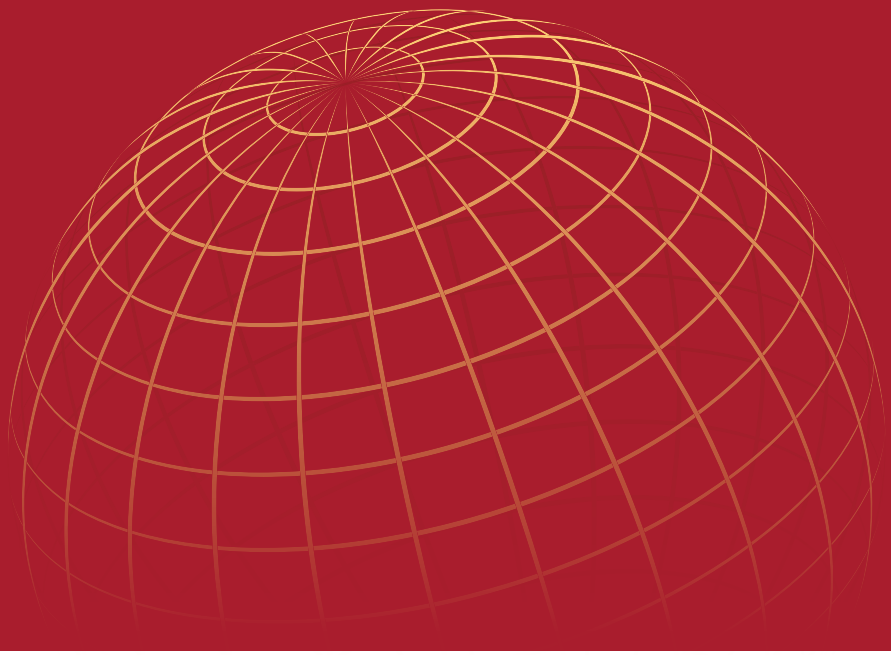


CHAPTER 3

THE MAGIC OF INVESTMENT ACCELERATIONS

Investment powers economic growth, helps drive down poverty, and will be indispensable for tackling climate change and achieving other key development goals in emerging market and developing economies (EMDEs). Without further policy action, investment growth in these economies is likely to remain tepid for the remainder of this decade. But it can be boosted. This chapter offers the first comprehensive analysis of investment accelerations—periods in which there is a sustained increase in investment growth to a relatively rapid rate—in EMDEs. During these episodes over the past seven decades, investment growth typically jumped to more than 10 percent per year, which is more than three times the growth rate in other (non-acceleration) years. Countries that had investment accelerations often reaped an economic windfall: output growth increased by about 2 percentage points and productivity growth increased by 1.3 percentage points per year. Other benefits also materialized in the majority of such episodes: inflation fell, fiscal and external balances improved, and the national poverty rate declined. Most accelerations followed, or were accompanied by, policy shifts intended to improve macroeconomic stability, structural reforms, or both. These policy actions were particularly conducive to sparking investment accelerations when combined with well-functioning institutions. A benign external environment also played a crucial role in catalyzing investment accelerations in many cases.

Introduction

Over the past two decades, capital accumulation is estimated to have accounted for more than half of potential output growth in emerging market and developing economies (EMDEs), highlighting the critical role of investment in driving economic growth (figure 3.1).[1] Yet, investment growth in these economies is going through a prolonged, broad-based slowdown since the global financial crisis that began in 2008. Investment growth in EMDEs (excluding China) averaged about 6 percent per year in the 2000s, before slowing to an annual average of 3 percent in the 2010s (World Bank 2023a). During the 2020 global recession triggered by the COVID-19 pandemic, investment contracted much more deeply than it did during the 2009 global recession. Despite a cyclical rebound in 2021, investment growth in EMDEs will likely be subdued over the medium term.

Prolonged weak investment growth dampens potential output growth and makes it more difficult to achieve climate-related and other development goals. It also exacerbates the challenges associated with sizeable unmet investment needs in many EMDEs: substantial investment is required to fill infrastructure gaps, enable adaptation to climate change, facilitate the energy transition away from fossil fuels, accelerate poverty reduction, and advance shared prosperity (G20-IEG 2023; Rozenberg and Fay 2019; Stamm and Vorisek 2023; UNEP 2023).[2]

Although there is extensive discussion about the urgent need to raise investment growth, there is insufficient research on past investment accelerations—defined as periods in which there is a sustained increase in investment growth to a relatively rapid rate. A fuller understanding of these accelerations could provide useful lessons for achieving long-term growth and development goals in EMDEs.

This chapter examines the drivers of investment accelerations and associated economic outcomes by addressing the following questions:

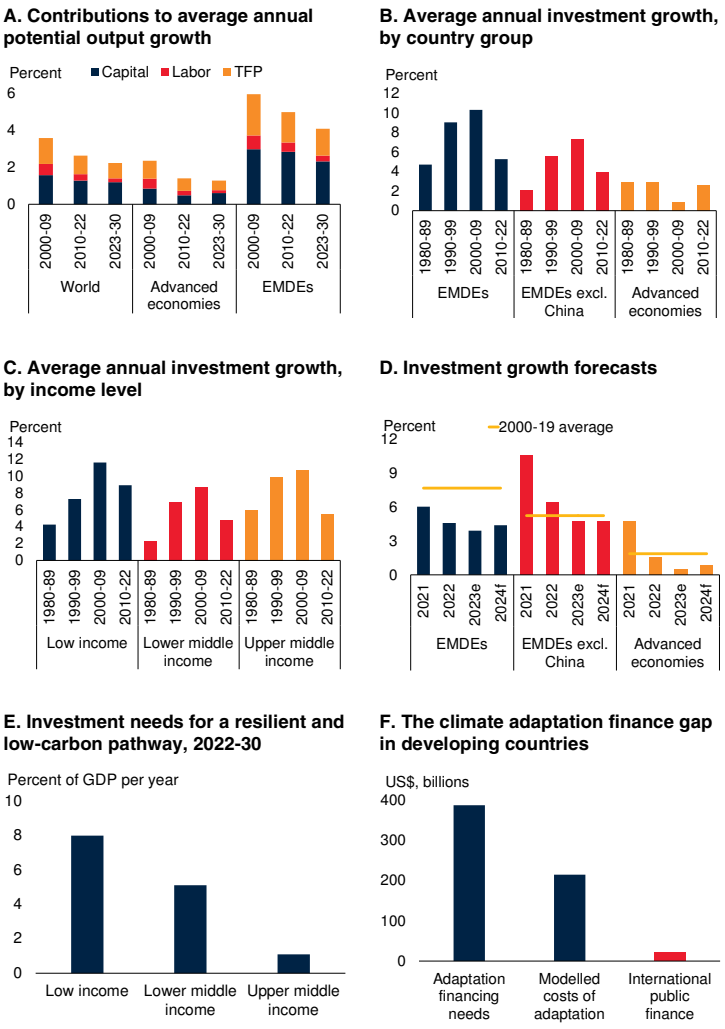
Note: This chapter was prepared by Kersten Stamm and Shu Yu. It is based on and extends Stamm, Yu, and de Haan (2024).

[1] This estimate is derived by applying the standard growth accounting framework to decompose output growth into estimated contributions of the growth in factor inputs and the growth of total factor productivity. See Kose and Ohnsorge (2023).

[2] To reach the climate targets of the Paris Agreement alone, there is a global need of more than US$4 trillion in annual investment through 2030 (IRENA 2023). EMDEs are projected to require annual investment equivalent to 1 to 8 percent of GDP through 2030 to reduce greenhouse gas emissions by 70 percent by 2050 and meet other development goals (World Bank 2022a). The costs of adaptation are estimated to be in a plausible range of US$215 billion-US$387 billion per year through 2030 (UNEP 2023). Even if these needs are fulfilled, there would be significant investment gaps for delivering the nationally determined contributions of the Paris Climate Agreement (IEA and IFC 2023; McCollum et al. 2018). These gaps imply that large amounts of private funding must be mobilized to complement the limited public sources (G20 and IEG 2023; Zattler 2023).

FIGURE 3.1 Evolution of investment growth

Capital accumulation is a key driver of potential output growth. Since the global financial crisis, most EMDEs have experienced prolonged, broad-based investment growth slowdowns that have exacerbated their unmet investment gaps. They especially need a resilient and low-carbon pathway of growth.



Sources: Haver Analytics; Feenstra, Inklaar, and Timmer (2015); Kose and Ohnsorge (2023); United Nations Environment Programme (2023); WDI (database); World Bank (2022a); World Bank.

Note: e = estimate; f = forecast. "Investment" refers to gross fixed capital formation. EMDEs = emerging market and developing economies.

A. Advanced economy and EMDE averages are calculated using GDP weights at average 2010-19 prices and market exchange rates. Sample includes 30 advanced economies and 53 EMDEs. See Kose and Ohnsorge (2023) for estimation details.

B.C. Investment growth averages are calculated using GDP weights at average 2010-19 prices and market exchange rates. Sample includes up to 35 advanced economies and 69 EMDEs.

D. Investment growth is calculated with countries' real annual investment in constant U.S. dollars as weights. Sample includes 35 advanced economies and 68 EMDEs.

E. Bars show estimates of the annual investment needs to build resilience to climate change and put countries on track to reduce emissions by 70 percent by 2050. Depending on data availability, estimates include investment needs related to transport, energy, water, urban adaptations, industry, and landscape.

F. Comparison of adaptation financing needs, modelled costs and actual international public adaptation finance flows (red) in developing countries. Values for needs and flows are for this decade through 2030, while international public finance flows are for 2021. Domestic and private finance flows are excluded.

- What are the main features of investment accelerations?
- What are the key macroeconomic and development outcomes associated with investment accelerations?
- What policy interventions are most likely to spark investment accelerations?

Contributions

The chapter makes the following contributions to the literature:

Exclusive focus on investment accelerations. This is the first study that examines periods characterized by a sustained increase in investment growth to a relatively rapid rate.[3] The earlier literature often examined the drivers of investment growth in the context of standard cross-country growth regressions. The event-study approach employed here demonstrates a stronger link between investment accelerations on the one hand and initial conditions and policy interventions on the other.[4]

Detailed analysis of investment accelerations. The chapter presents a comprehensive analysis of the evolution of investment, output, and other key macroeconomic and financial variables during investment accelerations. It examines 104 economies—35 advanced economies and 69 EMDEs—from 1950 to 2022. This analysis documents the macroeconomic correlates of investment accelerations, such as capital accumulation, total factor productivity (TFP) growth, and employment growth, which contribute to output growth. It also studies how

[3] Macroeconomic studies of cross-country investment include Anand and Tulin (2014); Caselli, Pagano, and Schivardi (2003); and Qureshi, Diaz-Sanchez, and Varoudakis (2015). Kose et al. (2017) and World Bank (2019, 2023a) also examine investment trends and correlates in a large sample of EMDEs.

[4] The chapter builds upon studies identifying accelerations in real GDP per capita. Hausmann, Pritchett, and Rodrik (2005) and Jong-A-Pin and de Haan (2011) identify output accelerations and show that these are related to trade, investment, and positive regime changes. Jones and Olken (2008) document that most countries experience output accelerations and slowdowns. Berg, Ostry, and Zettelmeyer (2012) find that adverse external shocks and macroeconomic volatility reduce the duration of output accelerations while strong institutions are positively correlated with longer-lasting accelerations.

some key macroeconomic and financial indicators—such as fiscal balances, trade, exchange rates, and credit—evolve around these episodes. Finally, this study analyzes the association between investment accelerations and key development outcomes, such as changes in poverty and inequality.

In-depth study of policies. The chapter draws both on empirical models and country case studies (box 3.1) to analyze the linkages between policies and investment accelerations. The empirical models assess the roles played by various initial conditions and policy interventions in triggering an investment acceleration. They also consider the interplay between policies and institutional environments in accelerating investment. The case studies zoom in on the experiences of selected countries to present more detailed accounts of the roles of policies, initial conditions, and the external environment in specific investment accelerations.

Main findings

The chapter's principal findings are:

Investment accelerations have happened in many EMDEs, but they have become less common. The chapter identifies 192 investment accelerations in 93 economies (34 advanced economies and 59 EMDEs) over 1950-2022. On average, the probability that an EMDE experienced an investment acceleration in any decade was 40 percent. Along with the protracted slowdown in investment growth since the global financial crisis, the number of investment accelerations in EMDEs has declined over time. In parallel, the external environment has become less supportive and domestic reform drives of the early 2000s lost momentum (Kose and Ohnsorge 2019; Stamm and Vorisek 2023).

Faster investment growth has often been driven by both the public and private sectors. The median annual growth of investment was 10.4 percent in EMDEs during investment accelerations, slightly more than three times the growth rate of 3.2 percent in other years. Often, both public and private investment growth have picked up during these episodes. Although the extent of the increase in public and private investment growth around investment accelerations differs across EMDE regions, the differences were relatively small.

Investment accelerations often coincided with periods of transformative growth. During investment accelerations, output growth in EMDEs reached 5.9 percent per year, which is 1.9 percentage points higher than in other years. This rapid growth rate translates into an expansion of almost two-fifths in GDP over six years, almost one-and-a-half times the median expansion during a comparable period outside accelerations. Investment accelerations are associated with higher output growth as they help boost capital accumulation, increase employment growth and strengthen growth of TFP—that is, the portion of growth that is not due to increased inputs of labor and capital and is generally considered a measure of efficiency. Specifically, an investment acceleration in EMDEs, on average, was associated with an increase of almost 1.3 percentage points in annual TFP growth, from slightly above zero in other years. Also, there was much higher growth of employment and output in the manufacturing and services sectors because investment accelerations support faster shifts of resources from less productive sectors, mainly agriculture, to more productive sectors.

Accelerations have coincided with better macroeconomic and development outcomes. Investment accelerations have also frequently been accompanied by improved fiscal balances, faster credit expansion, and larger net capital inflows. In addition, they have tended to coincide with better development outcomes, including faster poverty reduction, lower inequality, and improved access to infrastructure, such as the internet.

Policies have helped to ignite investment accelerations. Both the chapter's empirical analysis and its country case studies arrive at three key observations about the role of policies in investment accelerations:

- Policy interventions that improve macroeconomic stability—such as fiscal consolidations (actions to reduce deficits) and inflation targeting—and structural reforms, including measures that ease cross-border

trade and financial flows, have been instrumental in sparking investment accelerations.

- Although individual policy interventions have played a role, country-specific comprehensive packages of policies fostering macroeconomic stability and addressing structural issues have tended to be more potent in driving investment accelerations. When a country's primary fiscal balance and openness to trade and financial flows have substantially improved, the probability of igniting an investment acceleration has increased by 9 percentage points. Country cases, such as the Republic of Korea in the late 1990s and Türkiye in the early 2000s, illustrate the potential efficacy of comprehensive policy packages.

- Having high quality institutions (such as a well-functioning and impartial legal system) is critical for the success of policy interventions in starting investment accelerations. The likelihood of investment accelerations and the ultimate impact of policy reforms have been greater in countries with better institutions.

Database and identification methodology

Database

Investment is defined as real gross fixed capital formation, including both private and public investment (World Bank 2023a). Data on investment are taken from Penn World Table 10.01 (PWT), extended to 2022 using data from Haver Analytics, and databases from the World Bank's World Development Indicators and Global Economic Prospects (see annex 3.2 for details on data). This chapter focuses on growth in investment per capita because it presents a clear parallel with growth in GDP per capita, which is the most basic measure of growth in living standards and, as such, central to the analysis of long-term economic growth (Libman, Montecino, and Razmi 2019). Investment and output data are converted into per capita terms using population data from PWT and the United Nations World Population Prospects database. The dataset covers up to 35 advanced economies and 69 EMDEs for 1950-2022. The IMF Investment and Capital Stock dataset, which covers the period 1960-2019, is used to separate public from private investment (for information on other data used in the chapter, see annex 3.2).

Identification methodology

A simple event study approach is employed to identify investment accelerations. The approach follows earlier studies on accelerations of output and capital stock, but it is adjusted to ensure that the identified episodes are characterized by *sustained increases in per capita investment growth to a relatively rapid rate*.[5] The methodology imposes the following rules, based on the data and the literature:

- *Sustained.* Each episode must be sustained for at least six years. The duration of episodes is selected to exclude purely cyclical rebounds in investment growth (Barro and Sara-i-Martin 1992; Christiano and Fitzgerald 2003).

- *Rapid.* The average annual growth rate of investment in the acceleration (of at least six years) must be at least 4 percent. Only one-third of the countries in the sample had a median annual per capita investment growth rate exceeding 4 percent between 1950 and 2022. Because of the volatile nature of investment growth, a 4 percent threshold was selected because it is sufficiently high, and surpassing an average growth rate of 4 percent is unlikely to be driven by one year of very high growth.

- *Higher growth rate*. To ensure that the episode is an acceleration, the average per capita growth rate of investment must be at least 2 percentage points higher than the average of

[5] Hausmann, Pritchett, and Rodrik (2005), Jong-A-Pin and de Haan (2011), and Libman, Montecino, and Razmi (2019) employ similar methods to identify output and capital stock accelerations (see annex 3.1). Alternative rules (involving the duration of episodes and other thresholds used in the baseline event study) do not change the headline results (see annex 3.3 for an extensive list of sensitivity exercises).

the previous six years. In addition, to ensure that the episode is not merely a cyclical recovery, the capital stock at the end of the period must exceed its pre-episode peak.

An acceleration is considered to end when per capita investment growth turns negative, or when the inclusion of the current year reduces the average annual per capita investment growth rate since the start of the acceleration to below 4 percent. Investment accelerations can end for a variety of reasons: diminishing returns to capital stock that naturally reduce the average investment growth rate, domestic shocks driven by the accumulation of macroeconomic and financial imbalances, or external shocks such as a regional or global financial crisis. In general, accelerations have rarely been followed by crises or major recessions: four-fifths of those in the sample were not followed by a currency, debt, or banking crisis in the four years after the acceleration.

The rest of the chapter focuses on growth rates of investment, output, and other macroeconomic variables in the three stages around an investment acceleration—namely *before, during*, and *after*, with *during* capturing the full duration of acceleration years. To report comparable statistics across these three stages, the analysis focuses mainly on the medians of changes in variables in each stage.

Features of investment accelerations

Number of accelerations

The method identifies 192 investment accelerations in 93 economies (34 advanced economies and 59 EMDEs) over the period 1950-2022 (see annex 3.1). For a typical country, the probability of an investment acceleration in any given decade was 44 percent, slightly higher than the probability in an EMDE (40 percent). Among the countries that experienced at least one investment acceleration, fewer than one-third of them had three or more investment accelerations. In countries with multiple accelerations, the average time between two episodes was about 10 years, with a few exceptions.

Eleven of the 104 countries in the sample experienced no acceleration. These countries had periods of rapid investment growth, but no true accelerations. In some countries, investment was so volatile that no significant increase in investment growth lasted as long as six years (Guatemala, and Iceland). In other countries, periods of rapid investment growth followed declines in the capital stock, were relatively short-lived, and were insufficient to raise the capital stock to its preacceleration peaks (Côte d'Ivoire, Ghana, Niger, South Africa).

Distribution of accelerations over time and across countries

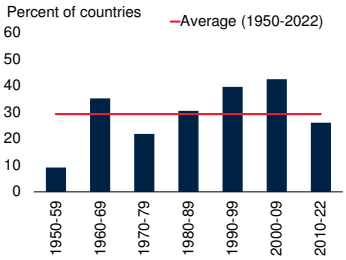
Globally, 42 percent of countries had an investment acceleration in the 2000s. In the following decade only about a quarter of the world's economies had one. This decline was fully accounted for by EMDEs, as the share of advanced economies with accelerations was virtually unchanged (figure 3.2). The wave of investment accelerations in these economies during the early 2000s was partially supported by benign global conditions, strong cross-border trade and financial flows, and structural reforms that improved many countries' policy frameworks (Kose and Ohnsorge 2019). Since the global financial crisis, the combination of an increasingly difficult external environment and a loss of domestic reform momentum has weighed on investment growth in EMDEs (Stamm and Vorisek 2023).

An EMDE, on average, experienced about 1.7 investment accelerations between 1950 and 2022, compared with about 2.2 such episodes in the average advanced economy. A typical low-income country (LIC) experienced fewer investment accelerations than a high-income country, but its number was similar to those in a typical EMDE. Across EMDE regions, the highest number of investment accelerations per country (nearly 2.4) occurred in East Asia and Pacific, which registered much higher investment growth than other regions over the past seven decades. Reflecting the high volatility of their investment, commodity exporters, economies facing fragile and conflict-affected situations (FCS), and small states experienced fewer investment accelerations than other country groups.

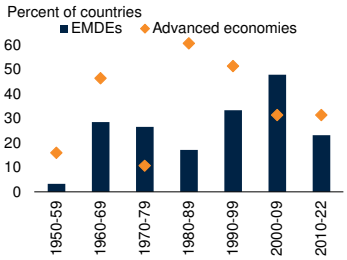
FIGURE 3.2 Frequency of investment accelerations

For EMDEs, the share of investment accelerations peaked in the 2000s and fell by about half in the 2010s. More investment accelerations per country have been observed in East Asia and the Pacific, on average, than in other EMDE regions. Investment accelerations have occurred less frequently in commodity exporters, fragile and conflict-affected situations, and small states—groups of countries where output growth performance is relatively volatile.

