

## Greece's Convergence to EU Standards: Is It Feasible for Greece to Attain an Unemployment Rate Below 10%?

Panagiotis Liargovas<sup>1,2</sup>, Georgios Bertatsos<sup>1,3</sup>, George Agiomirgianakis<sup>4,5\*</sup>, and George Sfakianakis<sup>5,6,7</sup>

<sup>1</sup>Centre of Planning and Economic Research, Athens, Greece

<sup>2</sup>University of Peloponnese, Tripoli, Greece

<sup>3</sup>Gulf One Lab for Computational & Economic Research, U.K.

<sup>4</sup>Hellenic Mediterranean University, Heraklion, Greece

<sup>5</sup>Hellenic Open University, Patras, Greece

<sup>6</sup>National and Kapodistrian University of Athens, Athens, Greece

<sup>7</sup>Hellenic Scientific Institute on the Economics of Education & Life-Long Learning, Research, and Innovation, Athens, Greece

**Abstract** Given the theory of efficient unemployment and using Eurostat data, it turns out that the average annual unemployment in Greece over the last -at least- 15 years has been consistently below 10% when job vacancies are considered. Given that based on cumulative data for the period 2010-2022 job vacancies are estimated to be between 98 thousand and 123 thousand, we argue that an appropriate indicator for the degree of slackness/tightness of the Greek labor market should combine both unemployed persons and job vacancies. That is, the  $u^*$  indicator of the full-employment rate of unemployment (FERU). Our analysis shows that if the positive trends of the declining unemployment rate and increasing job vacancy rate continue, a full-employment state could be reached even in the next 3.5 years converging to EU standards.

**Keywords:** Labor Market, Unemployment, Vacancies, Greece

*JEL Classifications:* E24, E61, J63, J64, O52

Received 6 November 2024, Revised 9 March 2025, Accepted 10 March 2025

**+Corresponding Author:** George Agiomirgianakis

Hellenic Mediterranean University, Department of Accounting and Finance, Estavromenos, GR 71404, Heraklion, Greece; Hellenic Open University, School of Social Sciences, Parodos Aristotelous 18, GR 26335, Perivola, Patras, Greece. E-mail: [georgeagios@hmu.gr](mailto:georgeagios@hmu.gr)

**Co-Author:** Panagiotis Liargovas

Centre of Planning and Economic Research, 11 Amerikis Str., GR 10672, Athens, Greece; University of Peloponnese, Department of Management Science and Technology, 70 Karaiskaki Str., GR 22100, Tripoli, Greece. E-mail: [liargova@uop.gr](mailto:liargova@uop.gr)

**Co-Author:** Georgios Bertatsos

Centre of Planning and Economic Research, 11 Amerikis Str., GR 10672, Athens, Greece; Gulf One Lab for Computational & Economic Research, Lancaster University Management School, UK. E-mail: [gbertatsos@kepe.gr](mailto:gbertatsos@kepe.gr)

**Co-Author:** George Sfakianakis

National and Kapodistrian University of Athens, Department of Business Administration, 1 Sofokleous Str., GR 10559, Athens, Greece; Hellenic Open University, Parodos Aristotelous 18, Perivola, Patras, GR 26335, Greece; Hellenic Scientific Institute on the Economics of Education & Life-Long Learning, Research and Innovation, Athens, Greece. E-mail: [gfsak@ba.uoa.gr](mailto:gfsak@ba.uoa.gr)

**Conflict of Interest Statement:** We declare no conflict of interest. Opinions expressed in this paper do not necessarily represent the position of the institutions with which we are affiliated.

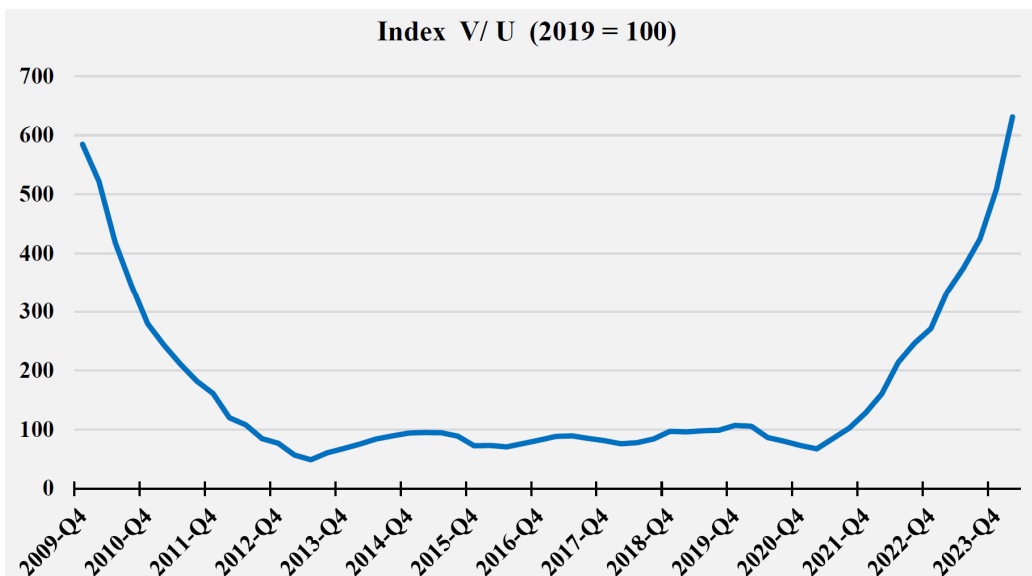
## I. Motivation

Several economic analyses, studies by academic/research institutions, banks and reports in financial websites argue that the labor market in Greece has been tight lately (see indicatively, Figure 1.6 on page 27 in OECD, 2024). This is a valid argument on the one hand, but incomplete on the other hand, as we will show below in our analysis.

## II. Unemployment and Job Vacancies

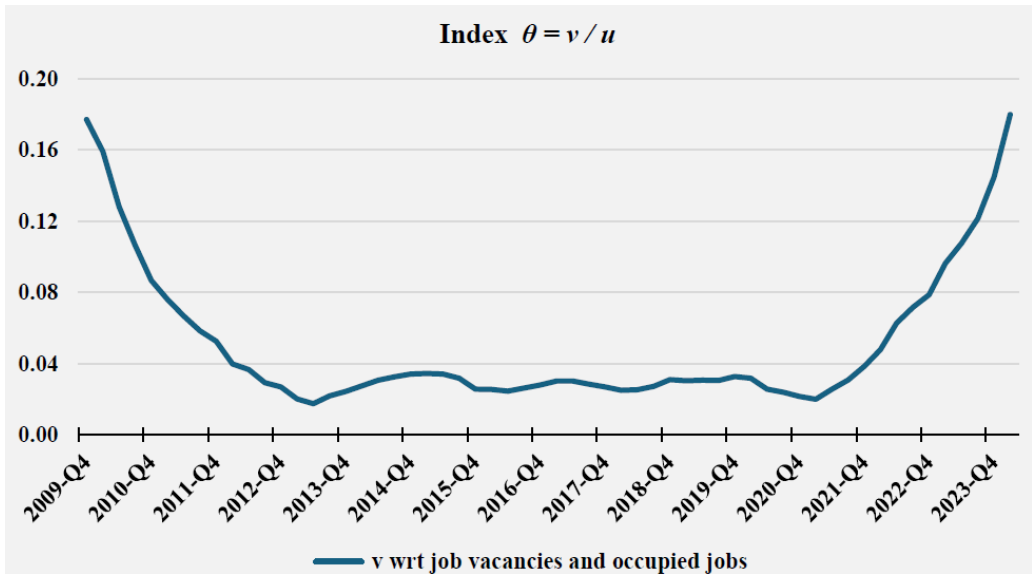
Figure 1 shows the index of the annualized job vacancies per annualized unemployed persons (henceforth average job vacancies per unemployed) on a rolling 4-quarter basis, taking the value of 100 in 2019.<sup>1)</sup> Based on this index, it is revealed that the average job vacancies per unemployed was 631.2 in 2024:Q1, surpassing the previous historical high of almost 584.7 average job vacancies per unemployed in 2009.

