"International Migration and Development of Human Potential", Dnipro, Ukraine, Sept. 14-15 2022

PORTUGAL 2022: HUMAN CAPITAL, ECONOMIC DEVELOPMENT AND MIGRATIONS

de Castro, Paulo M. S. T.
emeritus professor, Universidade do Porto,
Faculdade de Engenharia,
Porto, Portugal
Email: ptcastro@fe.up.pt
ORCID: 0000-0003-3202-1343

Abstract. *This communication to the 1st International Scientific and Practical Internet Conference "International Migration and Development of Human Potential", September 14-15, 2022, Dnipro, Ukraine briefly touches the topics education, skills, economic development, and migrations, as they impact upon the author's country – Portugal. Since Ukraine is now formally a candidate to EU membership, it seems useful to share aspects of the earlier Portuguese experience, which so far has not produced the desired convergence with EU average performance in several important indicators. Of course, each country has its own features and historical past making the process of its EU adhesion unique; nevertheless, it may be interesting to share experiences where perhaps common problems might be identified, or transversal truths established. The presentation associates the difficulties of Portuguese convergence to the investment in education, which was too short during a great part of the XXth century. The importance of education in science, technology, engineering, and mathematics (the so-called STEM fields) is highlighted given its role in promoting the knowledge basis upon a technological society*

– as all societies of the developed world - is based. The communication aims at providing answers to the questions: what is the relation of the evolution of education in Portugal, particularly at tertiary education level, with the economic performance of the country? what are the consequences of the economic performance in migration trends? what national and EU policies may redress the persistent lack of convergence of the Portuguese economy?

Keywords: *human capital, higher education, economic development, migrations, demographics.*

Introduction.

The motivation for the communication is the persistent lack of convergence of the Portuguese economy with average EU values. It aims at contributing to identify relationships of the evolution of education in Portugal, particularly higher education, with economic performance, and to find consequences in terms of migration trends. After an introduction, the communication deals in sequence with demographics, skills, education, economic performance, and migration, and finalizes with concluding remarks.

For any country, the educational attainment of its population is one among several aspects that influence economic growth. Others include the quality of its institutions, personal characteristics of its people, and geographical aspects with their natural and political consequences. While geography is a given (for ex., in general a desert will not turn into a forest), the quality of institutions or the characteristics of people and its cultural norms may be changed, for worse or for the better, particularly with appropriate incentives. Among institutions, characteristics as

- their strength or weakness,
- timely and effective - or slow and/or ineffective – justice,
- state above group or private interests, or state captured by those interests,
- corruption in general and of judges in particular,

- tax system and labor legislation,

are aspects to be considered, while as far as people is concerned,

- trust – or lack thereof - in the other,
- risk aversion or risk predisposition,
- entrepreneurial mindset,
- acceptance or rejection of income inequality,

are a few among many relevant aspects.

Among the above, corruption deserves note. At European level the Council of Europe created the Group of States against Corruption – GRECO, which monitors the situation in member countries and periodically makes recommendations for its improvement, *e.g*. the last report on Portugal [1] which emphasizes the judiciary, see also the report of the European Network of Councils for the Judiciary (ENCJ) [2].

How to measure the influence of each aspect that contributes to economic growth? What is available are historical facts and their interpretation. It is not feasible to subject unique historical events to experimental analysis, [3], but cliometrics (or econometric history) made some experimentation possible by construction of counterfactuals, aiming at quantifying the difference between reality and alternative idealized scenarios or circumstances. Such studies may elucidate the ranking of the above and other aspects influencing growth; but the aim of this communication is simply to concentrate on human capital aspects, in Portugal.

In Portugal during most of the 20th century the low educational level of the population in general, and particularly of employers and entrepreneurs, certainly affected economic growth. Sérgio, a Portuguese thinker and believer in the social responsibilities of the elites, spoke of elites without qualities meaning that further to lack of education, the elites also missed other desirable characteristics as civic leadership, [4].

Educational level in Portugal is increasing steadily but was dramatically below European standards during most of the XX century, with special neglect during the long

dictatorship of 1926-1974. In the book by Goldin and Katz *'The Race Between Education and Technology'* [5], data for secondary school achievement in mid-20th century puts Italy, Spain and Portugal in the bottom of the table comparing 18 European countries and the USA (where the trend for universal secondary school achievement arrived earlier than elsewhere, with undisputable positive consequences in that country's economic development, see *e.g*. [5], [6], [7]).

The situation in Portugal since the turn of the millennium is shown in Figure 1 with data from EUROSTAT for the several ISCED (International Standard Classification of Education) levels of education. The Portuguese Government document [8] includes further data, reinforcing the comparative weakness *vis a vis* the European Union – EU (21 member states or 22 after 2015, see page 49).

Although trends for all levels of education deserve discussion, this communication concentrates on post-secondary education since the complexity of present-day technological societies implies the need for a growing percentage of population with higher education (in Portugal tertiary or higher education degrees are awarded in *institutos politécnicos* and *universidades* - polytechnical institutes and universities).

As a reflex of the neglect of education during the long dictatorship, and of the efforts to improve the situation since 1974, a big difference between age groups is found. Data on population with tertiary education obtained in the Economic Co-operation and Development (OECD) databases is presented in Figure 2, as percentage in given age groups: 25-64-year-olds (Figure 2a) and 25-34-year-olds (Figure 2b).

