

## Virtual work in Portugal: a literature review

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**Abstract:** Despite having been one of the first countries in Europe to introduce provisions in the labour law to promote virtual work and having made strong investments in ICT infrastructure, the adoption of virtual work in Portugal lags significantly behind most European countries. This paper examines the literature, official documents and databases to understand this lag. We found that, notwithstanding the difficulty to measure virtual work, it is possible to say that there were 1.8% of workers in 2005 involved in virtual work. In 2010, less than 3% were involved in virtual work, and in 2015 it grew to 8.2%. The paper identifies two main factors hindering the growth of virtual work: the legal framework and the organisational aspects of work.

**Keywords:** Virtual work, Telework, Digitalisation, Social dialogue.

## Trabalho virtual em Portugal: uma revisão da literatura

**Resumo:** Apesar de ter sido um dos primeiros países da Europa a introduzir disposições no direito do trabalho para promover o trabalho virtual e ter feito fortes investimentos em infraestruturas de TIC, a adoção do trabalho virtual em Portugal fica significativamente atrás da maioria dos países europeus. Este artigo examina a literatura, documentos oficiais e bancos de dados para entender esse atraso. Constatamos que, apesar da dificuldade de medir o trabalho virtual, é possível afirmar que existiam 1,8% dos trabalhadores em 2005 envolvidos em teletrabalho. Em 2010, menos de 3% estavam envolvidos neste tipo de trabalho, enquanto em 2015 subiu para 8,2%. O artigo identifica dois fatores principais que dificultam o crescimento do trabalho virtual: a estrutura legal e os aspetos organizacionais do trabalho.

**Palavras-chave:** Trabalho virtual, Teletrabalho, Digitalização, Diálogo social.

## 1. Introduction

Portugal was one of the first countries in Europe to regulate virtual work in the private sector (Gil, 2015; Ramalho, 2019; Rebelo, 2019; Redinha & Sousa, 2003). In the last decades, the country also made strong investments in ICT infrastructure. In fact, the OECD indicator of fixed broadband subscriptions per 100 inhabitants shows a growth of penetration rates from 4.8 in 2003 to 368 in 2018, corresponding to a significant average annual growth rate of 14%. The adoption of virtual work, however, lags significantly behind most European countries (Eurofound, 2010)<sup>1</sup>. This paper aims to identify the past and existing lag, as well as to understand its reasons through a systematic exam of scientific literature, official documents and national and international databases related to virtual work in Portugal.

The text first describes the methodology used, followed by a description of the evolution of the Portuguese labour legal framework. After, the paper identifies the incidence and trends of Portuguese virtual work, reviews the existing literature in Portugal and summarises the main conclusions.

## 2. Methodology

The work was carried out from March to July 2018. It included extensive online searches of literature in the last decades and using the strings “*teletrabalho*”, “*tele-trabalho*”, “*tele trabalho*”, “*trabalho à distância*”, “*trabalho-à-distância*”, “*virtual work Portugal*”, “*virtual work Portuguese*”, “*digital work Portugal*” and “*digital work Portuguese*”. The searches were conducted in three different sites: First, the work compiled scientific literature existing in national and international databases using the search engine Nova Discovery, which aggregates: the main databases of scientific articles, B-On (the main scientific engine in Portugal), institutional repositories and catalogues of all libraries of Universidade Nova de Lisboa, as well as ScienceDirect. Second, the work included searches in Boletim do Trabalho e Emprego, the official publication of labour conventions. Last, other searches were conducted in Google Search engine to assure a widest coverage possible of documents related to the topic. The typology of documents considered in the systematic review included: articles, theses, dissertations, books, book sections, conference proceedings, reports, bills, statutes, working papers, newspapers and magazines.