**Figure 1.** Average job vacancies per unemployed person (2009 = 100), 2009:Q4 - 2024:Q1



(Source) Eurostat - Authors' calculations. Unemployed workers are aged 15-74, and vacancies are in the industry, construction and services sectors.

1) In what follows capital letters denote absolute numbers and small letters denote percentages.

**Figure 2.** Job vacancy rate to unemployment rate, 2009:Q4 - 2024:Q1

(Source) Eurostat - Authors' calculations. The index  $\theta$  shown is equal to the ratio of job vacancy rate ( $v$ ) to the unemployment rate ( $u$ ). The job vacancy rate is equal to the annualized job vacancies to the sum of the annualized occupied and vacant jobs, on a rolling 4-quarter basis. The unemployment rate is calculated as the ratio of the annualized unemployed persons to the annualized labor force, i.e. the sum of the annualized number of unemployed and employed persons, on a rolling 4-quarter basis.

Based on Figure 2, it similarly emerges that the ratio of the annualized job vacancy rate to the annualized unemployment rate has been rising steadily since early 2021, reaching a value of 0.180 in 2024:Q1, surpassing the previous historical high of 0.177 in 2009:Q4. Both indicators (in Figures 1 and 2) are indeed rising, indicating that the Greek labor market is becoming relatively tighter.

### A. Box 1: Indicators measuring labor market tightness

The indicators used in the relevant literature (see, for example, Heise et al, 2024; Theofilakou and Vasardani, 2024; Domash and Summers, 2022; Michailat and Saez, 2024; Andolfatto and Birinci, 2022) to estimate how tight the labor market under consideration is, are usually two: (a) vacancies per unemployed  $V/U$  and (b) vacancy ratio-to-unemployment ratio ( $\theta = v/u$ ).

Andolfatto and Birinci (2022), and Domash and Summers (2022), present monthly job vacancies per unemployed person in the US for the period 2000-2021 and 1960-2021, respectively, concluding that a historical high was reached in late 2021. Andolfatto and Birinci (2022) express concerns about the extent to which the index vacancy per unemployed ( $V/U$ ) is a representative indicator of the labor market tightness, and conclude (as do Blanchflower

et al., 2024) that the US labor market is not as tight as other analysts believe: see for example Domash and Summers (2022), who argue that the US labor market is extremely tight. The main argument of Andolfatto and Birinci (2022) is: if indeed the US labor market was so tight, why do real wages appear to be falling while at the same time, firm profit margins appear to be rising? This is not consistent with a tight labor market.

Theofilakou and Vasardani (2024) state that the higher the values of the more complex vacancy-to-unemployment ratio, the higher the labor demand relative to the labor supply and thus, the tighter the labor market is considered to be. They also report (1) that a broad indicator of labor market tightness is that of excess labor demand, and (2) that the tightness in the labor markets of many advanced economies is due, in addition to other factors, to increases in labor demand and decreases in labor supply (either individually or combined). Focusing on Greece, they find that the tightness of the Greek labor market in 2022-2023 relative to 2019 is due to a significant increase in the labor demand and a slight decrease in the labor supply (see *Chart 5* in their analysis), while for the US and the Euro 19 (EA19) for the same period, the tightness is due to a relatively larger increase in the labor demand relative to the labor supply.

Heise et al. (2024) show for the US that there is a strong correlation between the rate of wage changes and the degree of labor market tightness (they use the vacancy ratio-to-unemployment ratio, as well as other alternative indicators), whilst they find that the percentage change in productivity does not seem to affect the percentage change in wages.

Finally, Michailat and Saez (2024) examine the (*i*) vacancy ratio-to-unemployment ratio, with quarterly averages of monthly values, for the US over the period 1930-2024. What differentiates their study is the theoretical foundation that values greater (less) than unity in the  $\theta$  index indicate a tight (slack) labor market. They rely on the efficient unemployment theory and it emerges for the US that the labor market is tight from mid-2021 to the end of their sample under consideration, i.e. 2024:Q2. Furthermore, they argue that if the index  $\theta$  equals unity, then the labor market is efficient and the economy under consideration is at full employment.

### III. Calculating the Efficient Unemployment in Greece

The first to talk about the so-called efficient unemployment, i.e. the unemployment that takes into account job vacancies, are Michailat and Saez (2021, 2022, 2024), who focus on the US labor market. In a recent paper Michailat and Saez (2024) call it the full-employment rate of unemployment (FERU),  $u^*$ , as the appropriate indicator of full employment, which they suggest that policymakers of the respective governments should monitor to stabilize their

country's economy at full employment. Indeed, Michaillat and Saez (2022) developed the notion of "the efficient unemployment rate" building their approach on the foundational ideas of matching theory, which explains the interaction between job seekers and employers in the labor market. This theory is based on the idea that unemployment and job vacancies coexist because it takes time and resources for workers and firms to find suitable matches. This interaction captured by the matching function, describes how unemployed workers and job vacancies are paired together, depending on factors, like search effort and market frictions. These factors prevent instantaneous employment and in turn, they are influenced by job creation and job destruction dynamics, as well as the role of wages in clearing the labor market. In a more recent paper, Michaillat and Saez (2024) extended further the matching theory by focusing on the macro-level efficiency in unemployment. They developed a framework to measure and explain how unemployment may be socially optimal under certain conditions. They claim that there is no guarantee that NAIRU (non-accelerating rate of inflation) is the efficient level of unemployment. By defining full employment as a socially efficient allocation of labor, they propose instead a new tool of targeting for policymakers, the notion of FERU as the geometric average of the unemployment rate,  $u$ , and job vacancy rate,  $v$  :  $u^* = \sqrt{uv}$ .

