CHAPTER 12

Economic and Development Policy in the Age of Low Growth Rates, Low Inflation, and Low Employment in the Greek Economy Until 2019

12.1 Introduction

Low growth rates, low investments, and low inflation rates form the new era of the global economy. In the second section of the chapter (Sect. 12.2) we focus on the case of the Greek economy, where these trends coexist along with high unemployment. These concepts interact with development and growth policy, both in theory and reality.

In this direction, especially at the heart of theoretical discussion on growth, there are a number of issues which are being analyzed in this chapter, such as the global recession and an investment-less recovery (Sect. 12.3) and the hyper cycle of debt and balance sheet recessions (Sect. 12.4). Section 12.5 discusses shortfalls and structural unemployment in the Greek economy. Finally, Sect. 12.6 presents economic growth under conditions of low development, low investments, low inflation, and also low employment in the Greek economy.

Note that the next chapter exclusively refers to Covid-19 crisis, that is in the short period from 2019 to September of 2020.
12.2 Economic Policy with Low Growth, Low Inflation, and Low Employment

In early 2013, the European crisis had escalated into a low growth trap where four components played a central role. These were:

- the fiscal austerity and the risk of public debt;
- the vulnerability of financial systems;
- the high unemployment rates; and
- the deleveraging from the financial sector, businesses, and households.

A recession that has its roots in the financial system is deeper and recovery time is slower than in the case of a productive recession (Akerlof, 2013). Therefore, the question that arises is whether the fundamental assumptions of economic theory should be examined even more deeply, on the one hand by the quantitative theory of money, which attributes the collapse to the instability of money supply (housing mortgage crisis, etc.) causing an explosion in consumption and, on the other hand, by Keynesian theory, which emphasizes that the crisis arose from investments instability (Skidelsky, 2010).

The global economic crisis of 2008 has largely shown that unfavorable disruptions reduce inflation—even leading to deflationary conditions, shrinking economic activity—while central banks may be stuck in a situation with near-zero interest rates (Gerlach & Lewis, 2011).

In the liquidity trap there is a low interest rate area, which is mainly shaped by the central bank’s interest rate, ranging from close from 0 to 1%, a level at which excessive risk-taking behaviors and speculation are developed in economic sectors. At the same time, there is always the possibility of new crises emerging, the treatment of which would subsequently require low interest rates.

Thus, a vicious circle of low interest rates is maintained with recovery dynamics being absent. More specifically, under conditions of low interest rates, the possibility of transferring liquidity from surplus to deficit portfolios is interrupted while, at the same time, monetary policy loses one of its main tools of implementation, managing interest rates. Therefore, only quantitative interventions remain, such as open market transactions or other non-conventional measures, in order to mobilize the economy.
Similar situations arise over fear whether short-term funds will not be available when required, because other participants in the interest rate system have the same goals, i.e., they expect to have access to funds whenever they wish (Giavazzi & Giovannini, 2010). For this reason, the demand for zero risk positions is being increased, something that only central banks can offer.

Deflationary conditions, moreover, lead to continually lower central bank interest rate targets (e.g., when targets follow Taylor’s rule), resulting in a liquidity trap. This is particularly true if the central bank’s goal is only price stability and not economic activity, as is the case for the European Central Bank (ECB), but not for the Federal Reserve (Fed)—Fed’s Dual Mandate. When the second situation occurs, it is much more likely that the central bank will be involved in quantitative interventions in capital markets, increasing liquidity in quantity and duration, so that risk shaping depends on the provision of quantitative liquidity and not just from the capital price. At the same time, possible intervention through open market operations may not have the desired result, if central banks do not change the expectations of protagonists regarding future policy being implemented (Eggertsson & Woodford, 2003).

In the short-term, deflationary pressures sharpen, hitting already anemic economic growth and pushing the global economy closer and closer into decline. In short, low inflation rates, as well as low bond yields, exert deflationary pressure on the economy.

In regards to Eurozone, a possible patient of such an unfavorable deflationary situation on the verge of “Japanization,” seems to primarily be Greece—with Italy coming next. This is due to persistent deflation, the demographic problem, high private debt, unattractive prices for assets and securities in international money and capital markets, the entrapment of the banking system due to a high level of non-performing loans in its portfolios, weak economic growth expected, and the excessive tendency of firms to save money. Note that the Covid-19 crisis intensified these tendencies (see next chapter).