Our review of the literature compiled of 150 publications of all types about virtual work or industrial relations. We analysed 58 international scientific publications and 14 grey publications concerning virtual work, industrial relations and/or Portugal. We also considered 77 publications written about Portugal that mentioned the string *teletrabalho*, out of which 61 publications were selected for detailed analyses. The scientific publications selected consisted of 3 PhD Thesis, 19 Master Thesis, 10 Journal Articles, 6 book chapters, 3 books, 4 conference proceedings and 16 reports. We also examined 14 grey publications.

The report also focused on three sectors: Computer programming, consultancy and related activities, which mostly covers activities embraced by NACE code 62; Financial activities, which mostly covers activities embraced by NACE code 64 - financial service activities except insurance and pension funding; and Health care activities, which covers home health care activities (e.g. for elderly or disabled individuals), excluding residential

<sup>1</sup> Database of the Sixth European Working Conditions Survey.

care and childcare services and in terms of occupations covers nurses, healthcare assistants and auxiliary care workers (medical doctors are excluded).

### 3. Legislative framework

The definition of telework evolved into the concept of virtual work to embrace technology developments (increased mobility, miniaturisation, etc.) that allowed work to be carried out in other alternative workplaces. For example, Eurofound defined telework in 2010 as “a form of organising and/or performing work, using information technology, in the context of an employment contract/ relationship, where work, which could also be performed at the employer’s premises, is carried out away from those premises on a regular basis” (p.3). Several years before, the International Labour Organisation (ILO) defined telework as “all the work carried out from a certain place or away from offices or central locations, where the worker does not have personal contact with his/her colleagues, but may communicate with them using the new technologies” (cf. Gbezo, 1995). According to Ursula Huws et al (1990), a pre-condition for the development of remote work, especially for telework, is the “computerisation of the office”. Ursula Huws refers to elusive offices (“not real” offices), which are organizations that control activities indirectly, by means of a network of contracts with small suppliers, with direct control of activities such as image projection, distribution or sales. Several other empirical studies indicated different types of telework (Olson, 1983; Korte & Wynne, 1996; Di Martino, 2001), and have been considered for later studies.

With more technological advancements towards cheaper and more powerful electronic devices in the 1980 and 1990 decades, both groups of occasional teleworkers and teleworking professionals made use of the same new form of work (Bailey & Kurland, 2002). From early this century, the legal setting for telework changed dramatically. As Messenger (2019) refers, “government regulations were expanded from the mere promotion of the new mode of work to a more balanced perspective. Policymakers increasingly responded to the wide spread of telework and controversial debates around working time regulations, working conditions and occupational safety and health. An important example of this development is the European Framework Agreement on Telework of 2002 (Messenger, 2019, p.6). According to this agreement, teleworkers are to enjoy the same working standards as their colleagues at the employer’s premises.

The mobile office broke with the classic bipolar spatial structure of work (home vs. office). With that, work became detached from place. Thus, the government regulations reflected these developments. They respond to the changing work environments and their conditions. From the last decade, it needed only the fast-growing dispersion of the Internet and web access to take telework to its third generation, the virtual office. In fact, technology is the driving force behind the evolutionary process of telework. But this form of work is often confused with similar-sounding work arrangements, when just “away from office premise” is considered.

Recently, the European project DeepView, in 2018, used the concept of virtual work defined as the “work arrangements affecting employees which involve different locations outside the employers’ premises and different degrees of mobility, as far as they entail a frequent use of ICT for the purpose of work” (Sanz de Miguel et al., 2018, p.7). The project considered that alternative workplaces are the locations outside employers’ premises

(home, other workplaces at customers, clients or partners' premises), and also the third spaces (hotel rooms, remote meeting rooms, cafes and congress venues, etc.)<sup>2</sup>.

In Portugal, the concept of telework has also been the subject of discussion for several decades in different scientific fields, mainly sociology, law and management. On the problem of (tele)work legislation (labour and legal implications) it is important to mention the study by Rui Fiolhais (1998) on the labour and legal implications of dependent telework in Portugal. As well, it is worth to mention the initial work carried out by the national association for the development of telework (APDT), on a telework good practice guide (cf. Gomes & Bettencourt, 2000).