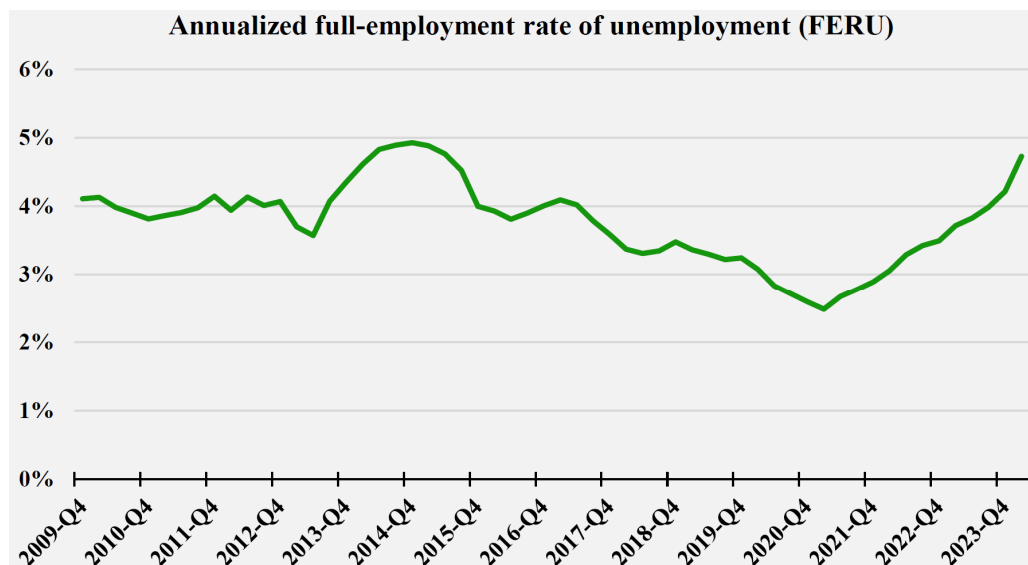
The key issues of their approach are (a) they argue that the most appropriate economic translation of the legal notion of full employment is social efficiency; (b) they consider labour market tightness, defined as the ratio of job vacancies to unemployed workers, arguing that the optimal level of unemployment depends on this tightness, balancing the costs of unemployment against the costs of recruiting; (c) they state that inefficient unemployment arises when tightness deviates from its socially optimal level.

Moving along these lines Agiomirgianakis, Bertatos and Sfakianakis (2023), estimate efficient unemployment rates in several European countries and examine whether their labor markets are classified into one of three categories: efficient, slack or tight. In a subsequent seminal paper, Michaillat (2023), studying the displacement of native workers by migrants, links the labor market type to migration flows.

The Greek labor market has indeed been comparatively tighter recently than in other periods (see Figures 1 and 2), but it has always been and remains slack, as we will show below. This follows from the theory of efficient unemployment, i.e. unemployment that takes into account job vacancies, following Michaillat and Saez (2024). Particularly, FERU, denoted  $u^*$ , is equal to the geometric mean of the unemployment rate and the job vacancy rate. In our analysis, the unemployment rate is calculated as the ratio of the annualized number of unemployed persons to the annualized labor force (i.e. the sum of the annualized number of unemployed and employed persons), on a rolling 4-quarter basis. The job vacancy rate, which is another indicator of labor market tightness, is equal to the annualized job vacancies divided by the sum of the annualized number of occupied and vacant jobs, on a rolling 4-quarter rolling

basis. Figure 3 shows that the annualized FERU in Greece for the period 2009:Q4 - 2024:Q1 was around 3.8%. The annual average FERU received its lowest value in 2021:Q1 (2.48%) and its highest value in 2014:Q4 (4.93%), while it was 4.22% in 2023.

**Figure 3.** Annualized full-employment rate of unemployment (FERU), 2009:Q4 - 2024:Q1

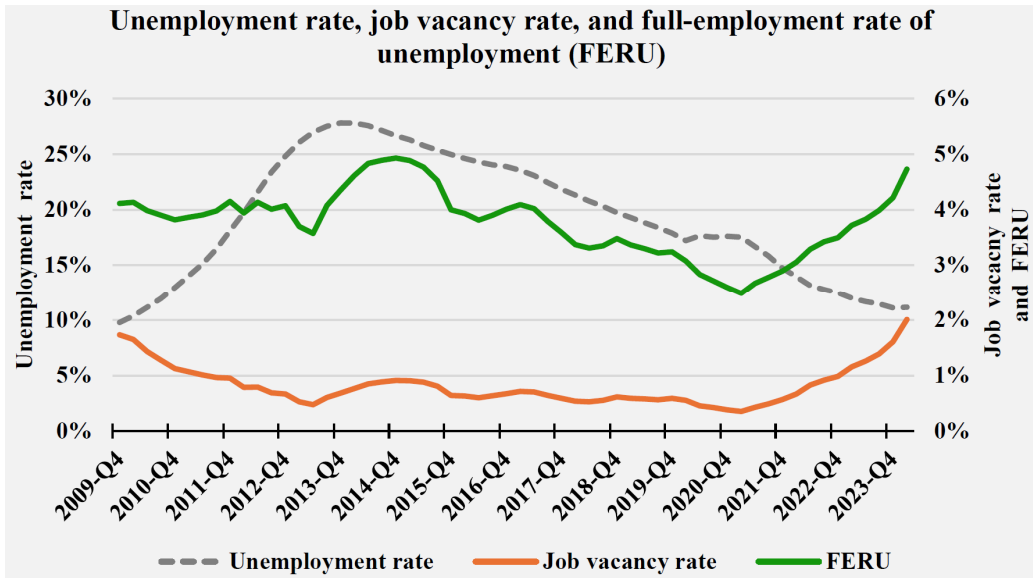


(Source) Eurostat - Authors' calculations. The full-employment rate of unemployment (FERU) is equal to the geometric mean of the unemployment rate and the job vacancy rate. The job vacancy rate is equal to the annualized job vacancies to the sum of the annualized occupied and vacant jobs, on a rolling 4-quarter basis. The unemployment rate is calculated as the ratio of the annualized unemployed persons to the annualized labor force, i.e. the sum of the annualized number of unemployed and employed persons, on a rolling 4-quarter basis.

Figure 4 depicts the whole picture contrasting (a) the annualized unemployment rates, (b) the annualized job vacancy rates and (c) the annualized full-employment rates of unemployment .<sup>2)</sup> As an illustration, on a rolling 4-quarter basis, for the 1<sup>o</sup> quarter of 2024, the average annual unemployment rate is assigned a value of 11.15%<sup>3)</sup>, the average annual job vacancy rate is assigned a value of 2.01%, and the average FERU is assigned a value of 4.73%.

2) Regarding the vacancy rate, it can be calculated as the ratio of job vacancies to the labor force (i.e. the employed plus the unemployed persons) as done by Blanchard et al. (2022), Michailat and Saez (2024), or to the sum of occupied and vacant jobs (see Agiomirgianakis et al., 2023, and Eurostat). Moreover, it could be calculated as the labor demand, i.e. employed persons plus job vacancies, as done by the National Skills Commission of Australia (National Skills Commission, 2021, Chapter 5). Therefore, three FERU indicators could be calculated, i.e. one indicator for each job vacancy rate. This analysis adopts the definition in terms of the occupied posts and job vacancies, however, if the other two measures are applied, the results remain qualitatively robust.