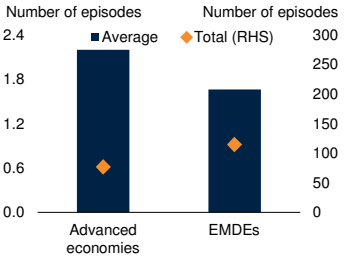
A. Share of countries with investment accelerations, by decade



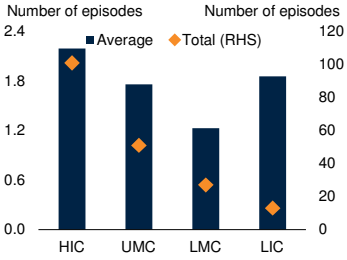
B. Share of countries with investment accelerations, by decade and country group



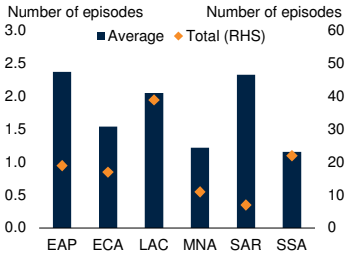
C. Number of investment accelerations, by country group



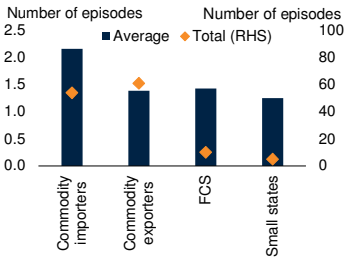
D. Number of investment accelerations, by income level



E. Number of investment accelerations, by EMDE region



F. Number of investment accelerations, by EMDE country group



Sources: Feenstra, Inklaar, and Timmer (2015); Haver Analytics; WDI (database); World Bank.
Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; EMDEs = emerging market and developing economies; FCS = fragile and conflict-affected situations; HIC = high-income countries; LAC = Latin America and the Caribbean; LIC = low-income countries; LMC = low-middle income countries; UMC = upper-middle income countries; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. Sample includes 192 investment accelerations in 93 economies, including 34 advanced economies and 59 EMDEs.
A.B. Bars and diamonds show the share of countries starting an investment acceleration during the corresponding decade. The red line in A shows the long-run average share of countries starting an investment acceleration over the past seven decades. The number of accelerations in the 1950s is constrained to episodes starting in 1956 or later by the filter criteria.
C.-F. Bars show the average number of investment accelerations per country over the period 1950-2022, while diamonds show the total number of episodes between 1950 and 2022.
E.F. The sample contains EMDEs alone.

Amplitude and duration of accelerations

In EMDEs, the median annual growth rate of investment was 10.4 percent in a typical investment acceleration during 1950-2022, just over three times the median growth rate in other years of 3.2 percent (figure 3.3). The rate of investment growth typically exceeded 5 percent in the first year of an acceleration episode and peaked at 13 percent in the following year. In one-fourth of the episodes, annual investment growth reached a peak of at least 21 percent. EMDEs typically experienced a greater increase in investment growth than advanced economies. Reflecting the higher volatility of investment, EMDEs also typically experienced a larger decline in investment growth in the six years following the end of an acceleration than did advanced economies. The basic pattern of investment growth over the three stages of acceleration episodes shows only minor differences across EMDEs in different regions and country groups. Most accelerations lasted six to seven years, with a median duration of seven years. One-fifth of accelerations lasted longer than 10 years.

During a typical investment acceleration, median private and public investment growth both improved significantly from the preceding six years—by about 7 percentage points per year globally—and by somewhat more in EMDEs than in advanced economies (figure 3.4). Of the 192 accelerations, just over half saw higher private than public investment growth. The subsequent decline in growth was slightly more pronounced in private than public investment—by about 1 to 2 percentage points a year—perhaps because of the supportive role that fiscal policy tends to play in periods of weaker private investment growth. The decline in private investment after accelerations was also more pronounced in EMDEs than in advanced economies. The behavior of public and private investment growth around investment accelerations did not differ much across EMDE regions. Across the six regions, LAC and SSA had the lowest share of accelerations with higher private than public investment growth, with 37 percent in LAC and almost 32 percent in SSA.

Correlates of investment accelerations

Investment accelerations are associated with faster output growth because they help boost capital accumulation and the growth of productivity and employment, and also because they tend to be accompanied by significant shifts of resources from less productive to more productive uses. Investment accelerations tend to coincide with improvements in some key macroeconomic and financial variables. In addition, they are associated with stronger progress toward some of the key development goals, such as reduction in poverty and inequality and increased access to infrastructure.

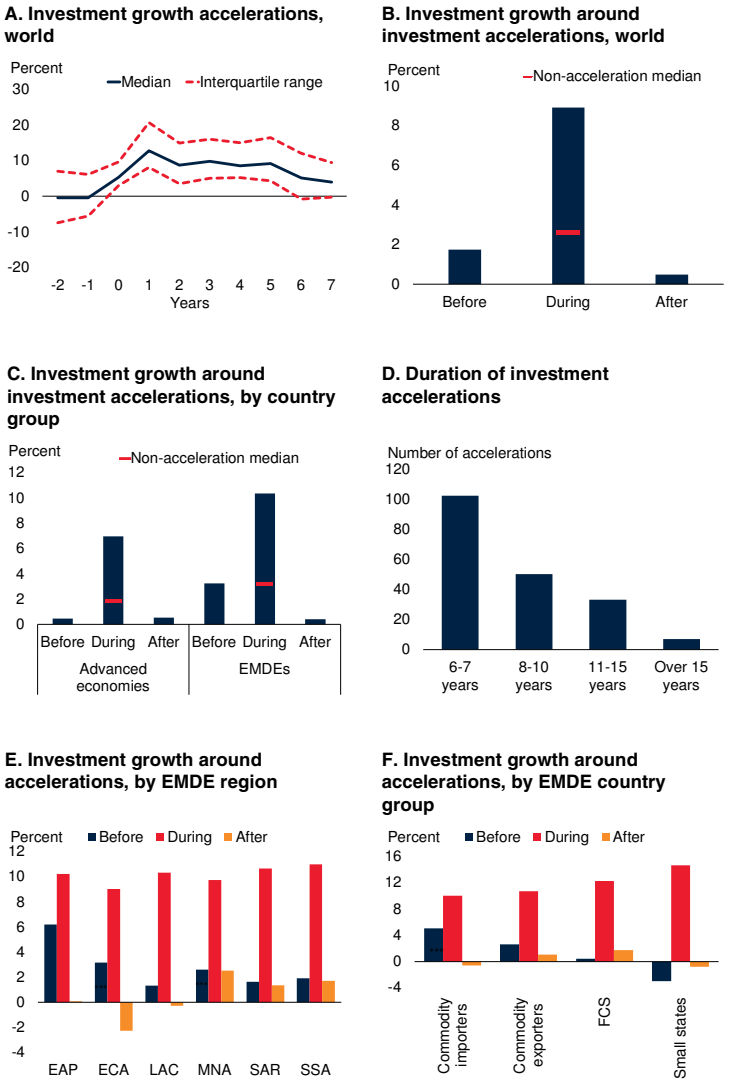
Output growth and its underlying channels

Output growth. Output growth has tended to surge during investment accelerations (figure 3.5). In EMDEs, output growth reached 5.9 percent per year during investment accelerations over the period 1950-2022—1.9 percentage points more than in other years. This rapid growth rate translates into an expansion of almost 40 percent in GDP over a six-year period, more than one-and-a-half times the expansion in a comparable six-year period outside acceleration years. In LICs, output growth was higher during accelerations than before and after them, but not to a statistically significant extent. This is partly due to the highly volatile nature of output growth in these economies and the small sample of LICs. Similarly, FCS display very volatile growth in periods before accelerations, with higher growth during and after accelerations. For small states, GDP growth rose particularly rapidly during accelerations, from 2.5 percent before a typical investment acceleration to more than 7.4 percent during one. After accelerations, output growth fell back to 4.7 percent. For small states, these changes in output growth are statistically significant.

Investment accelerations are associated with higher output growth through their impact on capital accumulation and the growth of both TFP and employment.

FIGURE 3.3 Investment growth during accelerations

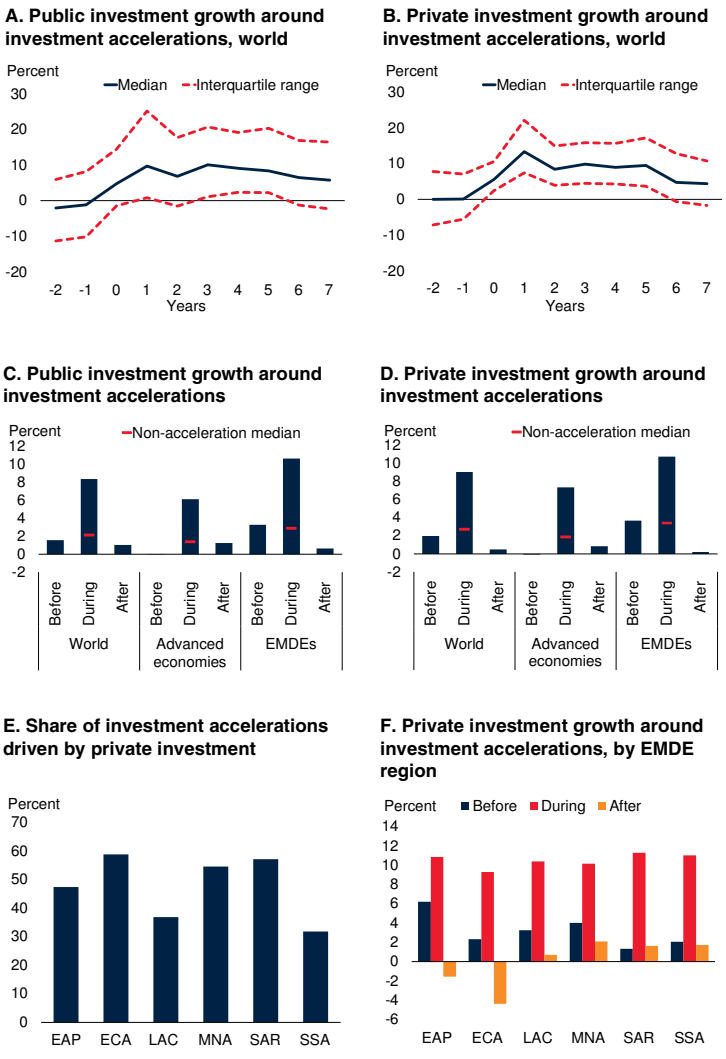
During an investment acceleration, the annual investment growth rate has typically reached 9 percent, significantly higher than the pace of the preceding and following years, by 7 and 8 percentage points, respectively.



Sources: Feenstra, Inklaar, and Timmer (2015); Haver Analytics; WDI (database); World Bank.
Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; EMDEs = emerging market and developing economies; FCS = fragile and conflict-affected situations; LAC = Latin America and the Caribbean; LICs = low-income country; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. The sample includes 192 investment acceleration episodes in 93 economies, including 34 advanced economies and 59 EMDEs.
A. $t = 0$ refers to the start year of an investment acceleration episode. The blue line shows the median, red dashed lines show the 25th and 75th percentile of investment growth in each year around an investment acceleration.
B.C.E.F. Bars show median annual investment growth during the six years before, the entire duration of, and the six years after an investment acceleration. At the 10 percent level, differences between before, during, and after periods are statistically significant unless otherwise specified.
B.C. Red tick mark indicates the median investment growth rate during non-acceleration years in the sample.
D. Bars show the number of investment accelerations that fall into each duration category.
F. For small states, the difference between before and during is not statistically significant.

FIGURE 3.4 Public versus private investment during investment accelerations

Both public and private investment growth have increased during investment accelerations. While the rise and subsequent decline in growth has been similar in magnitude in regard to both private and public investment in EMDEs, the rise and decline in private investment has been more notable than that in public investment in advanced economies. The behavior of public and private investment growth before and during investment accelerations has not differed notably across EMDE regions, except that public investment has accounted for a larger share of accelerations in Latin America and the Caribbean and Sub-Saharan Africa.



Sources: Feenstra, Inklaar, and Timmer (2015); Haver Analytics; IMF, Investment and Capital Stock dataset; WDI (database); World Bank.

Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; EMDEs = emerging market and developing economies; LAC = Latin America and the Caribbean; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa. Sample includes 192 investment acceleration episodes in 93 economies, including 34 advanced economies and 59 EMDEs.

A.B. $t = 0$ refers to the start year of an investment acceleration episode. The blue line shows the median and the red dashed lines show the 25th and 75th percentile of investment growth (public in A, private in B) in each year around an investment acceleration.

C.D.F. Bars show median annual investment growth during the six years before, the entire duration of, and the six years after an investment acceleration. At the 10 percent level, differences between before, during, and after periods are statistically significant unless otherwise specified.

C.D. Red tick mark indicates the median public investment growth rate (in C) and private investment growth rate (in D) during non-acceleration years in the sample.

E. Bars show the share of accelerations in each EMDE region during which median private investment growth exceeded public investment growth.

- *Capital accumulation.* Investment accelerations are associated with stronger output growth directly through their links with faster capital accumulation (Kose and Ohnsorge 2023; Loayza and Pennings 2022). Capital accumulation alone accounted for 45 percent of output growth during investment accelerations globally in 1950-2022 (figure 3.6). The share of output growth explained by capital accumulation is markedly higher in EMDEs—almost half—than in advanced economies, where it accounts for one-third during these episodes. This contribution remains sizable after accelerations, contributing to 77 percent of growth in EMDEs, compared with 48 percent in the years before an acceleration. Globally, the annual growth rate of the capital stock increased by almost 50 percent from its preceding level during a typical investment acceleration, reaching 5.2 percent, and kept growing at a faster rate after an acceleration compared with before. For EMDEs, the pickup in capital stock growth during investment accelerations was significantly larger, and from lower initial levels, than for advanced economies. Growing at 6.2 percent a year, the capital stock in EMDEs expanded by nearly 44 percent over the first six years of an investment acceleration, almost 45 percent more than the expansion over a similar period outside an acceleration.

- *Productivity growth.* Heightened output growth during an investment acceleration is also often accompanied by increased TFP growth (figure 3.7). During 1950-2022, TFP typically grew by 1.7 percent a year in EMDEs during accelerations, significantly faster than in other years. While TFP growth tended to return close to its preceding rate after accelerations in advanced economies, it dropped below its preacceleration pace in EMDEs. Along with TFP growth, labor productivity growth, one of the main drivers of per capita income growth, also significantly increases during these episodes.

- *Employment growth.* Investment accelerations were often accompanied by significant increases in employment growth (figure 3.7).

Globally, the employment rate expanded significantly by 0.3 percentage point a year during accelerations, compared with slight contractions in the six years before and after accelerations. Though still significant, the pickup in employment growth during investment accelerations in EMDEs was smaller than in advanced economies, while EMDEs avoided a decrease in the employment rate after accelerations and advanced economies did not.

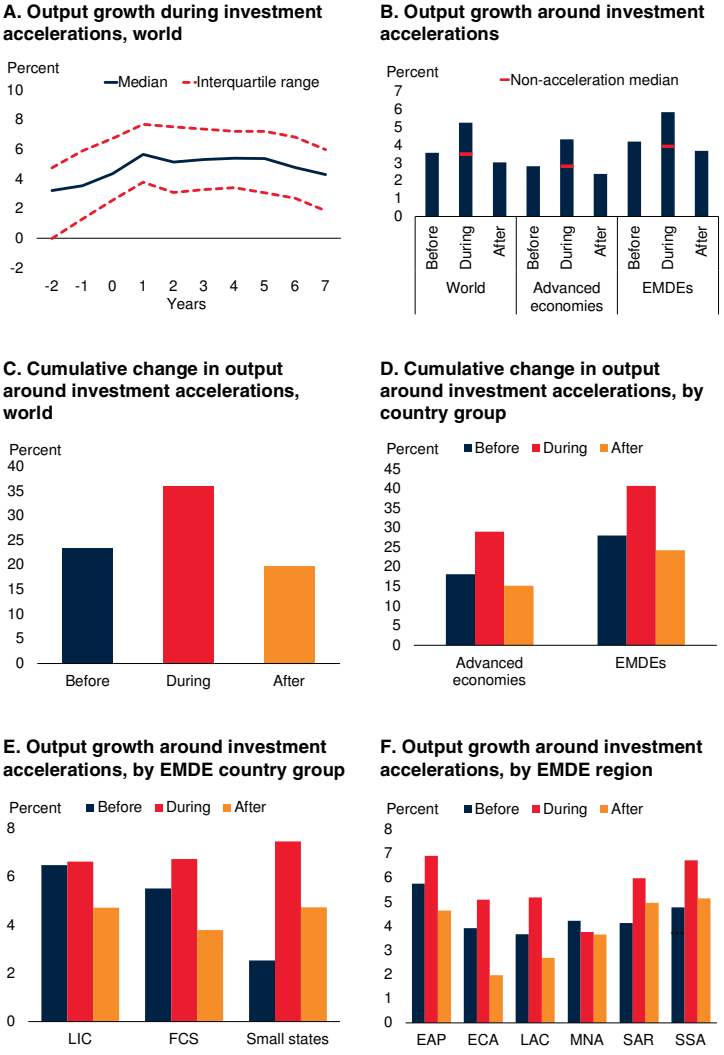
Sectoral shifts. Investment accelerations are also associated with higher productivity growth through intersectoral resource shifts (Dieppe 2021; Hoyos, Libman, and Razmi 2021). During a typical investment acceleration, the composition of employment has moved significantly away from the agriculture sector toward manufacturing and services, and output growth in manufacturing and services has registered significant increases (figure 3.7). The pace of sectoral shifts has tended to gain momentum during accelerations as the growth rates of employment in the manufacturing and services sectors tend to be significantly higher than in other years. The reallocation of workers from less productive sectors to more productive sectors is a substantial source of productivity growth—particularly in recent decades in EMDEs, such as China. It is estimated, for instance, that such reallocations accounted for two-thirds of productivity growth in LICs in the decades leading up to the global financial crisis (Dieppe 2021).

Other macroeconomic and financial correlates

Consumption. During investment accelerations, both public and private consumption growth improved significantly, by about 1 and 1.6 percentage point a year globally, respectively (figure 3.8). In EMDEs, the increase in the growth of public consumption (including all government current expenditures) during accelerations was comparable to that in private consumption, whereas in advanced economies, public consumption increased much less. Both public and private consumption growth tended to fall back to preacceleration rates.

FIGURE 3.5 Growth of output during investment accelerations

Output growth has risen notably during investment accelerations. In EMDEs, annual output growth has typically reached 5.9 percent during an investment acceleration—about 2 percentage points higher than that in other years. Cumulatively, GDP has typically expanded by two-fifths during an investment acceleration. The increase in output growth during these episodes has varied across EMDE regions.



Sources: Feenstra, Inklaar, and Timmer (2015); WDI (database); World Bank.

Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; EMDEs = emerging market and developing economies; FCS = fragile and conflict-affected situations; LAC = Latin America and the Caribbean; LIC = low-income country; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa; TFP = total factor productivity. Sample includes 192 investment acceleration episodes in 93 economies, including 34 advanced economies and 59 EMDEs.

A. $t = 0$ refers to the start of an investment growth acceleration. The blue line shows the median and the red dashed lines show the 25th and 75th percentile of output growth in each year around an investment acceleration.

B.E.F. Bars show median annual GDP growth during the six years before, the entire duration of, and the six years after an investment acceleration. The red tick mark in B indicates the median GDP growth rate during non-acceleration years in the sample. At the 10 percent level, differences between before, during, and after periods are statistically significant unless otherwise specified.

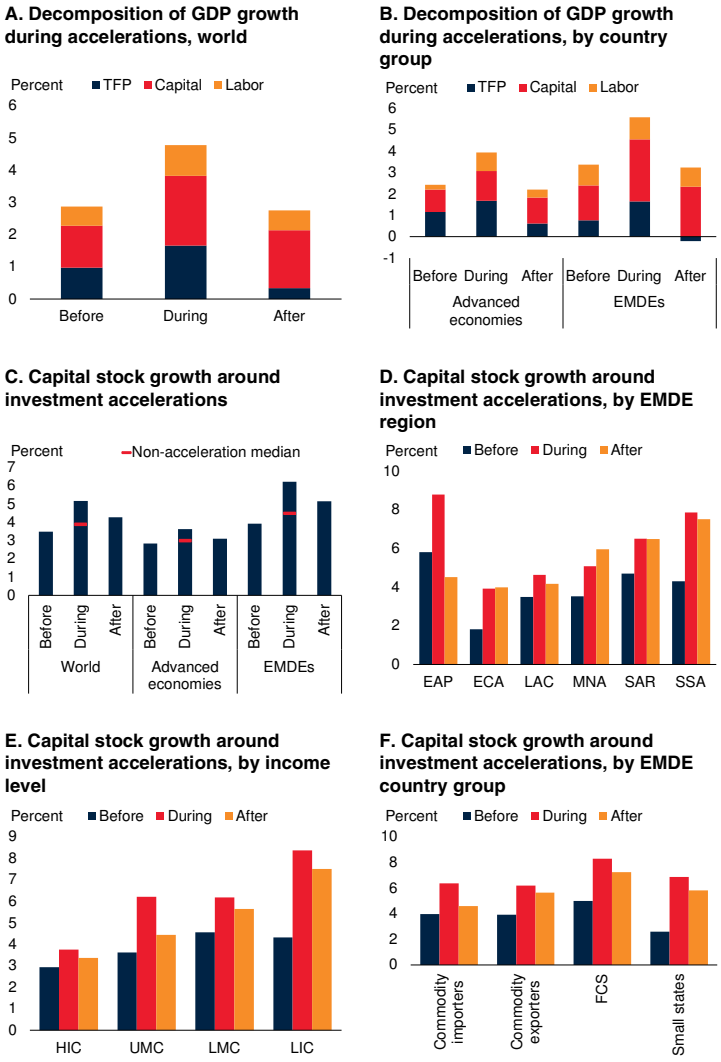
C.D. Cumulative change is calculated for a six-year period based on annual median growth rates by group and period.

E. For LICs, the difference in values before and during is not statistically significant.

F. For MNA, the difference in values before and during is not statistically significant.

FIGURE 3.6 Contributions to GDP growth during investment accelerations

Capital accumulation made a major contribution to output growth in 1950-2022, especially in EMDEs. During an investment acceleration in EMDEs, annual growth of capital almost doubled from its preceding rate. Both total factor productivity (TFP) growth and employment growth contributed more to output growth during investment accelerations than during other periods. The moderation in TFP growth after investment accelerations was sharper in EMDEs than in advanced economies.