The Portuguese legal concept of telework is contained within the broader definition of virtual work. In fact, the current Portuguese legislation uses the expression *teletrabalho* [telework] to refer to “work performed with legal subordination, usually outside the company and through the use of information and communication technologies” (Article 165 of the Labour Code). Thus, there is a conceptual equivalence of *teletrabalho* to virtual work, except for non-subordinated work arrangements.

Although no changes were introduced in this definition, the early legislative frame created in 2003 has received other updates. The initial Portuguese Labour Code (Law No. 99/2003 in its articles 233 to 243) had a statutory scheme for virtual work in the private sector in line with the main dictates of the European Framework Agreement on Telework of 16 July 2002. A few years later, the Law No. 7/2009 of 12 February, which approved the revision of the Labour Code, regulated virtual work in its Articles 165 to 171 only with occasional amendments to the previous scheme. While changes in the legal framework for teleworking were not significant when comparing the two diplomas, there was one significant change: the 2003 labour code based the regime of employment contract on the typical working relationship paradigm, and the 2009 Law takes on the reality of special employment contracts. In addition, Susana Gil (2015) pointed that the legal framework for *teletrabalho* (or virtual work) existent in Portuguese law was based on principles that guarantee the application of the principle of equality and the confidentiality of the teleworker's privacy. Regina Redinha (2009) indicated that teleworkers have exactly the same collective rights as other workers, without the need for express reaffirmation in the teleworking regime. Guilherme Dray (2010) considered teleworking as an important tool for the protection of human dignity, as it promotes the employability of disabled people, namely people with mobility problems.

The regime of telework in the public sector came later than in the private sector, with the Law No. 59/2008 that stated the legal discipline established for the teleworker in public functions. This law was revoked in 2014 by the General Labour Law (LTFP) approved by Law No. 35/2014, which enshrined the content within Articles 68 and 69.

According to several legal experts, there are some difficulties to regulate telework in Portugal (Gabinete de Estratégia e Planeamento, 2017 and 2018a; Ramalho, 2019; Rebelo, 2017 and 2019). This article does not intent to fully describe all the problems with the regulatory frame, but the main difficulty relates to the fact that teleworking is in conflict

<sup>2</sup> Considering these definitions and using the European Working Conditions Survey (EWCS) by Eurofound, the project assumed the definition of telework/ICT-Mobile work (TICTM) by Eurofound and International Labour Office (2017) as a proxy for virtual work. TICTM is defined as a work arrangement characterized by working with ICTs from more than one place and with different degrees of mobility (hotels, cafes, home, etc.) and with a potential for flexibility as regards time and place of work (*idem*). Besides these references, the works by Huws et al. (2016), Holts (2018), Valenduc & Vendramin (2016) and Meil & Kirov (2017) have been central references to our analysis.

with many of the current labour regulations, because the Portuguese legislative scheme is designed to work with reference to a fixed and determined place, according the Susana Gil (2015). In addition, the regulatory framework does not allow for the easy establishment of subordination, lack of managerial control, difficulties in house inspections by the labour authority (Rebello, 2017 and 2019) and difficulty to maintain a time records of telework. Therefore, it can be stated that legal experts agree on the existence of significant difficulties with the current legislation related to virtual work.

#### 4. Incidence and trends of virtual work in Portugal

In a context of increasing applications of virtual work in Europe, this atypical form of work has a residual expression in the Portuguese context, and has, in fact, been losing relevance (Dray et al., 2016). The situation between member states also varies significantly. In some countries (mostly Scandinavia) it is widely disseminated, but in others not as much. In terms of Digital Economy and Society Index ranking, Portugal occupied the mid position among EU member states according to the Europe's Digital Progress Report of 2017.