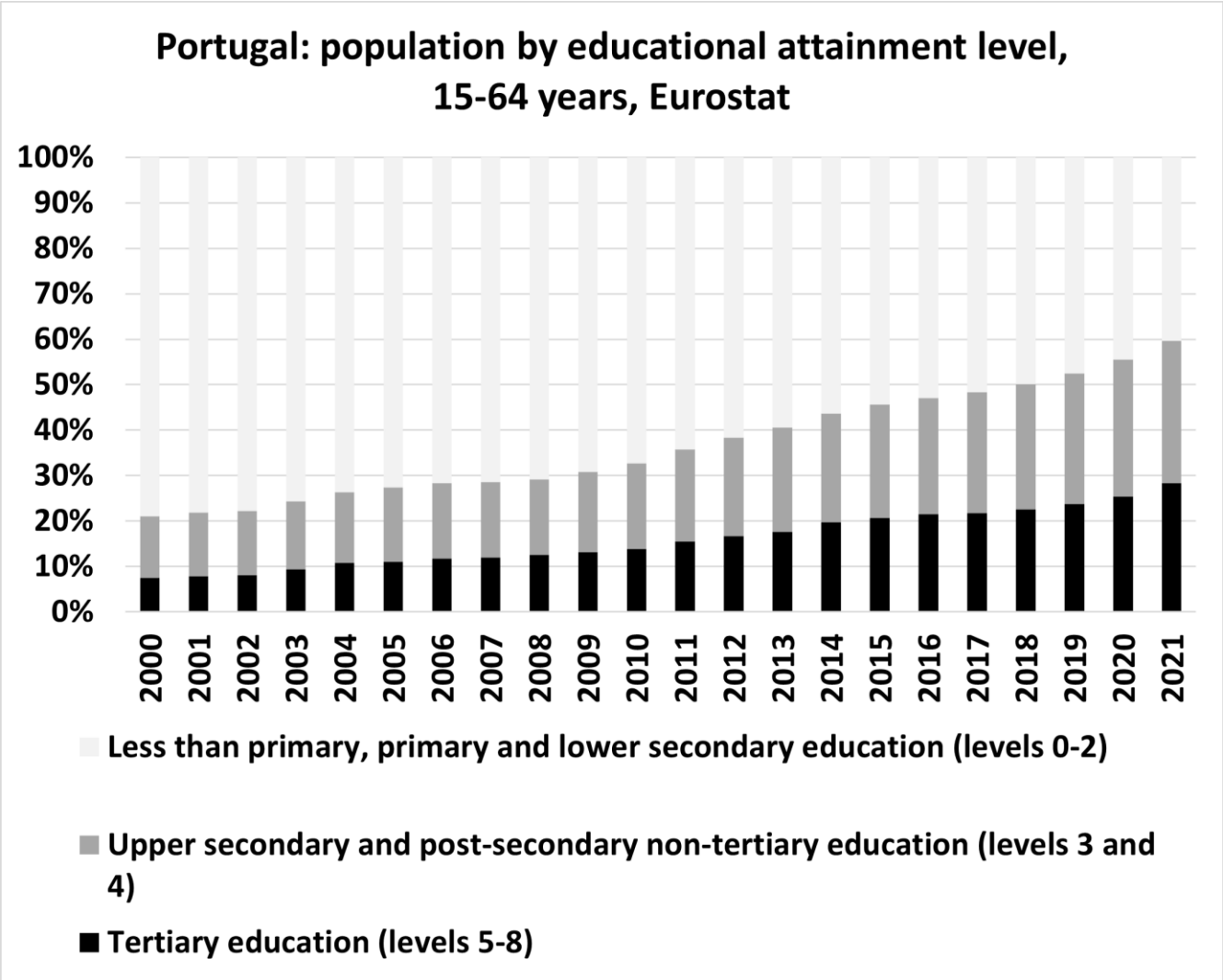

Figure 1 - Portugal, educational attainment, population 15-64 years, Eurostat.

Figure 2a shows data for the age group 25-64 years, whereas data for the age group 25-34 years is shown in Figure 2b, both including the average value for OECD member countries, and Lithuania as an example of a more recent EU member country. Figure 2b indicates that the younger generations in Portugal are fast catching up with the average performance of the OECD countries. Unless one is satisfied with the situation and let it progress until the older generations disappear, it is necessary to design policies concerning continuing, lifelong education, an aspect that has been so far neglected in Portugal, but carefully considered elsewhere *e.g.* the United Kingdom (UK) [9].

Statistics are nowadays easily accessible, and governments can be tempted to 'work for the statistics', meaning that not only the numbers of graduations are important, but also the quality of the education. At the tertiary level the role of accreditation and quality assessment is usually in the hands of independent bodies as A3ES (Agência de Avaliação e Acreditação do Ensino Superior) in the case of Portugal. In lower levels, the role of international exercises allowing for benchmarking, as the PISA (Programme for International Student Assessment) exercise of OECD, are of critical importance because they are based in objective outcomes.

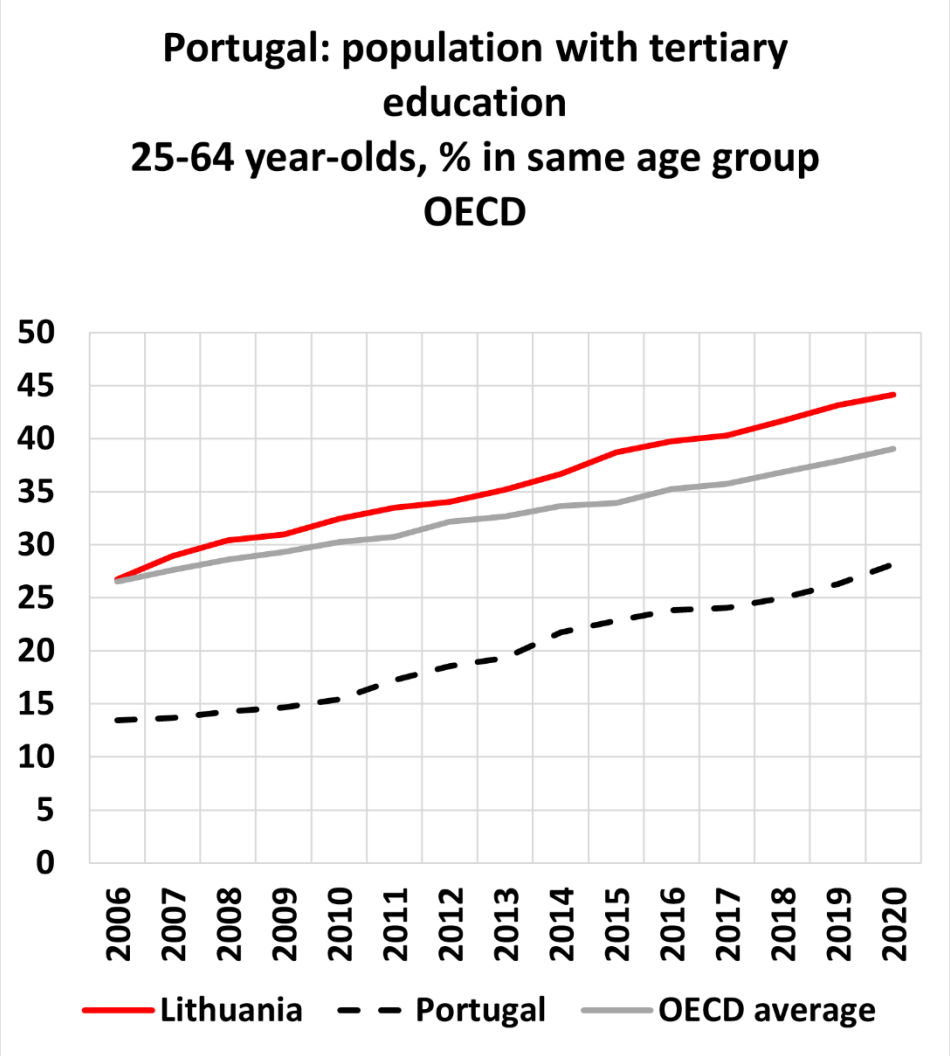

Figure 2a - Share of population (%) by educational attainment: tertiary education, 25-64 years. OECD.

