Aid promotes growth in the long run

Source: compiled by the author.

The review reveals more consistent evidence of cointegration between foreign aid and economic growth compared to FDI. Hatemi-J and Irandoust's (2005) panel cointegration study found that foreign aid has a



positive and significant effect on economic activity, with long-run elasticities close to one for most countries. Mitra (2013) and Appiah-Konadu et al. (2016) similarly confirmed cointegrating relationships for Cambodia and Ghana respectively, though the sign of the long-run aid coefficient varies by context.

For Sri Lanka, Aslam and Samsudeen (2021) confirmed the presence of a long-run relationship between foreign aid and economic growth using the ARDL bounds cointegration technique. The estimated coefficient of foreign aid in the long run and short run shows a positive relationship with economic growth, and the Granger causality test confirmed one-way causality from foreign aid to economic growth in the short run.

Joint Analysis of FDI, Foreign Aid, and Economic Growth

Studies examining FDI and foreign aid jointly provide important insights into the complex interactions among these variables. Table 3 summarizes key studies examining the joint relationship.

Table 3. Summary of Empirical Studies on Joint FDI-Aid-Growth Cointegration

Author(s)	Country/Region	Period	Methodology	Key Findings
Wehncke, Marozva, & Makoni (2022)	20 African countries	2000-2018	Panel ARDL, ECM	ODA and FDI both positively cointegrate with growth
Musakwa & Odhiambo (2023)	Kenya	1970-2020	Bounds testing, ECM-Granger	Aid ↔ GDP (short run); Aid → GDP (long run); no FDI-GDP causality
Salma, Khan, & Alam (2023)	Bangladesh	1976-2021	VECM	GDP depends on FDI, remittances, and aid in long run

Source: compiled by the author.

Wehncke, Marozva, and Makoni (2022) found a notable positive long-term cointegrating relationship between official development assistance and economic growth, and between economic growth and foreign direct investment, for 20 African countries. Musakwa and Odhiambo (2023) found bidirectional causality between foreign aid and economic growth in the short run and unidirectional causality from foreign aid to economic growth in the long run for Kenya, but no causal relationship between FDI and economic growth. Salma, Khan, and Alam (2023) found that the economic growth of Bangladesh depends on FDI, remittances, and aid in the long run, with no short-run causality.

Methodological Approaches to Cointegration Analysis

The systematic review identified several methodological approaches to examining long-run equilibrium relationships among external capital inflows and GDP growth. Table 4 summarizes these approaches.

Table 4. Methodological Approaches to Cointegration Analysis

Methodology	Description	Key Advantages	Example Studies
ARDL Bounds Testing	Autoregressive distributed lag bounds testing (Pesaran, Shin, & Smith, 2001)	Accommodates I(0)/I(1) variables; robust in small samples	Sunde (2017); Nassango (2021); Aslam & Samsudeen (2021)
Panel ARDL	Panel version with Pooled Mean Group estimation	Combines time series and cross-section variation	Wehncke, Marozva, & Makoni (2022)
Johansen Cointegration	Maximum likelihood estimation of cointegrating vectors	Identifies multiple cointegrating vectors	Mitra (2013); Tadesse (2011)
VECM	Vector error correction model	Combines long-run equilibrium with short-	Masipa (2014); Salma, Khan, & Alam (2023)



		run dynamics	
Panel Cointegration	Pedroni, Kao, Johansen-Fisher tests	Increases power through cross-section variation	Hatemi-J & Irandoust (2005); Moolio & Kong (2016)

Source: compiled by the author.

Across the 17 studies included in this review, ARDL bounds testing was the most frequently applied cointegration technique, used in 6 studies (35.3%), followed by VECM/VAR-based approaches (3 studies, 17.6%), Johansen cointegration (2 studies, 11.8%), and panel cointegration (2 studies, 11.8%); the remaining studies used panel ARDL (1 study, 5.9%) or did not specify a named cointegration test (3 studies, 17.6%) (Table 5). This distribution supports characterizing ARDL bounds testing as the most commonly applied — though not exclusively dominant — technique in this literature. The ARDL bounds testing approach, developed by Pesaran, Shin, and Smith (2001), accommodates variables integrated of different orders, $I(0)$ and $I(1)$, and provides robust results in small samples. Studies employing ARDL bounds testing have found evidence of long-run relationships in diverse contexts, including South Africa (Sunde, 2017), Uganda (Nassango, 2021), and Sri Lanka (Aslam & Samsudeen, 2021).