##### 4.1. Direct measures

Statistics about telework in Portugal are not very exact. In fact, statistics about the incidence of telework may not take into account the distinction between subordinate and independent teleworkers; may not cover teleworkers at home; may account for only those who telework all the time; and may exclude the mixed formulas (the most frequent) such as those who telework occasionally or once a week. Several reasons may account for these discrepancies, such as lack of political will, inefficiencies of the statistical system, strategic and competitive factors of companies, as well as workers' fiscal interest (Gil, 2015). Nevertheless, we will report on the data found about Portugal in the two main periods of data collection: the early period of 2000 to 2005 and, later, the period from 2010 to 2016, where concepts evolved from telework to virtual work.

The earliest data about the incidence of virtual work in Portugal refers to the period from 2000 to 2005. In this period, five main results were found to characterise this type of work:

- In 2000, there was 1% of workers involved in telework from home all the time, and 2% at least  $\frac{1}{4}$  of the time (Paoli & Merllié, 2001);
- In 2001, the telework activity, regularly or occasionally, involved 1.8% of the 29% of population that used a computer, according to the first national survey that collected data about virtual work (Instituto Nacional de Estatística, 2002);
- In 2005, there was 2.1% of workers working in telework from home (Parent-Thirion et al., 2007);
- In 2005, 1.8% of the workers were involved in telework at least 'a quarter of the time' or more, and 0.5% were involved in telework 'almost all of the time' (Eurofound 2010)<sup>3</sup>. These percentages of workers were significantly low when compared to the European average of 7% and 1.7%, respectively;
- Between 2000 and 2005, there was a decreasing trend in terms of telework usage in Portugal (Eurofound 2010).

<sup>3</sup> The workers responded to the question "Does your main paid job involve: telework from home with a PC?" on the European Working Conditions Survey in 2005.

Portugal has been categorised in the group of countries made up of eastern and southern Member States (with Bulgaria, Hungary, Italy and Romania) with very low levels of telework and with a percentage of less than 3% (Eurofound, 2010). The country also revealed a decreasing trend in terms of telework usage with four other countries (i.e. Bulgaria, Cyprus, Luxembourg and Romania) (Eurofound, 2010). However, the number of employed persons usually working from home (sometime or usually) as a percentage of the total employment, has increased in Portugal from 2008 until 2016, almost as Estonia when we compare countries.

#### 4.2. Indirect measures

There are two datasets about the incidence and trend of virtual work in Portugal for the period between 2010 and 2016. These datasets are based on indicators collected in two surveys: the European Working Conditions Survey (EWCS) in 2010 and 2016; and Gabinete de Estratégia e Planeamento in 2013 and 2018 (2018; 2013).

According to the EWCS, there were 8.2% of employees engaged in virtual work in 2015. Furthermore, these datasets allow the analysis of four main indicators to characterise in more detail virtual work: the (i) place of work, (ii) mobility of workers, (iii) ICT usage in work and (iv) telework contracts<sup>4</sup>.

##### 4.2.1. Place of work

In 2010, the EWCS collected data about the main place of work in major European countries. According to the survey, 33% of the Portuguese workers reported other locations as their main place of work (other than the employer's premises) such as clients' premises (12%), car or other vehicle (4%), outside site (13%), own home (3%) and other (1%)<sup>5</sup>. This is the second highest rate of other locations (than employer premises) in the European Union, after Romania. The EU27 average is 23%. Thus, in 2010, the proportion of Portuguese workers that identified other places of work was relatively high in the European context.

In 2015, the EWCS collected data about workers with one or more work locations. 24% of workers considered having one or more than one work location. The EU27 average was at 30%. Portugal belonged to a group of four countries (alongside Italy, Bulgaria and Slovenia) where the number of workers with more than one location was lower. Furthermore, out of those who were frequently<sup>6</sup> involved in work in other locations (than employer's premises) in Portugal, 13.1% of workers were frequently<sup>6</sup> involved in work in the client's premises; and 8.5% were frequently involved in work while a car or another vehicle.

