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## **Foreign Direct Investment and Economic Growth: A Theoretical Reassessment with Empirical Illustrations from MENA Economies**

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**Abstract:** This paper examines the relationship between foreign direct investment and balanced growth within the classical Keynesian synthesis framework. As foreign capital has become increasingly important for developing economies, understanding how FDI contributes to long-term growth is both a theoretical and policy concern. This study seeks to explain that relationship by extending the classical-Keynesian growth model to include FDI as a complementary component of domestic capital, while also distinguishing between physical and human capital accumulation. The model is built around an augmented production function in which foreign capital is linked proportionally to domestic capital, allowing us to derive new steady-state expressions for capital intensity and income per worker. To support the theoretical analysis, a descriptive study of national statistics is conducted using data from Algeria, Egypt, Tunisia, and Iran over the period 2010–2024, based on UNCTAD statistics on capital coefficients and foreign participation rates. The results show that the average capital-output ratio for the sample is 4.60 and the average foreign participation ratio is 0.236. The model indicates that foreign

participation contributes more effectively to investment performance in economies characterised by stronger domestic savings and higher levels of human capital. The analytical results identify an adjustment mechanism whereby FDI influences growth through capital accumulation and productivity, with the magnitude of these effects depending on domestic absorptive capacity. Where human capital formation and technological capabilities remain limited, the spillover effects associated with foreign investment appear considerably weaker and may be accompanied by greater capital-labour substitution. These results point to the importance of complementary investments in education, institutional effectiveness, and innovation capacity when designing FDI-oriented development strategies. The model therefore offers a semi-endogenous interpretation of the contribution of foreign capital to long-run growth through its interaction with domestic accumulation processes and broader development policies.

**Keywords:** foreign direct investment, classical-Keynesian synthesis, capital complementarity, absorptive capacity, MENA economies.

## **Introduction**

Since the 1950s, growth theory has evolved through efforts to reconcile short-run Keynesian demand-side dynamics with long-run neoclassical supply-side mechanisms. These efforts gradually produced what became known as the classical-Keynesian synthesis, with foundational contributions by Solow, (1956), Pfouts and Hicks (1957), Kurihara (2013), Tobin (1956), Moore (1974) and Klein (1966). The Solow model, in particular, exemplifies this synthesis by blending Keynesian assumptions, such as a fixed savings function and exogenous labour supply, with neoclassical features like substitutable factors of production and a self-correcting goods market. As a result, the framework became a central reference point for analysing balanced growth and capital accumulation in closed economies.

The theoretical foundations of the relationship between foreign direct investment (FDI) and economic growth originate in the neoclassical growth tradition. In the Solow (1956) model, long-run growth is driven by exogenous technological progress, while capital accumulation determines only transitional dynamics. Within this framework, foreign capital is not explicitly distinguished from domestic capital, and does it alter the steady-state mechanism. Subsequent developments introduced important refinements to this view. Arrow (1962) emphasised learning-by-doing as an internal source of productivity improvement, while Romer (1986), Romer (1990), and Lucas (1988) formalised endogenous growth theories in which knowledge accumulation, increasing returns, and human capital drive sustained long-run growth. Even in these extensions, however, foreign investment generally appears as an external source of finance rather than as a component embedded in the production structure itself.

One aspect of the synthesis has received comparatively little attention: the role of foreign direct investment within the growth process itself. This omission is noteworthy given the growing importance of FDI as a source of capital formation, technology transfer, and productivity enhancement in many developing economies.

## **Research Problem**

While substantial empirical literature has documented FDI's impact on host country growth, its integration into the theoretical foundations of classical-Keynesian growth models has been limited. Most existing models treat FDI as an exogenous inflow or additive form of capital, overlooking the potential for interactive and complementary dynamics between foreign and domestic capital.

The present study examines this issue by extending the classical-Keynesian framework to include FDI directly within the capital accumulation mechanism. Specifically, we introduce a capital complementarity mechanism that links foreign and domestic capital through a proportional relationship, enabling a more realistic representation of how FDI interacts with domestic investment

processes. The model also distinguishes between physical and human capital accumulation, allowing for a more nuanced analysis of the conditions under which FDI contributes to long-run output growth.

### **Research Focus**

Within the classical Keynesian synthesis paradigm, this study aims to explain the interaction between foreign direct investment and balanced growth. The analysis shows that incorporating FDI into the accumulation process modifies the adjustment mechanism that characterises the balanced-growth path. The framework also has implications for development policy. By explicitly modelling the interaction between foreign and domestic capital, the study seeks to provide guidance for designing development strategies that reconcile attracting FDI with strengthening national capacities.

### **Research Aim and Research Questions**

The analytical structure of the model yields new closed-form expressions for the steady-state levels of income per worker and capital intensity, showing that FDI alters the long-run equilibrium through a distinct adjustment channel. The research in this article focuses on the following fundamental questions: Is FDI-induced growth contingent on the level of national human capital and savings behaviour? What is the level of agreement between the model's predictions and observed capital dynamics in developing countries? To answer these questions, the model establishes an analytical link between exogenous and endogenous growth theories, incorporating FDI as a semi-endogenous driver of productivity and output. Furthermore, descriptive country-level statistics for four major MENA (Middle East and North Africa) economies, based on data from Algeria, Egypt, Tunisia, and Iran over the period 2010–2024, illustrate the model's consistency (Bouchoucha & Bakari, 2021).