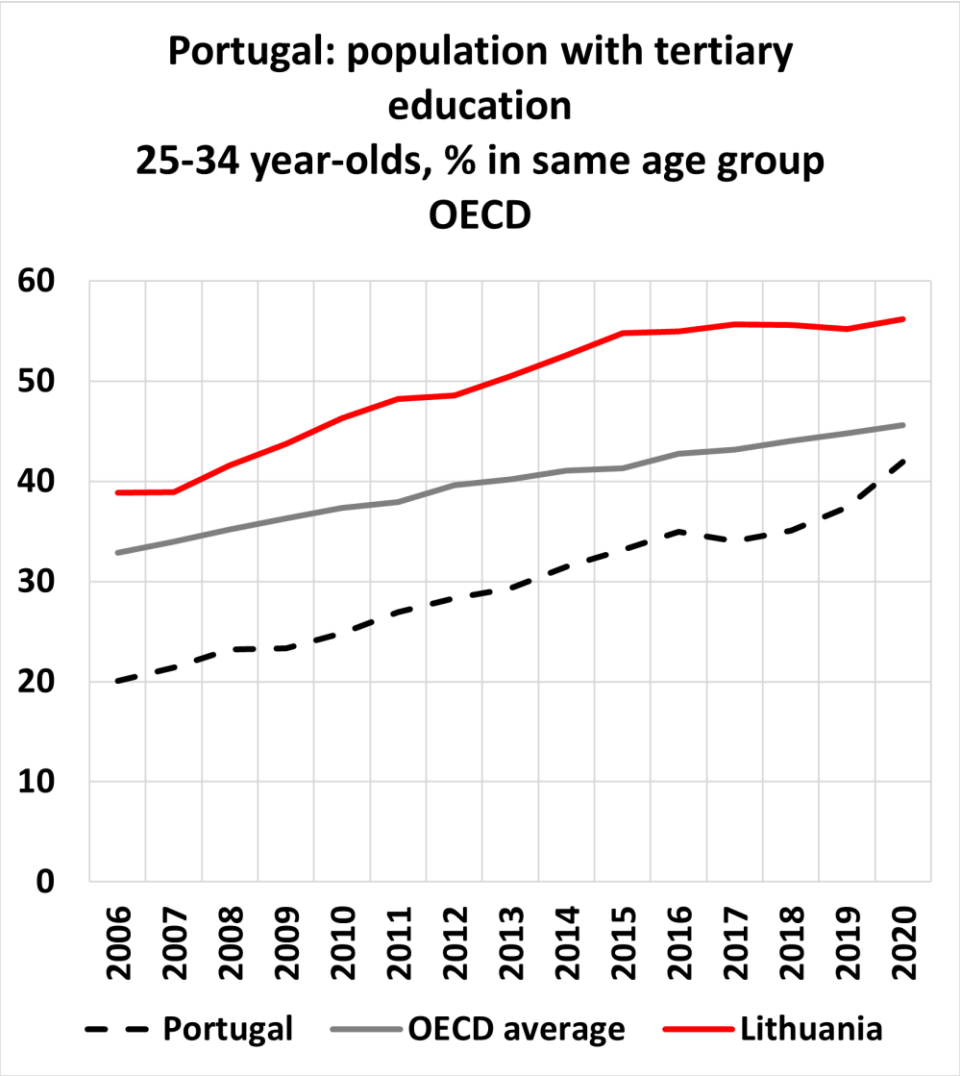

Figure 2b - Share of population (%) by educational attainment: tertiary education, 25-34 years. OECD.

At Harvard and MIT (Massachusetts Institute of Technology) work has been developed concerning economic complexity, a designation that describes the capability of an economy to design, produce and market sophisticated products and services [10], [11], [12]. Economic complexity relates to the performance of countries and depends on the level of education of the country or region considered, which facilitates – or not – the innovation process. Innovation will be the theme of following paragraphs, but before a short reference to demographics will be made.

Demographics.

Demographic trends are an important feature of a country's situation. In most places lives are becoming longer. Is the population growing or diminishing? how is the age pyramid changing? These matters are discussed in the media, *e.g.* [13], or financial institutions, [14], [15]. There are several sources of information on these trends, in particular the UN (United Nations) Department of Economic and Social Affairs in the site *'World Population Prospects 2022'* [16]. While the world's population is expected to stabilize at 10-11 billion in 2075, decreasing population is predicted for Europe, from ~0.75 billion in 2025 to ~0.59 billion in 2100. Worldwide, the group aged 85+ is growing particularly fast, and Bloom predicts it will be larger than half a billion towards 2100, [17].

For Portugal, a decrease from the current ~10.3 million to approximately 7 million in 2100 is predicted by the UN [16], Figure 3, and similarly in other sources as [18]. The EU report *'Demographic and human capital scenarios for the 21st century - 2018 assessment for 201 countries'* [19] shows three scenarios for the evolution of the population; starting from 10.2 million people in 2020 the medium scenario indicates 8.28 million in 2060, with a percentage of over 65+ of 22,8% in 2020 and 33.3% in 2060, showing the growing percentage of older people. The EU created an online tool for demographic data, currently with projections up to 2050, [20].

For a country as Portugal, policies promoting natality and economic development that encourages natives not to emigrate, are among the main tools to fight these demographic trends. Other tools are policies promoting healthy lives, and alleviation of labor shortages through facilitation of international immigration from regions with relatively large working-age populations immigration (particularly young and educated segments). Technological and institutional innovations are needed to facilitate coping with population aging, [17]. The Banco de Portugal (Bank of Portugal) studied the impact of demographics on GDP (gross domestic product), and shows that notwithstanding the decreasing population, the adverse impact on growth resulting from demographic change

will coexist with a favorable impact arising from the higher qualification of the workforce, [21].