3) Although there is a non-trivial discrepancy in the number of unemployed persons between the ELSTAT and DYPA (former OAED), in this paper we rely on Eurostat statistics.

**Figure 4.** Unemployment, job vacancy and FERU rates, 2009:Q4 - 2024:Q1

(Source) Eurostat - Authors' calculations. The full-employment rate of unemployment (FERU) is equal to the geometric mean of the unemployment rate and the job vacancy rate. The job vacancy rate is equal to the annualized job vacancies to the sum of the annualized occupied and vacant jobs, on a rolling 4-quarter basis. The unemployment rate is calculated as the ratio of the annualized unemployed persons to the annualized labor force, i.e. the sum of the annualized number of unemployed and employed persons, on a rolling 4-quarter basis.

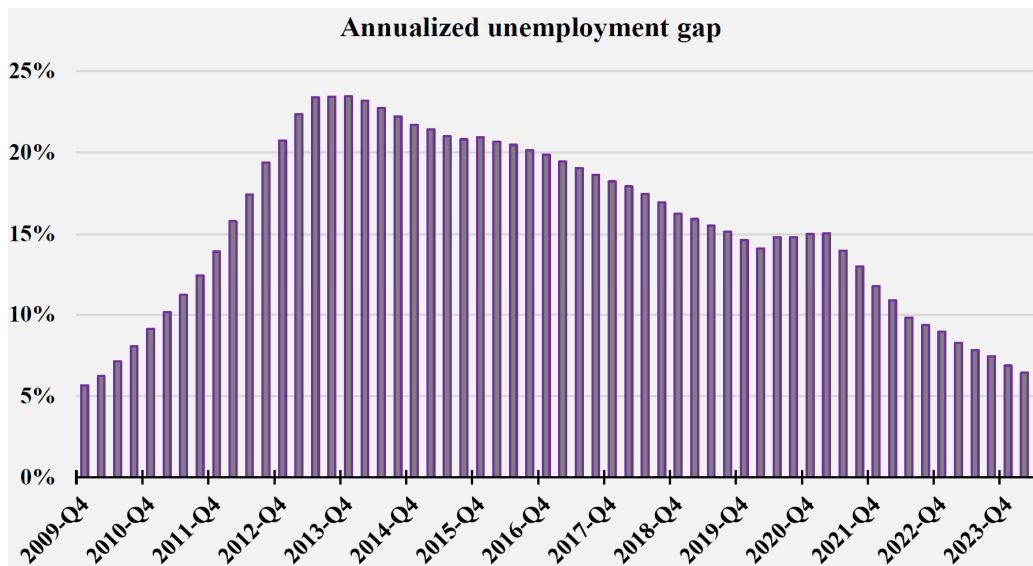
According to Michailat and Saez (2024), when the unemployment rate exceeds the job vacancy rate, or when unemployment is greater than FERU, then the labor market under consideration is inefficiently slack. However, when the unemployment rate is less than the job vacancy rate, or when unemployment is less than FERU, then the examined labor market is inefficiently tight. Finally, when the unemployment rate is equal to that of vacancies, or when unemployment is equal to FERU, then the labor market is considered to be an efficient labor market and the economy is at full employment.<sup>4)</sup> FERU appears to be the most appropriate indicator of full employment and is the socially desirable level of unemployment (Michailat and Saez, 2024), as it minimizes the nonproductive use of labor in the labor market (alternatively, it minimizes the waste of resources from unemployment and job vacancies).<sup>5)</sup>

4) The concept of full employment is linked to the NAIUR (non-accelerating inflation rate of unemployment), which is the theoretical unemployment rate where the economy is at full employment. When the unemployment rate is above the NAIUR, a downward pressure in inflation and the rate of change in wages is expected. However, when the unemployment rate is below the NAIUR, then the labor market is considered tight and upward pressure on prices and wages are expected (Cusbert, 2017). However, there is criticism of the practical usefulness of the NAIUR (see, for example, McAdam and Mc Morrow, 1999; Cusbert, 2017), as its estimates are noisy and confidence intervals are large, and in addition, its calculation does not explicitly include job vacancies. Therefore, in this analysis we do not include the NAIUR (as provided, for example, by the AMECO database) measurement.

5) Because of the Beveridge curve, according to which the job vacancy rate and the unemployment rate are inversely

When the unemployment gap, i.e. the deviation from FERU, is positive, then the labor market is considered to be inefficiently slack, and it is more difficult for the worker to find a job. But when the gap is negative, then the labor market is considered tight, and it is more difficult for the employer to find workers. Moreover, in the case of a zero gap, then the economy is at full employment (efficient labor market). In Figure 5 one can observe that the unemployment gap in the Greek labor market remains consistently positive, taking its maximum value in 2013 at around 23.46% and its minimum in 2009 at 5.66%. The latest available values of this gap refer to 2023 at 6.87% and 1<sup>o</sup> quarter of 2024 at 6.42%. In conclusion, it emerges that [1] the labor market in Greece was and is slack, but showing in recent quarters a trend of decreasing slackness (see also Antonopoulos et al., 2022), and [2] the Greek economy was and is far from full employment status.

Figure 5. Annualized unemployment gap, 2009:Q4 - 2024:Q1



(Source) Eurostat - Authors' calculations. The annualized unemployment gap is defined as the deviation of unemployment from the full-employment rate of unemployment (FERU). FERU is equal to the geometric mean of the unemployment rate and the job vacancy rate. The job vacancy rate is equal to the average annual job vacancies divided by the sum of the average annual occupied and vacant jobs on a rolling 4-quarter rolling basis. The unemployment rate is calculated as the ratio of the average annual unemployed to the average annual labor force, i.e. the sum of the average annual number of unemployed and employed persons, on a rolling 4-quarter basis.

Since 2014 the annualized unemployment rate decreases by about 0.40% per quarter and by mid-2021 the annualized job vacancy rate increased by almost 0.14%. It can be concluded that in the hypothetical scenario, where the above quarterly rates of change/convergence (towards

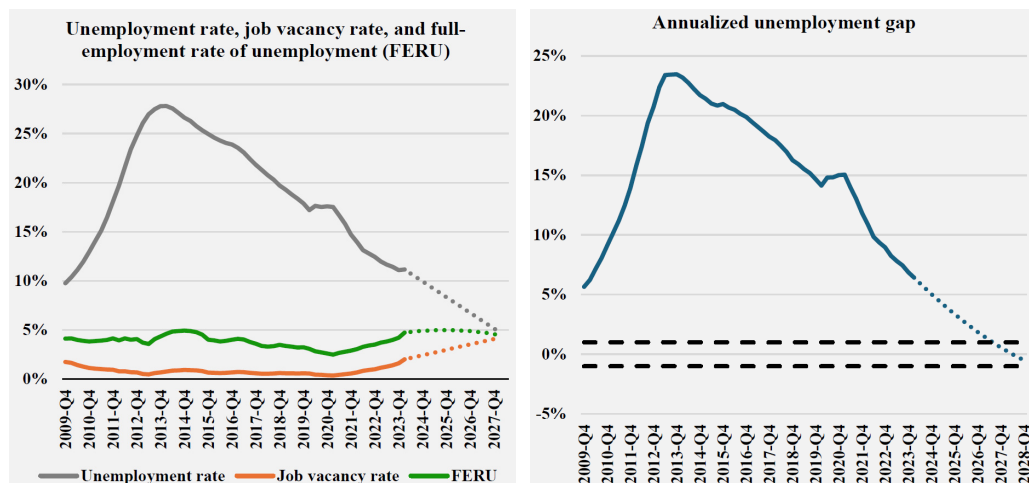
---

related, it is impossible to reduce unemployment and job vacancy rates at the same time. Therefore, the social planner has to trade-off between reducing unemployment and job vacancy rates.