Figure 12.1 shows the evolution of non-performing loans, with Greece presenting the biggest problem, in terms of excessive debt held by the private sector. Despite the fact that the phenomenon is in the process of de-escalation, non-performing loan levels are still high, compared to other European economies, with the exception of Cyprus.

The Greek banking system’s non-performing loans crisis, the biggest crisis to occur in the world’s developed system, arose in two phases.
The first phase related to the possession of Greek government bonds in Greek bank portfolios, included in the voluntary bond exchange program (Private Sector Investment [PSI]) in March 2012. Banks were forced to record estimated losses of around 38 billion euros due to their participation in PSI and the (reduced) valuation of new government bonds, based on current values (Bank of Greece [BoG], 2012). This raised the need for the immediate recapitalization of the Greek banking system. Up until now, the Greek banking system has absorbed 64 billion euros from successive recapitalizations. The second phase is being related to the inclusion of loans that have stopped being serviced in bank portfolios (Fig. 12.1). These are essentially the effects of a typical “Minsky moment” created by market participants (borrowers) and bank executives (lenders).

The post-Keynesian theory of “financial expansion” is relevant to the Greek economy, not via the typical “Ponzi scheme” but in the form of continual expectations for higher returns, at a time (2001–2008) of high funding for the economy and the banking system. Essentially, self-fulfilling prophecies of increasing returns led to higher leverage, often without the necessary guarantees. The sudden drop in yields then led to the non-fulfilment of borrower obligations and increasing of non-performing loans. It should be noted that the inability of households to service debt was combined with the problem of unemployment, as a result of falling demand and production.
Risks to the domestic banking system remain, as non-financial enterprises retain high levels of leverage. After a significant decrease in the third and fourth quarters of 2013, they increased again in the first quarter of 2014 (Fig. 12.2). At the same time, household deleveraging seems to have started from the first quarter of 2012 and is continually progressing.

Greece’s financial system still has a very large stockpile of non-performing loans, even when compared with Italy and Portugal. However, Greece is now a few steps away from tackling this structural challenge. The solution approved by the European Commission copies, up until a point, measures previously taken in Italy for non-performing loans. The government will provide guarantees to help banks deal with high levels of non-performing loans, but the time required to see the benefits is uncertain. The plan will accelerate the reduction of non-performing loans and boost banks’ profitability. In this context, banks will be able to reduce non-performing loans worth up to 30 billion euros, with the Greek government providing guarantees for the higher levels of securitized loans, in exchange for a fee, subject to market conditions, and therefore, based on the risk it undertakes.

Indicative of the Greek economy’s liquidity situation is the fact that total household disposable income from 2009 (Q4) to 2019 (Q2) decreased by 19%.

Fig. 12.2 Leverage levels (financial liabilities against financial assets) for non-financial enterprises and households (Source Bank of Greece [BoG, 2019] and author’s own creation)
However, the situation seems to be gradually improving as of 2016, particularly in Eurozone, possibly due to higher prices and return on assets in money and capital markets, which were mainly the result of quantitative easing (QE) from central banks (Figs. 12.3 and 12.4). The

![Graph 1](image1.png)

**Fig. 12.3** Balance sheet FED and ECB (in bn USD or euros) (*Source* Board of Governors of the FED [2020], ECB [2020], and author’s own creation)

![Graph 2](image2.png)

**Fig. 12.4** ECB monetary policy operations (*Source* ECB [2020] and author’s own creation)
Covid-19 crisis will decelerate the improvement process by two to three years.

More specifically, in Eurozone, the coordinated effort to stabilize the euro by implementing economic policies, according to the famous speech of Draghi (2012), which reassured pessimists about the euro course, the revised expansionary scope of policies (such as QE implementation) and the reduction of non-performing loans from bank portfolios contributed in helping European assets recover their attractiveness. These assets, from 1998 until 2012, presented a similar trend with assets in Japan during the period of deflation (1988–2002). Additionally, the global resurgence of economic growth, from 2014 onwards, has contributed to increasing expectations.