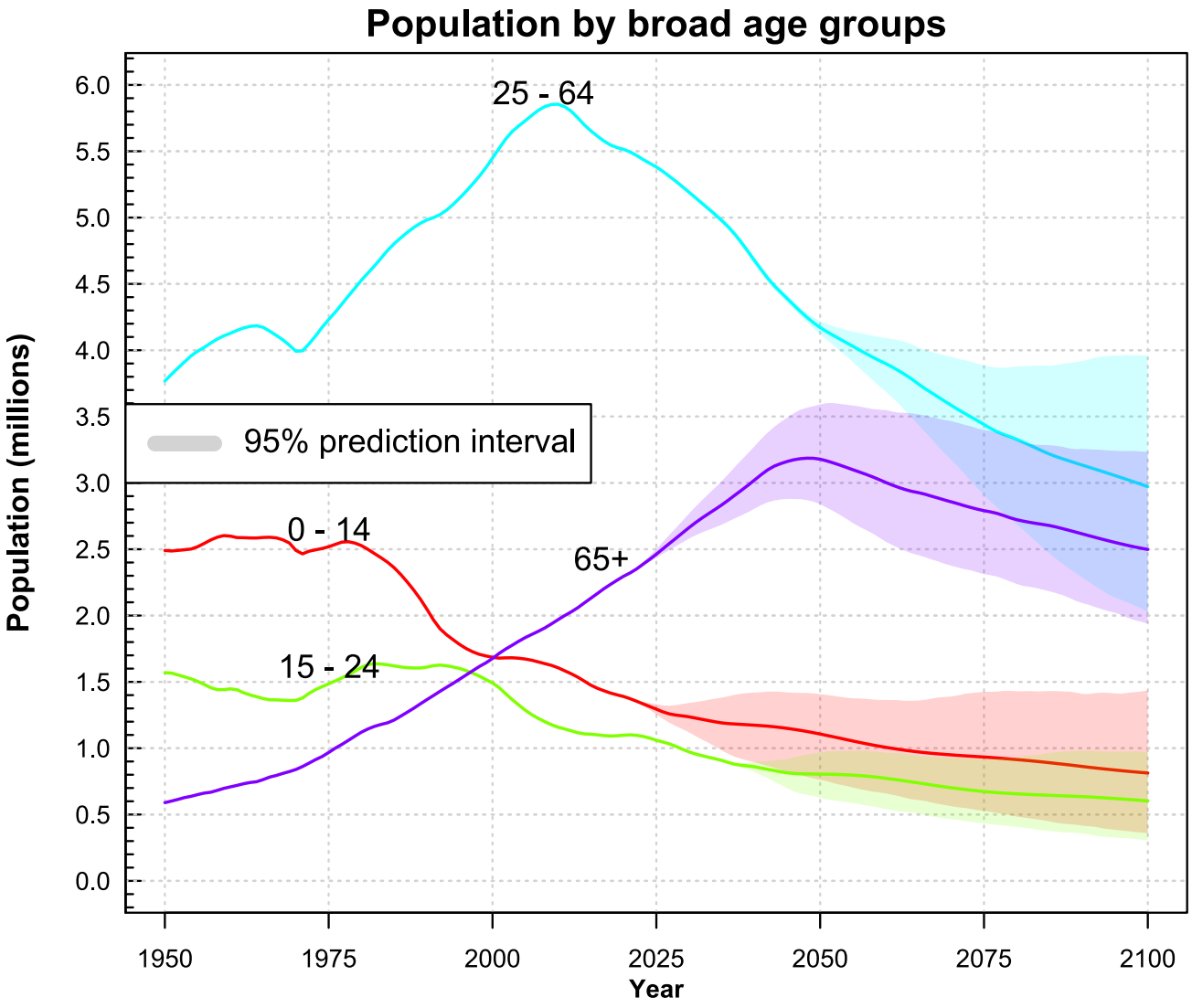

Figure 3 – Portugal's population. Source: UN, 'World Population Prospects 2022', [16].

Skills.

Skills are an essential aspect of human capital, critical for the success of companies and nations. Given the role of engineering and related fields in shaping the future, STEM - science, technology, engineering, and mathematics - is of critical relevance in present day technological societies. In the EU, CEDEFOP (Centre Européen pour le Développement de la Formation Professionnelle - European Centre for the Development

of Vocational Training) is a source of data on trends concerning skills and labour market [22]. While companies as Boeing express the desired attributes for their engineers, [23, 24], the US Department of Labor sponsors the O*NET Resource Center which makes available detailed description of requirements, skills, and knowledge pertinent to an extensive list of activities. Using mechanical engineering as an example, [25], lists of skills are given in Figure 4, and of work activities in Table 1, both including grades of importance attributed by O*NET according to its methodology [26]. The inclusion of Figure 4 and Table 1 intends to highlight the importance of non-technical aspects in the professional life of engineers, a fact that should be considered when designing the curricula for their academic education.

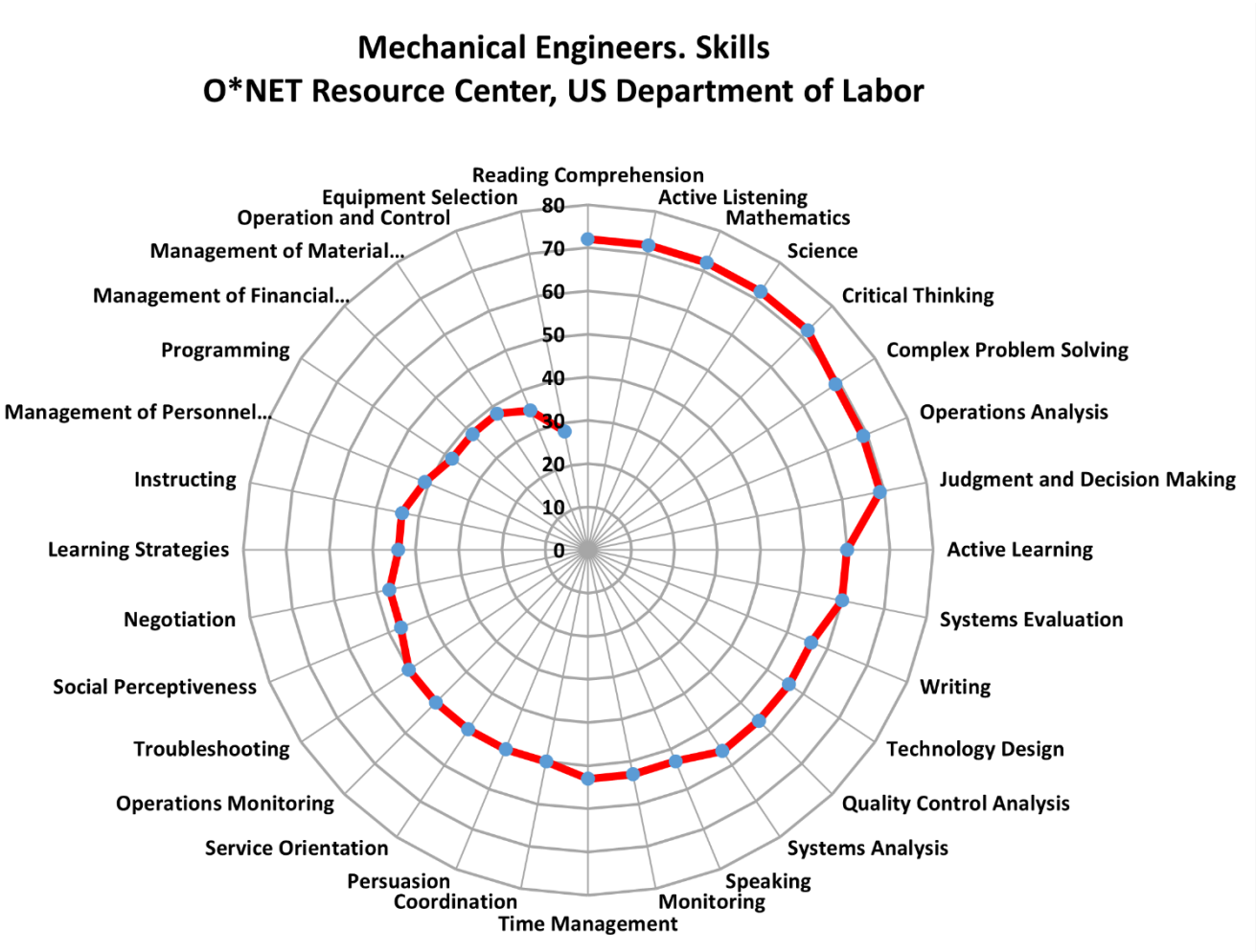

Figure 4 – Mechanical engineers' skills. O*NET Resource Center. (partial).