efficiency/full employment) are maintained, it would take at least 3.5 years from 2024:Q1 (i.e. towards the end of 2027) for the labor market to be classified as efficient and the Greek economy would approach full employment (see Figure 6). In such a case, unemployment, job vacancy, and FERU would hover around 4.5%.<sup>6)</sup>

**Figure 6.** A hypothetical scenario of convergence of the unemployment, job vacancy, and FERU rates, 2009:Q4 - 2024:Q1



Source: Eurostat - Authors' calculations. The annualized unemployment gap is defined as the deviation of unemployment from the full-employment rate of unemployment (FERU). FERU is equal to the geometric mean of the unemployment rate and the job vacancy rate. The job vacancy rate is equal to the average annual job vacancies divided by the sum of the average annual occupied and vacant jobs on a rolling 4-quarter basis. The unemployment rate is calculated as the ratio of the average annual unemployed to the average annual labor force, i.e. the sum of the average annual number of unemployed and employed persons, on a rolling 4-quarter basis.

As already mentioned, the labor market in Greece is slack, but this is not a Greek novelty amongst European countries. Most European labor markets appear to be persistently slack over time, the Czech Republic seems to be the only European "country exception" with a tight labor market in the period 2018-2022, while some North-Central countries (Germany, Norway, the Netherlands, Hungary) tend to have efficient labor markets for certain periods of time, notably Germany in 2016-2022 and the Netherlands in 2018-2022 (see Agiomirgianakis et al., 2023).

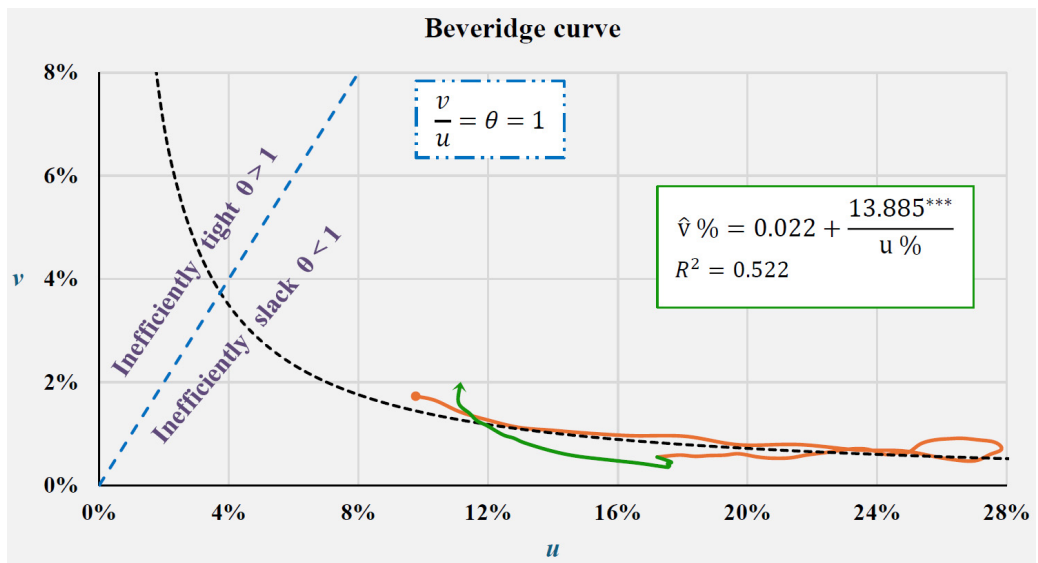
In addition, Agiomirgianakis et al. (2023) highlight the strong phenomenon of mismatch between the qualifications demanded by employers and those possessed by employees in Greece and suggest various policy proposals to achieve labor market efficiency and close the unemployment gap. That is, proposals to reduce unemployment and increase the job vacancy rate. Furthermore,

6) One of Greece's many memorandum commitments was a freeze on pay increases (the so-called "triennials") in the private sector until the unemployment rate falls below 10%. The suspension of wage increases was lifted as of 01.01.2024, but as of 01.01.2027, if the annual unemployment of the previous year exceeds 10%, then the aforementioned suspension is automatically suspended (see Law 5053/2023, Part E, Article 33).

it is also suggested that labor market reforms should be taken, such as supporting maternity (e.g. with supportive measures for families in terms of child-care and elderly care) will increase the female employment rate and at the same time alleviate the demographic problems in Greece. However, as newcomer women in the labor force increase initially the overall unemployment rate, ambiguous results may arise in the medium-to-long run depending upon the absorption rate and skills matching of women in the labor market. Hence, these policies that promote women participation in the labor market could be beneficial and vital for other reasons (such as gender equality) at the cost of a higher unemployment rate, probably requiring policy measures targeting the absorption rate and skills matching of women in the labor market (e.g. technical education and vocational training).<sup>7)</sup> Therefore, the unemployment gap in absolute terms -given a constant job vacancy rate in the short term- may initially widen (narrow) in the case of an inefficiently slack (tight) labor market.

In Figure 7 below we present for Greece the "Beveridge curve" for the period 2009:Q4 - 2024:Q1, which predicts an inverse relationship between the job vacancy rate and the unemployment rate (see black theoretical line).

Figure 7. Beveridge curve (2009:Q4 - 2024:Q1)



(Source) Eurostat - Authors' calculations. The job vacancy rate is equal to the annualized job vacancies to the sum of the annualized occupied and vacant jobs, on a rolling 4-quarter basis. The unemployment rate is calculated as the ratio of the annualized unemployed persons to the annualized labor force, i.e. the sum of the annualized number of unemployed and employed persons, on a rolling 4-quarter basis. The orange line refers to observations in the time period 2009:Q4 - 2019:Q4 and the green line refers to observations for the time period 2020:Q1 - 2024:Q1. The blue line is the efficient frontier, where the index  $\theta = v/u = 1$ .\*\*\* denote statistical significance at the 1% significance level with a covariance matrix for autocorrelation and heteroskedasticity (HAC).

7) We thank an anonymous referee for this comment.

The orange line in Figure 7 is the observations in the period 2009:Q4 - 2019:Q4 and the green line is the data in the period 2020:Q1 - 2024:Q1. One observes that there is a negative correlation between the job vacancy rate and the unemployment rate in the period 2009-2024, exactly as predicted by the black theoretical line of the Beveridge curve. Moreover, it appears that the Greek labor market is far from the efficient frontier  $\theta = 1$  (see the blue line in Figure 7), as the index  $\theta$  has increased considerably since 2020, but equals only 0.18 (see also Figure 2) in 2024:Q1.