Sources: Feenstra, Inklaar, and Timmer (2015); Haver Analytics; WDI (database); World Bank.
Note: EAP = East Asia and Pacific; ECA = Europe and Central Asia; EMDEs = emerging market and developing economies; FCS = fragile and conflict-affected situations; HIC = high-income country; LAC = Latin America and the Caribbean; LIC = low-income country; LMC = lower-middle-income country; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa; TFP = total factor productivity; UMC = upper-middle-income country. Sample includes 192 investment acceleration episodes in 93 economies, including 34 advanced economies and 59 EMDEs.
A.B. Bars show the median contribution of TFP growth, capital accumulation, and labor to output growth. Capital accumulation and labor are weighted by the labor share.
C.-F. Bars show median annual capital stock growth during the six years before, the entire duration of, and the six years after an investment acceleration. The red tick marks in C indicate the median capital stock growth rate during non-acceleration years in the sample. At the 10 percent level, differences between before, during, and after periods are statistically significant unless otherwise specified.
D. For all regions except EAP and LAC, the difference in capital stock growth between during and after the acceleration is not statistically significant.
E. For LMC, the difference in capital stock growth between during and after the acceleration is not statistically significant.
F. For small states, the difference in capital stock growth between during and after the acceleration is not statistically significant.

Fiscal positions. Fiscal balances have tended to improve during investment accelerations (figure 3.8). Globally the primary balance (which excludes net interest on government debt) shifted from a small deficit in the preceding six years to a small surplus during accelerations. In EMDEs, it remained unchanged, while the overall fiscal deficit narrowed by about 1 percentage point of GDP. During accelerations, the ratio of government debt to GDP fell by 9 percentage points both in EMDEs and globally, largely reflecting, in EMDEs, both faster GDP growth and improvements in primary balances. However, as output growth moderated after investment accelerations, improvements in fiscal and primary balances have tended to erode.

International trade. Trade growth has tended to increase significantly during investment accelerations, partly reflecting shifts of resources to the tradeable manufacturing sector and increased growth in imports of capital goods (figure 3.8; Irwin 2021; Lee 1995). Both import and export growth increased markedly during accelerations, with import growth roughly tripling the rate prior to accelerations. The surges in import and export growth were slightly larger in EMDEs than in advanced economies; the larger increase in import growth in EMDEs may partly reflect EMDEs' greater reliance on imports for capital goods (Bustein, Cravino, and Vogel 2013). As a result of the growth of imports relative to exports, current account deficits tended to widen somewhat in EMDEs and globally during and after accelerations.

Capital inflows. Capital inflows increased notably during investment accelerations (figure 3.8). In EMDEs, capital inflows rose by about 2 percentage points of GDP during accelerations, relative to their preceding levels, partly on account of increases in FDI inflows relative to GDP. Increases in capital inflows seem to have supported some investment accelerations in EMDEs—such as those in Türkiye in the 2000s and Poland in the 1990s (box 3.1). Increases in capital inflows were often sustained after the acceleration.

Credit and saving. Both domestic credit and gross domestic saving grew significantly faster during investment accelerations. In EMDEs, credit

growth increased by about 4.5 percentage points a year during accelerations, while the real interest rate fell by more than half. Growth of saving increased by 3 percentage points a year. The increases in both credit growth and saving growth were larger in EMDEs than in advanced economies. While saving growth tended to moderate after investment accelerations in EMDEs, credit growth tended to remain elevated. Accelerations that were supported by credit growth lasted longer and saw significantly higher output growth than accelerations that were not accompanied by credit growth.

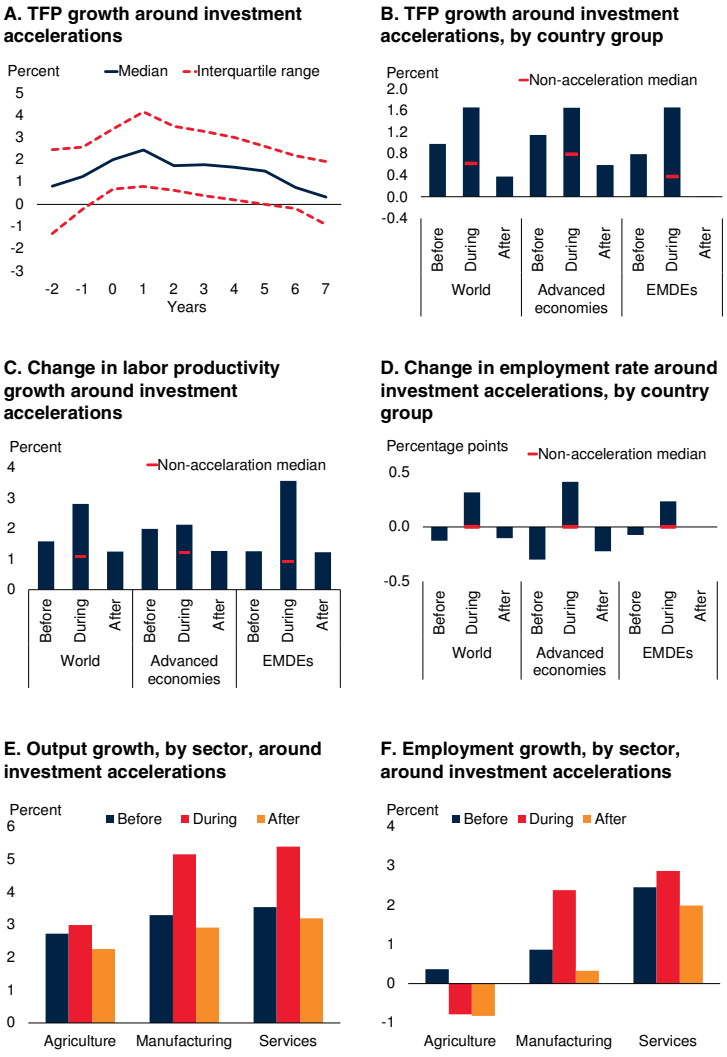
Inflation and real effective exchange rates. Falling inflation rates have often preceded or accompanied investment accelerations (for example, Korea in the late 1990s; see box 3.1). Globally, annual inflation fell during 1950-2022, from about 7 percent before to about 4 percent during accelerations, while in EMDEs, it dropped from 8 percent to 6 percent. The low inflation rates were typically sustained after investment accelerations (especially after the 1980s).

Real effective exchange rates have not changed materially during investment accelerations, but rose slightly (statistically significantly) afterward, with domestic currencies thus appreciating in real effective terms. There is evidence that, at least in EMDEs, a competitive exchange rate can facilitate capital accumulation both through households' saving and investment behaviors and by expanding the tradeable sector, which supports investment growth.[6] Some countries, such as Germany, Japan, and Korea, have at times relied largely on exports to achieve faster growth. These countries eventually had to allow their currencies to appreciate after the period of rapid growth (Rodrik 2010).

[6] Rodrik (2008) argues that currency undervaluation helps the rapid development of the tradeable sector, which is more reliant on investment in EMDEs. Bleaney and Greenaway (2001) suggest that there are two reasons why currency overvaluation can hurt investment in Sub-Saharan Africa: first, overvaluation reduces the returns to investment in the tradables sector, and second, the accompanying current account deficit may cause a tightening of import licensing procedures, which further reduces the returns to investment. There are also drawbacks, such as increases in income inequality and lack of product diversification, associated with currency undervaluation (Bergin 2022; Ribeiro, McCombie, and Lima 2020).

FIGURE 3.7 Total factor productivity growth, employment growth, and sectoral shifts around investment accelerations

Investment accelerations have often been accompanied by improvements in productivity growth, stronger employment growth, and greater reallocation across sectors.



Sources: Dieppe (2021); Feenstra, Inklaar, and Timmer (2015); Haver Analytics; WDI (database); WEO (database); World Bank.

Note: EMDEs = emerging market and developing economies; TFP = total factor productivity. Sample includes up to 192 investment acceleration episodes in 93 economies, including 34 advanced economies and 59 EMDEs.

A. $t = 0$ refers to the start year of an investment acceleration episode. The blue line shows the median, red dashed lines show the interquartile range of TFP growth in each year around an acceleration.

B.-F. At the 10 percent level, differences between before, during, and after periods are statistically significant unless otherwise specified.

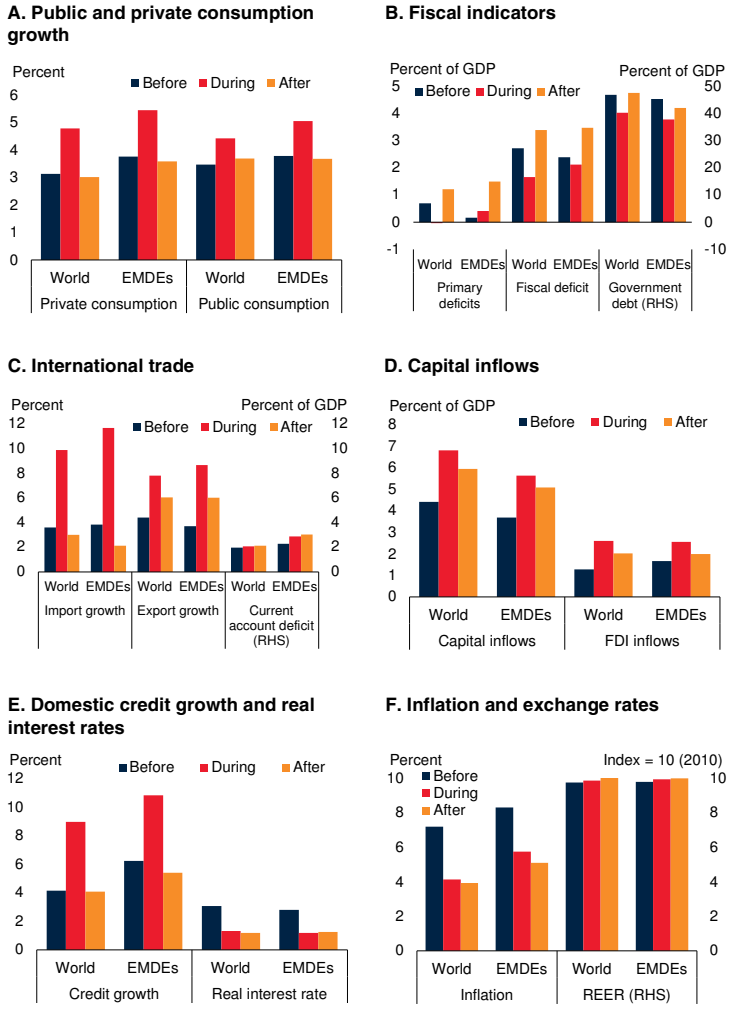
B.-D. Bars show median annual growth (median annual change in the employment rate in D) during the six years before, the entire duration of, and the six years after an investment acceleration. Red tick mark indicates the median annual growth (annual change in the employment rate in D) during non-acceleration years.

C. Difference between before and during for advanced economies is not statistically significant.

E.F. Bars show median annual sector output (in E; employment in F) growth during the six years before, the entire duration of, and the six years after an investment acceleration. In E, the difference in output growth between the before and during periods for the agriculture sector are not statistically significant. In F, the difference in growth rates in the agriculture sector during and after the acceleration are not statistically significant, as well as the difference in the growth rate of employment in the services sector before and during the acceleration.

FIGURE 3.8 Macroeconomic indicators around investment accelerations

Investment accelerations in EMDEs have been accompanied by improvements in key macroeconomic variables: both private and public consumption growth have picked up; fiscal deficits and government debt, relative to GDP, have declined; the growth of credit has increased; and inflation has declined. While the growth of both imports and exports has picked up during such accelerations, the rise in imports growth has been relatively larger in EMDEs, partly reflecting their greater reliance on imports for capital goods.



Sources: Bank for International Settlements; Feenstra, Inklaar, and Timmer (2015); Ha, Kose, and Ohnsorge (2021); Haver Analytics; IMF, International Financial Statistics; WDI (database); WEO (database); World Bank.

Note: EMDEs = emerging market and developing economies. FDI = foreign direct investment; REER = real effective exchange rate. Sample includes up to 192 investment acceleration episodes in 93 economies, including 34 advanced economies and 59 EMDEs.

A.-F. Bars show the median values for the six years before, the entire duration of, and six years following investment accelerations. At the 10 percent level, differences between before, during, and after periods are statistically significant unless otherwise specified.

B. For EMDEs, differences between before and during in primary and fiscal deficits are not statistically significant.

C. For World and EMDE current accounts, differences between before and during, and during and after are not statistically significant.

D. For EMDE capital inflows, differences between during and after are not statistically significant.

E. For World and EMDE real interest rates, differences between during and after are not statistically significant.

F. For World inflation, differences between during and after are not statistically significant. For World and EMDE REERs, differences between before and during are not statistically significant.

Development outcomes

Poverty and inequality. During investment accelerations, more progress has often been made in reducing both poverty and inequality (figure 3.9). The share of the population in extreme poverty barely changed in the six years before a typical investment acceleration in 1950-2022, but declined significantly, by 0.2 percentage point per year, during the acceleration. Similarly, the Gini coefficient, which measures income inequality, fell significantly during the typical investment acceleration after rising slightly in the years preceding it. Measured at national poverty lines, the fall in poverty was even more pronounced with a 0.5 percentage point improvement in the national poverty headcount ratio per year.

Income convergence. These gains in poverty and equality are underpinned by the rapid increase in per capita output growth during investment accelerations, which led to faster income convergence toward advanced-economy income levels. Specifically, the median per capita output growth in EMDEs was 0.6 percentage point higher than in advanced economies (4.3 percent compared with 3.7 percent). In contrast, EMDEs registered weaker per capita output growth than advanced economies in other years (1.8 percent versus 2.1 percent per year).

Access to infrastructure. Access to infrastructure improved during investment accelerations. For example, the share of the population with access to basic sanitation increased by 0.4 percentage point globally during investment accelerations, while the incidence of stunting among children aged 5 or younger fell by 0.6 percentage point. Since the 1990s, access to the internet has also tended to rise significantly during investment accelerations: 2.4 percent of the population per year gained access to the internet during a typical acceleration, two times the increase during the prior period.

Drivers of investment accelerations

A rich body of empirical research has shown that investment growth in a country is affected by both global (or regional) conditions and the country's

initial conditions, economic policies and institutional settings.[7] However, this literature has not considered the roles of these factors in sparking investment accelerations. This section presents the results of a series of empirical exercises and compares these with insights from the country case studies (box 3.1) on how these factors help trigger investment accelerations.

Initial conditions

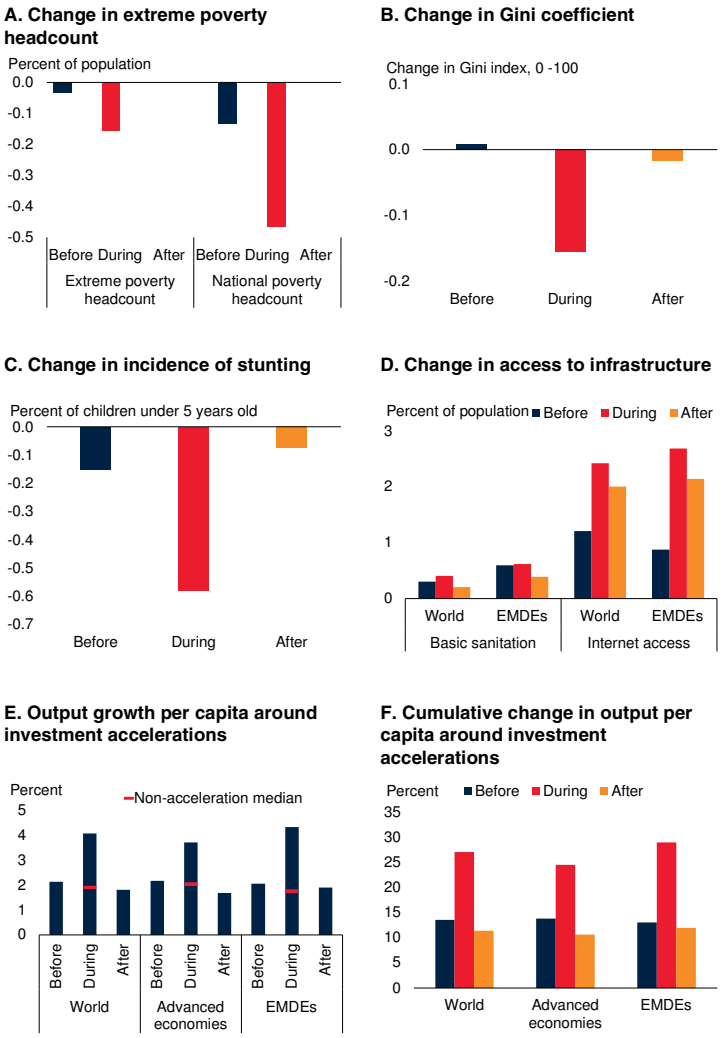
Initial conditions have influenced the onset of investment accelerations (figure 3.10). For example, economies with higher institutional quality have been more likely to experience an investment acceleration: specifically, moving from the bottom quartile to the top quartile in institutional quality increases the probability of starting an investment acceleration by 5.6 percentage points. Similarly, a more undervalued currency is associated with a significantly higher likelihood of an investment acceleration, whereas overvalued currencies have often been a sign of macroeconomic and financial imbalances. In EMDEs, a competitive exchange rate can facilitate capital accumulation either by boosting higher-income households' propensity to save and invest or by supporting the tradables sector (Gluzmann, Levy-Yeyati, and Sturzenegger 2012, 2013; Guzman, Ocampo, and Stiglitz 2018). In both cases, maintaining a competitive currency may help initiate and sustain investment accelerations.

Benign global economic conditions, proxied by strong global output growth, also substantially increase the likelihood of an acceleration. In the sample period of this study, raising global GDP growth from the bottom to the top quartile—from 2.1 percent to 3.5 percent—increased the

[7] Kose et al. (2017) show how the slowdown in investment growth in EMDEs following the global financial crisis was driven by spillovers from slowing growth in advanced economies, heavier debt burdens, and falling commodity prices. Libman, Montecino, and Razmi (2019) show how capital stock accumulation is positively correlated with higher human capital endowments, exchange rate undervaluation, low capital-output ratios, and net capital outflows. Manzano and Saboin (2022) find that higher institutional quality is correlated with capital stock accelerations. Stamm and Vorisek (2023) document the contribution of the COVID-19 pandemic to the slowdown in investment growth and show how the weak investment recovery coincides with subdued growth in output, trade, productivity, and credit, and high debt levels.

FIGURE 3.9 Development outcomes during investment accelerations

Investment accelerations have typically been accompanied by faster poverty reduction, larger improvements in income equality and human development indicators, and greater enhancements in access to infrastructure than at other times.



Sources: Feenstra, Inklaar, and Timmer (2015); SDG data dashboard; WDI (database); World Bank.

Note: EMDEs = emerging market and developing economies.

A.-D. Bars are medians of the annual changes in the corresponding indicators during the six years before, entire duration of, and six years after investment accelerations. Sample includes up to 192 investment acceleration episodes in 93 economies, including 34 advanced economies and 59 EMDEs. At the 10 percent level, differences between before, during, and after periods are statistically significant unless otherwise specified.

A. The difference in national poverty change between before and during is not significant for World, but is statistically significant for EMDEs.

B. The Gini coefficient is a measure of income inequality. The smaller the coefficient, the more income is equally distributed.

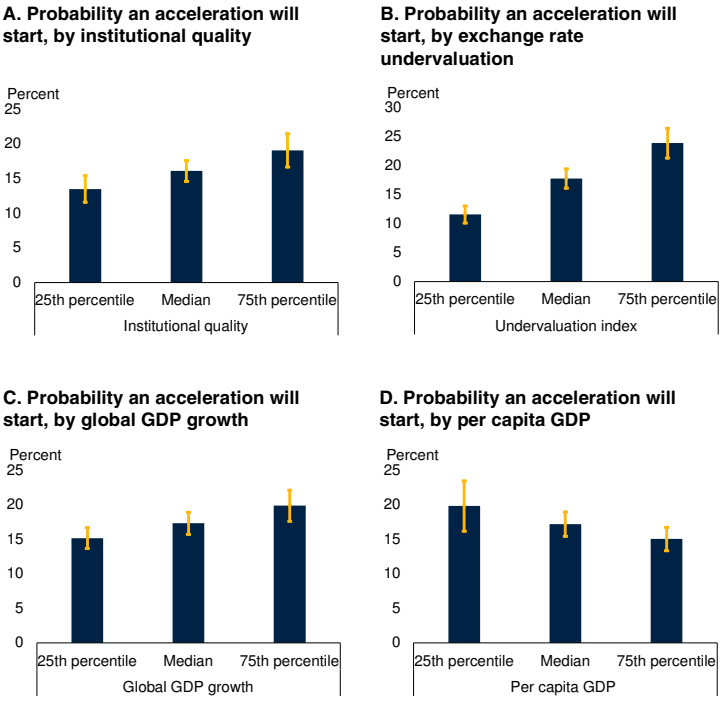
D. Data availability limited to 1998 and later. Differences for basic sanitation indicator not statistically significant.

E. Bars show median per capita growth of output in the six years before, entire duration of, and six years following an acceleration. Red tick marks indicate non-acceleration-year medians.

F. Cumulative change is based on the median growth rates shown in E and calculated for a six-year period.

FIGURE 3.10 Initial conditions and the start of investment accelerations

Economies with better institutional quality and a more competitive exchange rate are more likely to experience an investment acceleration. Additionally, benign global economic conditions have also tended to increase the likelihood of accelerations. Conversely, the probability of initiating an investment acceleration tends to be lower with higher levels of per capita GDP.



Sources: Feenstra, Inklaar, and Timmer (2015); Haver Analytics; PRS Group; WDI (database); World Bank.