### 12.3 The Case of the Secular Stagnation and Investment-Less Recovery

The extended appearance of low growth rates has brought to the surface the possibility of a secular stagnation. The basic concern is that the global recession is making it very difficult to achieve full employment, given low inflation rates and zero-lower bound interest rates (Teulings & Baldwin, 2014). It is argued that low interest rates, i.e., low returns, increased levels of uncertainty, and the slow adoption of new technologies in production create fertile ground for conditions that fuel a permanent recession, i.e., continual secular stagnation (Summers, 2017).

Similar conditions have emerged at global level after the outbreak of the Great Recession of 2008. Concerns relate to the possibility that developed economies, as a whole, will continue to be particularly vulnerable in the future to secular stagnation conditions (Rachel & Summers, 2019). In recent decades, neutral real interest rates have fallen by at least 300 basis points. These secular movements mainly reflect changes in the tendency toward savings and investments rather than the safety and liquidity properties of Treasury instruments.

In this regard, the predominant assumption is that, although negative real interest rates are required to equalize savings with investments securing full employment, this is, in fact, impossible. If the existence of secular recessionary conditions is confirmed, while real interest rates are low, or even negative for a long time, traditional monetary policy instruments become inadequate (Wolff, 2014). Consequently, on the one hand, extraordinary monetary and fiscal measures currently being applied may be ineffective in dealing with the next crisis (Teulings & Baldwin,
On the other hand, these conditions may lead to the resumption of the role of fiscal policy strengthening and, consequently, the debt accumulation process (Blanchard, Furceri, & Pescatori, 2014), so that if we succeed, the growth rate will be higher than the cost of borrowing, possibly to justify the increase in public debt (Blanchard, 2019).

In the secular stagnation environment, a set of unusual features is observed in the structure of economies, which strengthen the conditions of constant economic stagnation (Krugman, 2014). In particular, the existence of extreme conditions in the money market, such as the zero interest rate threshold, has bigger effects than expected.

The secular stagnation has spread to different countries through two complementary channels (Eggertsson, Mehrotra, Singh, & Summers, 2016):

- the reduced demand from abroad and the binding zero limit, which led to an appreciation of the domestic exchange rate and pushed central banks to reduce interest rates; and
- capital flows being directed through current accounts to countries that do not face conditions of a secular stagnation.

However, this situation is pushing down real interest rates for those receiving capital inflows. However, it is argued that economic policy, in monetary terms, has exhausted the stockpiles of its arsenal, and this is something that traps central banks in their attempt to normalize the impact of economic volatility. Summers (2014) expressed the belief that low interest rates may encourage economic stagnation and create instability through three channels:

- the increased probability of taking a “sustainable” risk, which reflects the tendency of investors to seek additional returns;
- the promotion of “irresponsible” borrowing or non-repayable borrowing, as the degree of demand and weight of borrowing obligations softens, making it easier for borrowers to respond to them; and
- the increase of financial Ponzi schemes (or pyramids), given that interest rates seem low in relation to expected growth rates.

In conclusion, deflation and negative interest rates create disincentives for new investments due to low returns (see Figs. 12.1 and 12.16 below). Thus, investments in both physical (infrastructure and machinery) and
human capital (education, technical training, competences, and experience) are limited. A lack of investments causes a drop in income; prolonged disinvestment conditions and pause of new investments; and, ultimately, a reduction in savings, thus creating conditions for long-term stagnation. The Covid-19 crisis amplifies and accelerates those tendencies (see next chapter).

### 12.4 The Debt Super-Cycle and Balance Sheet Recession

Debt management is one of the most critical determinants of growth conditions development. Two fundamental issues that arise concern both the relationship between public debt and budget deficits—with current and future economic activity, and, therefore, economic growth—and the long-term management and resolution of the debt problem.

The theoretical interpretation of Reinhart and Rogoff (2010) findings that relate to the effects of debt expansion on growth, is related to the principle of “Ricardian Parity.” This principle argues that, if consumers have absolute predictability of the future and accessibility to capital markets, then any debt increase will lead to a reduction in their current consumption, because they will take into account the future burden of tax increase. In fact, the reduction in consumption will be so great that it will eliminate the benefits of expansionary fiscal policy. The rationale behind this thinking is that rational actors realize that tax substitution today is equivalent to taxes plus interest rates in the future, through government debt financing (Barro, 1974).