This paper is organised as follows. We begin by reviewing the theoretical background on growth models and the evolving role of FDI. Then, we present the structure of our augmented production function and derive the modified equilibrium conditions. Subsequently, we analyse the model's dynamic behaviour and long-run implications and extend the model, using data from selected countries. Finally, we discuss the results, their implications and conclude our study.

### **Literature Review**

Empirical research has since highlighted that the relationship between FDI and growth is far from uniform, particularly in developing and emerging economies. Early contributions, such as those of De Mello (1997), show that FDI can promote growth, but only when the host economy possesses sufficient human capital and technological capacity. (Alfaro et al., 2004) further demonstrate that financial market development is a key determinant of whether FDI translates into productivity gains. At a more disaggregated level, Aitken & Harrison (1999) find that FDI can generate both positive spillovers and negative competitive pressures, while Javorcik (2004) shows that spillovers are primarily transmitted through backward linkages rather than general equilibrium effects. Evidence from MENA economies, including Kamal (2012) and Fawaz (2025), confirms this heterogeneity, showing that FDI effects remain weak or inconsistent in contexts characterised by structural and institutional constraints.

One explanation frequently advanced in the literature for these contrasting results is absorptive capacity. (Cohen & Levinthal, 1990) define absorptive capacity as the ability to identify, assimilate, and apply external knowledge, making it a key determinant of technology diffusion. In macroeconomic applications, Benhabib et al. (2002) show that human capital not only contributes directly to growth but also enhances the effectiveness of foreign technology transfer. Similarly, (Borensztein & al., 1998) demonstrate that FDI becomes growth-enhancing only above certain thresholds of human capital. These findings suggest that the impact of foreign investment depends not only on the volume of capital inflows but also on the domestic capabilities available to absorb and utilise external knowledge.

The literature also points to the role of institutions in shaping these outcomes. (North, 1990) argues that institutions define the incentive structure of economic activity, while Acemoglu et al. (2005) identify institutions as a fundamental determinant of long-run differences in development. Empirical

evidence confirms that governance quality significantly affects both FDI inflows and the productivity impact of FDI. (Kaufmann et al., 2011) show that regulatory quality, rule of law, and government effectiveness are strongly correlated with investment efficiency. In this context, Alfaro et al. (2004) and Hermes & Lensink (2003) emphasise the role of financial development as a mediating channel between institutions, FDI, and growth performance. For many MENA economies, these institutional conditions remain an important factor in explaining the uneven effects of foreign investment on growth and productivity (Emako et al., 2022).

More recent literature has shifted attention toward the increasing role of digital transformation and intangible assets in international investment patterns. (Liu & al., 2026) show that intangible assets such as software, data, and intellectual property have become central drivers of productivity in advanced economies. (UNCTAD, 2025) documents a structural shift in FDI toward digital sectors, including artificial intelligence, data infrastructure, and platform-based business models. Similarly, OECD (2025) highlights that modern FDI is increasingly determined by digital readiness, innovation systems, and knowledge-intensive capabilities. (Baldwin, 2017) describes this transformation as a reorganisation of global production networks in which intangible assets play a dominant role in value creation.

Taken together, these contributions provide valuable insights but do not always fit within a common analytical framework. Growth models generally continue to treat FDI as an external source of capital, whereas empirical studies focus on the conditions under which its effects materialise. In addition, the emergence of digital and intangible forms of investment has received limited attention within formal growth theory. As a result, a disconnect remains between contemporary investment patterns and the theoretical frameworks commonly used to analyse long-run growth. The approach developed in this paper addresses this issue by incorporating FDI as a complementary component of domestic capital within a classical-Keynesian synthesis framework. This formulation makes it possible to examine how foreign and domestic accumulation processes interact in shaping long-run growth outcomes.

## **Materials and Methods**

Foreign direct investment (FDI) flows, discussed in this article, can be interpreted within the framework of the balanced growth trajectory analysis of the synthesis model. In this model, this "trajectory" reflects the existence of a long-run full-employment equilibrium. The set of equations defining its conditions constitutes an equilibrium model based on the capital invested in each period. In our case, we disaggregate capital into local and foreign capital. To examine these relationships formally, we construct an augmented growth model. Building on the foundations of the classical-Keynesian synthesis, the next section formally integrates FDI into the structure of capital accumulation. The purpose is to analyse how foreign capital interacts with domestic investment and human capital formation within a unified framework.

Furthermore, descriptive country statistics for the MENA economies region, based on data from Algeria, Egypt, Tunisia, and Iran for the period 2010–2024, are presented. These data, obtained from UNCTAD, provided practical ratios for our study. The evolution of the capital stock in these four countries allowed us to illustrate the equations of the theoretical model for identifying the capital coefficient and the foreign participation rate.