Note: Figure is based on the regression results of table A3.2.1, column (6). See annex 3.2 for a description of the data and sources.

A. The bars show the predicted probability of an investment acceleration at different levels of the lagged International Country Risk Guide Law and Order index. Yellow whiskers refer to the 90 percent confidence interval. The percentile thresholds of the index are 3, 4, and 5.

B. The bars show the predicted probability of an investment acceleration at different levels of the lagged exchange rate undervaluation index. Yellow whiskers refer to the 90 percent confidence interval. The percentile thresholds of the log index are -0.32, -0.01, and 0.25.

C. The bars show the predicted probability of an investment acceleration at different levels of lagged global GDP growth. Yellow whiskers refer to the 90 percent confidence interval. The percentile thresholds are 2.1 percent, 2.8 percent, and 3.5 percent.

D. The bars show the predicted probability of an investment acceleration at different levels of lagged per capita GDP levels (in logs). Yellow whiskers refer to the 90 percent confidence interval. The percentile thresholds are 8.3 , 9.2, and 10.1.

probability of starting an investment acceleration for an average economy by 4.7 percentage points. Several of the country case studies (box 3.1) illustrate how commitment to comprehensive reforms enables countries to seize on supportive external factors, such as high commodity prices or international assistance. The probability of an investment acceleration also increased significantly in countries with lower per capita income. For instance, the likelihood of an acceleration was about one-fourth higher in countries in the bottom quartile of income per capita compared with those in the top quartile.

Macroeconomic policies and structural reforms

Investment accelerations have often been preceded or accompanied by policy measures to improve macroeconomic stability or reduce restrictions on cross-border trade or financial flows. An improved primary fiscal balance or reduced capital flow restrictions tended to precede or accompany about a third of investment accelerations during 1956-2017. Trade restrictions were relaxed by policy measures prior to 70 percent of accelerations in this period. The adoption or tightening of an inflation target was followed or accompanied by 10 percent of accelerations (figure 3.11).[8]

A combination of more stringent fiscal policies, the adoption of an inflation target, and structural reforms to promote trade and financial openness can raise the likelihood of an investment acceleration by more than might be deduced from the effects of each of these individual policy improvements in isolation. Using the sample of accelerations, it is estimated that if the primary balance and trade and financial openness indices were all improved by one standard deviation, there would be a marked increase of 9 percentage points in the probability of starting an investment acceleration. If these reforms were also accompanied by the adoption of an inflation-targeting regime, the probability would be raised by an additional 33 percentage points.[9] These results underline the case for a comprehensive package of stabilization and reform policies to spark an investment acceleration.

[8] Inflation targeting has become a policy tool in recent decades, with New Zealand being the first economy adopting it in 1990 in the sample. It is typically implemented as a one-time policy measure.

[9] Specifically, a one-standard-deviation increase in all of the following three policy measures (excluding the adoption of inflation-targeting) results in 9 percentage point increase in the probability of starting an acceleration: a one-standard-deviation increase involves a 35 percent increase in the capital openness index (ranges from 0 to 1 with a higher value indicating more capital openness), an 8 percent increase in the trade openness index (ranges from 0 to 1 with a higher value indicating more trade openness), and a 2.3 percentage point increase in the primary balance. For details, see annex 3.2.

The country cases also highlight the role of policies aimed at stabilizing the macroeconomy and implementing structural reforms, particularly when these are part of a comprehensive package, in initiating accelerations (box 3.1). In general, the country cases show that investment accelerations were preceded by at least one of the two types of policy intervention: those aimed at improving macroeconomic stability (such as Türkiye in the early 2000s) and those intended to address structural shortcomings (such as ending public-sector monopolies in India in the 1990s). Often, comprehensive packages containing both types of policy intervention (such as in Korea in the late 1990s and Morocco in the 1990s and 2000s) accompanied or preceded strong growth accelerations. Demonstrated commitment to such reforms allowed countries to seize favorable external conditions and turn them into investment accelerations.

Institutional quality

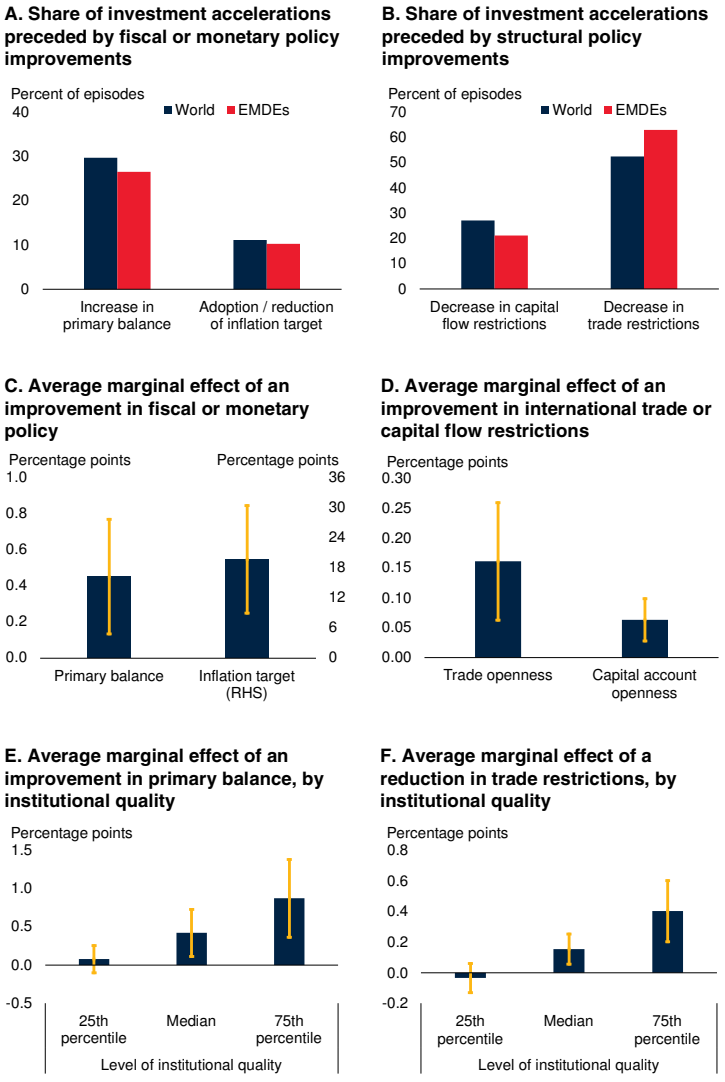
The effect of economic policies on the likelihood of accelerations depends on institutional quality. There was a greater likelihood that improved fiscal policies and trade reforms were associated with investment accelerations in countries with better institutions than in those with weaker institutions. Specifically, in countries with institutional quality in the top quartile of the sample, improvements in the primary fiscal balance or reductions in trade restrictions significantly increased the likelihood of starting an acceleration, whereas such policies had no statistically significant impact in countries where the quality of institutions was in the bottom quartile of the sample (figure 3.11).

Robustness

A broad array of robustness exercises was conducted, including employing different thresholds to identify investment accelerations; adding additional control variables to check whether the results were driven by global economic conditions or financial cycles; and using aggregate investment growth, rather than per capita investment growth (see annexes 3.3 and 3.4). These changes did not alter the headline results.

FIGURE 3.11 Policy improvements and the start of investment accelerations

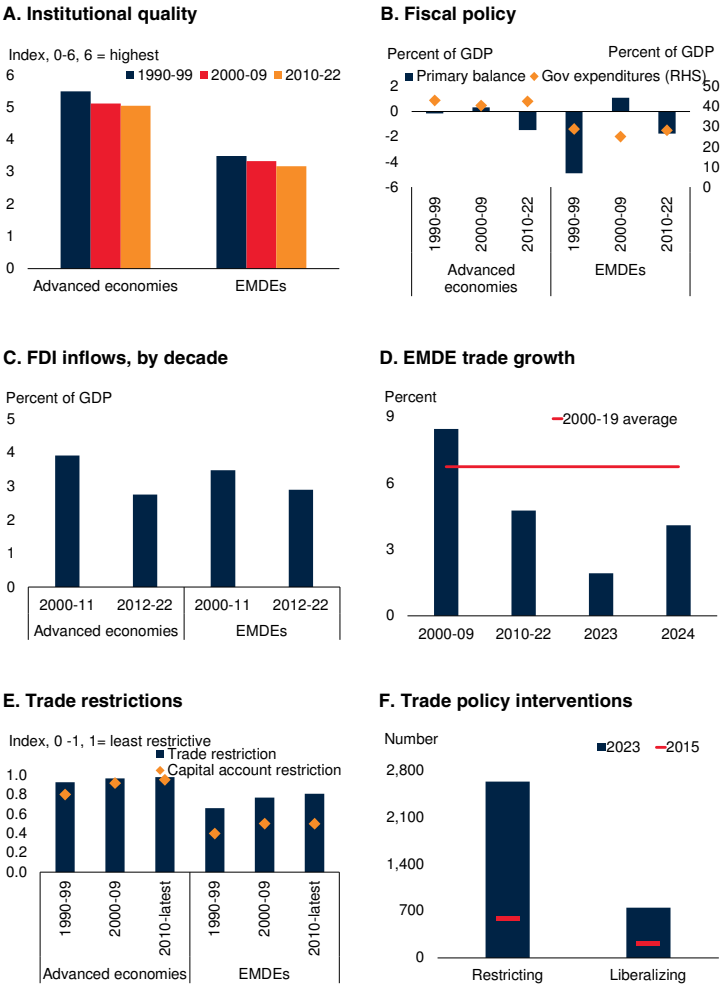
Improvements in the primary fiscal balance, the adoption or reduction of inflation targets, and structural reforms that increase openness to international trade or financial flows have been conducive to investment accelerations. The scale of the effects of improvements in the fiscal balance and trade liberalization have depended on the institutional environment.



Sources: Alesina et al. (2020); Chinn and Ito (2008); IMF, International Financial Statistics; PRS Group; WDI (database); WEO (database); World Bank.
Note: EMDEs = emerging market and developing economies. See annex 3.2 for a description of the data and sources.
A.B. Bars show the share of investment accelerations that were preceded by or coincided with an improvement in the policy variables of at least 2 percent (trade restrictions index or capital account openness index) or 2 percentage points of GDP (primary balance) or an adoption or tightening of an inflation target all within the preceding five years. For the trade restrictions index, primary balance to GDP ratio, and capital account openness index, an improvement is an increase in the variable. Data on inflation targeting are available from 1990.
C.D. Panels are based on regression results shown in table A3.2.2. Bars show the average marginal effect of improvements in economic policies. Yellow whiskers refer to the 90 percent confidence interval.
E.F. Panels are based on regression results shown in table A3.2.2. Bars show the average marginal effect of improvements in economic policies at different quartiles of the institutional quality index (based on International Country Risk Guide's Law and Order index). Yellow whiskers refer to the 90 percent confidence interval. The quartile thresholds for institutional quality are 3, 4, and 5.

FIGURE 3.12 Enabling factors for investment accelerations

Policy and institutional conditions that have helped trigger investment accelerations have been more prevalent in advanced economies than in EMDEs. Over the past few decades, EMDEs have made some progress in removing trade restrictions, but less progress in enhancing institutional quality and reducing fiscal imbalances. The number of restrictive trade policy measures in EMDEs has increased significantly over the past eight years.



Sources: Alesina et al. (2020); Chinn and Ito (2008); Global Trade Alerts; IMF, International Financial Statistics; PRS Group; WDI (database); WEO (database); World Bank.

Note: See annex 3.2 for a description of the data and sources. EMDEs = emerging market and developing economies; FDI = foreign direct investment.

Bars show simple averages by country classification.

A. Institutional quality is proxied with the International Country Risk Guide Law and Order index, which ranges from 0 (lowest) to 6 (highest).

C. Average FDI-to-GDP ratio of a median country. Balanced sample of 35 advanced economies, 135 EMDEs and 4 unclassified economies.

D. Trade refers to volume of goods and nonfactor services and is defined as an average of exports and imports. Aggregate is calculated using trade weights at average 2010-19 prices and market exchange rates. Data for 2023 are estimates, and data for 2024 are forecasts.

E. Latest available data for trade restrictions are from 2014, and those for capital account restrictions are from 2019.

F. Panel shows the number of implemented trade policy interventions since November 2008. Restricting (Liberalizing) measures are interventions that discriminate against (benefit) foreign commercial interests. Adjusted data as of November 26, 2023.

Policies to start investment accelerations

To promote investment accelerations, EMDEs need to implement a comprehensive package of policies, tailored to their specific circumstances. This package typically includes fiscal and monetary interventions, structural policies, and efforts to improve institutional quality (figure 3.12).

Fiscal and monetary policies

Both the empirical analysis and country cases highlight the important role that fiscal policy can play in sparking investment accelerations. Expenditure and revenue measures, and fiscal rules, can help improve fiscal positions.

Revenue measures that can improve fiscal balances include reforming tax administrations, enlarging tax bases, and increasing tax rates. In many EMDEs, particularly those in South Asia and Sub-Saharan Africa, revenue-to-GDP ratios are much lower than in advanced economies (World Bank 2015, 2016b). Eliminating tax exemptions and strengthening the administration of tax collection could improve fiscal positions by increasing revenues. Tax policies can also be used to improve incentives, particularly for investment in the private sector (Djankov et al. 2010). For example, the elimination of fossil fuel subsidies, together with the introduction of carbon taxes, can incentivize investment into energy-efficient technologies (World Bank 2023b).

Expenditure measures that can improve fiscal balances include eliminating distortive agriculture and fossil fuel subsidies, which currently account for sizable shares of government expenditure in many EMDEs. EMDEs can also enhance the efficiency and predictability of their expenditures. By eliminating wasteful spending and prioritizing public investment in assets such as productive infrastructure and human capital, through education and healthcare spending, they can improve fiscal positions and contribute to both investment accelerations and improved output growth. Efficient public investment in infrastructure can also crowd in private investment by

stimulating economic development (Ansar et al. 2016; World Bank 2023b).

Fiscal rules, over the past three decades, have reduced the volatility of fiscal policy in EMDEs and allowed governments to respond to adverse events countercyclically by conserving fiscal space (IMF 2022; Marioli, Fatas, and Vasishtha 2023). Fiscal rules that ensure that current expenditures are fully financed by revenues over the cycle can provide appropriate protection for public investment. By implementing fiscal rules and utilizing stabilization funds, commodity-exporting EMDEs can improve budget positions while reducing the procyclicality of fiscal policies (World Bank 2022e).

If excessive, government borrowing to fund deficits can put pressure on credit markets, tighten financial conditions, and crowd out private investment (Huang, Pagano, and Panizza 2020; World Bank 2023c). Conversely, improving fiscal positions can, under certain circumstances, boost (crowd in) private investment (Essl et al. 2019). This is particularly true for EMDEs that are in or near debt distress, as measures to improve their fiscal positions, when feasible, can yield benefits. In many EMDEs, fiscal policy in the near term needs to be calibrated to regain the ability to take appropriate expansionary measures when needed—creating so-called "fiscal space," which was eroded during the pandemic.

Monetary policy reforms, such as the establishment or reinforcement of central bank independence or the adoption of an inflation-targeting regime, may also be important to securing a stable macroeconomic environment that supports investment growth. Low and stable inflation in the medium term is a key requirement of macroeconomic stability and healthy investment growth.

Structural policies

A broad range of structural policies can promote investment accelerations.

Trade policy. Reducing restrictions on cross-border trade can play an important role in sparking investment accelerations. Such measures have significantly increased the likelihood of starting an investment acceleration and have often preceded accelerations, such as in India, Morocco, and Türkiye (box 3.1). In recent decades, tariffs have been lowered substantially in many EMDEs, but costly and widespread non-tariff barriers remain.

Easing these de facto restrictions, which include unwieldy customs procedures, poor trade-related infrastructure, and uncompetitive domestic logistics sectors, can significantly improve trade flows and support investment growth (Kose and Ohnsorge 2023, Breton, Farrantino, and Maliszewska 2022; World Bank 2021a). A comprehensive reform package could lower trade costs by more than one-half among the EMDEs that perform worst in shipping and logistics—which account for the bulk of trade costs. Digital technology can facilitate many of these reforms, for example, by enabling the electronic processing of documents ahead of time, linking logistics services at borders, and helping lower barriers to entry for small and medium-sized enterprises.

The nontariff costs involved in border crossings can be reduced by lessening wait times created by lengthy administrative procedures and unclear or extensive documentation requirements. The WTO Agreement on Trade Facilitation, for example, provides a framework to simplify border procedures. Harmonizing inspection requirements and labeling standards between countries can also lower firms' costs and smooth border crossings (World Bank 2021a). Regarding logistics, improving physical infrastructure, like ports, airports, and roads, can reduce travel time and variability.

Membership in trade agreements—for example, the African Continental Free Trade Area agreement—can help solidify trade facilitation reforms and lower tariffs. Further, trade treaties can boost economies of scale and lower costs by standardizing regulatory requirements across multiple jurisdictions. Trade agreements also promote regional and global value chain participation by codifying intellectual property rights, and competition and investment protocols. This can significantly benefit small countries and countries that are geographically isolated from trade hubs (Echandi, Maliszewska, and Steenbergen 2022; Moïsé and Le Bris 2013; World Bank 2020b).

Financial sector policies. Improvements in access to external finance have tended to raise the probability of starting an investment acceleration. Actions to enhance access to external finance include the loosening of regulations on capital flows (Alesina et al. 2020). Since restrictions on outflows tend also to discourage inflows, the easing of restrictions on both capital inflows and outflows will generally need to be considered (Chinn and Ito 2008; Lee 1997). Nevertheless, the easing of capital flow restrictions may need to be accompanied by measures to mitigate risks arising from instability in capital inflows and outflows, which could destabilize the domestic economy. Such measures include safeguards to prevent capital inflow surges from generating boom-and-bust cycles, as was experienced by Malaysia in the 1990s (box 3.1). A well-regulated domestic financial sector is essential. Also important are measures to reduce country risk, including sound macroeconomic policies (Fratzscher 2012; Koepke 2019).

Policies that help develop domestic capital markets can also support investment accelerations. Capital market development can improve access to credit and financing in local currency, especially long-term financing. Policies to promote capital market development include improving contract enforcement to reduce collateral requirements, mitigating country-specific risks or market failures through partial credit guarantees to intermediaries, and developing digital infrastructure to allow small firms and financial institutions to participate in financial markets at low cost (United Nations 2022; World Bank 2022d).

The establishment of local currency equity and debt markets can help attract institutional investors to EMDEs with less-developed financial intermediation infrastructure. For instance, pension funds and private equity firms, which tend to have higher risk tolerance, may provide financing in situations where traditional banks are unwilling to do so (United Nations 2022). Multilateral development banks play a critical role in supporting these markets by providing liquidity through innovative products, including catastrophe bonds, blue and green bonds, provisioning of loans in local currencies in the most illiquid markets and offering guarantees against political and other noncommercial risks (World Bank 2015a, 2022d).

In many EMDEs, it is critical to improve the digital and technological infrastructure. This enhancement is essential to lower the costs of access to finance and running a business, and to enable rural residents to access broadband networks. Facilitating investment in digital infrastructure requires aligning regulations with international standards, encouraging competition among providers to lower prices and improve services, and educating the workforce in relevant skills (OECD and IDB 2016). Increasing access to the internet has been shown to boost foreign direct investment, increase the incomes of rural households, and lower poverty rates (Bahia et al. 2020; Mensah and Traore 2022).

Institutional quality

In EMDEs with better institutions, particularly those emphasizing the improvement in law and order and property rights protection, the likelihood of initiating an investment acceleration is higher. Additionally, in such environments, policies have been more effective in leading to investment accelerations. The potential for institutional improvements in EMDEs is indicated by the fact that the quality of institutions is much lower than in advanced economies (figure 3.12).

Policymakers can improve institutions by, for example, defining property rights more clearly and protecting them more effectively, increasing the independence of the judiciary and strengthening the rule of law, and improving the enforcement of contracts. In many EMDEs, reforms are also needed to improve and unify regulatory and institutional structures, which are often fragmented, to help ease excessive constraints on private investors and businesses, and to ensure the effective enforcement of necessary regulations.

To enhance the quality of public infrastructure investment, countries can establish public investment management systems, robust project appraisal systems, and effective procurement and monitoring frameworks to mitigate the problems of asymmetric information and moral hazard (Gardner and Henry 2021; Kim, Fallov, and

Groom 2020). Public-private partnerships are commonly utilized for delivering public investment and services, while limiting fiscal risks, provided that a robust framework of contract preparation, procurement and management is in place (Dappe et al. 2023; Dappe, Melecky, and Turkgulu 2022; Engel, Fischer, and Galetovic 2020). These reforms tend to be especially important in LICs, where regulatory frameworks are often inadequate (World Bank 2020a). Countries with better governance of public investment projects tend to register larger improvements in macroeconomic and fiscal outcomes (Schwartz et al. 2020).

Interventions at the micro level

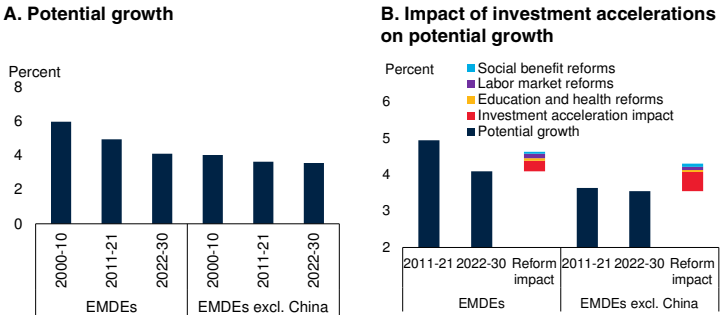
In addition to macro-level policy interventions, micro-interventions also play a pivotal role in supporting investment, especially in the private sector. For instance, training and mentorship programs targeted at entrepreneurs can enhance their capabilities in scaling up their businesses, adopting new technologies, and conducting long-term profitable investment (Donald et al. 2022; Karlan, Knight, and Udry 2012; McKenzie and Woodruff. 2014). Providing financial education to the general public can improve financial literacy, which is positively correlated with planning for savings and wealth accumulation (Hastings, Madrian, and Skimmyhorn 2013; Kaiser and Menkhoff 2017).