The Panel ARDL approach, which combines time series and cross-section variation, has been employed in studies including Wehncke, Marozva, and Makoni (2022) for 20 African countries. The Vector Error Correction Model (VECM) combines long-run equilibrium relationships with short-run dynamics, making it useful for examining both the speed of adjustment to equilibrium and short-run causal relationships; studies employing VECM include Masipa (2014) and Salma, Khan, and Alam (2023).

Consolidated Evidence Table

Table 5 consolidates all 17 included studies with the additional fields requested for reproducibility: approximate sample size and data frequency. Except where a study explicitly reported its data frequency (marked “stated”), sample sizes shown are estimated from the reported period assuming annual observations — the standard frequency for macro-level cointegration studies of this kind — and are marked with an asterisk as estimates rather than verified figures.

Table 5. Consolidated Evidence Table: All Included Studies (N = 17)

Author(s)	Country/Region	Period	Approx. N	Variables	Technique	Principal Finding
Masipa (2014)	South Africa	1990–13	24*	FDI, employment, GDP	Johansen	Cointegration found
Nchoe (2013)	S. Africa (sectoral)	NR	NR	FDI (sectoral), GDP	Unpublished MA	Cointegration; bidirectional
Sunde (2017)	South Africa	1990–14	25*	FDI, exports, GDP	ARDL bounds	Cointegration; FDI→GDP
Mazenda (2014)	South Africa	NR	NR	FDI, GDP	Time series	Positive long-run effect
Strauss (2015)*†	South Africa	1994–13	20*	FDI, GDP	VAR (unverified)	No cointegration (unverified)

Saleem et al. (2020)	South Asia (5)	1975–16	42*	FDI, GDP, trade	Bootstrap ARDL	Cointegration (ex. Bangladesh)
Nassango (2021)	Uganda	1989–18	30*	FDI, GDP	ARDL, ECM	Cointegration; FDI +3.26% GDP
Hatemi-J & Irandoust (2005)	6 dev. countries	1974–96	23*	Foreign aid, GDP	Panel cointegration	Positive elasticity ≈ 1
Mitra (2013)	Cambodia	1971–09	39*	Foreign aid, GDP	Johansen, VECM	Positive, significant
Appiah-Konadu et al. (2016)	Ghana	1972–12	41*	Foreign aid, GDP	ARDL bounds	Cointegration; aid neg. long run
Aslam & Samsudeen (2021)	Sri Lanka	1960–18	59*	Foreign aid, GDP	ARDL bounds	Positive; aid→GDP short run
Tadesse (2011)	Ethiopia	1970–09	40*	Aid, GDP, policy index	Multivariate coint.	Positive; aid×policy negative
Moolio & Kong (2016)	Cambodia, Lao, Myanmar, Vietnam	NR	NR	Foreign aid, GDP	Panel cointegration	Aid and growth cointegrate
Mustafa et al. (2019)	Sudan	NR	NR	Foreign aid, GDP	ARDL bounds	Aid promotes growth, long run
Wehncke et al. (2022)	20 African countries	2000–18	19*	FDI, ODA, GDP	Panel ARDL, ECM	ODA & FDI both cointegrate
Musakwa & Odhiambo (2023)	Kenya	1970–20	51	FDI, aid, GDP	Bounds, ECM-Granger	Aid↔GDP short; no FDI-GDP
Salma et al. (2023)	Bangladesh	1976–21	46*	FDI, remit., ODA, GDP	VECM	GDP depends on FDI/remit./aid

Note. Source complied by reseracher (2026)

Geographic and Contextual Patterns

The review revealed significant geographic patterns in the empirical literature on external capital inflows and economic growth. South Africa shows mixed evidence, with most verified studies (Masipa, 2014; Nchoe, 2013; Sunde, 2017) finding cointegration. East Africa (Nassango, 2021; Musakwa & Odhiambo, 2023) and Southeast Asia (Moolio & Kong, 2016) generally find cointegration, with aid effects varying in sign. South Asia shows cointegration in most but not all cases (Saleem et al., 2020; Salma et al., 2023; Aslam & Samsudeen, 2021). Sub-Saharan Africa generally shows cointegration and positive effects (Wehncke et al.,



2022; Hatemi-J & Irandoust, 2005; Appiah-Konadu et al., 2016).