Table 1
Mechanical Engineers. Work activities.
O*NET Resource Center, US Department of Labor.

Work activity	
working with computers	89
making decisions and solving problems	85
communicating with supervisors, peers, or subordinates	82
analyzing data or information	80
getting information	79
processing information	78
monitoring processes, materials, or surroundings	72
thinking creatively	71
updating and using relevant knowledge	71
drafting, laying out, and specifying technical devices, parts, and equipment	70
documenting/recording information	69
estimating the quantifiable characteristics of products, events, or information	67
establishing and maintaining interpersonal relationships	66
communicating with people outside the organization	65
organizing, planning, and prioritizing work	59
coordinating the work and activities of others	59
judging the qualities of objects, services, or people	57
providing consultation and advice to others	55
inspecting equipment, structures, or materials	54
training and teaching others	54
identifying objects, actions, and events	53
developing objectives and strategies	51
evaluating information to determine compliance with standards	50
scheduling work and activities	45
interpreting the meaning of information for others	44
monitoring and controlling resources	44
developing and building teams	43
coaching and developing others	43
……	…

Skills are an essential ingredient of the human capital, a most valuable intangible asset of any society. Human capital is a dynamic asset which can be enhanced through public policies, namely those promoting lifelong learning [9]. It is the object of attention of many large and small organizations *e.g.* the New Club of Paris [27]. Given the huge discrepancy on the level of educational attainment of the young and old segments of the Portuguese labour force, the brain drain effect, briefly addressed in the EU *'A new skills agenda for Europe'* [28, 29] is a matter of concern. This leads to the emigration of the

younger and better qualified, as engineers, nurses, etc., and reasons associated to salaries are touched upon in the next section of this communication.

Schumpeter recognized the need for a constant flow of innovations to sustain a modern society - the mechanism of 'creative destruction' that keeps the economy going. Innovation implies positive, tangible change, as increased efficiency, improved social responses, creation of market opportunities etc., [30].

Creativity may be hampered by schooling, or is it promoted? Certainly, countries with highly educated citizenry tend to generate higher levels of innovation! Personal characteristics and circumstances determine the innovation and creativity potential of each one. Among these, willingness to take risks, trust in others, self-confidence and acceptance of eventual failures, capacity to focus on and get passionate about a subject, certainly play a role.

Education, economic performance, and migration

Arts and humanities education are essential parts of the education, and their value is not disputed. While recognizing their irreplaceable role, STEM subjects give the means for scientific and technological progress and innovation, without which sooner or later society emaciates, as stated by Schumpeter in the 'innovate or perish' paradigm [31].

The contribution of education for the well-being of citizens includes positive impacts on health [32] [33]. Human capital is associated to educational attainment but also to the health of the population and consequent longer life expectancy; numeracy has a measurable impact on life expectancy [34] and underpins financial literacy [35]**.**

Hanushek and Woessmann [36] demonstrate that long-run economic growth of a nation is a function of the cognitive skills of the population, its 'knowledge capital', a conclusion equally applicable to developing and developed countries. This calls for an increasing access to tertiary education. OECD data for 2013 and 2019 shows that in Portugal 25-34 year-old adults with tertiary attainment earn 1.5× more than those with secondary education, [37].

Labour productivity is related to salaries. When discussing the percentage of population with tertiary education in Portugal reference was made to data on Lithuania, a more recent EU member country. Lithuania is again mentioned, now to illustrate recent trends in labour productivity. Figure 5 shows data for labour productivity, expressed in PPP (purchasing power parity), for EU (average), for Portugal and for Lithuania. The difference in growth rate between the three data sets is noticeable.

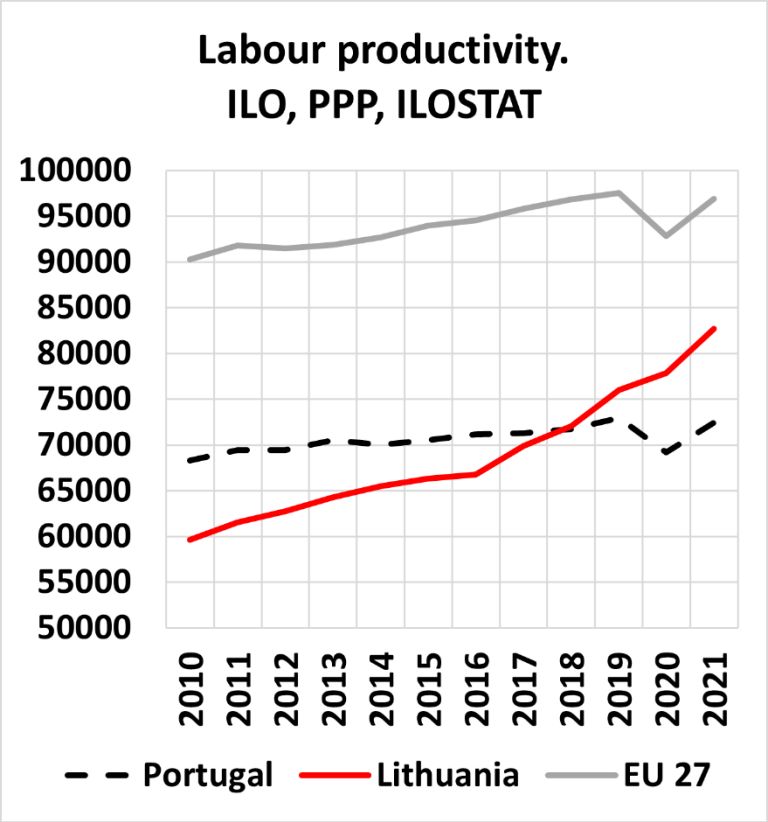

Figure 5 – Labour productivity, PPP, ILO.

The specificities of the Portuguese economy include the difficulties in generating well paid jobs and fully benefitting from the dramatic improvement in educational attainment of the population in the recent decades. This is well suggested by Figure 6 with data on average monthly earnings of employees, from the International Labour Organization (ILO), on-line at ILOSTAT Explorer, concerning the Euro area EU member countries (except Cyprus).

Figure 6 - Average monthly earnings of employees. 2020 US dollars. ILO.