Designing a policy package

Policies to accelerate investment need to take account of country-specific conditions, be formulated in a well-designed package, and be carefully sequenced. The empirical analysis and country case studies demonstrate the importance of combining policies that enhance macroeconomic stability with policies that address structural barriers facing private-sector development and institutional weaknesses. Country experiences, such as those in Korea in the late 1990s and Türkiye in the early 2000s, support the view that a comprehensive package of policies can be potent in triggering an investment acceleration.

FIGURE 3.13 Policy packages and potential growth

In the past several decades, comprehensive policy packages that have improved macroeconomic stability and promoted cross-border trade and financial flows have significantly increased the likelihood of initiating an investment acceleration. Based partly on this evidence, a scenario in which EMDEs that experienced an acceleration between 2000 and 2022 start another in 2023 and all EMDEs replicate their best reform efforts in a decade, suggests that the slowdown in potential growth projected in the baseline for 2022-30 would not occur.



Sources: Kose and Ohnsorge (2023); World Bank.
Note: EMDE = emerging market and developing economies.
A. Blue bars show the potential output growth rates based on production function approach. GDP-weighted averages for a sample of 53 EMDEs.
B. The scenario assumes that in 40 EMDEs (excluding China) that experienced an investment acceleration between 2000 and 2022, investment growth will increase to 10.4 percent per year from 2023-28 before returning to 0.4 percent per year in 2029-30. The 40 EMDEs were chosen because they have the highest expected average investment growth for 2021-25 and are included in the Kose and Ohnsorge (2023) sample. The increase in investment growth to 10.4 percent and subsequent fall to 0.4 percent matches the median investment growth during and after investment accelerations in EMDEs between 1950-2022.

When designing a policy package, the sequencing of measures should be carefully planned. For example, fiscal measures may need to take precedence in countries with significant fiscal challenges. The implementation of institutional policies, including measures to improve the business climate and regulatory structures, may need to be advanced particularly in countries that have difficulty mobilizing private investment. Policies to strengthen the regulation of the financial system and reform exchange rate arrangements may need to be implemented before the liberalization of capital flows. Such careful sequencing helps countries gird against potential disruptions that could otherwise imperil reform efforts, and lays the groundwork to take advantage of any favorable turn in the external environment.

In the absence of additional policy reforms, potential output growth in EMDEs is projected to decline from an annual average of 4.9 percent in

2011-21 to 4.0 percent a year in 2022-30 (figure 3.13; Kose and Ohnsorge 2023). Nevertheless, if the EMDEs that registered an investment acceleration since 2000 were able to spark another such episode between 2022 and 2030, their annual potential output growth would be 0.3 percentage point higher than projected in the baseline.[10] Furthermore, in a scenario where all EMDEs replicated their best 10-year performance in labor force participation reforms, as well as health and education improvements, potential growth for 2022-30 could increase by 0.5 percentage points per year higher, reaching 4.6 percent. This increase would almost eliminate the decline projected in the baseline (figure 3.13).

Conclusion

Raising investment growth is a critical objective for EMDEs. They have significant investment needs to enable them to deliver sustainable and inclusive output growth, cope with climate change, and make progress toward broader development goals. Nevertheless, EMDEs face many obstacles in seeking to accelerate investment: the near-term investment growth outlook is weak, long-term growth prospects have deteriorated, fiscal resources are limited, and external borrowing costs are elevated.

This chapter has presented the first study of investment accelerations using a large sample of countries over an extended period. Investment accelerations are often associated with much improved macroeconomic and development outcomes. The median annual growth rate of investment jumped to 10.4 percent during these episodes, three times the median in other years. Investment accelerations also coincided with substantial increases in output growth coming alongside faster capital accumulation and growth of TFP and employment, relative to non-acceleration years. In addition, poverty and inequality declined during these episodes.

These results collectively suggest a strong association between investment accelerations and improved macroeconomic and development outcomes. However, it is important to highlight that they do not imply a one-way causal link. Indeed, there can be self-reinforcing dynamics between investment accelerations and other beneficial developments during these episodes. That said, the regular coincidence of investment accelerations and transformative phases of macroeconomic and developmental progress underscores the critical importance of periods of rapid and sustained investment growth.

National policies have played an important role in sparking investment accelerations. For example, both fiscal consolidation measures and structural reforms to liberalize international trade and financial flows have facilitated investment accelerations. However, while individual policy measures can help ignite accelerations, comprehensive packages of measures have tended to be more effective. In addition, an enabling institutional environment has tended to significantly amplify the impact of policies on investment growth and increase the likelihood of accelerations. A country that is bolstering its institutions, fostering macroeconomic stability, and demonstrating commitment to structural reforms is particularly well placed to turn supportive external conditions into a transformative investment acceleration.

To boost private capital mobilization, multilateral development banks (MDBs) can offer various financial instruments and support (G20-IEG 2023). These include providing credit enhancement and disaster risk management instruments, enhancing liquidity in local-currency debt and equity markets in EMDEs with less-developed financial markets, and promoting innovative investment products such as blue and green bonds. In situations where market failures prevent investors from insuring risks, MDBs can also offer loan guarantees. Additionally, MDBs can provide technical assistance by advising governments on creating the regulatory and institutional framework for well-functioning markets. This assistance extends to supporting the formulation of prudent fiscal policies, and providing guidance on achieving the energy transition and facilitating adaptation to climate change.

[10] Forty-one out of 67 EMDEs in the sample used for this exercise have experienced an investment acceleration since 2000.

BOX 3.1 Sparking investment accelerations: Lessons from country case studies

Investment accelerations often have been preceded by at least one of two types of policy intervention: measures to improve macroeconomic stability and reforms to address structural problems. While each type of policy measure has helped trigger investment accelerations, comprehensive packages of policies that combine both types appear to have sparked faster investment and output growth than might have been expected from the individual effects of each type of measure. A benign external environment has also played a crucial role in catalyzing investment accelerations in most cases.

Introduction

The empirical analysis in this chapter documents the common features of investment accelerations—periods in which there are sustained increases in investment growth to a relatively rapid rate—and the policies that have been associated with them. It also highlights some substantial differences across investment accelerations. This box presents a brief account of notable investment accelerations in select countries. Specially, it aims to answer the following questions:

- What types of policy changes have triggered investment accelerations?
- How have the macroeconomic implications of investment accelerations differed depending on the underlying policy drivers?

The box focuses on 13 investment accelerations in 10 countries (tables B3.1.1, B3.1.2, and B3.1.3): Chile (1986-93), Colombia (2001-07), India (1994-99), Malaysia (1988-97), Morocco (1996-2009), Poland (1992-2000 and 2003-08), Republic of Korea (1985-96 and 1999-2007), Türkiye (2003-08), Uganda (1993-2012), and Uruguay (1991-98 and 2004-14).[a]

East Asia and Pacific

Malaysia (1988-97)

Economic performance. Malaysia experienced an investment acceleration from 1988 to 1997. Annual investment growth averaged 17.9 percent during this period, exceeding the level in other years by 20.9 percentage points (figure B3.1.1). Private investment growth increased more than public investment growth. Both credit growth and capital inflows played major roles in triggering this episode. During the acceleration in investment, output growth averaged 9.2 percent, enabling Malaysia to attain upper-middle-income-country status in 1992.

Policy drivers. The 1988 acceleration was triggered by policy changes that reduced restrictions on capital flowing in and out of the country (so-called capital account liberalization), which translated into a sharp increase in capital inflows and improved access to domestic credit, as well as structural reforms in the Fifth Malaysia Plan. Net capital inflows increased from -2 percent of GDP (that is, a net outflow) in 1988 to 16 percent at the peak in 1993, and the financial sector undertook an expanding array of activities that increased credit flow especially through bank lending (Ghani and Suri 1999). With improved access to credit and foreign capital, exports of manufactured goods rose (Naguib and Smucker 2009). A currency devaluation and tax reform improved the business climate while public revenue shortfalls were prevented through the elimination of tax loopholes (Somogyi 1991). However, the episode was not accompanied by policy changes to control financial excesses associated with the rapid opening of the capital account, a major factor in the financial crisis of 1997.

Republic of Korea (1985-96 and 1999-2007)

Economic performance. The Republic of Korea experienced two investment accelerations since the 1980s—one in 1985-96 and the other in 1999-2007. Investment growth surged during both accelerations, reaching 9.2 percent a year (figure B3.1.1). Output growth picked up by 4 percentage points per year during the accelerations, relative to other years. While capital accumulation had played a large role in Korea's growth miracle since the 1960s, the two episodes were

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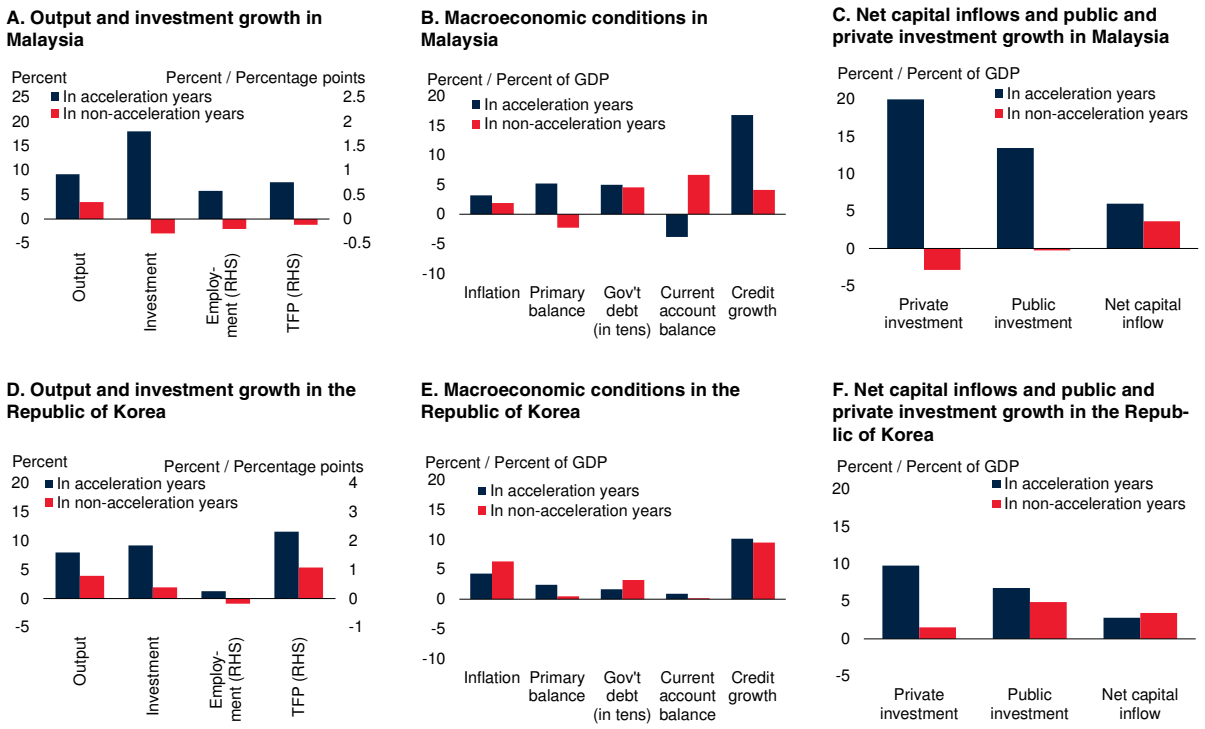
Note: This box was prepared by Marie Albert, Jongrim Ha, Reina Kawai, Philip Kenworthy, Jeetendra Khadan, Dohan Kim, Emiliano Luttini, Joseph Mawejje, Valerie Mercer-Blackman, Kersten Stamm, Guillermo Verduzco, Collette Wheeler, and Shu Yu.

[a] The 13 investment accelerations covered here are not all of the accelerations these 10 countries have experienced since 1980. The accelerations were chosen because they are representative of the fiscal, monetary, or structural reform efforts that often precede accelerations. The other accelerations in these countries were: Chile (2002-08), India (1985-90; 2004-12), Malaysia (2006-18), Poland (1983-88; 2017-22), the Republic of Korea (2013-18), and Türkiye (2010-17). Tables B3.1.1, B3.1.2 and B3.1.3 present an overview of the accelerations and accompanying policies for each country.

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

FIGURE B3.1.1 Investment accelerations in the Republic of Korea and Malaysia

Malaysia experienced an investment acceleration from 1988 to 1997. In that episode, private investment growth increased more than public investment growth. Both credit growth and capital inflows played major roles in triggering this episode. The Republic of Korea experienced two investment accelerations—in 1985-96 and in 1999-2007. While capital accumulation played a large role in Korea's growth miracle, the two episodes were also associated with faster growth of employment and productivity.



Sources: Bank for International Settlements; Feenstra, Inklaar, and Timmer (2015); Ha, Kose, and Ohnsorge (2021); Haver Analytics; IMF, International Financial Statistics; IMF, Investment and Capital Stock dataset; WDI (database); WEO (database); World Bank.

Note: The sample period is 1980-2022. Acceleration years cover the full duration of the episode. Non-acceleration years exclude acceleration years that were not included in this box; CPI = consumer price index; TFP = total factor productivity.

A.D. Bars are simple averages of growth in output, investment, and TFP, as well as the percentage point change in the employment rate.

B.E. Bars are simple average of the change in CPI in percent, primary balance as a percent of GDP, government debt as a percent of GDP, current account balance as a percent of GDP, and real credit growth in percent.

C.F. Bars are simple averages of growth in private investment and public investment in percent, and the net capital-inflow-to-GDP ratio in percent of GDP.

also associated with much faster growth of employment and productivity, and improvements in human capital (Rodrik 1995; Kim and Lau 1994).

Furthermore, enhanced price stability, strengthened fiscal positions, and improved current account balances accompanied both accelerations: on average across the two accelerations, inflation fell to 4.3 percent; government debt declined by 15 percentage points of GDP; the primary balance was in surplus by 2.4 percent of GDP and the current account balance was in a slight surplus of 0.9 percent of GDP. A notable 8.3 percentage point increase in annual private investment growth underpinned both acceleration episodes. Korea attained high-income-country status in 1995, fell back in 1998 because of the 1997 Asian financial crisis, and then regained high-income status in 2001.

Policy drivers. The 1985 acceleration was preceded by a comprehensive set of macroeconomic stabilization policies. First, to curb inflation that was partly driven by the government-led growth strategy in the late 1970s, fiscal policy was tightened based on a balanced budget principle. This ended the subordination of

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

monetary policy to government financing (Koh 2007; Cho and Kang 2013). Second, the number of price controls was reduced, and the Monopoly Regulation and Fair-Trade Act was established to ensure market competition (Nam 1988). Third, restrictions on imports were loosened which helped relieve pressure on inflation by promoting domestic competition (Dornbusch and Park 1987; Koh 2010).

Against a backdrop of broader measures to bolster macroeconomic stability, the acceleration that began in 1999 benefited from structural reforms to address financial and corporate sector problems that contributed to the 1997 crisis. These included comprehensive steps to liberalize capital markets and foreign investment (Lee 2013; Vashakmadze et al. 2023). Extensive restructuring of corporates and financial institutions also strengthened financial soundness, governance, and profitability. Notably, reforms geared toward Chaebol groups (family-controlled large conglomerates) required their affiliated firms to exit nonviable businesses, which improved loan availability for smaller firms (Krueger and Yoo 2002). In addition, a floating exchange rate system was adopted in late 1997, and an inflation-targeting regime with enhanced central bank independence was established in 1998.

Europe and Central Asia

Poland (1992-2000 and 2003-08)

Economic performance. Poland experienced two investment accelerations, during 1992-2000 and 2003-08 (figure B3.1.2). During these accelerations there were sharp increases in both investment growth (which averaged 10.4 percent per year) and output growth (which averaged 5 percent per year). In contrast, in non-acceleration years since 1980, investment fell 3 percent per year and output declined 0.7 percent per year. Both private and public investment growth rose sharply in these episodes, with the 2003 episode driven by a more pronounced increase in public investment. The two accelerations were also accompanied by an improvement in the fiscal position and an uptick in net capital inflows. Inflation declined notably during the 1992 acceleration.

Policy drivers. The 1992 acceleration in Poland was preceded by reforms to stabilize the economy and structural policy shifts that helped transition from a centrally planned economy toward a market-oriented one. Prior to the 1992 acceleration, the collapse of the Soviet Union caused output and investment to plummet and inflation to skyrocket in Poland. To curb inflation, a stabilization program was employed to tighten monetary policy, restrict credit flow, and enhance central bank independence. The exchange rate system transitioned from a fixed regime in 1990 to a crawling peg in 1991, and then progressively to a fully floating regime in 2000.

Fiscal sustainability improved because of a comprehensive set of interventions: cuts in subsidies and spending by public enterprises; the introduction of personal, corporate, value added, and excise taxes; the implementation of a more targeted system of social transfers; and sizable debt reliefs granted by the Paris Club (Berg and Blanchard 1994; World Bank 2022c). Poland also undertook structural policy changes—liberalizing international trade to become a key exporter to Western Europe, encouraging capital inflows (especially FDI), privatizing state-owned enterprises, recapitalizing the financial system, and lowering entry barriers for new firms (Georgiev, Nagy-Mohacsi, and Plekhanov 2017). Private sector development was also supported by capital market deepening, reinforced by the creation of regulatory bodies, the Stock Exchange, and an increasing role of foreign banks (de Haas and van Lelyveld 2006).

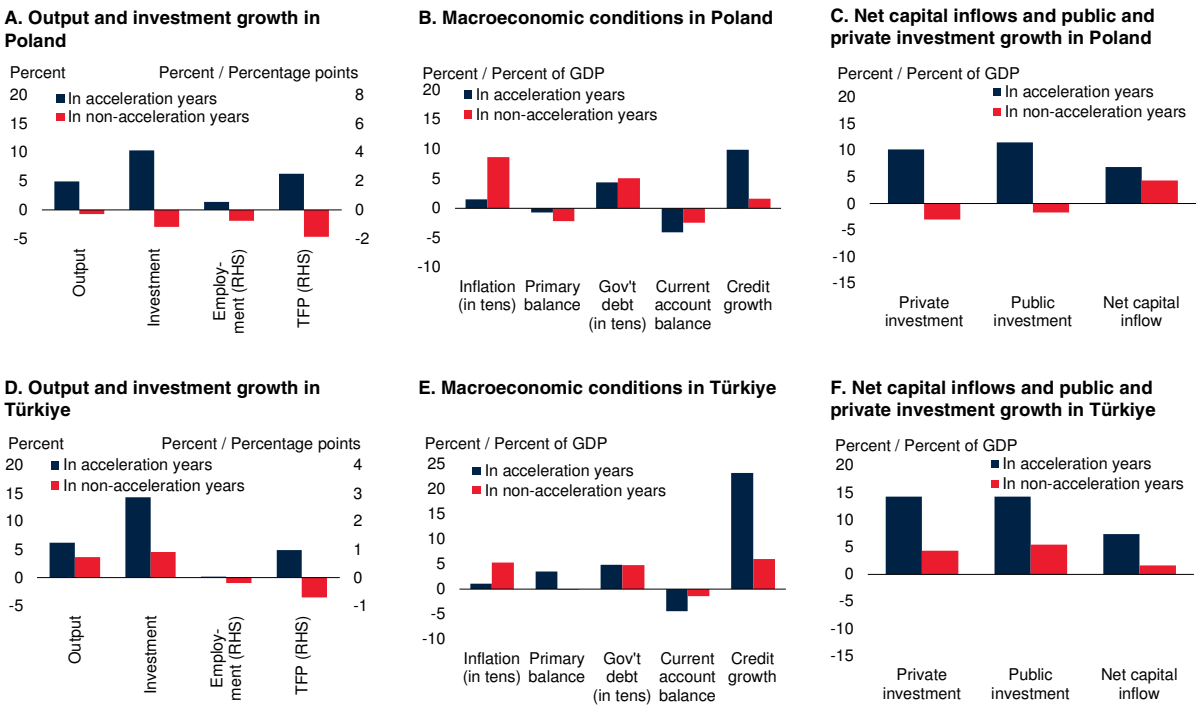
The 2003 acceleration was triggered by reforms tied to Poland's EU accession process which granted the country access to the single European market and additional EU structural funds (IMF 2003; IMF 2008; World Bank 2022b). To become an EU member, Poland maintained prudent fiscal policy and transitioned to an inflation-targeting regime in 1998. Lower corporate income taxes and research and development tax allowances were introduced to promote investment (Murgasova 2005).

Attaining full EU membership accelerated Poland's structural changes and integration with the global economy. The EU accession process led to improvements in institutional quality as Poland aligned policies and regulations to European standards, privatized the telecommunications and energy sectors, strengthened banking regulation, and improved access to public infrastructure (Bruszt and Campos 2016). Labor market policies became more flexible. Capital

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

FIGURE B3.1.2 Investment accelerations in Poland and Türkiye

Poland had two investment accelerations—in 1992-2000 and 2003-08. Both private and public investment growth rose sharply in these episodes, with the 2003 episode driven by a more pronounced increase in public investment. The two episodes were also accompanied by improved fiscal positions and higher net capital inflows. Türkiye's investment acceleration occurred during 2003-08. Both private and public investment growth surged to similar degrees, while credit growth and net capital inflows more than tripled.



Sources: Bank for International Settlements; Feenstra, Inklaar, and Timmer (2015); Ha, Kose, and Ohnsorge (2021); Haver Analytics; IMF, International Financial Statistics; IMF, Investment and Capital Stock dataset; WDI (database); WEO (database); World Bank.