In short, there was a declining trend in places of work in the period of 2010 to 2015: in 2010, 33% Portuguese workers identified other places of work; and in 2015 only 24% indicated to have more than one work location. Work in client premises increase from 12%

<sup>4</sup> These indicators can be used to characterise the incidence and trends of virtual work, as the definition adopted by the project Deep View about virtual work is a comprehensive concept, which involves different locations outside the 'employers' premises' and different degrees of mobility, as far as they entail a frequent use of ICT for the purpose of work.

<sup>5</sup> In the figure, we see the percentages of the people per answers when asked 'Where is your main place of work?'

<sup>6</sup> Daily or several times a week, during the last 12 months in their main paid job / since they started their main paid job.

in 2010 to 13.1% in 2015. Similarly, work in a car increased from 4% to 8.5%. Thus, the location of work increases in this period.

#### 4.2.2. Mobility of workers

In 2015, the EWCS also collected data about the work mobility. This year, 82% of workers considered that their work did not involve visiting customers, patients, clients or working at their premises or in their home. Portugal had the second highest response after Hungary. The EU27 average was at 70%. Thus, there was a significantly high proportion of Portuguese workers considering that their work did not involve visiting customers, patients, clients or working at their premises or in their home in 2015.

From 2010 to 2015, there was a growing trend in mobility of workers: In 2010, 67% reported working in their employer's premises; and, in 2015, 82% of workers considered that their work did not involve visiting customers, patients, clients or working at their premises or in their home.

#### 4.2.3. ICT usage

The 2010 EWCS found that 62% of the workers considered that they were almost never involved in working with computers. The EU27 average was 48%. Furthermore, only 17% were involved in this type of work between  $\frac{1}{4}$  and  $\frac{3}{4}$  of the time. The EU27 average was 23%. In addition, 14% indicated to be almost all of the time involved in working with computers. The EU27 average was 29%. Therefore, in 2010 Portuguese workers spent a low proportion of time with work that involved computers.

In 2015, 59% of the Portuguese workers were (almost) never involved in working with computers, laptops, smartphones, etc. This was the highest proportion in the EU context. The EU27 average was 43%. Furthermore, only 14% were involved in this type of work between  $\frac{1}{4}$  and  $\frac{3}{4}$  of the time. This proportion was the lowest in the EU context. The EU27 average was 25%. In addition, 26% indicated to be (almost) always involved full-time in working with computers, laptops, smartphones, etc. The EU27 average was 31%. Therefore, in 2015, Portuguese workers spent a low proportion of time with work involving computers, laptops, smartphones, etc.

In sum, Portuguese workers revealed a low percentage of work with ICT when compared to their European Union colleagues. However, there was a growing trend in ICT-usage from 2010 to 2015: the trend declined among those who never use ICT (62% to 59%) and among those who used it between  $\frac{1}{4}$  and  $\frac{3}{4}$  of the time (23% to 14%); and the trend increased among those who used it (almost) all of the time (14% to 26%).

#### 4.2.4. Sector

The EWCS<sup>7</sup> reveals information by sector about those who work from their own homes: 14% of the workers in the sector of computer programming, consultancy and related activities engaged frequently (daily and several times a week) in work from their own home (while the EU27 average was 23%); 10% in the financial activities sector (while the EU27 average was 7%); and 6% in the human health activities sector (while the EU27 average was 36%). The survey also presents data about locations where virtual work can occur: 9% of the workers in the computer programming sector, consultancy and related

<sup>7</sup> The literal question was "Please take a look at these locations. In a moment, I will ask you how often you have worked in each location [during the last 12 months in your main paid job / since you started your main paid job]".

activities engaged frequently (daily and several times a week) in work in locations where virtual work can occur (while the EU27 average was 14%); 4% in the financial activities sector (while the EU27 average was 5%); and 3% in the human health activities sector (while the EU27 average was 6%). Thus, the computer and human health sectors are consistently below EU27 averages, with the exception of the financial sector.