Figure 7 shows recent data for the Euro area EU member countries (except Cyprus and Malta) on labour productivity expressed as GDP per hour worked.

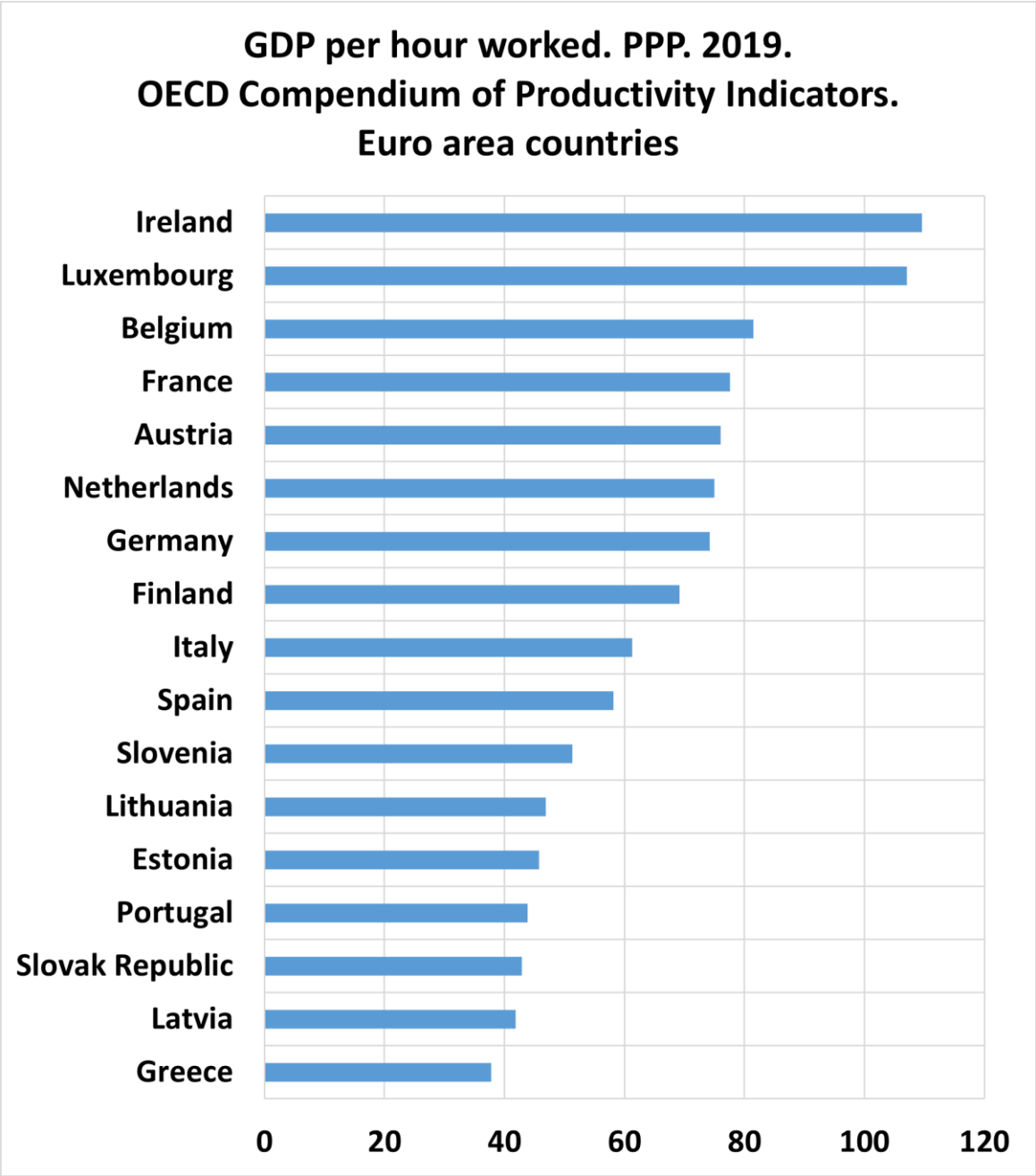

Figure 7 - GDP per hour worked. PPP. 2019. OECD.

A number of Portuguese job seekers only find occupations below their level of qualification: among the 25–34-year-olds, 15% of engineering graduates are in that situation, nevertheless a substantially lower figure than *e.g.* social sciences or services where it is of the order of 30% or 50%, [38].

Data on income by educational attainment level is made available by EUROSTAT [39]. The situation for the 18-64-year-old with tertiary education is shown in Figure 8 where vertical axis unit is PPS (purchasing power standard) [1] . Between 2010 and 2020 Portugal and Greece show a negative trend, to be compared with the rather positive tendency of the other countries shown in the Figure.

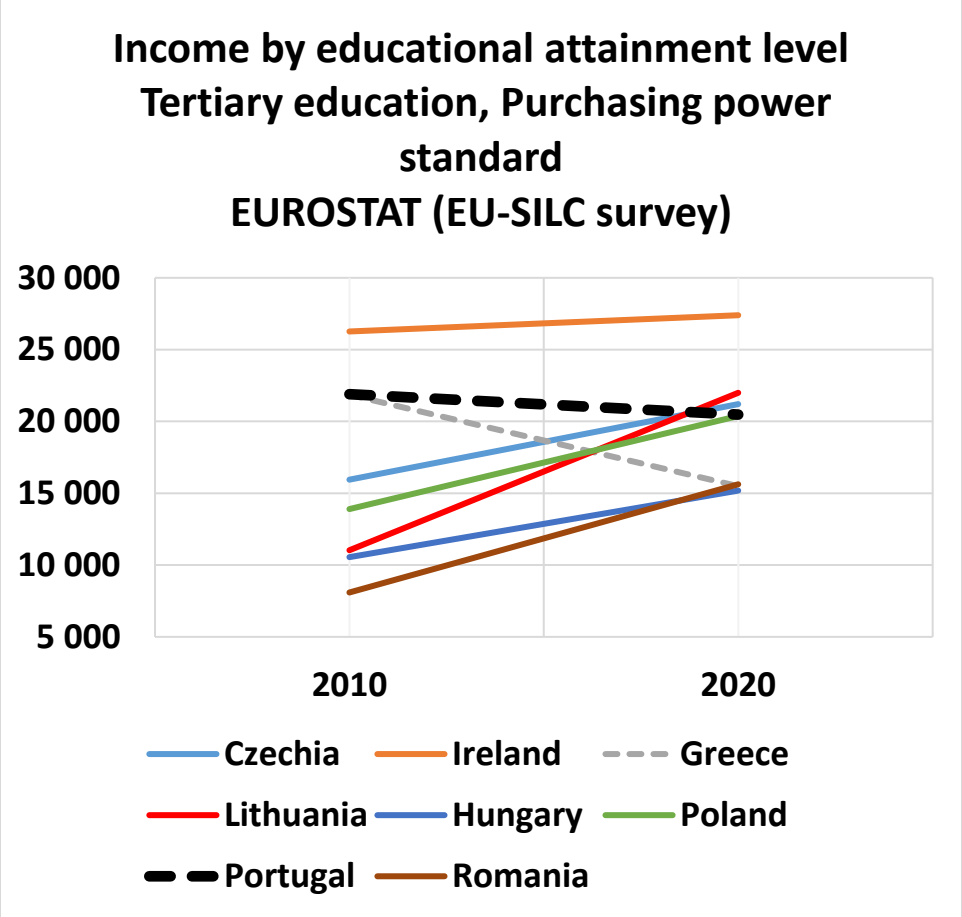

Figure 8 – Income by educational attainment level. Tertiary education. Purchasing power standard. EUROSTAT (EU-SILC survey).