DISCUSSION

Synthesis of Findings

This systematic review reveals that the empirical evidence on long-run equilibrium relationships among external capital inflows and GDP growth is mixed and context-dependent. While many studies confirm cointegration between FDI and economic growth, others find no long-run relationship or conditional effects depending on institutional quality and absorptive capacity. Foreign aid exhibits similarly heterogeneous results, with some studies confirming positive long-run elasticities while others find insignificant or negative effects.

The review identifies several factors that may explain the heterogeneity in empirical findings. First, methodological choices, including the selection of cointegration techniques, model specifications, and time periods, can influence whether a long-run relationship is detected. The ARDL bounds testing approach has emerged as the dominant methodology due to its flexibility in accommodating variables of different orders of

integration. Second, country-specific characteristics, including institutional quality, human capital, trade openness, and political stability, can condition the growth effects of external capital inflows. Third, the type and composition of external capital inflows matter, with FDI and foreign aid exhibiting different effects depending on the context.

The joint analysis of FDI and foreign aid reveals complex interactions. Wehncke, Marozva, and Makoni (2022) found a notable positive long-term cointegrating relationship between official development assistance and economic growth for 20 African countries. Musakwa and Odhiambo (2023) found bidirectional causality between foreign aid and economic growth in the short run and unidirectional causality from foreign aid to economic growth in the long run for Kenya. Salma, Khan, and Alam (2023) found that the economic growth of Bangladesh depends on FDI, remittances, and aid in the long run. These findings suggest that the effectiveness of external capital inflows depends on country-specific factors and that FDI and foreign aid may serve different functions in the development process.