Adversely, Krugman (2011) stressed that the implementation of the assumption of full market efficiency is difficult to be applied in the real world, while, even in the event that assumptions for perfect links within a generation (non-distorting taxation, perfect rationality) are valid, increasing spending does not need to be permanent, as long as governments ensure that debt is increased at a rate lower than the tax base. This is how developed countries have come out of over-indebtedness in the past.

Research by Reinhart and Rogoff on the theoretical relationship between debt and growth includes a serious conceptual problem: it did not provide evidence of the causality between high debt and growth. The probability that debt will grow due to the recession, rather than being what causes it, is actually considered higher (Irons & Bivens, 2010). The
same conclusion is reached by Krugman (2013), who, while looking at the link between high debt and slow growth, cites the example of Italy and Japan saying that, “both Italy and (especially) Japan ran up high debts as a consequence of their growth slowdowns, not the other way around.”

In general, the debt problem has two sides. One concerns the formation of flows that reflect the outcome of economic policies. They are added to debt. The other relates to accumulated public debt (stocks). The debt to gross domestic product (GDP) ratio can be considered unusual, given that there are times when it is considered a crucial criterion for decision-making (small European peripheral countries) and other times when it is of negligible importance (Great Britain and Spain).

The ratio of deficit to GDP, which determines the possibility of repayment, significantly affects expectations. However, the deficit, the growth rate, and global borrowing create the so-called “snowball” effect, which changes a country’s risk profile. In particular, it describes how the ratio of public debt to GDP may increase, even when the primary deficit (budget deficit minus interest) is zero, that is, even when there is no new borrowing from the public sector. Given that debt must be serviced each year, when a country pays interest to its creditors, the rate of change in the existing debt (when there is no new borrowing) may be the same as the interest rate. Therefore, when the nominal GDP rate is less than the interest rate, then the public debt-to-GDP ratio increases (the numerator increases at a faster rate than the denominator).

Table 12.1, based on the European Commission’s (2020a) Spring forecasts, lists the debt decomposition for the Greek economy 2018–2020 showing the impact of the “snowball” effect. It can be seen that the biggest factor in debt increase in 2020 is the primary surplus and the real growth effect (see also Fig. 12.5). More particularly, the contribution of the primary deficit to the change in the gross debt ratio is expected to reach 3.4% of GDP for 2020, compared with −4.3% for 2018 and −4.4% for 2019. Regarding the real growth effect, it is expected at 9.7% of GDP for 2020, versus −3.3% and −1.9% in 2018 and 2019, respectively.

Seven years after the Great Recession (2016), all major economies continued to have higher debt levels, as a percentage of GDP, than in 2007. The evolution of public debt, as a percentage of GDP, for the Greek economy and selected countries is presented in Fig. 12.6.

Rogoff (2015) argues that debt overhang and debt accumulation issues are the main causes of what happened after the Great Recession in 2008,
Table 12.1 Debt decomposition: Greece

| (% of GDP)          | 2018     | 2019     | 2020     |
|---------------------|----------|----------|----------|
| Gross debt ratio    | 181.2    | 176.6    | 196.4    |
| Change in the ratio | 5.0      | −4.6     | 19.8     |

Contributions:
1. Primary balance: −4.3, −4.4, 3.4
2. “Snow-ball” effect: −1.0, 0.5, 13.3
   Of which:
   Interest expenditure: 3.3, 2.9, 3.0
   Real growth effect: −3.3, −1.9, 9.7
   Inflation effect: −0.9, −0.5, 0.6
3. Stock-flow adjustment: 10.3, −0.7, 3.1

Note: The snow-ball effect captures the impact of interest expenditure on accumulated debt, as well as the impact of real GDP growth and inflation on the debt ratio (through the denominator). The stock-flow adjustment includes differences in cash and accrual accounting, accumulation of financial assets and valuation and other residual effects.