### ***The Augmented Synthesis Model***

Between endogenous and exogenous growth, as well as classical versus Keynesian perspectives, the longstanding dichotomy between these approaches deserves to be re-examined. In this section, FDI is incorporated into the growth model through an explicit treatment of foreign and domestic capital accumulation. The objective is to account for the role of foreign investment within the accumulation process observed in open economies. While the reference framework remains the Classical-Keynesian

synthesis model, our reformulation expands its structure to account for both domestic and foreign capital components, along with differentiated investment behaviours in human and physical capital. The resulting specification extends the production function used in the standard framework. It also allows the interaction between different forms of capital to be analysed explicitly.

The main variables and parameters used in the model are presented in Table 1.

**Table 1**

*Variable definitions*

Variable(s)	Definition
Y, K, H, L, A	Output (production), physical capital, human capital, labor, and technological progress, respectively.
$\alpha, \beta$	Positive constants.
$K_E, K_L$	Foreign capital and domestic (local) capital, respectively.
$\delta_k, \delta_h$	Depreciation rates of physical and human capital, respectively.
n, g	Rates of natural population growth and technological progress, respectively.
$s_k, s_h$	Propensities to invest in physical and human capital, respectively, which together determine total savings.
C	Proportion of foreign capital relative to domestic capital.
I, s	Investment and savings, respectively.

Source: Author's development

In what follows, we reconstruct this model and present the analytical results derived from our approach. The original Solow (1956) production function is expressed as follows (Abraham-Frois, 2002):

$$Y = K_t^\alpha \cdot [A_{(t)} \cdot L_{(t)}^{(1-\alpha)}]$$

It can be expressed in the form of the production function from the model of Arrow (1962):

$$Y = K_t^\alpha \cdot [A_{(t)} \cdot L_{(t)}]^{(1-\alpha)}$$

By disaggregating local capital into physical capital and human capital, Mankiw et al. (1992) propose an extension with human capital, as follows:<sup>1</sup>

$$Y_{(t)} = K_t^\alpha \cdot H_{(t)}^\beta [A_{(t)} \cdot L_{(t)}]^{(1-\alpha-\beta)};$$

We introduce FDI and decompose physical capital into foreign and local capital, as follows:

$$Y_{(t)} = (K_L + K_E)^\alpha \cdot H_{(t)}^\beta \cdot [A_{(t)} \cdot L_{(t)}]^{(1-\alpha-\beta)}$$

This decomposition explicitly recognises the role of foreign capital as a distinct and influential contributor to production capacity.

We assume that foreign capital complements local capital and represents a proportion denoted by "c", such that:

$$K_E = cK_L$$

Hence, the structure of the model we propose:

### ***Model Structure: Definitions, Assumptions, and Equilibrium Conditions Analysis***

<sup>1</sup> Mankiw, Romer, and Weil (1992) build on the foundations of the synthesis model developed by Solow and introduce an additional variable: human capital (H).

This section outlines the relationships among the variables used in our model. We group them into three categories for clarity: definitional, behavioural and equilibrium conditions.

### **Definitions and production function**

$$\text{Let, } K = K_t; L = L_{(t)}; Y = Y_t$$

$$Y_{(t)} = (K_L + K_E)^\alpha \cdot H^\beta \cdot [A_{(t)} \cdot L_{(t)}]^{(1-\alpha-\beta)} \quad (1)$$

Returns to scale are assumed to be constant:

$$y_t = \frac{Y_t}{AL_{(t)}}; k_t = \frac{K_t}{AL_{(t)}}; h_t = \frac{H_t}{AL_{(t)}} \quad (2)$$

$$\dot{K} = \frac{dK}{dt}; \dot{H} = \frac{dH}{dt}; \dot{L} = \frac{dL}{dt} \quad (3)$$

$$I = {}^d K_{t+1} - K_t \quad (4)$$

$$I_k = \dot{K} + \delta_k K \quad (5)$$

$$I_h = \dot{H} + \delta_h H \quad (6)$$

### **Behavioural assumptions**

Labour and technology grow exogenously at rates  $n$  and  $g$ :

$$L_t^s = L_0 e^{nt}; \quad (7)$$

and

$$A_t = A_0 e^{gt} \quad (8)$$

$$S = (s_k + s_h)Y \quad (9)$$

such that:

$$s_k = \frac{I_k}{Y}; s_h = \frac{I_h}{Y} \quad (10)$$

These saving propensities reflect household or economy-wide preferences influencing investment allocation across capital types.

### **Equilibrium conditions**

Goods market equilibrium requires  $I = S$ , yielding:

$$I_k = \dot{K} = s_k y_t \quad (11)$$

Full employment holds when labour demand equals supply:

$$L_t^d = L_0 e^{nt} \quad (12)$$

These conditions define the equilibrium configuration used in the subsequent analysis. The next step is to derive the dynamics of physical and human capital accumulation in the presence of foreign investment. The resulting equations characterise both the transition path and the steady-state equilibrium of the model.