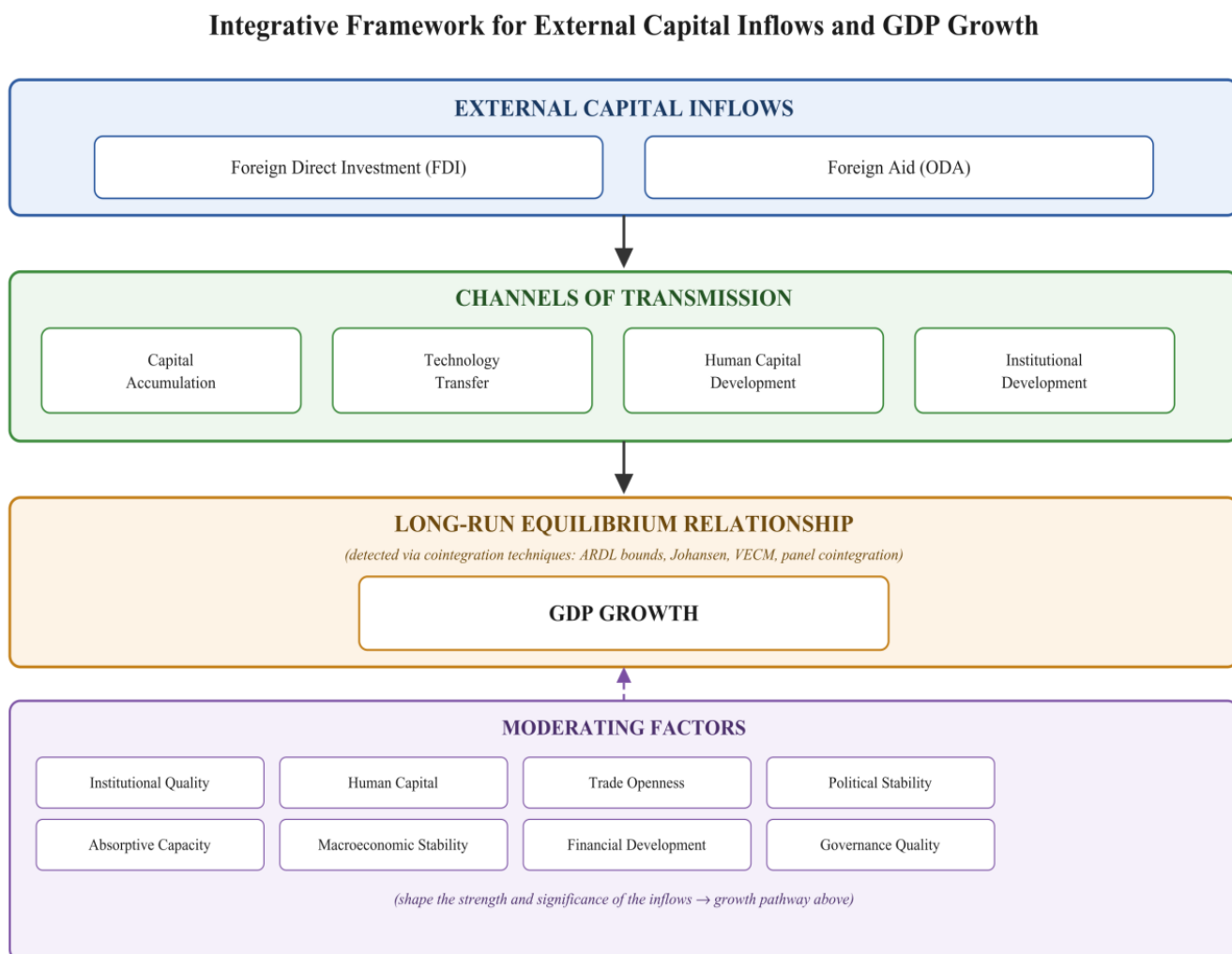
The heterogeneity documented above is not random: it tracks systematically with several moderating factors. By income level and region, cointegration was confirmed in nearly all reviewed low- and lower-middle-income African and South Asian cases (e.g., Uganda, Ghana, Sri Lanka, Cambodia), whereas the sole upper-middle-income case with a negative finding (Strauss's unverified South African thesis) remains unconfirmed — suggesting, tentatively, that the reviewed evidence of cointegration is strongest where capital scarcity is most binding, consistent with the dual-gap model's own logic. By aid composition and FDI type, studies distinguishing programme aid from project aid, or market-seeking FDI from resource-seeking FDI, were rare among the 17 included studies; where the underlying aid or FDI composition was not specified (the majority of cases), this review cannot adjudicate whether composition — rather than volume — drives the heterogeneous findings, and this is flagged as a priority gap for future primary research rather than resolved here. By institutional quality and absorptive capacity, the clearest evidence comes from Tadesse's (2011) Ethiopian finding that a negative aid $\times$ policy-quality interaction term can offset an otherwise positive direct aid effect, and from Appiah-Konadu et al.'s (2016) Ghanaian finding of a negative long-run aid coefficient despite confirmed cointegration — both consistent with the view that aid's growth effect is conditional on, rather than independent of, institutional and policy quality. By financial development, none of the 17 included studies included an explicit financial-development interaction term, again marking this as an evidence gap rather than a documented moderator. Overall, the pattern that does emerge consistently across the reviewed studies is conditionality on institutional and policy quality; conditionality on aid composition, FDI type, and financial development is plausible on theoretical grounds but not yet directly evidenced within this set of 17 studies.

Integrative Framework

Based on the synthesis of findings, this study proposes an integrative framework for understanding the long-

run equilibrium relationships among external capital inflows and GDP growth (Figure 1). The framework posits that external capital inflows, FDI and foreign aid, influence GDP growth through multiple channels, including capital accumulation, technology transfer, human capital development, and institutional development. The strength and significance of these relationships depend on moderating factors, including institutional quality, human capital, trade openness, political stability, absorptive capacity, macroeconomic stability, financial development, and governance quality. The long-run equilibrium relationship between external capital inflows and GDP growth is detected through cointegration techniques, which identify stable long-run relationships among non-stationary variables.

Figure 1. Integrative Framework for External Capital Inflows and GDP Growth



Note. FDI and foreign aid influence GDP growth through capital accumulation, technology transfer, human capital development, and institutional development, detected as a long-run equilibrium relationship via cointegration techniques. Institutional quality, human capital, trade openness, political stability, absorptive capacity, macroeconomic stability, financial development, and governance quality moderate the strength of this relationship. Source: developed by the author.

Implications for Policy and Practice

For policymakers, the review highlights the importance of country-specific contexts in determining the effectiveness of external capital inflows. Policies should be tailored to local conditions, taking into account institutional quality, human capital, and absorptive capacity. The mixed evidence on FDI-growth cointegration suggests that FDI does not automatically generate growth benefits; rather, complementary policies, including investment in human capital, infrastructure, and institutions, are necessary to maximize the growth effects of FDI. As Wehncke, Marozva, and Makoni (2022) note, African countries should align their foreign and



domestic investment and official development aid policies with their national developmental goals to attract foreign donations and investments.