#### IV. Economic Crisis, Brain Drain, and Migration Flows

At this point it would be nice to refer to migratory flows and their impact on FERU. This is because during the years of the Greek debt crisis and memoranda of understanding that led to internal devaluation through a reduction in real wages, Greece experienced a brain drain that led about half a million young and skilled scientists to leave the country in the period 2010-2019 (Pratsinakis, 2022). This was the phenomenon of brain drain. The wave of migration of Greeks working in Greece abroad (e.g. due to better employment prospects and wages) creates labor gaps and thus, makes the labor market tighter. However, as we have mentioned above the Greek labor market, and many European labor markets are slack, not tight, according to the efficient unemployment theory. So, this brain drain may have led to a tighter labor market, but the Greek labor market has remained, and remains, basically slack. On the other hand, we often see vacancies reported in various sectors of the economy, e.g. in manufacturing, construction, tourism, agri-food and health care.<sup>8)</sup>

According to ELSTAT, job vacancies amounted to 70,826 in the first quarter of 2024 and decreased in the second quarter of 2024 to 58,941 (see Figure 8).

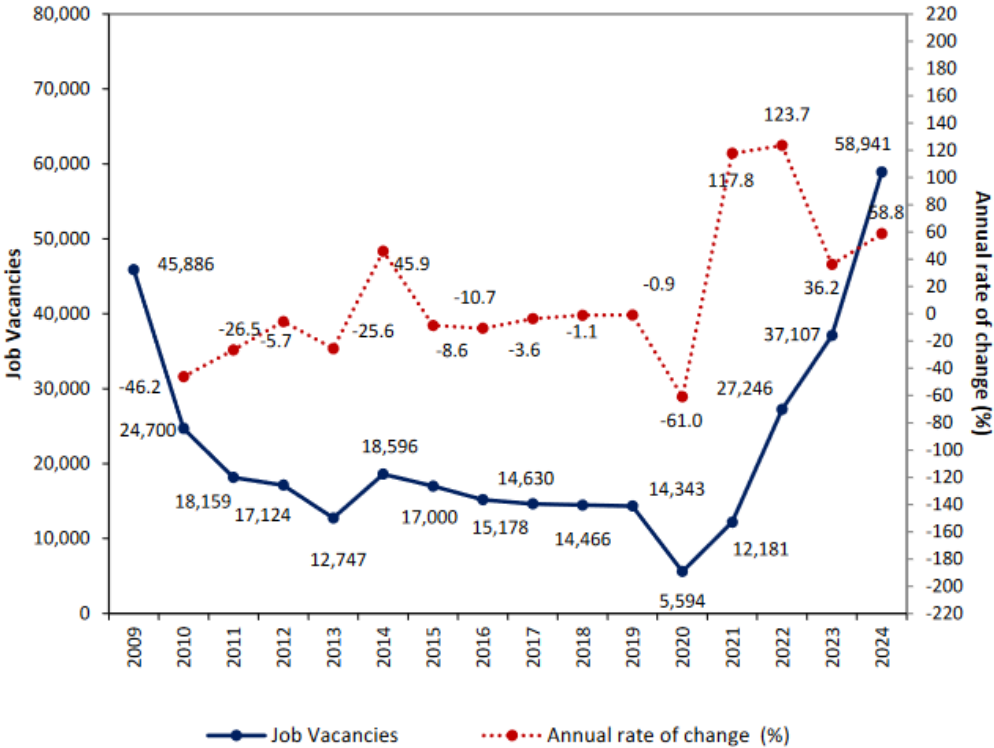
However, the actual vacancies may be underestimated. This is because if, as newer research and publications (Eurobank, 2023, Kathimerini, 2024) indicate, 600 thousand Greeks did indeed emigrate abroad in the period 2010-2021 and about 350 thousand have already returned (Eurobank, 2023), then there is a cumulative migration outflow of 250 thousand Greeks. Overall (and not only for Greeks), based on the available Eurostat data for the period 2010-2022<sup>9)</sup>, migration outflows from Greece amounted to 1.258 million and migration inflows to Greece were respectively 1.076 million. Therefore, cumulatively, there is a net migration outflow of about 181.8 thousand for Greece in the period 2010-2022, creating a gap between 98 thousand

8) See for example <https://www.bankofgreece.gr/enimerosi/grafeio-typoy/anazhthsh-enhmerwsewn/enhmerwseis?announcement=474ccb8f-e88b-4b82-8a04-02535100ede6>

9) See [https://ec.europa.eu/eurostat/databrowser/view/migr\\_imm2ctz\\_\\_custom\\_12984168/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/migr_imm2ctz__custom_12984168/default/table?lang=en) and [https://ec.europa.eu/eurostat/databrowser/view/migr\\_emilctz\\_\\_custom\\_12984189/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/migr_emilctz__custom_12984189/default/table?lang=en).

and 123 thousand job vacancies.<sup>10)</sup> Therefore, it is suggested in Greece that a policy in favor of migration inflows from non-European countries should be pursued. The potential substitution of highly educated human resources, such as Greeks who have emigrated abroad, with an influx of migrants from countries such as Egypt, Pakistan and India could be potentially ineffective both in general and much more so in the service sector (e.g. tourism, health).<sup>11)12)</sup>

Figure 8. Job vacancies in Greece, 2<sup>nd</sup> quarter



The number of Job Vacancies refers to the Job Vacancies to be filled in immediately, that is job vacancies, which are to be filled in within a period not longer than three months and also refers to sections B-S of statistical classification of economic activities NACE Rev. 2. Job vacancies are recorded on the first day of the third month of each calendar quarter

Source: ELSTAT, Job Vacancies Survey.

10) The annual participation rate of workers aged 25-54 as a percentage of the corresponding age group of the population in Greece averages almost 67.5% for the period 2010-2022 in Greece, based on Eurostat data. For the 15-64 (20-64) age group, the corresponding historical average is approximately equal to 53.8% (58.3%). Therefore, given the net migration outflow of 181.8 thousand for Greece and based on the above percentages, the potentially implied estimated job vacancies are between almost 98 thousand and 123 thousand.

11) Employing data by diaNEOsis (2024, see figure about employment of persons with foreign citizenship 2011-2023), it turns out that, on average per year, about 140 thousand persons with foreign citizenship in Greece are employed in the tertiary/third sector comprising almost 60% of total persons with foreign citizenship. The rest 12% (29 thousand) and 28% (66 thousand) of them are employed in the primary and secondary sector.

12) Regarding the net migration flows in Greece and their linkage to the public sector corruption and other governance indicators, see Agiomirgianakis, Bertatos and Sfakianakis (2024).