### **Model Processing**

Let us study the variations of  $k$  in terms of the definitions of equations (2) and (3).

$$\frac{\dot{k}}{k_t} = \frac{\dot{K}}{K_t} - \frac{\dot{A}}{A_t} - \frac{\dot{L}}{L_t} \quad (13)$$

Now, based on equations (7) and (8), we can deduce:

$$\frac{d}{dt} \ln L_t = \frac{d}{dt} \ln (L_0 e^{nt}) = n \quad (14)$$

$$\frac{d}{dt} \ln A_t = \frac{d}{dt} \ln (A_0 e^{gt}) = g \quad (15)$$

From equations (11), (14), (15), (3) and (5), we can write:

$$\frac{\dot{k}}{k_t} = \frac{s_k}{k_t} y_t - (\delta_k + n + g) \quad (16)$$

By multiplying both sides of equation (16) by  $k_t$ , we obtain:

$$\dot{k} = s_k y_t - (\delta_k + n + g) k_t \quad (17)$$

Using the same reasoning for human capital  $H$ , we obtain the following equation:

$$\dot{h} = s_h y_t - (\delta_h + n + g) h_t \quad (18)$$

The equations (17) and (18) are differential equations whose general solutions depend on the form of the function  $y_t$ , given that:

$$y_t = (1 + c) k_t^\alpha h_t^\beta$$

Thus, starting from equations (17) and (18), we obtain:

$$\frac{\dot{k}}{k_t} = s_k (1 + c) k_t^{(\alpha-1)} h_t^\beta - (\delta_k + n + g) \quad (19)$$

$$\frac{\dot{h}}{h_t} = s_h (1 + c) k_t^\alpha h_t^{(\beta-1)} - (\delta_h + n + g) \quad (20)$$

Equations (19) and (20) summarize the evolution of physical and human capital intensities under the assumption of foreign capital complementarity.

### **Convergence to a steady-state**

The economy is said to follow a balanced growth path when both capital intensities grow at a constant rate or remain unchanged over time. This implies:

$$\frac{\dot{k}}{k_t} = \frac{\dot{h}}{h_t} = 0$$

We pose:

$$\frac{\dot{m}}{m_t} = \frac{\dot{k}}{k_t} - \frac{\dot{h}}{h_t} = 0 \quad (21)$$

Now, from the relationships presented in equations (19), (20) and (21), we obtain the following expression:

$$\frac{\dot{m}}{m_t} = s_k(1+c)k_t^{(\alpha-1)}h_t^\beta - s_h(1+c)k_t^\alpha h_t^{(\beta-1)} = 0 \quad (22)$$

If we factor out  $(1+c)k_t^{(\alpha)}h_t^{(\beta)}$ , the equilibrium condition of equation (22) can then be written as follows:

$$s_k k_t^{(-1)} = s_h h_t^{(-1)} \Rightarrow \frac{k_t^*}{h_t^*} = \frac{s_k^*}{s_h^*} \quad (23)$$

we pose:

$$\bar{m} = \frac{k_t^*}{h_t^*} = \frac{s_k}{s_h} \quad (24)$$

Now, from relationships presented in equations (19) through (24), we can deduce:

$$s_k(1+c)k_t^{*(\alpha+\beta-1)}\bar{m}_t^{(-\beta)} = (\delta_k + n + g)$$

And

$$s_h h_t^{*(\alpha+\beta-1)}\bar{m}_t^{(\alpha)} = (\delta_k + n + g)$$

By replacing  $\bar{m}_t$  with its value  $\frac{s_k}{s_h}$  indicated by equation (24), we obtain:

$$k_t^* = \left[ \frac{(1+c)s_k^{(1-\beta)}}{(\delta_k + n + g)} \right]^{\frac{1}{1-\alpha-\beta}} \quad (25)$$

And

$$h_t^* = \left[ \frac{s_k^\alpha s_h^{(1-\alpha)}}{(\delta_k + n + g)} \right]^{\frac{1}{1-\alpha-\beta}} \quad (26)$$

Moreover, we can verify that:

$$y_t = \frac{Y_t}{A_t L_t} = ((1+c)k_t)^\alpha \cdot h_t^\beta$$

Analogous to the results shown in equations (25) and (26):

$$y_t^* = \left[ \frac{(1+c)s_k^{(1-\beta)}}{(\delta_k + n + g)} \right]^{\frac{\alpha}{1-\alpha-\beta}} * \left[ \frac{s_k^\alpha s_h^{(1-\alpha)}}{(\delta_k + n + g)} \right]^{\frac{\beta}{1-\alpha-\beta}} \quad (27)$$

From the previous relation (27), we can deduce the logarithm of income per worker ( $\ln(Y_t/L_t)$ ). Knowing that, in the long term:

$$\frac{Y_t}{L_t} = y_t^* A_t$$

Hence:

$$\begin{aligned} \ln\left(\frac{Y_t}{L_t}\right) &= \ln(y_t^* A_t) = \ln(y_t^*) + \ln(A_t) \\ &= \frac{\alpha}{1-\alpha-\beta} \ln\left[\frac{(1+c)s_k^{(1-\beta)}}{(\delta_k + n + g)}\right] + \frac{\beta}{1-\alpha-\beta} \ln\left[\frac{s_k^\alpha s_h^{(1-\alpha)}}{(\delta_k + n + g)}\right] \\ &\quad + \ln(A_{t0}) + g_t \end{aligned} \quad (28)$$

The expression (28) indicates that the long-run level of income per worker is influenced by technological progress as well as by the interaction between domestic saving behaviour and the complementarity parameter  $c$ . Within this framework, foreign capital affects growth through its interaction with domestic accumulation variables. The model, therefore, treats foreign investment as part of the accumulation process rather than as an external addition to it. The implications of these results are discussed in the following sections.