#### 4.2.5. Occupation

EWCS provides data on Portugal by occupation in 2015. The most prominent workers who reported having work frequently in other locations than the employers' premises were the Armed forces occupations, other ranks (52%), Drivers and mobile plant operators (35%), Production and specialised services managers (26%), Building and related trades workers, excluding electricians (26%), Market-oriented skilled agricultural workers (25%), Agricultural, forestry and fishery labourers (25%), Labourers in mining, construction, manufacturing and transport (25%), Information and communications technicians (24%). Other had percentages below 22%.

#### 4.2.6. Telework contracts

The telework contracts are a form of labour contracts to develop virtual work specific to the Portuguese legal frame. The data<sup>8</sup> collected by Portuguese organisations about the existence of these formal subordinated forms of telework contracts reveal that, in 2016, only 0.03% of the contracts were of telework. This year, 83% of these telework contracts were open-end contracts of telework, 14% were fixed-term contracts and 4% were of uncertain-term contracts. These data also show a declining trend in the total of telework contracts from 0.09% in 2010 to 0.03% in 2016.

The available data<sup>8</sup> about telework contracts broken by gender in 2016 show that 42% of workers with telework contracts were females. The lowest percentage of females was found in uncertain-term contracts of telework with 33%, down from 40% in general uncertain-term contracts for females. Furthermore, the data also reveals a minor declining trend of females in telework contracts, as 43% of females had a telework contract in 2010 and, in 2016, 42% had this type of contracts.

Importantly, this specific type of telework contracts does not account for the workers who 1) have a regular contract and are also involved with virtual work or 2) those who are self-employed. The former and the latter have been recently considered significant in Portugal by several authors (Eurofound, 2015; Gil, 2015; Sousa, 2016).

In summary, the analysis of the incidence and trend of telework/virtual work suggests that virtual work was never very significant in Portugal. According to the EWCS, there were 8.2% of employees that engaged in virtual work in 2015. Furthermore, an analysis of period 2010 to 2015-6 reveals a declining trend in both telework contracts and places of work. In the same period, increasing trends were detected in relation to the mobility of workers and their ICT-usage, which might indicate a potential to increase the use of virtual work. As mentioned before, an Eurofound (2015) study identified a significant trend in ICT-based mobile work in Portugal (along with Belgium, Cyprus, Denmark, Lithuania, Spain and Sweden) generally involving the self-employed. However, this type of workers without the status of employees is not covered by statistics.

<sup>8</sup> The data from *Quadros do pessoal (Gabinete de Estratégia e Planeamento 2012, 2018)* refers only to continental Portugal.



## 5. Research on the effects on virtual work on working conditions

Recent research about working conditions of teleworkers in the last decade was published mostly as PhD and Master theses. There were five main studies. The work of Gil (2015) analysed telework mostly from a legal perspective comparing Portugal and Spain. The definition of telework was the existence of three characteristics: work carried out at a distance; use of information and communication technologies; and a strong connection between employer and worker, revealing virtual subordination.

The author considered four concepts regarding telework: Domestic telework, mobile telework, telecentres and cross-border teleworking. Gil concluded that the number of subordinate teleworkers has increased, albeit modestly, in recent years, not keeping pace with the growth of independent teleworkers. According to Gil, the Portuguese legal regime on teleworking is one of the most complete in the European legislative system. The author considered that the motives that drove the development of teleworking will not disappear in the short or medium term, and envisaged a growth of this reality, although in a gradual way. The author pointed that the “chaotic” statistics about telework and the labour law need to deal with the tendency of many employers to hire service providers rather than subordinate workers (p.229). According to Susana Gil, the main barrier to the implementation of teleworking remains the entrepreneurial resistance to change, both culturally and in terms of organisation, sustained in arguments of lack of effective worker control and the consequent fear of lack of productivity. “It is wrong to assume that a worker who is out of the visual range of his / her superior will not have the same income as if he or she were working at the employer's premises”. To the author, the main conclusions from teleworking analysis developed in Spain demonstrate the exact opposite: some Spanish companies reported difficulties in managing their teleworkers' schedules, but from overwork”. Gil concluded that telework will increase if organisations find: “a teleworker with the right profile, a hierarchical superior with the necessary characteristics and a dialogic and harmonious working relationship” (Gil, 2015, p.229).