As mentioned before, a consequence of the difficulties in finding jobs consistent with their academic qualifications has driven many Portuguese to find work somewhere

[1] Purchasing power standard (PPS): https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Purchasing_power_standard_(PPS) .

else, particularly within the EU, thus augmenting the traditional flow of emigrants with lower qualifications. Figure 9 shows the estimated temporary and permanent emigration from Portugal, a total of nearly 1 million people from 2011 to 2020, [40].

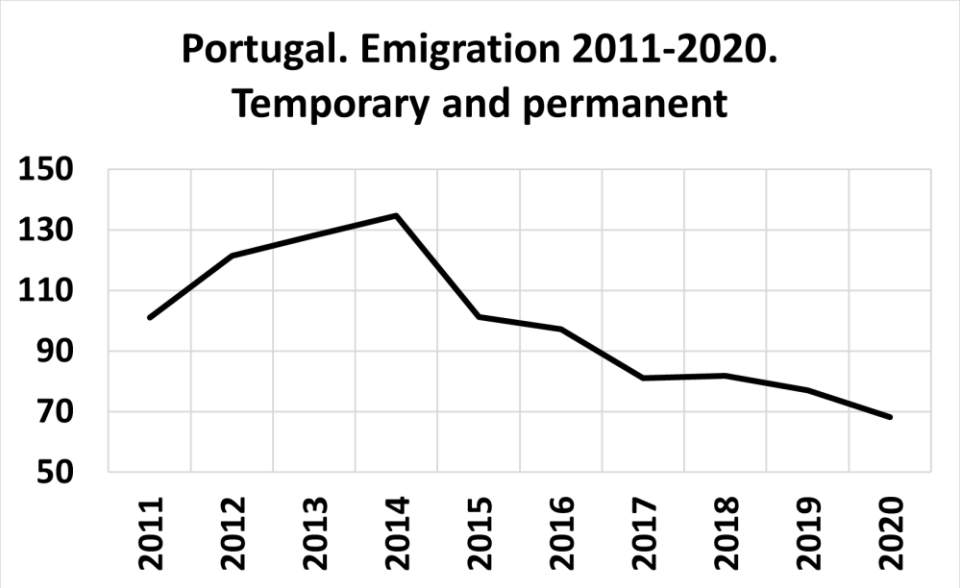

Figure 9 – Portugal. Temporary and permanent emigration 2011-2020.

So far reference was made to Portuguese emigrants. Portugal is traditionally a country of emigrants, but also of immigrants. Currently, foreigners residing in Portugal amount to ~7% of the total population, with the largest communities coming from Brazil, United Kingdom, Cabo Verde, Italy, India, Romania, Ukraine, among others, [41]. The UNDP - United Nations Development Programme publishes periodically the *'World Development Report'*, where an attempt is made to characterize the level of development of a country, going far beyond the simple GDP measurements, [42]. In a nutshell, the Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. As noted in [40], the Portuguese GDP per capita and HDI are lower than those of the main destination countries for Portuguese emigration, and higher than those of the main countries of origin of most of the immigrants it has received in the

last four decades. In terms of the labor market, the situation is similar: Portugal has an unemployment rate typically higher than that of the main countries of destination for emigration and lower than that observed in the main countries of origin of the immigrants it receives. The search for improved economic conditions just mentioned explains most of the immigrants received in Portugal, but certainly not all of them. UK permanent residents in Portugal were mentioned above; many of them are retirees whose motivation is essentially to benefit from the generally good weather, safety, and comparative peacefulness of the country.

Figure 10 shows data from [43] highlighting the impact of the Euro debt crisis of 2010 in Portugal – translated here in an enormous increase of emigrants and decrease of immigrants, as a result of the conditions imposed to Portugal by the European Commission, European Central Bank and IMF (the ‘Troika’) during its intervention in 2011-2014. This period is shaded in Figure 10.