### Illustrative Country Cases

This section examines the capital coefficient and the foreign participation rate for a sample of countries over the period 2010–2024. The statistics are drawn from the United Nations Conference on Trade and Development (UNCTAD) Data Hub and pertain to Algeria, Egypt, Tunisia, and Iran.

**Table 2**

*Capital Stock Change as a Percentage of GDP (K/Y)*

Country/Period	2010/2014	2015/2019	2020/2024	Average
Algeria	7.78	6.84	4.6	6.40
Egypt	0.89	0.91	0.90	0.90
Iran	7.82	9.58	13.36	10.57
Tunisia	1.89	1.14	-1.34	0.56
Average	4.60	4.61	4.38	4.60

Source: Author's calculations, UNCTAD database.

<https://unctadstat.unctad.org/datacentre/dataviewer/US.GDPComponent>

For the four countries considered here, the average capital coefficient, measured as the variation of capital stock relative to GDP, equals  $K/Y = 4.6$  over the period 2010–2024.

Tunisia's capital stock contracted significantly between 2020 and 2024, with a negative change of (-1.34). This downward trend can be explained by two main reasons. First, the COVID-19 crisis, which

forced Tunisian companies to draw heavily on their reserves. Second, the massive destocking in 2023-2024, following difficulties in accessing external financing (WorldBank, 2025). Indeed, Tunisia drastically reduced its raw material imports, and domestic industries were forced to liquidate their reserve stocks to maintain operations, resulting in a sharp contraction in GDP.

Hence, the total investment rate is given by:

$$\frac{I}{Y} = \frac{\dot{K}}{K} * \frac{K}{Y}$$

By analogy, the foreign investment rate is expressed as:

$$\frac{I_e}{Y} = \frac{\dot{K}_e}{K_e} * \frac{K_e}{Y}$$

Assuming a complementary relationship between the two components of capital, i.e.,  $K_e = cK$  the capital coefficient relative to foreign capital is:

$$\frac{K_e}{Y} = c \frac{K}{Y}$$

For our sample, the average foreign participation coefficient over 2010–2024 is presented in Table 3 below.

**Table 3**

*Foreign participation coefficient (“c”) as a percentage of total capital stock*

Country/period	2010/2014	2015/2019	2020/2024	Average
Algeria	0.127	0.064	0.076	0.089
Egypt	0.287	0.460	1.11	0.619
Iran	0.236	0.163	0.108	0.169
Tunisia	0.087	0.054	0.056	0.066
Average	0.184	0.185	0.338	0.236

Source: Authors’ calculations, UNCTAD statistics.

<https://unctadstat.unctad.org/datacentre/dataviewer/US.FdiFlowsStock>

Combining the results reported in Tables 2 and 3 yields the foreign participation rates presented in Table 4.

**Table 4**

*Determination of the foreign participation rate average over the period 2010-2024*

	$(\frac{K}{Y})$	« c »	« $\frac{K_e}{Y} = c \frac{K}{Y}$ »
Algeria	6.4	0.089	0.57
Egypt	0.9	0.619	0.56
Iran	10.57	0.169	1.787
Tunisia	0.56	0.066	0.037

Source: Authors’ calculations based on Tables 2 and 3.

The relatively high value of 1.787 obtained for Iran's foreign participation rate during 2010–2024 reflects several country-specific circumstances:

- Under the effect of international sanctions, Iranian companies' access to international markets became restricted. In response, many firms accumulated inventories of raw materials and intermediate inputs to reduce supply disruptions (Heydarian & al., 2023). This accumulation of inventory contributed to the unusually high K/Y ratio observed during the period.

- At the same time, government financing was directed toward several strategic sectors in response to declining foreign participation and capital outflows (Farzanegan & Habibi, 2025). While these investments supported capital formation, they were concentrated in large state-led projects whose productivity characteristics differ from those of internationally financed private investment (World Bank, 2024, 2025). Taken together, inventory accumulation, public investment, and substantial currency depreciation (Shahabadi et al., 2022) help explain why the estimated contribution rate exceeded unity during the period under consideration.

## Discussion

The results of this study provide new insights into the role of FDI in long-run growth when it is embedded within a classical-Keynesian synthesis framework. The findings are consistent with a large body of research showing that the growth effects of FDI depend on domestic economic conditions and provide a formal explanation of the mechanisms by which these effects arise. In line with Alfaro et al. (2004), Borensztein (1998), and Blomström and Sjöholm (1999), the results suggest that FDI contributes positively to economic growth only when the host economy has reached a sufficient level of human capital development and financial market maturity. Similarly, the findings are consistent with (Javorcik, 2004), who shows that productivity spillovers from foreign firms are transmitted through specific linkages rather than occurring uniformly across the economy.

Recent evidence points in the same direction. Studies by Chizema et al. (2023) on the Arab Maghreb countries, Abed et al. (2026) on MENA economies and Chengying et al. (2023) on developing countries report that institutional quality, financial development and absorptive capacity continue to shape the effectiveness of foreign investment. These studies suggest that differences in domestic capabilities remain an important source of variation in FDI outcomes across countries.