Source: European Commission (2020a) and author’s own creation

Fig. 12.5 GDP growth rate, primary balance, and structural balance for Greece (Source: Oxford Economics [2020] and author’s own creation)

and that the deleveraging process could keep the risk of over-indebtedness to a sustainable level. As he states “some argue that we live in a world of inadequate demand, doomed to decades of secular stagnation.” However, the alternative possibility is that the global economy will be in the final stages of a debt super-cycle and will be crushed under the weight of a
burden that has accumulated over time through elastic regulations and financial exaggerations. When deleveraging process and over-indebtedness decline, expected growth trends may prove to be enough for economies to return to normality. But what has not been clarified is what will be the stage that will follow the phase of over-indebtedness. Will the problem “explode” with catastrophic consequences?

Beyond the amount of public debt as a percentage of GDP and its composition (Figs. 12.7 and 12.8), what is also important is that most of the debt after 2012 has been transferred to the official sector. In other words, it is proved that the amount of public debt to GDP does not play a decisive role in a mechanical way, despite the importance of who possesses the debt.

Figure 12.9 presents the evolution of public debt and the course of bond spreads (i.e., the cost of borrowing for the Greek economy) for the 2000s. Then, despite the de-escalation of borrowing rates (after 2015), debt remains at high levels.

The debt distribution and repayment path of the Greek economy show that the servicing of public debt service is covered by a cash buffer created by the primary surplus until 2022. This profile identifies two issues: The first is that under normal circumstances, debt issues can take
Fig. 12.7  The Structure of Greek public debt per creditor type as of 31-12-2018 (Source Hellenic Republic Ministry of Finance [2019] and author’s own creation)

Fig. 12.8  The structure of the Greek public debt per lender as of 31-12-2018 (Note ESM = European Stability Mechanism and BoG = Bank of Greece. Source Hellenic Republic Ministry of Finance [2019] and author’s own creation)
place if they expire by 2022. The second is that gross financial needs (GFNs), which go beyond 2022, appear to face funding difficulties (see Chapter 13, Fig. 13.14). It should be noted that this finding deviates from the widespread impression that the financing of public debt has been secured until 2030. This will be reconsidered when Greece regains an investment grade, which is placed around 2021.

The conclusions of debt sustainability have been changed under the Covid-19 effect (see next chapter).

12.5 Hysteresis and Structural Unemployment in the Greek Economy

One of the most important consequences of the Great Recession of 2008 was the change in GDP trend, in relation to the trend prior to the crisis. As a result, the debate over the issue of GDP hysteresis has begun.

The term hysteresis was first discussed in the labor market, where Blanchard and Summers (1986) argued that cyclical unemployment could become permanent, as unemployed lose part of their skills over time, resulting in a persistent cyclical shock, while high periods of high unemployment tend to increase unemployment to a rate that does
not accelerate inflation (non-accelerating inflation rate of unemployment [NAIRU]).

On the one hand, in the downward phase of the economic cycle, where the economy is in a bust, companies hold the bargaining power in determining wage levels and usually asking for fewer employees due to reduced production caused by weak demand, even completing redundancies. On the other hand, in the upward phase of the economic cycle—where the economy is booming, expanding, or overproducing—it is employees, who have the bargaining power to affect wages, as firms try to meet higher demand and increase production, intending to create jobs by hiring new employees. In short, in times of recession, employees need firms more and are therefore willing to work for the equilibrium wage in the labor market, while in times of prosperity, companies are the ones who need more the employees, so they are willing to pay them higher wages. However, as one can see, there is a hysteresis, i.e., unemployment becomes permanently high after negative shocks (Blanchard & Summers, 1986).

The issue of hysteresis is directly linked to the prevalence of high levels of structural unemployment. The composition of unemployment in Greece shows that the problem of the economy is mainly structural. Of the 805,000 unemployed in 2019, the long-term unemployed (who have been looking for work for more than 12 months) amount to 570,000, or 71% of total unemployed, according to official data from the Hellenic Statistical Authority (ELSTAT, 2019a). The hysteresis is very likely to appear again as a Covid-19 consequence (see next chapter).

At the same time (ELSTAT, 2019a), the 279,900 unemployed are young people with no work experience, 101,800 come from wholesale and retail trade, 90,600 come from accommodation and catering services, and 41,500 from the construction sector.