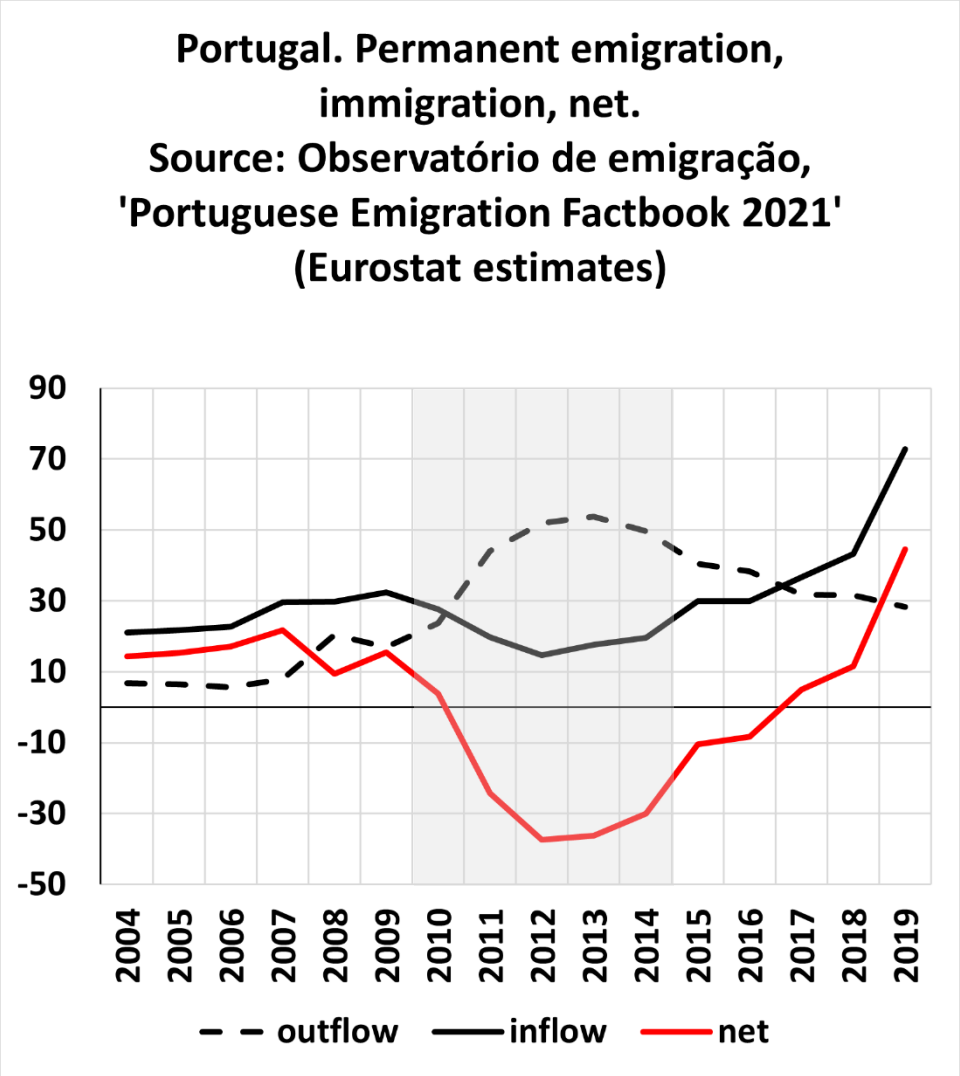

Figure 10 - Portugal. Permanent emigration, immigration, net.

As mentioned above, health is a relevant aspect of human capital. Using life expectancy at birth as a proxy for health, this is an aspect where the Portuguese situation is favourable as illustrated by Figure 11 with data from The World Bank. As a sideline, in Figure 11 the USA offers a contrasting trend, which may be related to the organization of health care in that country. The Portuguese good performance concerning this indicator is due to the public national health service created in Portugal in 1979; the performance displayed in the Figure must be valued taking into account the poor starting point – writing in the first decades of the XXth century, Sérgio mentioned inadequate nourishment and general poor health as a feature of the country [4], p.191.

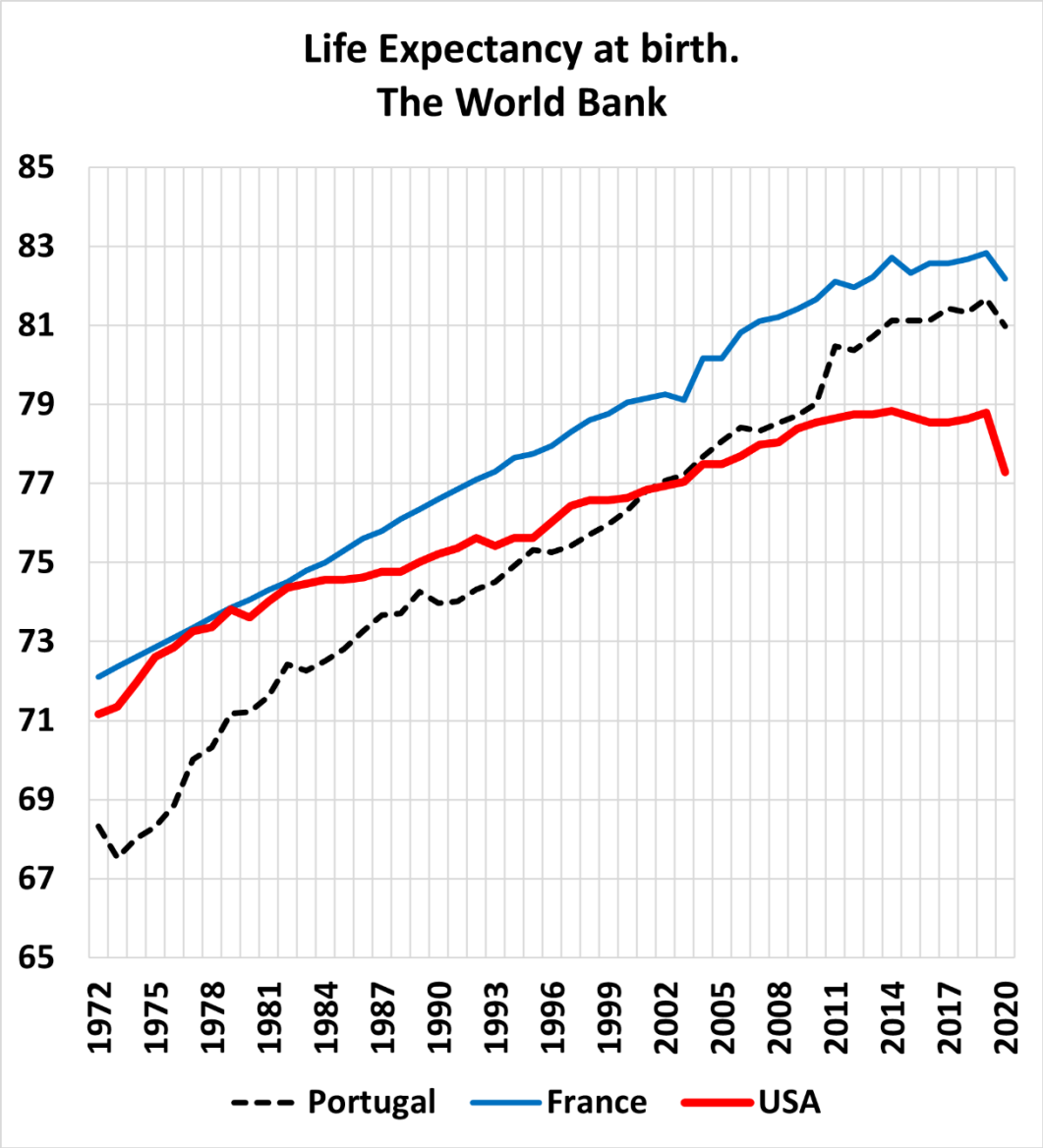

Figure 11 – Life expectancy at birth. The World Bank.

It is not only in health issues that the Portuguese indicators are now favourable. Also in the perspective of peace as a positive, achievable, and tangible measure of human well-being and progress, the international ranking of the Institute for Economics and Peace puts Portugal in the 4th position worldwide, just behind Iceland, New Zealand and Denmark [44].

Concluding remarks.

The presentation aimed at relating the evolution of education in Portugal with the economic performance, showing that in present day's technological societies the lack of a suitable percentage of the population with tertiary degrees negatively impacts the economic performance. The role of STEM disciplines in promoting a suitably educated labour force was underlined. The difficulties of the highly educated younger Portuguese generation in finding suitable jobs leads to the emigration of a part of the population which could otherwise have an important role in the growth of the country. The very favourable ranking of Portugal in life expectancy and in rankings concerning peace should be valued. Adhesion to the UE had a positive impact in many aspects of Portugal; nevertheless, persistent difficulties in economic growth after the adhesion to the Euro currency show the need for further efforts on the Portuguese side, designing new policies to promote growth. However, belonging to the Euro area implies a lack of tools that could otherwise be deployed; this imposes that when designing its policies, the EU must take into consideration the needs of all.

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