The contribution of the present model lies in the way FDI is incorporated into the growth process. Rather than treating foreign capital as an external addition to domestic investment, the model introduces it as a complementary component of capital accumulation. Under this specification, foreign and domestic capital evolve jointly, and changes in foreign participation influence steady-state outcomes through their interaction with domestic accumulation. This contrasts with standard neoclassical growth models, such as Solow (1956), where foreign capital inflows do not fundamentally change the long-run equilibrium mechanism.

In the framework developed here, the effect of FDI depends on saving behaviour, capital accumulation, and human capital formation rather than operating through an independent growth channel. From a theoretical perspective, these results contribute to a broader reconciliation between exogenous and endogenous growth theories. By introducing a complementarity parameter between foreign and domestic capital, the model shows that long-run growth is jointly determined by internal accumulation processes and external capital inflows. The results therefore support the view that FDI is neither an autonomous engine of growth nor a neutral source of finance. Its contribution depends on the domestic conditions under which foreign capital is absorbed and employed. In this sense, the classical steady state is no longer invariant to external capital flows but becomes sensitive to the degree of integration between domestic and foreign investment.

All else being equal, an increase in the participation rate “ $c$ ” will improve both the investment rate and GDP through the accumulation of physical capital, provided that employment levels follow the same trajectory. However, if the accumulation of physical capital is insufficient to trigger growth, with growth being necessary to improve employment levels and sustain additional output in a new competitive

context, FDI risks will substitute capital for labour. The effectiveness of FDI also depends on the transfer of intangible assets, including managerial practices, technological capabilities and organisational knowledge. Where these channels remain weak, FDI is less likely to generate productivity gains within domestic firms. This issue has become increasingly important as international investment shifts toward knowledge-intensive and digital activities (OECD, 2024; UNCTAD, 2025). The analysis also deepens the understanding of absorptive capacity in growth processes. While previous literature (Benhabib et al., 2002; Cohen & Levinthal, 1990) has emphasised the importance of human capital and learning capacity in enabling technology diffusion, this study directly integrates absorptive capacity into the production mechanism.

In the model, absorptive capacity operates as an internal channel through which foreign investment influences both productivity and capital accumulation. This allows for a more unified explanation of why the same level of foreign investment can generate very different outcomes across economies. Recent studies have renewed interest in this issue. Research published after the COVID-19 period increasingly emphasises the interaction between FDI, institutional quality, digital readiness, and human capital formation. The findings reported here are broadly compatible with that literature, particularly the view that foreign investment generates its strongest effects when supported by complementary domestic capabilities.

The country evidence from the MENA region is consistent with this interpretation. The heterogeneous impact of FDI across Algeria, Egypt, Tunisia and Iran reflects differences in institutional quality, human capital formation and financial development. Where domestic capabilities remain limited, foreign capital appears to generate weaker spillovers and may contribute to greater substitution between capital and labour. By contrast, economies characterised by stronger educational systems and more supportive institutions appear better positioned to convert foreign investment into sustained gains in productivity and output. This pattern is consistent with recent evidence from developing economies and highlights the importance of country-specific conditions in shaping the economic effects of FDI. The results also have implications for current debates on development strategy in middle-income economies.

The model indicates that the economic effects of foreign investment depend on the broader environment in which it operates. Measures that strengthen education, innovation systems and financial development can increase the capacity of domestic firms to benefit from foreign capital and knowledge flows. The results further suggest that improvements in human capital and institutional quality influence the extent to which foreign investment contributes to long-run growth.

Despite these contributions, several limitations must be acknowledged. First, the empirical component remains illustrative and is based on aggregate capital coefficients rather than micro-level firm data, which limits the ability to capture heterogeneity within sectors. Second, the assumption of proportional complementarity between foreign and domestic capital simplifies the potentially non-linear and dynamic nature of multinational investment behaviour. In practice, foreign investment may generate threshold effects, crowding-in or crowding-out mechanisms, and sector-specific spillovers that fall outside the scope of the present model. Third, the model does not explicitly account for institutional heterogeneity, even though governance quality plays a central role in shaping FDI outcomes. Finally, the time horizon of the empirical analysis may not fully capture long-term structural changes, particularly those associated with the increasing role of digital investment, intangible capital, and global value chain restructuring.

These limitations point toward several directions for future research. Extending the model to incorporate institutional heterogeneity, firm-level behaviour, and digital forms of foreign investment would provide a useful basis for assessing how the complementarity mechanism identified here operates under different economic conditions. Such extensions may also help explain the changing

character of FDI in an economy increasingly shaped by intangible assets and knowledge-intensive activities.

## **Conclusions**

This study revisits the classical-Keynesian growth framework by incorporating FDI into the capital accumulation process. The resulting formulation identifies an adjustment mechanism through which foreign and domestic capital interact in shaping long-run income, capital accumulation and productivity. Within this framework, the contribution of FDI to steady-state income depends on its interaction with domestic saving behaviour and human capital formation rather than on foreign capital alone.