Regarding the link between migration flows and the type of labor market, according to Michailat (2023), a policy of encouraging migration inflows is appropriate in the case of a tight labor market. This is because a wave of immigration increases the labor supply (there are more available workers) and not the labor demand. This leads to a less tight labor market, thus closing the negative unemployment gap. Also, Michailat (2023) shows that when the labor market is tight (slack), then social welfare for natives improves (decreases) after an increase in immigration, while when the labor market is efficient, then an inflow of migrants has no impact on the social welfare of natives. Moreover, migrant inflows could be reduced when the labor market is slack, to protect local workers who are already struggling to find work and to increase their social welfare. For more on the above, see Michailat (2023).

Therefore, the possible encouragement of a massive influx of migrants to solve the labor shortage by the Greek authorities is destined to be a highly questionable move from the perspective of the domestic population, as the labor market in Greece is persistently slack. Such a policy could be likened to throwing "fuel on the fire", worsening the situation and job prospects for locals (there will be fewer vacancies per Greek unemployed person). In addition, there are potentially increased risks of deterioration of both the services provided (e.g. in tourism and food) by the presumed low specialization of *guest workers*<sup>13</sup>, and in terms of social cohesion in the Greek territory, especially if the accelerating geopolitical instability and military tensions in the Middle East are taken into account (see e.g. Iran, Israel, Lebanon, Palestine, Yemen) which always tend to increase migration inflows to Greece. On the other hand, of course, as Michailat (2023) points out, in the light of *unequal and capitalist regimes* that are exclusively concerned about the welfare of firms, the influx of immigrants is in any case a welcome policy as it tends to improve the profits of domestic firms, especially when it comes to lower-paid immigrants.

## A. Box 2: Germany and the closure of its borders

What could be said regarding Germany and the recent closure of its borders with the tightening of border controls is the following: The German labor market since mid-2017 enjoys an annualized unemployment gap in the range of  $\pm 50$  basis points, while from mid-2022 to early 2024, the annualized unemployment gap takes negative values close to -50 basis points. Alternatively, based on the  $\pm 50$  basis point range (see Agiomirgianakis et al., 2023), this implies that the German economy is tending towards full employment and that the German labor market has been approaching efficiency over the last 6-7 years. Moreover, according to Michailat (2023), the inflow of migrants has no impact on the social welfare of natives when the labor

---

13) Guest workers are presumably employed in low-paid jobs (see Ruhs, 2006; Costa and Martin, 2018) and it appears that migrants are paid less than native workers (see Ottaviano and Peri, 2008).

market is efficient, as mentioned above. Therefore, the decision by the current German government to close the border and reintroduce the issue of returning migrants to the countries of first reception was apparently intended, possibly exclusively, for political reasons aiming at limiting the electoral potential of the political party of the Alternative for Germany (AfD).

## V. Conclusions

To summarize, our analysis, using Eurostat data (from 2009 to 2024), shows that while the Greek labor market has become tighter recently, however, it remains persistently slack across the whole sample. In this paper, we used FERU, i.e. the full-employment rate of unemployment that takes into account the job vacancies. According to this approach, FERU falls short of the usual and more widely accepted unemployment rate (there is a positive unemployment gap), which characterizes the Greek labor market as slack and reveals that the Greek economy is far from full employment. However, if the positive trends of the declining unemployment rate and increasing job vacancy rate continue, full employment could be reached even in the next 3.5 years, and the unemployment, job vacancy and FERU rates would hover around 4.5% converging to EU standards (see e.g. Palpant, 2006). To this end, policies should be sought to encourage and accelerate these trends, i.e. policies that encourage and facilitate [1] the enhancement of innovation and improvement of entrepreneurship, [2] the participation of a greater part of the population in the labor market, especially women<sup>14</sup>), [3] the creation of high-value-added enterprises while avoiding an exclusive focus on the tourism sector,<sup>15</sup>) [4] the development of human capital and skills that are needed in the labor market (particularly through technical education and vocational training), and [5] the participation of pensioners in the labor market (optionally for those pensioners willing to participate in such programs),

---

14) As pointed by an anonymous referee, an increase in the participation rate of women, *ceteris paribus*, might raise the unemployment rate in the short run and thus, widen the positive unemployment gap from FERU ( $u - u^*$ ) rather than close it. However, such effect could be reversed if policy measures are taken to increase the absorption rate and skills matching of women in the labor market (e.g. technical education and vocational training).

15) Similarly, promoting innovation or supporting high-value-added firms induced by higher government spending could reduce in the long run the unemployment gap by leading to higher exports of goods and services, providing work opportunities to the abundant and highly skilled human capital in Greece. Provided, of course, that the optimal level of government spending is determined by the unemployment gap, together with the elasticity of substitution between public and private consumption and the fiscal multiplier as stated in Michailat and Saez (2024). It should be noted at this point that Michailat and Saez (2024) are in favor of monetary policy in reducing a positive unemployment gap to achieve full employment in the USA. Namely, reducing FED interest rates would reduce real interest rates and thus, consumption would increase at the expense of savings and boost aggregate demand; Michailat and Saez (2024) refer to several papers supporting this empirically. However, this is not possible within the EU. The mandate of the FED is a dual one, i.e. price stability and maximum employment. On the contrary, the ECB has a primary mandate of price stability, whilst unemployment is a secondary one, subordinated to price stability only if it does not conflict with price stability.

combined with increased wages<sup>16)</sup> and salaries to reduce the outflow of high-skilled Greek workers abroad.

On the other hand, policy proposals aiming at increasing (low-wage) migrant inflows to solve the shortage of workers could be highly questionable (provided that social cohesion is likely to deteriorate), given the persistent slackness of the Greek labor market over time, both from the point of view of the qualitative competitiveness of the Greek products and services and from that of the social welfare of indigenous/native workers.

## References

- Agiomirgianakis, G., Bertsatos, G., & Sfakianakis, G. (2024). Corruption, Exchange Rates, and Migration Flows. *Review of Economic Analysis*, 16(4), 469-498. <https://openjournals.uwaterloo.ca/index.php/rofea/article/view/5590>
- Agiomirgianakis, G., Bertsatos, G., & Sfakianakis, G. (2023). On the efficient unemployment rates in Europe. *Theoretical Economics Letters*, 13(7), 18. [https://www.researchgate.net/publication/376851582\\_On\\_the\\_Efficient\\_Unemployment\\_Rates\\_in\\_Europe](https://www.researchgate.net/publication/376851582_On_the_Efficient_Unemployment_Rates_in_Europe)
- Andolfatto, D., & Birinci, S. (June 21, 2022). *Is the Labor Market as Tight as It Seems?* On the Economy, Federal Reserve Bank of St. Louis. <https://www.stlouisfed.org/on-the-economy/2022/jun/is-labor-market-as-tight-as-it-seems>
- Antonopoulos, C., Anyfantaki, S., Kosma, T., Papapetrou, E., Petroulakis, F., Petroulas, P., & Zioutou, P. (2022). The Greek Labour Market Before and After the Pandemic: Slack, Tightness and Skills Mismatch. *Economic Bulletin*, 56, Bank of Greece, 45-88. <https://doi.org/10.52903/econbull20225602>
- Blanchard, O., Domash, A., & Summers, L. (2022). *Bad news for the Fed from the Beveridge space* (Policy Brief 22-7). Peterson Institute for International Economics, 17. <https://www.piie.com/sites/default/files/documents/pb22-7.pdf>
- Blanchflower, D., Bryson, A., & Spurling, J. (2024). The wage curve after the Great Recession. *Economica*, 91(362), 653-668. <https://doi.org/10.1111/ecca.12515>
- Costa, D., & Martin, P. (August 1, 2018). *Temporary labor migration programs: Governance, migrant worker rights, and recommendations for the U.N. Global Compact for Migration*. Economic Policy Institute. Retrieved from <https://www.epi.org/publication/temporary-labor-migration-programs-governance-migrant-worker-rights-and-recommendations-for-the-u-n-global-compact-for-migration/>
- Cusbert, T. (2017). *Estimating the NAIRU and the unemployment gap*. RBA Bulletin, Reserve Bank of Australia, p. 10. <https://www.rba.gov.au/publications/bulletin/2017/jun/pdf/bu-0617-2-estimating-the-n>