Note: The sample period is 1980-2022. Acceleration years cover the full duration of the episode. Non-acceleration years exclude acceleration years that were not included in this box; CPI = consumer price index; TFP = total factor productivity.

A.D. Bars are simple averages of growth in output, investment, and TFP, as well as the percentage point change in the employment rate.

B.E. Bars are simple average of the change in CPI in percent, primary balance as a percent of GDP, government debt as a percent of GDP, current account balance as a percent of GDP, and real credit growth in percent.

C.F. Bars are simple averages of growth in private investment and public investment in percent, and the net capital-inflow-to-GDP ratio in percent of GDP.

inflows surged as Poland integrated further into the supply chains of Western Europe (Georgiev, Nagy-Mohacsi, and Plekhanov 2017).

Türkiye (2003-08)

Economic performance. Türkiye experienced an investment acceleration during 2003-08. Average investment growth rose to 14.3 percent per year during the acceleration, compared with 4.6 percent in other years (figure B3.1.2). Output growth reached more than 6 percent per year during this episode, up from 3.7 percent per year in other years. During this period, the primary balance improved, and inflation was brought under control—falling from 65 percent in the six years before the acceleration to about 11 percent during the acceleration. Both private and public investment growth surged to similar degrees, while credit growth and net capital inflows more than tripled. Rapid output growth allowed Türkiye to attain upper-middle-income status in 2004.

Policy drivers. Policy reforms implemented in the early 2000s, accompanied by a benign external environment, laid the foundation for the 2003 acceleration. Prior to the acceleration, a series of macroeconomic stabilization policies were implemented in response to the 2000-01

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

economic crisis. Fiscal discipline was established with a primary surplus target of 6.5 percent of GNP, and the central bank became an independent institution (IMF 2007). The result was a virtuous cycle of disinflation, lower interest rates, and higher economic growth (Macovei 2009). These macroeconomic policies were complemented by structural reforms in several areas, including enterprise restructuring and privatization, improvements to the business climate, trade liberalization, labor market liberalization, and comprehensive reform of the banking sector. As a result, both access to credit and foreign direct investment inflows improved (World Bank 2008).

Latin America and the Caribbean

Uruguay (1991-98 and 2004-14)

Economic performance. Uruguay experienced two investment accelerations: 1991-98 and 2004-14. Average annual investment growth reached 10.3 percent, exceeding the level in non-acceleration years by 14.7 percentage points (figure B3.1.3). Output growth rose to 5 percent per year during the acceleration episodes (from near zero in non-acceleration years) as both employment and productivity growth surged. In both episodes, private investment grew much faster than public investment. Each acceleration was accompanied by improved macroeconomic conditions, including lower government debt, subdued inflation, larger primary surpluses, and higher credit growth compared with non-acceleration years. Uruguay attained high-income-country status in 2012.

Policy drivers. Following a period of stagnation between 1983 and 1990, policies to stabilize the economy and promote trade laid the foundation for the 1991 acceleration (Marandino and Oddone 2019). Fiscal policy measures included reducing external debt by 5 percentage points of GDP and restructuring short-term debt through the 1991 Brady Plan, as well as broader fiscal consolidation (Rial and Vicente 2003). Following high inflation in the 1980s, these fiscal adjustments fed into a price stabilization plan which also included a preannounced crawling exchange rate peg (Peluffo 2013). The country's first Central Bank Act was approved in 1995 to strengthen monetary policy and establish limits on central bank financing of the public sector. The 1991 acceleration was also associated with further trade liberalization, marked by the signing of the Treaty of Asunción that formed the Southern Common Market.

The 2004 acceleration coincided with a series of macroeconomic and structural policy reforms. After a major banking crisis in 2002 and several external shocks between 1999 and 2001, the government adopted a range of measures to improve macroeconomic stability and debt sustainability (de la Plaza and Sirtaine 2005; Marandino and Oddone 2019). Fiscal consolidation and better debt management were combined with monetary policy measures including greater exchange rate flexibility, adoption of an inflation target, and enhanced central bank independence. Banking regulations were introduced in 2008 to mitigate risks associated with currency mismatches between banking sector assets and liabilities (Marandino and Oddone 2019).

This acceleration episode was also supported by structural reforms that improved the investment climate. These included strengthening the national investment office and improving physical infrastructure and the business environment (IMF 2008, 2010). The 2004 acceleration was accompanied by elevated agricultural commodity prices, favorable global financial conditions, and stronger regional trade linkages. Late in the 2000s investment acceleration, Uruguay regained an investment grade sovereign rating (Che 2021).

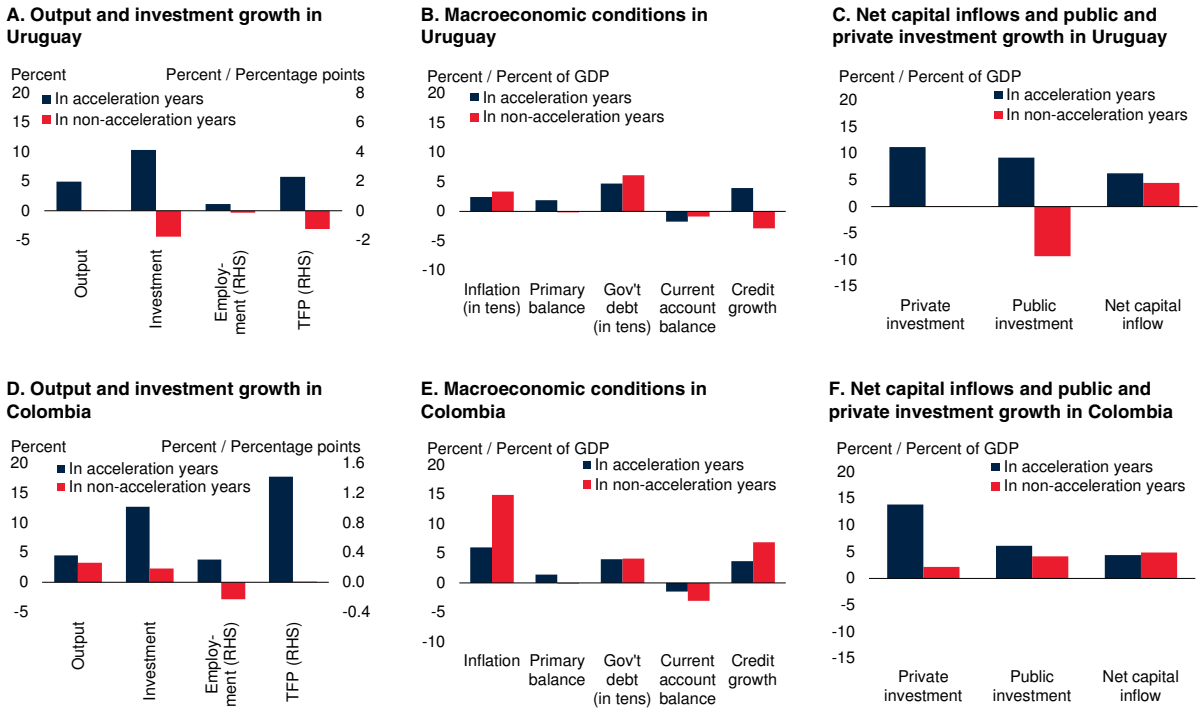
Colombia (2001-07)

Economic performance. Colombia experienced an investment acceleration between 2001 and 2007. Annual investment growth reached 12.7 percent during the acceleration, exceeding the level of non-acceleration years by 10.3 percentage points (figure B3.1.3). Output growth averaged 4.5 percent during the investment acceleration compared with 3.3 percent outside of that period. During the acceleration, private investment grew over six times faster than during non-acceleration years, at 13.8 percent, while public investment growth increased from 4.2 percent to 6.1 percent. Inflation declined to single digits in the year before the acceleration for the first time in more than two decades. The overall fiscal deficit was less than 1 percent of GDP by 2004, while the primary balance reached a surplus. Government debt fell from 48 percent of GDP at its peak in 2002 to 33 percent of GDP in 2007.

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

FIGURE B3.1.3 Investment accelerations in Colombia and Uruguay

Uruguay experienced two investment accelerations: in 1991-98 and 2004-14. Private investment grew much faster than public investment during the two episodes. Both accelerations were accompanied by more favorable macroeconomic conditions, including lower government debt, subdued inflation, larger primary surpluses, and higher credit growth. Colombia experienced an investment acceleration between 2001 and 2007. During the acceleration, private investment grew more than six times faster than during non-acceleration years, while public investment growth increased from 4.2 to 6.1 percent. Both employment and TFP grew strongly.



Sources: Bank for International Settlements; Feenstra, Inklaar, and Timmer (2015); Ha, Kose, and Ohnsorge (2021); Haver Analytics; IMF, International Financial Statistics; IMF, Investment and Capital Stock dataset; WDI (database); WEO (database); World Bank.

Note: The sample period is 1980-2022. Acceleration years cover the full duration of the episode. Non-acceleration years exclude acceleration years that were not included in this box; CPI = consumer price index; TFP = total factor productivity.

A.D. Bars are simple averages of growth in output, investment, and TFP, as well as the percentage point change in the employment rate.

B.E. Bars are simple average of the change in CPI in percent, primary balance as a percent of GDP, government debt as a percent of GDP, current account balance as a percent of GDP, and real credit growth in percent.

C.F. Bars are simple averages of growth in private investment and public investment in percent, and the net capital-inflow-to-GDP ratio in percent of GDP.

Policy drivers. The 2001 acceleration came after a difficult decade and was preceded by a series of reforms that significantly improved macroeconomic stability. First, a floating exchange rate regime was introduced in 1999 that helped reduce the impact of shocks on international reserve buffers. Second, in 2000, inflation targeting was adopted, accompanied by several legal measures to improve central bank independence and transparency (IMF 2006a). Third, on the fiscal front, government finances were improved by the introduction of tax reforms in the early 2000s, spending restraint, a pension reform, and a series of reforms to public spending management (Clavijo 2009; IMF 2006b). Rising oil prices increased fiscal revenues during this period. Colombia's external position was also boosted by strong export growth in industrial goods. Domestic financial markets were deepened via the privatization and liquidation of public banks and improved supervision (IMF 2005, 2006b). Significant improvements in administrative procedures also supported the business environment.

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

Chile (1986-93)

Economic performance. Chile experienced an investment acceleration between 1986 and 1993 which resulted in annual average investment growth of 12.3 percent—8.4 percentage points higher than in other years (figure B3.1.4). Output growth doubled during this episode, exceeding 7.6 percent per year, supported by both productivity and employment growth. Broad improvements in macroeconomic indicators accompanied this acceleration. These included the primary balance moving from deficit to surplus, a significant decline in inflation (from almost 20 percent in the first year of the acceleration to 12.7 percent in 1993), and a substantial improvement in the current account from -6 percent of GDP in 1986 to -0.25 percent of GDP at its peak in 1991. Trade openness (the sum of exports plus imports relative to GDP) increased from about 50 percent of GDP to 63 percent of GDP at its peak in 1989, and proportion of exports from sectors other than mining increased by about 5 percentage points. Chile became an upper-middle-income country in 1993.

Policy drivers. Several policy interventions preceded or coincided with the acceleration. After the 1982 debt crisis during which output contracted by 15 percent, macroeconomic stability was an essential enabler (De Gregorio 2005; Corbo, Hernández, and Parro 2005). After the debt crisis, Chile took steps to reduce government borrowing, resulting in several consecutive years of fiscal surplus. The public debt-to-GDP ratio declined to roughly 50 percent by 1993, from 120 percent in 1986. The adoption of an inflation targeting regime in 1991 also helped to bring inflation under control.

Structural reforms—including trade liberalization, pension system reform, and banking sector reforms—were essential to sparking the investment acceleration (Corbo, Hernández, and Parro 2005, Gallego and Loayza 2002). The 1981 pension reform from a pay-as-you-go system toward a capitalization scheme helped deepen domestic financial markets by creating an additional source of credit for the private sector (Edwards 1998). Reforms that bolstered the ability of banks to provide credit and set up bankruptcy proceedings with well-defined property rights were critical factors in improving resource allocation (Bergoing et al. 2002).

Middle East and North Africa

Morocco (1996-2009)

Economic performance. Morocco underwent a significant economic transformation during the investment acceleration between 1996 and 2009 (figure B3.1.4). Annual investment growth rose from 2.3 percent in non-acceleration years to 7.5 percent during acceleration years, with annual output growth improving from 3.2 percent to 5 percent (despite a brief recession in 1997 during which investment growth did not contract). The period coincided with improvements in the fiscal position, external balance, and productivity growth, as well as higher credit growth. Both inflation and government debt (as a share of GDP) declined during the period.

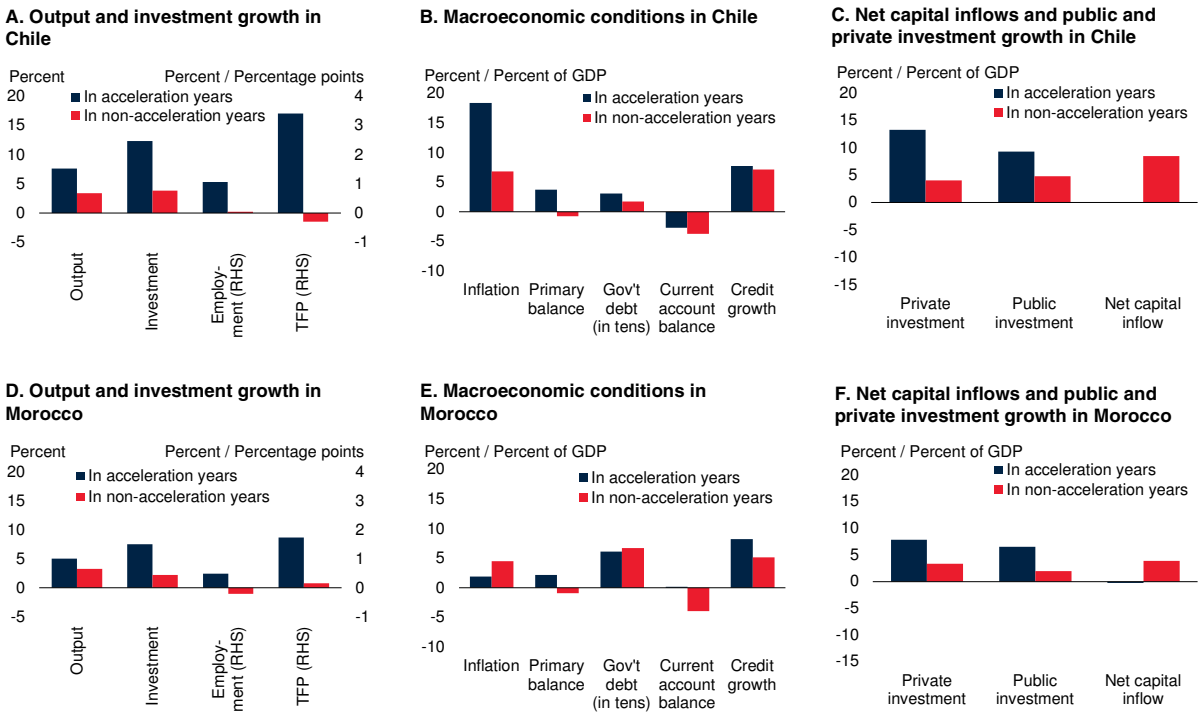
Policy drivers. The acceleration followed and was accompanied by a range of fiscal and monetary reforms to foster macroeconomic stability (Harrigan and El-Siad 2010; IMF 2001, 2004). Fiscal revenue capacity was strengthened, including through the privatization of the telecommunications sector, tax reforms in the 1980s, and the strategic allocation of privatization revenues in 2001 (IMF 2001, 2004). During this period, improved fiscal capacity, exemplified by a large reduction in the external debt-to-reserves ratio, lessened marginal borrowing costs, allowing the government to finance much-needed social development initiatives.

Trade integration was strengthened by the Association Accord with the EU in 1996 and a free trade agreement with the United States in 2004. Morocco's trade openness surged by 31 percentage points of GDP during the acceleration. Financial reforms and price liberalization created a more conducive business and trade environment (Moreira 2019). Strategic policies supporting vital and internationally competitive sectors such as agriculture and renewable energy helped improve production (Paus 2012; Agénor and Aynaoui 2015). Other significant reforms included improvements in governance and competitiveness, measures to streamline public investment processes, and incentives to increase tourism revenues. This broad suite of growth-friendly reforms helped increase the net-capital-inflows-to-GDP ratio to 2 percent of GDP during the acceleration, from -2 percent prior to the episode (World Bank 2001; Achy 2011).

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

FIGURE B3.1.4 Investment accelerations in Chile and Morocco

Chile experienced an investment acceleration between 1986 and 1993. Output growth doubled during this episode, exceeding 7.6 percent per year, supported by both productivity and employment growth. Morocco underwent a significant economic transformation during an investment acceleration between 1996 and 2009. This period coincided with improvements in the fiscal position, the external balance, and productivity growth, as well as higher credit growth. Both inflation and government debt (as a share of GDP) declined.



Sources: Bank for International Settlements; Feenstra, Inklaar, and Timmer (2015); Ha, Kose, and Ohnsorge (2021); Haver Analytics; IMF, International Financial Statistics; IMF, Investment and Capital Stock dataset; WDI (database); WEO (database); World Bank.
Note: The sample period is 1980-2022. Acceleration years cover the full duration of the episode. Non-acceleration years exclude acceleration years that were not included in this box; CPI = consumer price index; TFP = total factor productivity.
A.D. Bars are simple averages of growth in output, investment, and TFP, as well as the percentage point change in the employment rate.
B.E. Bars are simple average of the change in CPI in percent, primary balance as a percent of GDP, government debt as a percent of GDP, current account balance as a percent of GDP, and real credit growth in percent.
C.F. Bars are simple averages of growth in private investment and public investment in percent, and the net capital-inflow-to-GDP ratio in percent of GDP.

South Asia

India (1994-99)

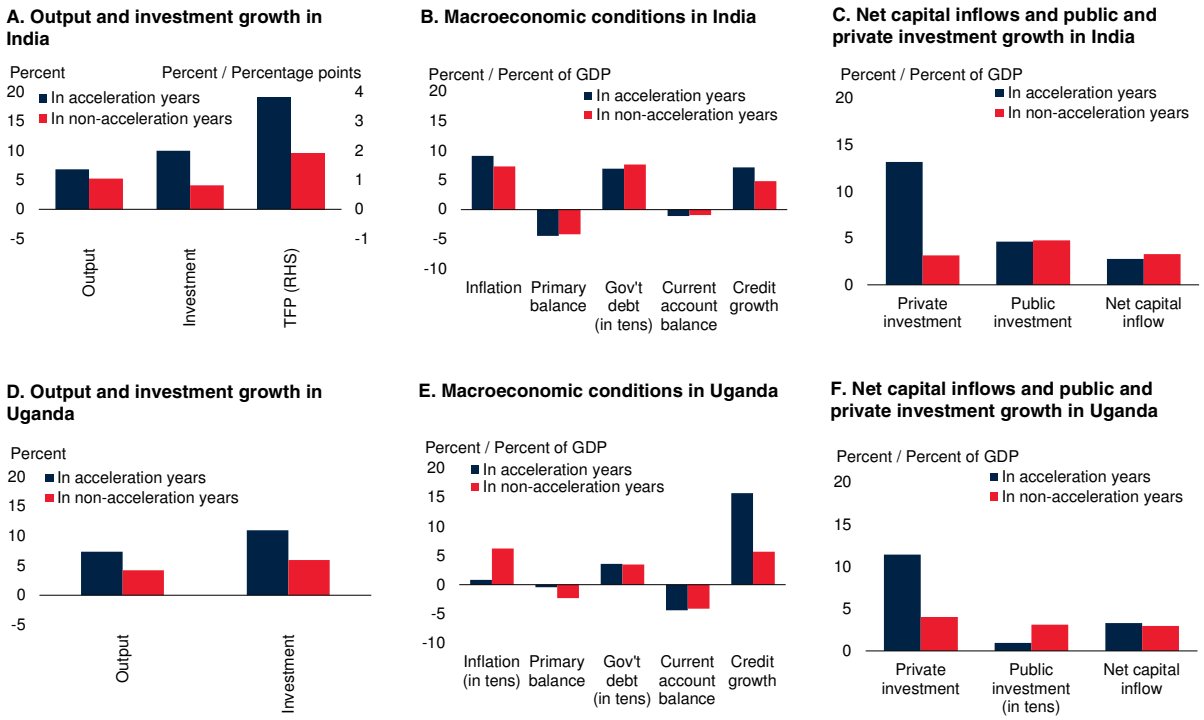
Economic performance. India experienced an investment acceleration from 1994 to 1999 (figure B3.1.5). During this acceleration, driven mostly by the private sector, average annual investment growth reached 10 percent per year, about 5.9 percentage points higher than in other years. The government debt -to-GDP ratio was about 6 percentage points lower during this episode than in non-acceleration years, while the primary fiscal deficit and current account deficit widened slightly. Net capital inflows to GDP improved slightly during the acceleration compared with those in the years before the acceleration while credit growth rose to over 7 percent compared with 4.8 percent in non-acceleration years. At the same time, TFP growth almost doubled during the acceleration, from 1.9 percent in nonacceleration years to 3.8 percent.

Policy drivers. The 1994 investment acceleration had its roots in reforms that started in 1991, addressing four major economic distortions (Ahluwalia 2002). First,

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

FIGURE B3.1.5 Investment accelerations in India and Uganda

India had an investment acceleration from 1994 to 1999. During this episode, driven mostly by the private sector, average annual investment growth reached 10 percent per year, while the government-debt-to-GDP ratio declined materially. Uganda's investment acceleration lasted from 1993 to 2012. The episode was accompanied by a significant reduction in inflation and an improved primary fiscal balance, as well as a notable increase in credit growth. Private investment also grew.