The problem in the Greek labor market has two sides and is located in the mismatch of workforce skills and job vacancies: in terms of demand, vacancies require skills that are not provided to new employees by the education system. On the other hand, the labor supply is overqualified for the vacancies.

Beveridge curve (Fig. 12.10) relates unemployment rates with job vacancies and highlights the structural nature of unemployment in Greece. Vertical curve movements represent circular changes in job demand: more vacancies and lower unemployment are reflected in an upward movement and fewer vacancies and higher unemployment is reflected in a downward movement. In contrast, left and right curve
movements represent structural changes. The curve’s mapping, as shown in Fig. 12.10, is complex, as there are simultaneous movements in length and shifts with different intensity. Thus, in 2009, unemployment in Greece can be characterized as circular, while from 2010 to 2013 it acquired a structural character. For the period 2013 –2017 it is characterized as circular, and acquires a structural character in the period 2017 until the first quarter of 2019.

The existence of hysteresis is at the same time the cause and effect of the reduced effectiveness of monetary and fiscal policy. Traditional analysis forecast that if there is no hysteresis in unemployment, central banks that want to reduce inflation can pursue contractionary monetary policy. If contractionary monetary policy is not fully expected, it will temporarily increase unemployment. But if this policy continues, theoretically, rising unemployment will be eventually disappeared and unemployment rates will return to normal.

The emergence of hysteresis in GDP contributes to the development of economic policies, which focuses on two key components:
• the implementation of low interest rate monetary policy (QE), the policy of front-loaded guidance, and the “money from heaven”; and
• the implementation of supply-side economics policies to boost capacity.

12.6 Economic Growth Under Conditions of Low Development, Low Investments, and Low Inflation in the Greek Economy

In recent decades, GDP growth, investments, and interest rates in developed economies have been declining at the same time. It can be argued that this situation does not come from the demand side, but from a reduction in supply, as in fact unemployment has fallen sharply in the last five years, while economic growth has been modest.

Low growth rates may be the result of a reduction in working age population \( (n) \) and labor-augmenting technological progress \( (g) \) that reduced potential output and shifted the Okun curve (a curve linking unemployment to GDP) to the left. The reduction in working age population and labor-augmenting technological progress also reduced investments in the economy. Essentially, companies are reducing their investments to prevent a sharp drop in return on capital. Central banks, from their part, ignored (Bakker, 2019) the slowdown in the growth of potential output. In Japan, in the 1990s, and in United Kingdom, Eurozone, and United States in the 2000s, they felt that the inability to grow was cyclical and that the potential growth of output remained strong.

However, it seems that expansionary monetary policy by central banks may stimulate gross investments, but not net investments or economic growth. Additionally, low interest rates will lead to an increase in the capital to output ratio \( (K/Y) \), low return on capital, and an increase in leverage.

This rejects the view that investments in developed economies are low relative to the state of the economy. Indeed, investments are lower than in the past, but this is due to the fact that the working age population and labor-augmenting technological progress have declined. A possible increase in investments, without a corresponding increase in total factor productivity \( (TFP) \) or working age population, may simply increase the \( K/Y \) ratio and further reduce return on investment. In reality, if a country with low \( n + g \) has high gross investment, it will not be driven to high
But let’s see what happened in the case of Greece. Greek economy, after the outbreak of Great Recession in 2008 and debt crisis, showed declining GDP growth rates until 2016, with the recovery being low-flying.

The reasons for Greek economic growth, before 2008 as well as the reasons for the deeper recession prior to 2016 (−25% of GDP), have been analyzed (Chodorow-Reich, Karabarbounis, & Kekre, 2019). Low external demand for tradable goods and fiscal contraction are the main reasons for the recession. For the recovery, a mix of policies increasing supply and improving demand (Ioannides & Pissarides, 2015) is required, along with shifting the equilibrium weight from nominal internal devaluation and taxes on spending to cover long-term production and consumption gains. However, these analyzes, while in the right direction, do not seem to cover the deeper requirements to analyze exit conditions from the crisis. At the same time, we see (Fig. 12.11) a shift of Okun’s curve to the left from 1991–2000 to 2008–2019.

At the same time, the gross fixed capital formation and interest rates have been declining over the last decade (Fig. 12.12).