The empirical illustration based on selected MENA economies over the period 2010–2024 is consistent with this interpretation and points to the importance of capital coefficients and foreign participation rates in explaining differences in investment performance. A central implication of the analysis is that the growth effects associated with FDI are conditional. Specifically, foreign investment contributes more effectively to growth when supported by human capital accumulation and sufficient domestic productive capacity. The results, therefore, indicate that foreign capital and domestic development efforts operate as complements rather than substitutes. Where absorptive capacity remains limited, the productivity effects of foreign investment appear weaker, and the accumulation of capital may not be accompanied by comparable improvements in employment and output. The framework developed here offers one possible explanation for why similar levels of foreign investment can generate different outcomes across open economies. The analysis also points to the importance of considering foreign investment alongside education, institutional conditions and investment efficiency rather than treating it as an isolated policy objective.

## ***Suggestions for Future Research***

While the current study addresses important issues, several extensions remain open for future research. One possibility would be to relax the assumption of proportional complementarity between foreign and domestic capital in order to examine threshold effects and other non-linear dynamics. Additional empirical work based on firm-level or sectoral data could also provide a more detailed assessment of spillover effects across industries. Incorporating institutional quality directly into the theoretical structure may help explain cross-country differences more effectively, particularly within developing and MENA economies. The growing importance of digital investment and intangible assets also raises the question of how data, knowledge-based capital and digital forms of FDI might be incorporated into future versions of the model. Finally, broader cross-country analyses over longer periods would enable evaluation of the robustness of the complementarity mechanism under different institutional and technological conditions.

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## **Conflict of Interest**

The author(s) do not have any conflict of interest to report.

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## **References**

- Abraham-Frois, G. (2002). *Economic dynamics*. Paris: Dalloz.
- Abed, W. E., Mtiraoui, A., & Lassoued, M. (2026). Institutional interaction and FDI dynamics in the growth of MENA economies: application to dynamic panel data. *Science of Law*, 2026(1), 66–76. <https://doi.org/10.55284/w5c8hx40>

- Acemoglu, D., Johnson, & Robinson. (2005). Institutions as a fundamental cause of long-run growth. In P. A. Durlauf, *Handbook of Economic Growth* (pp. 385-472). Elsevier. [https://doi.org/10.1016/S1574-0684\(05\)01006-3](https://doi.org/10.1016/S1574-0684(05)01006-3)
- Aitken, B. J., & Harrison, A. E. (1999). Do domestic firms benefit from direct foreign investment? Evidence from Venezuela *American Economic Review*, 89(3), 605–618. <https://doi.org/10.1257/aer.89.3.605>
- Alfaro, L., Chanda, A., Kalemli-Ozcan, S., & Sayek, S. (2004). FDI and economic growth: The role of local financial markets. *Journal of International Economics*, 64(1), 89–112. [https://doi.org/10.1016/S0022-1996\(03\)00081-3](https://doi.org/10.1016/S0022-1996(03)00081-3)
- Arrow, K. J. (1962). The Economic Implications of Learning by Doing. *The Review of Economic Studies*, 29(3), Article 155. <https://doi.org/10.2307/2295952>
- Baldwin, R. (2017). *The great convergence: Information technology and the new globalization*. Harvard University Press. <https://doi.org/10.4159/9780674972667>
- Benhabib, J., Spiegel, M. M., & Federal Reserve Bank of San Francisco. (2002). Human capital and technology diffusion. *Federal Reserve Bank of San Francisco, Working Paper Series, 2003(02)*, 01–49. <https://doi.org/10.24148/wp2003-02>
- Blomström, M., & Sjöholm, F. (1999). Technology transfer and spillovers: Does local participation with multinationals matter? *European Economic Review*, 43(4–6), 915–923. [https://doi.org/10.1016/S0014-2921\(98\)00104-4](https://doi.org/10.1016/S0014-2921(98)00104-4)
- Borensztein, E., De Gregorio, J., & Lee, J.-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, 45(1), 115–135. [https://doi.org/10.1016/S0022-1996\(97\)00033-0](https://doi.org/10.1016/S0022-1996(97)00033-0)
- Bouchoucha, N., & Bakari, S. (2021). The impacts of domestic and foreign direct investments on economic growth: fresh evidence from tunisia. *Journal of Smart Economic Growth*, 06(01). <https://jseg.ro/index.php/jseg/article/view/125>
- Chengying, H., Wang, T., Shah, S. A., Chang, Y., & Zhou, X. (2023). A study on the moderating role of national absorptive capacity between institutional quality and FDI inflow: Evidence from developing countries. *Economic Research-Ekonomska Istraživanja*, 36(1), 2177–2198. <https://doi.org/10.1080/1331677X.2022.2096659>
- Chizema, D., Mabugu, R. E., & Meniago, C. (2026). Political institutions and Foreign Direct Investment in the Arab Maghreb Union. *International Journal of Research in Business and Social Science (2147-4478)*, 15(3), 563–578. <https://doi.org/10.20525/ijrbs.v15i3.4959>
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), Article 128. <https://doi.org/10.2307/2393553>
- De Mello, L. R. (1997). Foreign direct investment in developing countries and growth: A selective survey. *Journal of Development Studies*, 34(1), 1–34. <https://doi.org/10.1080/00220389708422501>
- Emako, E., Nuru, S., & Menza, M. (2022). The effect of foreign direct investment on structural transformation in developing countries. *Cogent Economics & Finance*, 10(1), 2125658. <https://doi.org/10.1080/23322039.2022.2125658>
- Farzanegan, M. R., & Habibi, N. (2025). The effect of international sanctions on the size of the middle class in Iran. *European Journal of Political Economy*, 90, 102749. <https://doi.org/10.1016/j.ejpoleco.2025.102749>