Sources: Bank for International Settlements; Feenstra, Inklaar, and Timmer (2015); Ha, Kose, and Ohnsorge (2021); Haver Analytics; IMF, International Financial Statistics; IMF, Investment and Capital Stock dataset; WDI (database); WEO (database); World Bank.

Note: The sample period is 1980-2022. Acceleration years cover the full duration of the episode. Non-acceleration years exclude acceleration years that were not included in this box; CPI = consumer price index; TFP = total factor productivity.

A.D. Bars are simple averages of growth in output, investment, and TFP, as well as the percentage point change in the employment rate.

B.E. Bars are simple average of the change in CPI in percent, primary balance as a percent of GDP, government debt as a percent of GDP, current account balance as a percent of GDP, and real credit growth in percent.

C.F. Bars are simple averages of growth in private investment and public investment in percent, and the net capital-inflow-to-GDP ratio in percent of GDP.

tariff and non-tariff barriers on imports were lifted, making it easier to import capital goods. Second, capital account restrictions were loosened to allow greater capital inflows. Third, state control of the banking and insurance sectors was reduced to facilitate greater competition and efficiency, leading to increased domestically supplied credit to the private sector.

Finally, most of the public sector monopolies were ended. Sectors reserved to public firms shrank from 18 important industries (including iron and steel, electricity, and telecommunications) to three (atomic energy, rail transport, and national defense-related aircraft and warships). A further reform was the transition to a market-determined exchange rate in 1993. These reforms promoted international investment and trade, and strengthened the private sector generally (Ahmad et al. 2018; Gupta et al. 2018).

Sub-Saharan Africa

Uganda (1993-2012)

Economic performance. Uganda, a low-income country, had a long period of investment acceleration between 1993 and 2012 (figure B3.1.5). Annual average investment growth, estimated at 10.9 percent

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

during the acceleration period, was 5 percentage points higher than during non-acceleration years. Output growth was similarly elevated during the acceleration, but to a lesser extent—averaging 7.4 percent in acceleration years, compared with 4.2 percent otherwise. The episode was accompanied by a significant drop in inflation, an improved primary balance, a sizable reduction in the debt-service-to exports ratio, and a notable increase in credit growth. Both private and public investment grew robustly during the acceleration. The proportion of the population in poverty fell from 68 percent in 1993 to 35 percent in 2013 (World Bank 2016).

Policy drivers. The 1993 acceleration was supported by a wide range of policies (World Bank 2007). Prior to the acceleration, Uganda committed to fiscal measures encompassing public enterprise and civil service reforms which helped stabilize the macroeconomy (Kuteesa et al. 2010; Mawejje and Odhiambo 2021). Public enterprise reforms, especially the privatization of key government-owned enterprises and the introduction of private sector participation in public utilities, sought to reduce the role of the government (Reinikka and Collier 2001; World Bank 2004). In addition, a comprehensive debt strategy formulated in 1991 strengthened debt management (Kitabire 2010). Monetary policy reforms focused on attaining a flexible exchange rate and price stability (Henstridge and Kasekende 2001).

A variety of structural reforms were implemented in the early 1990s to improve efficiency in the banking sector, liberalize the capital account, reduce trade barriers, and eliminate tax, legal, and other regulatory burdens on firms (Kuteesa et al. 2010; World Bank 2004). Debt relief initiatives and development assistance programs championed by the international community also played a significant role in supporting the acceleration. For example, Uganda was the first country to qualify for the Heavily Indebted Poor Countries debt relief initiative in 1998 and benefited from the Multilateral Debt Relief Initiative in 2006 (Andrews et al. 1999; Kitabire 2010). Uganda's participation in these initiatives reduced the debt-service-to-exports ratio by more than half, creating fiscal space that allowed more fiscal resources to be channeled into investment (Muwanga-Zake and Ndhaye 2001; Kitabire 2010).

Conclusion

These country studies show how initial conditions, together with comprehensive efforts to improve fiscal, monetary, and structural policies, can spark investment accelerations (tables B3.1.1, B3.1.2, and B3.1.3). The policy packages documented above allowed the 10 countries to seize favorable external conditions and turn them into accelerations. The case studies also demonstrate how such accelerations can be the source of sizable economic and development achievements.

The comprehensive policy packages overlapped considerably, even if the subsequent accelerations differed in some important dimensions (such as the split between private and public investment growth, or levels of credit growth). First, at about the start of each acceleration, improvements in the credibility and independence of monetary policy helped achieve lower and more stable inflation (for example, the Republic of Korea in 1998). Second, all accelerations were preceded by fiscal consolidation, either through stricter expenditure controls, the elimination of subsidies, tax reforms, or privatization of state-owned enterprises (for example, Colombia, India, or Uganda). Third, all accelerations were accompanied structural reforms. These encompassed trade and capital account liberalization efforts, the strengthening and deepening of financial markets and their regulation, and improvements to business climates, including policies to promote greater competition (for example, India, Poland in 1992, and Türkiye).

Investment accelerations were crucial for economic and human development. Output growth was substantially higher during these 13 accelerations than in non-acceleration years. Further, for many countries, productivity and employment growth was only positive, on average, during accelerations. Several countries either became high-income countries during the acceleration (for example, the Republic of Korea in 2001, Poland in 2009, or Uruguay in 2012), or saw sizable gains in the fight against extreme poverty (Colombia, India, Morocco, Uganda).

In some cases, the international community played a critical role in addressing long-standing debt problems, such that investment accelerations could take hold. For example, well-calibrated debt relief preceded or accompanied accelerations in Uganda and Uruguay.

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

TABLE B3.1.1 Investment and output growth during and outside investment accelerations

Country	Acceleration episode	Investment growth		Private investment growth		Public investment growth		Output growth	
		During	Outside	During	Outside	During	Outside	During	Outside
Chile	1986-93	12.3 (13.2)	3.9 (5.1)	13.2 (16.0)	4.0 (5.9)	9.2 (20.6)	4.8 (3.1)	7.6 (7.1)	3.4 (3.4)
Colombia	2001-07	12.7 (11.8)	2.3 (3.1)	13.8 (13.4)	2.1 (2.8)	6.1 (5.7)	4.2 (2.9)	4.5 (4.7)	3.3 (3.4)
India	1994-99	10.0 (9.0)	4.1 (4.6)	13.2 (11.9)	3.2 (3.4)	4.6 (5.9)	4.8 (2.5)	6.8 (7.1)	5.2 (6.1)
Korea, Rep.	1985-96	12.2 (11.2)	1.9 (1.2)	12.9 (12.1)	1.5 (-0.1)	9.4 (8.2)	4.9 (4.5)	9.3 (9.4)	4.0 (3.3)
Korea, Rep.	1999-2007	5.2 (5.1)	1.9 (1.2)	5.7 (5.3)	1.5 (-0.1)	3.3 (2.4)	4.9 (4.5)	6.3 (5.3)	4.0 (3.3)
Morocco	1996-2009	7.5 (7.2)	2.2 (2.0)	7.8 (7.8)	3.3 (2.8)	6.5 (4.0)	2.0 (-0.3)	5.0 (5.4)	3.2 (4.0)
Malaysia	1988-97	17.9 (16.3)	-3.0 (-1.2)	19.9 (20.1)	-2.9 (-2.3)	13.4 (11.7)	-0.2 (-10.3)	9.2 (9.2)	3.4 (5.4)
Poland	1992-2000	10.4 (8.5)	-3.0 (-2.1)	10.7 (10.2)	-3.0 (-3.7)	8.5 (6.4)	-1.7 (0.3)	5.0 (4.7)	-0.7 (1.3)
Poland	2003-08	10.4 (8.9)	-3.0 (-2.1)	9.3 (7.2)	-3.0 (-3.7)	15.8 (17.4)	-1.7 (0.3)	4.9 (4.6)	-0.7 (1.3)
Türkiye	2003-08	14.3 (17.1)	4.6 (2.8)	14.3 (17.1)	4.3 (2.3)	14.3 (17.1)	5.5 (4.7)	6.2 (6.4)	3.7 (4.9)
Uganda	1993-2012	10.9 (10.3)	5.9 (2.1)	11.4 (10.6)	4.0 (2.5)	9.6 (11.0)	31.0 (12.2)	7.4 (7.1)	4.2 (4.7)
Uruguay	1991-98	10.9 (9.3)	-4.4 (-4.6)	12.0 (7.0)	-0.1 (-4.7)	9.5 (7.9)	-9.3 (-6.6)	4.5 (4.7)	0.0 (0.8)
Uruguay	2004-14	9.9 (10.7)	-4.4 (-4.6)	10.5 (13.4)	-0.1 (-4.7)	8.9 (9.8)	-9.3 (-6.6)	5.4 (5.0)	0.0 (0.8)

Source: World Bank.
Note: All numbers are average growth rates in percent with median growth rates in parentheses for the respective acceleration years, or all non-acceleration years in a country since 1980. During refers to statistics for the acceleration years between 1980-2022. Outside refers statistics for all non-acceleration years over the same period. For details about the acceleration episodes, see box 3.1.

TABLE B3.1.2 Economic indicators during and outside investment accelerations

Country	Acceleration episode	Real credit growth		TFP growth		Change in employment rate		Net capital inflows (percent of GDP)		Cumulative real GDP per capita growth (percent)
		During	Outside	During	Outside	During	Outside	During	Outside	During
Chile	1986-93	7.7 (7.4)	7.1 (8.5)	3.4 (3.2)	-0.3 (-0.2)	1.1 (1.2)	0.1 (0.2)	0.1 (1.7)	8.4 (9.9)	52
Colombia	2001-07	3.7 (2.3)	6.9 (6.1)	1.4 (1.1)	0.0 (0.2)	0.3 (0.4)	-0.2 (-0.1)	4.4 (5.0)	4.9 (4.8)	23
India	1994-99	7.1 (5.6)	4.8 (5.4)	3.8 (4.4)	1.9 (2.0)			2.8 (2.8)	3.3 (2.6)	27
Korea, Rep.	1985-96	14.0 (13.7)	9.5 (7.6)	2.3 (2.2)	1.1 (0.8)	0.1 (0.1)	-0.2 (0.1)	2.3 (3.0)	3.5 (3.6)	140
Korea, Rep.	1999-2007	4.9 (4.6)	9.5 (7.6)	2.4 (1.9)	1.1 (0.8)	0.4 (0.3)	-0.2 (0.1)	3.5 (3.5)	3.5 (3.6)	49
Morocco	1996-2009	8.3 (7.5)	5.1 (3.5)	1.7 (1.5)	0.2 (1.1)	0.5 (0.5)	-0.2 (0.0)	-0.3 (-0.2)	3.9 (3.7)	50
Malaysia	1988-97	16.7 (17.6)	4.1 (3.6)	0.8 (0.6)	-0.1 (1.6)	0.6 (0.6)	-0.2 (-0.1)	6.0 (5.6)	3.7 (3.5)	74
Poland	1992-2000	8.2 (11.2)	1.6 (6.9)	3.1 (3.1)	-1.9 (-0.0)	-0.5 (-1.8)	-0.8 (-0.5)	5.4 (5.7)	4.3 (4.7)	50
Poland	2003-08	12.4 (14.2)	1.6 (6.9)	1.7 (2.0)	-1.9 (-0.0)	2.1 (1.9)	-0.8 (-0.5)	8.3 (7.5)	4.3 (4.7)	29
Türkiye	2003-08	23.2 (21.7)	6.0 (6.3)	1.0 (1.5)	-0.7 (0.7)	0.0 (0.1)	-0.2 (-0.0)	7.4 (7.5)	1.7 (1.6)	27
Uganda	1993-2012	15.7 (11.7)	5.7 (5.0)					3.3 (4.2)	3.0 (3.0)	114
Uruguay	1991-98	5.4 (7.3)	-2.9 (-0.4)	2.0 (2.1)	-1.2 (-0.7)	-0.2 (-0.2)	-0.1 (-0.4)	3.4 (3.4)	4.5 (5.6)	30
Uruguay	2004-14	2.8 (8.6)	-2.9 (-0.4)	2.6 (2.3)	-1.2 (-0.7)	1.0 (0.8)	-0.1 (-0.4)	8.3 (7.8)	4.5 (5.6)	65

Source: World Bank.
Note: All numbers except last column are average growth rates in percent with median growth rates in parentheses for the respective acceleration years, or all non-acceleration years in a country since 1980. During refers to statistics for the acceleration years between 1980-2022. Outside refers statistics for all non-acceleration years over the same period. Empty cells reflect missing data. For details about the acceleration episodes, see box 3.1. GDP = gross domestic product; TFP = total factor productivity.

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

TABLE B3.1.3 Policy changes and reforms during investment accelerations

Country	Acceleration episode	Fiscal policy	Monetary policy	Structural policy	External environment
Chile	1986-93	Fiscal consolidation	Central bank independence (1989) Adoption of inflation target (1990)	Trade liberalization Financial sector deepening Banking reforms	Rising copper prices in the late 1980s
Colombia	2001-07	Fiscal consolidation Structural tax reforms SOE and public investment management reforms	Increased exchange rate flexibility Adoption of inflation target (1999) Enhanced central bank independence	Enhanced trade linkages Financial sector deepening	Rising oil prices Strong global growth and supportive global financial conditions
India	1994-99	Fiscal consolidation Structural tax reforms	Increased exchange rate flexibility	Ended most public sector monopolies Capital account and trade liberalization Reduced state control of banking and insurance	Solid global growth
Malaysia	1988-97	Structural tax reforms (revenue collection focus)	Currency devaluation	Financial sector deepening (better access to credit)	
Morocco	1996-2009	Fiscal consolidation Structural tax reforms	Reforms to balance fixed exchange rate	Trade liberalization (trade agreements with the EU and U.S.) Reduction in price controls and subsidies Financial sector deepening (better access to credit)	Strong global growth and supportive global financial conditions
Poland	1992-2000	Reduction of inefficient subsidies SOE management reforms Structural tax and entitlement reforms	Increased exchange rate flexibility Monetary tightening (curbing excess credit growth) Adoption of inflation targeting (1998)	Privatization of state-owned enterprises Trade liberalization (joined GATT and signed multiple trade agreements) Capital account liberalization Banking reforms and recapitalization Competition reforms	Paris Club debt forgiveness
Poland	2003-08	Targeted tax reductions to promote investment	Increased exchange rate flexibility	Financial sector deepening Alignment of many policies and regulations to the EU	Accession to the EU in 2004 Strong global growth and supportive global financial conditions
Korea, Rep.	1985-96	Fiscal consolidation and rules (balanced budget principle) Institutional fiscal improvements (establishing a budget council)	End central bank financing of government	Trade liberalization (reduced import restrictions) Reduction in price controls Competition reforms (Monopoly Regulation and Fair Trade Act)	
Korea, Rep.	1999-2007	Fiscal consolidation (especially lower spending growth)	Enhanced central bank independence Increased exchange rate flexibility Adoption of inflation targeting (1998)	Liberalization of capital markets (reduced FDI restrictions) Corporate governance reforms Restructuring of financial corporations	Strong global growth and supportive global financial conditions

BOX 3.1 Sparking investment accelerations: Lessons from country case studies (*continued*)

TABLE B3.1.3 Policy changes and reforms during investment accelerations (*continued*)

Country	Acceleration episode	Fiscal policy	Monetary policy	Structural policy	External environment
Türkiye	2003-08	Fiscal consolidation and rules (primary surplus target)	Central bank independence (2001)	Privatizations and corporate restructuring Business climate improvements Trade liberalization Labor market liberalization Banking reform	Strong global growth and supportive global financial conditions
Uganda	1993-2012	Privatizations and SOE reforms Institutional fiscal improvements (establishing Uganda Tax authority)	Increased exchange rate flexibility	Banking reform Trade liberalization Business climate improvements	HIPC and Multilateral Debt Relief Development assistance
Uruguay	1991-98	Fiscal consolidation	Increased exchange rate flexibility Limit central bank financing of government	Trade liberalization (MERCOSUR regional trade agreement)	Reduced external debt through Brady plan
Uruguay	2004-14	Institutional fiscal improvements (improved public balance sheet management)	Increased exchange rate flexibility Enhanced central bank independence Adoption of inflation targeting (2005)	Banking reform Business climate improvements	Elevated agricultural commodity prices Improving regional trade integration Supportive global financial conditions

Source: World Bank.
Note: EU = European Union. For details about the acceleration episodes, see box 3.1.

ANNEX 3.1 Identification of investment accelerations

Definition. Investment accelerations are defined as episodes of rapid acceleration in investment per capita that are sustained for at least six years. Using per capita growth in investment takes into account the significance of population growth, which has averaged more than 2 percent in the typical EMDE between 1950 and 2022. Per capita growth rates also have a better link with GDP per capita growth, which is the focus of long-term growth analyses (Libman, Montecino, and Razmi 2019).

As suggested by Barro and Sala-i-Martin (1992) and Christiano and Fitzgerald (2003), economic indicators taken more than five calendar years apart are less influenced by business cycle fluctuations. According to Hausmann, Pritchett, and Rodrik (2005), output growth accelerations require heightened output growth to last at least eight years. Given the volatile nature of investment growth, the approach preferred here uses a time frame of a minimum of six years. In addition, the requirement that capital stock per capita at the end of an acceleration must exceed its pre-episode peak is added to ensure that the episodes identified are indeed accelerations and not merely periods of recoveries. The sensitivity analysis shows that shorter (or longer) periods of acceleration do not affect the main results of this chapter (see annexes 3.3 and 3.4 for details). Based on the length of six years and the sample's end year of 2022, the latest year an acceleration can start is in 2017. The distribution of episodes by country groups is shown in table A3.1.1, and the list of episodes in EMDEs detailed in table A3.1.2.

The chapter aims to identify the same type of large-scale investment acceleration with transformative development implications. To avoid pooling different types of accelerations, the same set of criteria detailed below is applied to per capita growth in investment in all economies in the sample:

- The average growth rate of investment over six years must be at least 4 percent a year.
- The average growth rate of investment over six years must be at least 2 percentage points higher than in the previous six years.
- The level of the capital stock per capita at the end of the acceleration must exceed its pre-episode peak.

The first two criteria are designed to identify rapid acceleration in investment per capita growth. The first criterion requires that growth is rapid, setting a threshold of at least 4 percent per capita growth per year. This rate corresponds to the long-run median growth rate of investment for the top one-third of countries in the sample.[11] The second criterion confirms that investment accelerates. It does so by requiring a minimum increase of 2 percentage points, which is the median difference in growth between two neighboring six-year periods for the top one-third of countries in the sample. Finally, the requirement that capital stock per capita at the end of an acceleration must exceed its pre-episode peak ensures that the episodes identified are indeed accelerations and not merely periods of recoveries. Three additional criteria are added to identify more reasonable episodes and starting years (see below).

Comparison with other identification approaches. The identification approach adopted here aligns with the existing studies on output and capital stock growth accelerations, but differs in two key dimensions: the duration of heightened growth required and the main criteria for identifying accelerations. First, all existing studies on accelerations typically adopt an eight-year framework without adapting to the volatile nature of investment growth (for instance, Libman, Montecino and Razmi, 2019; Manzano and Saboin 2022). Second, the values for various criteria detailed above are taken from sample statistics, while other approaches used ad-hoc values (for instance, Hausmann, Pritchett and Rodrik 2005; Jong-A-Pin and de Haan 2011). In addition, Libman, Montecino and Razmi (2019) study capital stock growth accelerations. Their approach differs slightly from the one used here in

[11] In the sensitivity analyses, alternative thresholds are used, which do not change the main results (see annex 3.3).

how they identify the correct starting years (that is, using a break test to smoothed capital stock growth series) and the focus on capital stock per capita growth. The use of capital stock growth makes their set of accelerations less linked with output performance.

Additional requirements. A few additional requirements are added to avoid overidentifying investment accelerations and to identify more reasonable episodes and starting years. These requirements are specifically added to tailor the filtering approach to the volatile nature of investment growth. Firstly, to exclude episodes driven by short-term surges in investment, the approach mandates that investment growth must be positive in at least five out of the six years of an acceleration period. Second, the investment per capita growth rate at the beginning of the six-year period should not be negative. Third, per capita investment has to accelerate and be higher in the second year of an episode than in the first year. Finally, if more than one year qualifies as the start of the investment acceleration episode, the first year that meets the criteria is identified as the start (Jong-A-Pin and De Haan 2008). The unconditional probability of experiencing an investment acceleration in a decade is calculated by dividing the number of identified investment accelerations by the total number of country-years in the sample (later converted to decades) during which an acceleration could occur.

TABLE A3.1.1 Investment accelerations: Distribution over country groups

Grouping	Number of economies	Number of investment accelerations	EMDE groups	Number of economies	Number of investment growth accelerations
AEs	35	77	CIM	25	54
EAP	8	19	CEX	44	61
ECA	11	17	LICs	7	13
LAC	19	39	FCS	7	10
MNA	9	11	Small states	4	5
SAR	3	7			
SSA	19	22			

Source: World Bank.
Note: Number of economies refers to economies for which data are available. All non-advanced economies have been classified in regions and EMDE groups as used by the World Bank in fiscal year 2024. AEs = advanced economies; CIM = commodity-importing EMDEs; CEX = commodity-exporting EMDEs; EAP = East Asia and Pacific; ECA = Eastern Europe and Central Asia; EMDEs = emerging market and developing economies; FCS = fragile and conflict-affected situations; LAC = Latin America and the Caribbean; LICs = low-income countries; MNA = Middle East and North Africa; SAR = South Asia; SSA = Sub-Saharan Africa.