**Fig. 12.11** Okun’s curve for the Greek economy (Source IMF [2019] and author’s own calculations and creation)
The high levels of unemployment that followed the debt crisis in the Greek economy are in a de-escalation phase without having reached pre-crisis levels (Fig. 12.13).

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**Fig. 12.12** Gross fixed capital formation* (% GDP) and real long-term interest rates (deflator GDP) (*Source* European Commission [2020b], The World Bank [2019a]*, and author’s own creation)

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**Fig. 12.13** Unemployment rate and total investments (*Source* IMF [2019] and author’s own creation)
However, the decline in unemployment was not accompanied by a similar rate of economic growth and higher investment. But if we look at what is happening with the working age population and labor-augmenting technological progress, it is possible to relate them to the reduction of potential output. The workforce has been growing steadily for many decades until the 2000s. But then there has been a decline in the working age population (Fig. 12.14), and since 2008 the brain drain has been estimated at 425,000 people.

Productivity follows a similar trend as it declines after 2008, following years of steady growth, with signs of recovery after 2016. Thus, it has returned to levels seen in the 1970s.

Businesses, for their part, reduced investments to prevent a sharp fall or to stabilize return on capital (Fig. 12.15). This is obvious if we take into consideration the relationship between the real rate of returns and private investment business (Fig. 12.16).

Private investments, without housing, i.e., the productive investments of the Greek economy, seem to be synchronized with the evolution of real returns. In particular, we note that in the period 2007–2013, the reduction in returns was combined with a disproportionately high reduction in investment. Subsequently, the slightly upward trend in returns was followed by an increase in investment.

At the same time, the capital accumulation, beyond the reduction in return on capital, is also responsible for high capital consumption, as companies are called upon to invest in maintaining the functionality of existing investments. Consequently, there is no increase in net investment, but an increase in gross investment due to high depreciation (Fig. 12.17).

In summary, the output gap of the Greek economy, while it seems like it is declining, remains at a high level, with the main determining factors being reduced potential output, working age population, and labor-augmenting technological progress, contributing to the brain drain and associated with low population expansion. At the same time, the output gap is affected by low active demand, as the ten-year recession has left deep signs which are not covered by exports.

Essentially, the Greek economy has been declining in recent decades, both in terms of the number of capable people in the workforce and in terms of labor-augmenting technological progress (Fig. 12.18). These two factors, together with the fiscal contraction that followed the policy of internal devaluation, are capable of interpreting low growth rates and weak flight of the Greek economy’s potential output after 2008. Under
these circumstances, it is clear that policies that release supply-side factors are expected to play a stable role in recovery along with demand policies that will shrink the output gap.
Fig. 12.15  Rate of return on capital and capital stock in the Greek economy (1950–2017)  

(*Note*)  Rate of return on capital is based on the variable “real interest rate of return on capital” [IRR]. Capital stock provide the accumulation of capital for 4 assets structures [including residential and non-residential], machinery [including computers, communication equipment and other machinery].  

*Source* Feenstra, Inklaa, and Timmer [2015] and author’s own creation

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Fig. 12.16  Rate of return on capital and private investments* in the Greek economy  

(*Note*)  Rate of return on capital is based on the variable “real interest rate of return on capital” [IRR].  

*Source* Feenstra et al. [2015], Oxford Economics [2019], and author’s own creation
Fig. 12.17  Annual change in investment and rate of capital depreciation: 1981–2019 (Source Feenstra et al. [2015] and author’s own creation)

Fig. 12.18  Output gap, potential output, and labor augmenting technological progress* (Note Labor Augmenting Technological Progress is determined by the active population [15–64 years old] and the UN’s Education Index. Potential gross domestic product at 2015 reference levels [euro]. Gap between actual and potential gross domestic product at 2015 reference levels [percentage of potential GDP]. Source European Commission [2020b], Statistical Office of the European Communities [2020]*, United Nations [UN] Development Programme [2020]*, and author’s own calculations)
Note
1. According to Summers (2013), we may well need, in the years ahead, to think about how we manage an economy in which the zero nominal interest rate is a chronic and systemic inhibitor of economic activity holding our economies back below their potential.

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