- Fawaz, A. (2025). Locational advantages and foreign direct investment in MENA: A comprehensive analysis of institutional and economic factors. *Transnational Corporations Review*, 17(2), 200131. <https://doi.org/10.1016/j.tncr.2025.200131>
- Hermes, N., & Lensink, R. (2003). Foreign direct investment, financial development and economic growth. *Journal of Development Studies*, 40(1), 142–163. <https://doi.org/10.1080/00220380412331293707>
- Heydarian, S., Pahlavani, M., & Mirjalili, S. H. (2023). The effect of financial sanctions on the imports of intermediate and capital goods in Iran: DID method. *International Journal of Business and Development Studies*, 15(2). <https://doi.org/10.22111/ijbds.2024.47819.2090>
- Hussey, A. J., Jetter, M., & McWilliam, D. (2021). The Fundamental Determinants of Economic Inequality in Average Income Across Countries: The Declining Role of Political Institutions. *Review of Income and Wealth*, 67(1), 104–133. <https://doi.org/10.1111/roiw.12459>
- Javorcik, B. S. (2004). Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. *American Economic Review*, 94(3), 605–627. <https://doi.org/10.1257/0002828041464605>
- Kamal A. El-Wassal. (2012). Foreign direct investment and economic growth in Arab countries (1970–2008): an inquiry into determinants of growth benefits. *Journal of Economic Development*, 37(4), 79–100. <https://doi.org/10.35866/CAUJED.2012.37.4.004>
- Kaufmann, D., Kraay, A., & Mastruzzi, M. (2011). The worldwide governance indicators: Methodology and analytical issues *Hague Journal on the Rule of Law*, 3(02), 220–246. <https://doi.org/10.1017/S1876404511200046>
- Klein, L. R. (1966). *The Keynesian Revolution*. Palgrave Macmillan UK. <https://doi.org/10.1007/978-1-349-16319-9>
- Kurihara, K. K. (Ed.). (2013). *Post-Keynesian Economics* (0 edn). Routledge. <https://doi.org/10.4324/9781315016849>
- Liu, S., Lahiri, R., & Silvennoinen, A. (2026). Imported intangible capital and sectoral economic growth: Evidence from 42 economies. *Economic Modelling*, 155, Article 107429. <https://doi.org/10.1016/j.econmod.2025.107429>
- Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3–42. [https://doi.org/10.1016/0304-3932\(88\)90168-7](https://doi.org/10.1016/0304-3932(88)90168-7)
- Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The Quarterly Journal of Economics*, 107(2), 407–437. <https://doi.org/10.2307/2118477>
- McKenzie, L. (1957). Demand Theory Without a Utility Index. *The Review of Economic Studies*, 24(3), 185. <https://doi.org/10.2307/2296067>
- Moore, B. J. (1974). The Pasinetti paradox revisited *The Review of Economic Studies*, 41(2), 297–299. <https://doi.org/10.2307/2296719>
- North, D. C. (1990). *Institutions, institutional change and economic performance* (1st edn). Cambridge University Press. <https://doi.org/10.1017/CBO9780511808678>
- OECD. (2025). *FFDI qualities: Investment policy framework for digital transformation*. OECD Publishing. [https://one.oecd.org/document/DAF/INV\(2025\)11/en/pdf?sessionId=1748866464390](https://one.oecd.org/document/DAF/INV(2025)11/en/pdf?sessionId=1748866464390)
- Pfouts, R. W., & Hicks, J. R. (1957). A revision of demand theory. *Southern Economic Journal*, 23(4), 457. <https://doi.org/10.2307/1054253>

- Romer, P. M. (1986). Increasing returns and long-run growth *Journal of Political Economy*, 94(5), 1002–1037. <https://doi.org/10.1086/261420>
- Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5, Part 2), S71–S102. <https://doi.org/10.1086/261725>
- Shahabadi, A., Qasemifar, S., & Shafieian, M. (2022). Economic dynamics during periods of financial stress (Iran Case Study). *Iranian Economic Review*, (Online First). <https://doi.org/10.22059/ier.2022.88409>
- Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics*, 70(1), Article 65. <https://doi.org/10.2307/1884513>
- Solow, R. M. (1957). Technical change and the aggregate production function. *The Review of Economics and Statistics*, 39(3), Article 312. <https://doi.org/10.2307/1926047>
- Tobin, J. (1956). The interest-elasticity of transactions demand for cash. *The Review of Economics and Statistics*, 38(3), Article 241. <https://doi.org/10.2307/1925776>
- UNCTAD. (2025). *World Investment Report 2025: International Investment in the Digital Economy*. United Nations. <https://doi.org/10.18356/9789211073843>
- World Bank. (2024). *Iran Economic Monitor, Spring 2024 : Sustaining growth amid rising geopolitical tensions*. Washington, D.C.: World Bank Group. <https://doi.org/10.1596/41861>
- World Bank. (2025). *Tunisia economic monitor, Spring 2025: Navigating economic imbalances and financing constraints*. Washington, D.C.: World Bank Group. <https://doi.org/10.1596/43293>