TABLE A3.1.2 List of investment accelerations in EMDEs

Economy	Starting year(s) of investment accelerations	Economy	Starting year(s) of investment accelerations
Albania	1999	Malaysia	1967, 1978, 1988, 2006
Algeria	1973, 1999	Mali	1971, 1984, 1992, 2002, 2014
Argentina	1967	Mauritius	1972, 1983
Armenia	1997	Mexico	1991, 2003
Bahrain	2012	Mongolia	1976, 2005
Belarus	1999	Morocco	1996
Belize	1986	Mozambique	2007
Benin	1966	Namibia	2005
Bolivia	2005	Nepal	2014
Botswana	1996	Nicaragua	1961, 2010
Brazil	1968, 2005	Nigeria	1969
Bulgaria	1994	North Macedonia	2006
Burkina Faso	1968, 2002, 2017	Oman	2002
Cambodia	2011	Panama	1965, 1990, 2005
Chile	1977, 1986, 2002	Paraguay	1971, 2005, 2016
China	1977, 1991	Peru	1961, 1969, 1992, 2002
Colombia	2001	Philippines	1973, 2012
Costa Rica	1973, 1983, 2004	Poland	1983, 1992, 2003, 2017
Dominican Republic	1970, 2005, 2014	Romania	1969, 1999, 2014
Ecuador	2007	Rwanda	1970, 2002
El Salvador	1970, 1984, 1991, 2017	Saudi Arabia	2003
Equatorial Guinea	1994	Sri Lanka	1974, 1990, 2002
Honduras	2003	Tanzania	2002
Hungary	1993, 2013	Thailand	1958, 1976, 1987, 2001
India	1985, 1994, 2004	Togo	1974
Indonesia	1987, 2003	Türkiye	1969, 2003, 2010
Iran, Islamic Rep.	1963, 1999	Uganda	1993
Jamaica	1966	Uruguay	1974, 1991, 2004
Kenya	2007	Viet Nam	2002, 2013
Kuwait	1990, 2001, 2012		

Source: World Bank.
EMDEs = emerging market and developing economies.

ANNEX 3.2 Methodological annex

Data

Data for investment, GDP, capital stock, and population for the period 1950-2019 are sourced from the Penn World Table (PWT) 10.01 because this database covers many more countries than alternative databases. To update the investment data provided by PWT, investment growth data for 2020-22 is sourced from Haver Analytics, World Bank Development Indicators (WDI), and *Global Economic Prospects* (GEP). To compute per capita series of GDP and investment after 2019, population data are taken from the United Nations population prospects database. The final sample of economies includes 35 advanced economies and 69 EMDEs (table A3.1.1). These economies represent about 97 percent of global GDP since the mid-2000s (World Bank 2023a).

Data on the explanatory variables are taken from a variety of sources. Institutional quality is proxied by the "law and order" subcomponent of the PRS Group's *International Country Risk Guide* (ICRG). The undervaluation index is constructed following Rodrik (2008) using data from PWT. Global GDP growth is computed using GDP weights at average 2010-19 prices and market exchange rates. Primary balance as a share of GDP is taken from the IMF's *World Economic Outlook*. Inflation data are taken from Ha, Kose, and Ohnsorge (2021). Trade restrictions and inflation targeting indices are taken from the IMF structural reform database (Alesina et al. 2020) and IMF AREAER database. The capital account restrictions index is taken from (Chinn and Ito 2008). Additional covariates for the robustness checks include natural resource rent as a share of GDP from WDI; global recession years defined by Kose, Sugawara, and Terrones (2020); and global financial cycle factor, retrieved from Miranda-Agrippino and Rey (2020).

Methodology

The correlates and probability of an investment acceleration starting in a given year are estimated using logit regressions. The following model is estimated:

$$Pr\,(Y_{i,t} = 1 | X_{i,t}) = \phi\,(\beta X_{i,t}),$$

where Pr denotes the probability that a sustained investment acceleration takes place in country i in year t ($Y_{i,t}$), conditioned on a set of variables ($X_{i,t}$), and ϕ denotes the cumulative distribution function. Because there is some uncertainty around the precise starting date of an acceleration, the approach of Hausmann, Pritchett, and Rodrik (2005) and Libman, Montecino, and Razmi (2019) is followed: the dependent variable takes the value 1 in the year immediately before and the year immediately after the beginning of the episode, and 0 otherwise. Also, the years an episode cannot take place (that is, year two until the end of an episode, as well as the first and last five years of the sample) are excluded. Because of data limitations, the regressions cover the period 1985-2017. Furthermore, to prevent a small number of countries from having a large influence on the results, estimates are unweighted.

The analysis focuses on the effect of institutional quality (IQ) and economic policy reforms (EPR) on the likelihood that an investment acceleration occurs. In the model, the level of institutional quality, the economic policy reform indicator, and their interaction are included.

The model is:

$$Pr\,(Y_{i,t} = 1 | X_{i,t}) = \phi(\beta_0 + \beta_1 IQ_{i,t-1} + \beta_2 EPR_{i,t} + \beta_3 [IQ_{i,t-1} * EPR_{i,t}] + \beta_4 CV_{i,t-1} + \mu_{i,t}),$$

where CV represents the control variables capturing the country's development status and domestic and external controls, such as the global GDP growth rate. Institutional quality is measured by the law and order subindex from ICRG. Economic policy reforms are calculated as the annual change in the trade restriction index and the Chin-Ito capital openness index (measured in percent), percentage points of GDP for the primary balance, or a dummy variable indicating whether a country has adopted an inflation target or tightened an inflation target since the preceding year.

Empirical results

Table A3.2.1 shows the results for the impact of institutional quality and control variables on the probability of an investment acceleration starting in the following year. Column (1) shows the main institutional quality variable, and controls for country-specific conditions that capture the development status (GDP per capita), level of capital (capital-to-output ratio), and the undervaluation index following Rodrik (2008). Columns (2) through (6) add additional control variables for global economic conditions (global GDP growth), economic stability (inflation rate), and the level of fiscal and external policies of this chapter. Based on these results and the limits that the level of fiscal and external policy place on the sample size, column (2) is the preferred baseline specification for the analysis of policy impacts on the probability of an investment acceleration.

Table A3.2.2 presents the impact of policy changes on the probability of an investment acceleration using the set of controls in column (2) of table A3.2.1. To simplify the interpretation of the results, the institutional quality variable and the policy change variables are demeaned. The results mirror those in table A3.2.1, showing that higher institutional quality, as well as the four policy changes presented in table A3.2.2, increase the likelihood of an investment acceleration. Furthermore, the impact of a policy is dependent on the level of institutional quality. For two policy changes, the interaction term between the lagged institutional quality variable and the policy change are significant. Column (5) includes all four policy reforms concurrently but does not include an interaction term with institutional quality.

TABLE A3.2.1 Institutional quality and initial conditions as drivers of the likelihood of investment accelerations

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Investment per capita growth acceleration					
Lagged institutional quality (IQ)	0.207***	0.204***	0.207***	0.219***	0.276***	0.222***
	(3.49)	(3.45)	(3.48)	(2.96)	(4.50)	(2.91)
Lagged GDP per capita	-0.016	-0.006	-0.022	-0.192**	-0.089	-0.206**
	(-0.25)	(-0.09)	(-0.35)	(-2.33)	(-1.18)	(-1.97)
Lagged capital-to-output ratio	-0.521***	-0.525***	-0.504***	-0.748***	-0.376***	-0.638***
	(-3.84)	(-3.87)	(-3.71)	(-4.43)	(-2.58)	(-3.46)
Lagged under valuation index	0.752***	0.766***	0.750***	1.432***	1.073***	1.634***
	(4.74)	(4.82)	(4.75)	(7.23)	(5.89)	(8.17)
Lagged global GDP growth		0.109**				0.260***
		(2.14)				(4.09)
Lagged inflation rate			-0.000			-0.012*
			(-0.09)			(-1.85)
Lagged government expenditure to GDP				0.037***		0.038***
				(4.31)		(3.71)
Lagged net capital inflows to GDP					-0.009***	-0.010***
					(-3.50)	(-2.78)
Constant	-1.610***	-1.965***	-1.571***	-0.877	-1.296**	-1.384*
	(-3.47)	(-3.95)	(-3.39)	(-1.57)	(-2.11)	(-1.71)
Number of observations	2,200	2,200	2,189	1,767	1,936	1,590
Pseudo R^2	0.027	0.029	0.026	0.056	0.043	0.079
Number of episodes	117	117	117	93	107	88
Number of economies	96	96	96	96	95	95

Source: World Bank.
Note: This table shows the estimated coefficients for the change in log-odds. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. Investment per capita growth accelerations are identified as described in annex 3.1.

TABLE A3.2.2 Institutional quality and policies as drivers of the likelihood of investment accelerations

Dependent variable	(1)	(2)	(3)	(4)	(5)
	Investment per capita growth acceleration				
Lagged institutional quality (IQ)	0.227***	0.224***	0.249***	0.289***	0.472***
	(3.60)	(3.66)	(3.27)	(3.71)	(5.06)
Lagged GDP per capita	-0.016	-0.018	-0.016	0.095	-0.021
	(-0.23)	(-0.28)	(-0.22)	(1.00)	(-0.17)
Lagged capital-to-output ratio	-0.556***	-0.533***	-0.593***	-0.420**	-0.311
	(-3.61)	(-3.86)	(-3.47)	(-2.18)	(-1.24)
Lagged under valuation index	0.963***	0.764***	1.259***	1.392***	2.078***
	(5.81)	(4.74)	(6.25)	(5.18)	(6.96)
Lagged global GDP growth	0.162***	0.116**	0.152***	0.062	0.125*
	(2.99)	(2.28)	(2.59)	(1.13)	(1.90)
Change in capital account openness	0.005***				0.004**
	(2.98)				(2.01)
Interaction of lagged IQ and change in capital account openness (percent)	0.001				
	(0.88)				
Adoption or lowering of inflation target (dummy)		1.133***			1.463***
		(3.75)			(4.13)
Interaction of lagged IQ and adoption or lowering of inflation target (dummy)		-0.058			
		(-0.31)			
Change in primary balance (percent of GDP)			0.032**		0.124***
			(2.20)		(2.72)
Interaction of lagged IQ and change in primary balance (percent of GDP)			0.027***		
			(3.58)		
Change in trade restriction index (percent)				0.010**	0.018***
				(2.41)	(2.96)
Interaction of lagged IQ and change in trade restriction index (percent)				0.014***	
				(2.88)	
Constant	-1.125*	-1.094*	-1.136*	-1.907**	-1.242
	(-1.83)	(-1.85)	(-1.71)	(-2.28)	(-1.22)
Number of observations	1,951	2,200	1,683	1,393	1,006
Pseudo R^2	0.037	0.036	0.051	0.051	0.108
Number of episodes	106	117	87	83	60
Number of economies	94	96	95	74	71

Source: World Bank.
Note: This table shows the estimated coefficients for the change in log-odds. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. Investment per capita growth accelerations are identified as described in annex 3.1.

ANNEX 3.3 Investment accelerations using different filtering algorithms

Table A3.3.1 displays the robustness of the identification approach when alternative parameter values of the minimum average investment growth rate and minimum length of investment acceleration are applied. Overall, setting lower thresholds for growth rates during accelerations or using shorter acceleration durations result in a larger number of identified episodes. Despite variations in the number of episodes identified under different parameter combinations, including those based on aggregate rather than per-capita investment growth, the findings show sustained and heightened investment and output growth, which supports the use of the baseline approach.

TABLE A3.3.1 Investment accelerations using different filtering algorithms

(1) Filtering method	(2) Number of episodes	(3) Investment per capita growth Before	(4) Investment per capita growth During	(5) *t*-test (*p* value)	(6) Output per capita growth Before	(7) Output per capita growth During	(8) *t*-test (*p* value)	(9) Countries without accelerations
Benchmark	192	1.56	9.87	0.00	1.74	4.50	0.00	11
6 years, 4% not per capita	226	3.34	10.73	0.00	1.97	4.13	0.00	11
5 years, 4%	243	1.72	10.00	0.00	1.88	4.41	0.00	8
7 years, 4%	142	0.20	9.96	0.00	1.64	4.60	0.00	23
6 years, 3%	210	1.46	9.28	0.00	1.74	4.26	0.00	10
6 years, 5%	165	1.77	10.74	0.00	1.81	4.78	0.00	16

Source: World Bank.

Note: This table displays the number of investment acceleration episodes identified using different thresholds for the algorithm as well as investment growth measured in aggregate rather than per capita terms. In column (1) years refers to the minimum duration of the acceleration, and the percent growth rate refers to the minimum average growth rate of (per capita) investment growth. The baseline as described in annex 3.1 uses a minimum 4 percent average growth and minimum duration of 6 years as parameters. Column (2) shows the number of identified accelerations. Columns (3) and (4) show the mean investment per capita growth rate during the six years before and during an acceleration. For the algorithm that does not use per capita investment growth in the second row, columns (3) and (4) show mean investment growth not in per capita terms. Column (5) shows the p-value from a two-sided test comparing investment growth rates before and during an acceleration. Columns (6), (7), and (8) show the per capita output growth rates before and during an investment acceleration along with the p-value of the two-sided test assessing if the means are equal. Column (9) shows the number of countries without identified investment accelerations for the given combination of parameters.

ANNEX 3.4 Robustness exercises

The empirical results presented in annex 3.2 are robust to the use of alternative sets of episodes identified using different algorithm thresholds and duration parameters as well as controlling for additional variables. Table A3.4.1 reruns the main regression shown in table A3.2.2 using investment accelerations identified when alternative minimum duration length is required while holding the minimum required growth rate of 4 percent constant. Table A3.4.2 shows that the results are also robust to alternative minimum average investment growth thresholds. In table A3.4.3, the following additional control variables are included in the baseline regression: lagged per capita investment growth, the global recession year dummies defined in Kose, Sugawara, and Terrones (2020), the global financial cycle factor provided by Miranda-Agrippino and Rey (2020), and natural resource rents as a share of GDP (taken from the World Development Indicators). Table A3.4.4 repeats the baseline regression using investment accelerations identified using the baseline parameters applied to aggregate investment growth (that is, not in per capita terms). Across all robustness tests, the baseline results presented in table A3.2.2 do not change in a meaningful way.

TABLE A3.4.1 Investment accelerations using different duration parameters

Policy variable	(1) Change in capital account openness	(2) Adoption or reduction of inflation target	(3) Change in primary balance	(4) Change in trade restrictiveness index
Model 1: minimum duration 5 years, average growth rate 4 percent				
Lagged institutional quality (IQ)	0.359***	0.360***	0.440***	0.435***
	(6.01)	(6.21)	(5.82)	(5.59)
Policy	0.003**	0.769***	0.033**	0.009**
	(1.98)	(2.64)	(2.25)	(2.21)
Interaction of policy with lagged IQ	0.000	0.011	0.029***	0.013**
	(0.21)	(0.06)	(3.78)	(2.54)
Number of observations	2,023	2,276	1,764	1,402
Number of episodes	122	138	98	92
Model 2: minimum duration 7 years, average growth rate 4 percent				
Lagged IQ	0.325***	0.332***	0.508***	0.486***
	(4.30)	(4.53)	(5.72)	(5.78)
Policy	0.003**	0.765**	0.029*	0.009*
	(2.05)	(2.27)	(1.67)	(1.66)
Interaction of policy with lagged IQ	0.002**	0.025	0.030***	0.023***
	(2.00)	(0.10)	(3.45)	(3.86)
Number of observations	1,956	2,198	1,661	1,447
Number of episodes	79	89	62	67

Source: World Bank.
Note: This table shows the estimated coefficients for the change in log-odds. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. The institutional quality variable and policy change variables have been demeaned for easier interpretation of the interaction term. All regressions use the baseline control variables in column (2) of table A3.2.1. The two models presented here use the baseline parameter of 4 percent minimum investment per-capita growth but a duration of five years (model 1), seven years (model 2) compared with six years in the baseline. See annex A3.3 on alternative algorithm specifications.

TABLE A3.4.2 Investment accelerations using different duration and growth parameters

Policy variable	(1) Change in capital account openness	(2) Adoption or reduction of inflation target	(3) Change in primary balance	(4) Change in trade restrictiveness index
Model 1: minimum duration 6 years, average growth rate 3 percent				
Lagged institutional quality (IQ)	0.271***	0.268***	0.288***	0.343***
	(4.40)	(4.44)	(3.98)	(4.51)
Policy	0.004***	1.277***	0.029**	0.009**
	(2.62)	(4.32)	(2.10)	(2.10)
Interaction of policy with lagged IQ	0.001	-0.004	0.025***	0.013***
	(0.58)	(-0.02)	(3.47)	(2.65)
Number of observations	1,887	2,130	1,623	1,334
Number of episodes	115	126	97	91
Model 2: minimum duration 6 years, average growth rate 5 percent				
Lagged IQ	0.182***	0.177***	0.266***	0.235***
	(2.63)	(2.62)	(3.13)	(2.95)
Policy	0.005***	1.206***	0.038**	0.006
	(3.03)	(3.92)	(2.25)	(1.36)
Interaction of policy with lagged IQ	0.001	0.044	0.032***	0.009**
	(0.99)	(0.24)	(3.80)	(2.46)
Number of observations	2,083	2,332	1,791	1,493
Number of episodes	85	96	69	68

Source: World Bank.

Note: This table shows the estimated coefficients for the change in log-odds. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. The institutional quality variable and policy change variables have been demeaned for easier interpretation of the interaction term. All regressions use the baseline control variables in column (2) of table A3.2.1. The two models presented here use varying minimum average growth and a minimum duration of six years to identify investment accelerations, around the baseline parameters of 4 percent and 6 years. Model 1 requires a minimum duration of 6 years and a minimum growth rate of 3 percent. Model 2 requires a minimum duration of 6 years but growth rate of 5 percent. See annex 3.3 for alternative algorithm specifications.

TABLE A3.4.3 Baseline regressions with additional controls

Policy variable	(1) Change in capital account openness	(2) Adoption or reduction of inflation target	(3) Change in primary balance	(4) Change in trade restrictiveness index
Model 1: Add lagged investment growth to the baseline model				
Lagged institutional quality (IQ)	0.235***	0.232***	0.253***	0.293***
	(3.71)	(3.76)	(3.31)	(3.75)
Policy	0.005***	1.115***	0.030**	0.009**
	(2.97)	(3.74)	(2.03)	(2.21)
Interaction of policy with lagged IQ	0.001	-0.069	0.026***	0.013***
	(0.94)	(-0.37)	(3.51)	(2.84)
Lagged investment growth	-0.013***	-0.012***	-0.014***	-0.015***
	(-2.94)	(-3.01)	(-2.85)	(-2.65)
Number of observations	1,951	2,200	1,683	1,393
Number of episodes	106	117	87	83
Model 2: Add global recession dummy to the baseline model				
Lagged IQ	0.223***	0.222***	0.245***	0.287***
	(3.55)	(3.63)	(3.23)	(3.69)
Policy	0.005***	1.124***	0.030**	0.010**
	(2.95)	(3.73)	(1.97)	(2.42)
Interaction of policy with lagged IQ	0.001	-0.055	0.026***	0.014***
	(0.89)	(-0.29)	(3.53)	(2.87)
Dummy for global recessions	-0.284	-0.192	-0.268	-0.170
	(-0.84)	(-0.65)	(-0.70)	(-0.51)
Number of observations	1,951	2,200	1,683	1,393
Number of episodes	106	117	83	83
Model 3: Add global financial cycle factor to the baseline model				
Lagged IQ	0.238***	0.230***	0.247***	0.296***
	(3.76)	(3.71)	(3.27)	(3.80)
Policy	0.005***	1.144***	0.033**	0.009**
	(2.94)	(3.78)	(2.27)	(2.16)
Interaction of policy with lagged IQ	0.001	-0.069	0.027***	0.013***
	(0.85)	(-0.37)	(3.62)	(2.83)
Global financial cycle factor	-0.154*	-0.080	-0.075	-0.192*
	(-1.74)	(-0.94)	(-0.69)	(-1.82)
Number of observations	1,951	2,200	1,683	1,393
Number of episodes	106	117	87	83
Model 4: Add natural resource rents to the baseline model				
Lagged IQ	0.236***	0.233***	0.254***	0.315***
	(3.73)	(3.74)	(3.38)	(4.00)
Policy	0.005***	1.105***	0.038**	0.010**
	(2.85)	(3.63)	(2.23)	(2.49)
Interaction of policy with lagged IQ	0.001	-0.061	0.030***	0.014***
	(0.84)	(-0.33)	(3.42)	(2.87)
Natural resource rents (share of GDP)	-0.017*	-0.010	-0.024**	-0.036
	(-1.93)	(-1.24)	(-2.42)	(-1.59)
Number of observations	1,942	2,174	1,677	1,384
Number of episodes	105	116	87	82

Source: World Bank.

Note: This table shows the estimated coefficients for the change in log-odds. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. The institutional quality variable and policy change variables have been demeaned for easier interpretation of the interaction term. All regressions use the baseline control variables in column (2) of table A3.2.1. The four models presented here use additional control variables in the baseline regression. Model 1 controls for lagged per capita investment growth, Model 2 controls for global recession years, Model 3 controls for global financial cycles, and Model 4 controls for natural resource rents as a share of GDP. See annex 3.2 for variable sources and definitions.

TABLE A3.4.4 Baseline regressions based on investment growth (not in per capita terms)

Policy variable	(1) Change in capital account openness	(2) Adoption or reduction of inflation target	(3) Change in primary balance	(4) Change in trade restrictiveness index
Lagged institutional quality (IQ)	0.192***	0.201***	0.215***	0.271***
	(3.16)	(3.45)	(3.00)	(3.64)
Policy	0.004***	1.102***	0.030**	0.010**
	(2.65)	(3.80)	(2.48)	(2.23)
Interaction of policy with lagged IQ	0.001	-0.074	0.013*	0.015***
	(1.03)	(-0.40)	(1.82)	(2.82)
Number of observations	1,861	2,093	1,613	1,344
Number of episodes	101	112	84	80

Source: World Bank.
Note: This table shows the estimated coefficients for the change in log-odds. Robust standard errors in parentheses. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively. The institutional quality variable and policy change variables have been demeaned for easier interpretation of the interaction term. All regressions use the baseline control variables in column (2) of table A3.2.1. The dependent variable is a dummy for the start years of investment accelerations identified using the baseline parameters applied to investment growth not in per capita terms. See annex 3.3 for algorithm parameters.

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