---

16) The transposition of Directive (EU) 2022/2041, on adequate minimum wages in the European Union, is a positive step towards strengthening wages. As far as Greece is concerned, the conclusion of the Scientific Committee for the transposition of this Directive proposes, provided that several conditions are met, an automatic and non-negative adjustment of the minimum wage, which will be linked to inflation (the lowest 20% of the household income distribution) and half of the annual rate of change in the purchasing power of the general wage index between 01/07 of the previous year and 30/06 of the current one.

- airu-and-the-unemployment-gap.pdf
- dianeosis. (2024, September). *Obstacles and opportunities for coexistence - Integration of immigrants and refugees in Greece*. Retrieved from [https://www.dianeosis.org/wp-content/uploads/2024/09/Immigration\\_brochure-v4.pdf](https://www.dianeosis.org/wp-content/uploads/2024/09/Immigration_brochure-v4.pdf)
- Domash, A., & Summers, L. H. (2022). *How Tight are U.S. Labor Markets?* (Working Paper No 29739). National Bureau of Economic Research. <http://www.nber.org/papers/w29739>
- Heise, S., Pearce, J., & Weber, J. P. (2024). *Wage Growth and Labor Market Tightness* (Staff Reports, No. 1128). Federal Reserve Bank of New York, p. 34. <https://doi.org/10.59576/sr.1128>
- ELSTAT. (n.d.). *Job vacancies, 1st quarter 2024*. Retrieved from <https://www.statistics.gr/en/statistics/-/publication/SJO41/2024-Q1>
- ELSTAT. (n.d.). *Job vacancies, 2nd quarter 2024*. Retrieved from <https://www.statistics.gr/en/statistics/-/publication/SJO41/2024-Q2>
- ELSTAT. (n.d.). *Labour Force Survey (quarterly), 2nd quarter 2024*. Retrieved from <https://www.statistics.gr/en/statistics/-/publication/SJO01/>
- Eurobank. (April 12, 2023). *7 Days Economy, 549, Eurobank Research*. Retrieved from <https://www.eurobank.gr/-/media/eurobank/omilos/oikonomikes-analuseis/elliniki-oikonomia/7-imeres-oikonomia/2023/7-imeres-oikonomia-12-04-23.pdf>
- Eurostat. (n.d.). *Job vacancy statistics*. Retrieved from [https://ec.europa.eu/eurostat/cache/metadata/en/jvs\\_sms.htm](https://ec.europa.eu/eurostat/cache/metadata/en/jvs_sms.htm)
- Kathimerini. (March 7, 2024). *Hatzidakis sees brain regain*. Retrieved from <https://www.ekathimerini.com/economy/1233441/hatzidakis-sees-brain-regain/>
- McAdam, P., & Mc Morrow, K. (1999). *The NAIRU concept - Measurement uncertainties, hysteresis and economic policy* (European Economy - Economic Papers 2008-2015, No. 136). Directorate General Economic and Financial Affairs (DG ECFIN), European Commission, p. 41. <https://ideas.repec.org/p/ef/uf/ecopap/0136.html>
- Michaillat, P. (2023). *Modeling the Displacement of Native Workers by Immigrants*. (CEPR Discussion Paper No. 18601). CEPR Press, Paris & London. <https://cepr.org/publications/dp18601>
- Michaillat, P., & Saez, E. (2021). Beveridgean unemployment gap. *Journal of Public Economics*, 2, p. 17. <https://doi.org/10.1016/j.pubecp.2021.100009>
- Michaillat, P., & Saez, E. (2022).  $u^* = \sqrt{uv}$  (Working paper 30211). National Bureau of Economic Research Working Paper No 30211, p. 31. <https://www.nber.org/papers/w30211>
- Michaillat, P., & Saez, E. (2024).  $u^* = \sqrt{uv}$ : *The Full-Employment Rate of Unemployment in the United States*. Brookings Papers on Economic Activity Conference, Fall, p. 56, <https://www.brookings.edu/articles/u-%E2%88%9Auv-the-full-employment-rate-of-unemployment-in-the-united-states/>
- National Skills Commission. (2021). *The state of Australia's skills 2021: now and into the future*. Australian Government, p. 191. <https://cica.org.au/wp-content/uploads/2021-State-of-Australias-Skills.pdf>
- OECD. (2024). *Employment Outlook 2024*, p. 293. <https://doi.org/10.1787/ac8b3538-en>
- Ottaviano, G. I. P., & Peri, G., (2008). *Immigration and national wages: Clarifying the theory and the empirics* (Working Paper No 14188). National Bureau of Economic Research, p. 78. <http://www.nber.org/papers/w14188>



- Palpant, C. (2006). *European Employment Strategy - An Instrument of Convergence for the New Member States?* (Policy Paper No 18). Notre Europe, Etudes & Recherches. <https://institutdelors.eu/wp-content/uploads/2020/08/policypaper18-en-3.pdf>
- Pratsinakis, M. (2022). Greece's Emigration During the Crisis Beyond the Brain Drain. In: Kousis, M., Chatzidaki, A., & Kafetsios, K. (Eds.), *Challenging Mobilities in and to the EU during Times of Crises* (pp. 27-45). IMISCOE Research Series. Springer, Cham. [https://doi.org/10.1007/978-3-031-11574-5\\_2](https://doi.org/10.1007/978-3-031-11574-5_2)
- Ruhs, M. (2006). The potential of temporary migration programmes in future international migration policy. *International Labour Review*, 145(1-2), 7-36. <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1564-913X.2006.tb00008.x>
- Theofilakou, A., & Vasardani, M. (2024). Labour Market Tightness in the post-COVID-19 Era. *Economic Bulletin*, 59, Bank of Greece, pp. 73-88. <https://doi.org/10.52903/econbull20245904>
- Tsekeris, T., Cholezas, I., Chymis, A., Rodousakis, N., & Skintzi, G. (2023). Productivity and Competitiveness from the Stakeholders' Viewpoint. *Productivity Reviews*, 1, p. 43. Centre of Planning and Economic Research (KEPE). <https://www.kepe.gr/images/npb/productivity-reviews-tefchos-01.pdf>