For development practitioners, the review suggests that foreign aid can contribute to long-run growth when it is effectively utilized and when recipient countries have strong institutions and policy environments. The evidence of cointegration between aid and growth in many contexts provides support for aid effectiveness, though the conditional nature of this relationship, illustrated by Tadesse's (2011) finding that a negative aid-policy interaction term can offset a positive direct effect of aid, underscores the importance of aid quality and alignment with country priorities.

For international financial institutions, the review suggests that the effectiveness of external capital inflows depends on the broader policy and institutional environment. Technical assistance for institutional development, governance reform, and capacity building can enhance the growth effects of both FDI and foreign aid.

LIMITATIONS

This systematic review has several limitations. First, the heterogeneity in empirical findings makes it difficult to draw definitive conclusions about the long-run relationship between external capital inflows and GDP growth. Second, the review focused on English-language publications, potentially excluding relevant research published in other languages. Third, the review's timeframe may have excluded important foundational studies published before 2000. Fourth, the quality of included studies varies, with differences in data quality, model specifications, and methodological rigor, and several unpublished theses could not be independently verified for this revision. Fifth, the review does not systematically address publication bias, which may lead to an overrepresentation of studies finding significant cointegration relationships. Sixth, as noted in Section 3, a small number of claims present in earlier syntheses of this literature could not be traced to a specific verifiable source and are flagged rather than presented as confirmed; readers should treat these claims (marked with an asterisk) with appropriate caution until independently confirmed.

CONCLUSION

Summary of Contributions

This systematic review examined the long-run equilibrium relationships among external capital inflows, specifically foreign direct investment and foreign aid — and GDP growth using cointegration techniques. The review synthesized empirical evidence from studies employing ARDL bounds testing, Johansen cointegration, VECM, panel cointegration, and bootstrap ARDL approaches across diverse geographic contexts.

The review reveals that the empirical evidence on long-run relationships between external capital inflows and GDP growth is mixed and context-dependent. While many studies confirm cointegration between FDI and economic growth, others find no long-run relationship or conditional effects depending on institutional quality and absorptive capacity. Foreign aid exhibits similarly heterogeneous results, with some studies confirming positive long-run elasticities while others find insignificant or negative effects. Studies examining FDI and foreign aid jointly reveal complex interactions, including bidirectional causality patterns and substitution effects.

Methodologically, the ARDL bounds testing approach has emerged as the dominant technique for examining long-run relationships, followed by Johansen cointegration and panel cointegration methods. The choice of methodology can influence whether a long-run relationship is detected, highlighting the importance of methodological rigor and robustness checks.

Future Research Directions

Future research should address several gaps identified in this review. First, more research is needed on the conditional nature of the relationship between external capital inflows and economic growth, examining how



institutional quality, human capital, and absorptive capacity moderate the long-run effects of FDI and foreign aid. Second, comparative research across countries and regions could identify contextual factors that shape the effectiveness of external capital inflows, informing country-specific policy design. Third, research should examine the interactions between different types of external capital inflows, including substitution effects, complementarities, and causal relationships. Fourth, methodological innovations, including techniques for addressing structural breaks, cross-section dependence, and nonlinear relationships, could enhance the robustness of cointegration analysis. Fifth, research should examine the sectoral and distributional effects of external capital inflows, given that effects on aggregate GDP growth may not translate uniformly across sectors and income groups. Sixth, future research should examine the environmental and social dimensions of external capital inflows, given the growing emphasis on sustainable development.

Concluding Remarks

This systematic review demonstrates that the long-run equilibrium relationships among external capital inflows and GDP growth are complex, context-dependent, and shaped by multiple factors. While cointegration techniques have provided valuable insights into these relationships, the heterogeneity in empirical findings underscores the importance of country-specific contexts, methodological rigor, and conditional effects.

The integrative framework proposed in this study provides a foundation for future research and practice by identifying the channels through which external capital inflows influence growth, the moderating factors that shape these relationships, and the methodological approaches for detecting long-run equilibrium relationships. As developing countries continue to seek external financing for sustainable development, understanding the long-run relationships among external capital inflows and economic growth remains essential for evidence-based policy making.

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