The dissertation of Crugeira (2015) studied home-based teleworking from a work life balance perspective. The author defined it as a flexible form of work, performed at a distance, in this case at home, via computer networks and telecommunications and including tasks such as the translation of documents, consulting, web designer, teacher, computer, among others. According to Crugeira (2015), Portugal is a country with a culture of presence at work, with no opening to teleworking. One of the main obstacles to the implementation of flexible work is the organisational culture, since companies have traditional methods that defend the physical presence of the worker. This culture embedded in the systems, hierarchies and mentalities of workers (Lencastre, 2006) leads to a difficult change, being one of the reasons why Portuguese companies do not adhere to telework.

From the teleworkers point of view, Redinha e Sousa (2003) argued that this form of work authorizes flexible management of working time, eliminates, totally or partially, the hassles and expenses related to commuting to work, allows better articulation of professional and family life, as well as creativity and individual responsibility. Furthermore, workers with disabilities on mobility see the prospects for employment and occupation substantially broadened, as well as to peripheral labour that is only, occasionally or temporarily, available. However, the isolation to which the teleworker is subject, especially the one who works at home, often leads to a social and psychological uprooting that leads to wage cuts due to the subtraction of portions corresponding to transport or food

subsidies, for example. In her thesis, Regina Redinha (2009) sustained that the greatest psychosocial drawback of teleworking is the isolation of the worker from a work community, and hence the need to establish mechanisms for integrating teleworkers into the employer's organization, without prejudice to the general duty of information under the employer's responsibility. The dependent teleworker is overexposed to the risk of erosion of labour protection, insofar as their visibility it is tiny, and the workstation is easily hidden.

For the company's perspective, Redinha e Sousa (2003) argued that teleworking is, above all, an option geared to gains in productivity and competitiveness, but it is also a means of compressing expenses: the physical installation space is smaller or moves away from urban centres and, therefore, is less expensive, in addition to the fact that fewer workers produce more and sometimes with a reduction in the number of managerial and supervisory staff. However, the relocation of work has negative factors, such as the cost of installing and maintaining the mobile workstation or the loss of effective control over the provision of work and confidentiality, integrity and availability of information handled externally.

On another perspective, Nunes (2007) focused his thesis on the role of ICT in reformulating territorial dynamics, specifically with regard to its influence on work organisation and the emergence of the information society. To question and ascertain the importance of ICT as a tool with the potential to redesign the pre-existing spatial patterns, an empirical survey was carried out on the Portuguese reality based on the analysis of the spatial coverage of broadband internet access and interviews with a set of teleworkers. The author concluded that the greater autonomy and flexibility enjoyed by teleworkers in exercising their professional activity has led to distinct lifestyles, usage and appropriation of space and time, both in terms of their professional life and their private life.

In her dissertation, Aranda (2012) analysed teleworking from a job latitude and skills perspective. The author used interviews with eight dyads of teleworkers and their direct leadership. Aranda found that what led to the adoption of telework are the functions to be performed and that there appears to be a profile on that responsibility, organisational skills and self-discipline. The author concluded that, overall, teleworkers are satisfied with the telework and do not intend to go back to the traditional workplace. However, some workers have admitted feeling isolation and lack of structure of the company. In terms of intervention, it is important that companies provide working conditions adapted to the modality in question and that develop mechanisms of support and monitoring of the teleworker, to improve their integration into work teams. Workers also need tools to manage their time and workspace (which often coincides with their residence), allowing adequate separation between professional and domestic sphere. In this sense, one of the findings relates to the need to invest in training for this type of modality, both as regards the preparation of workers as their direct leadership.

Finally, in his thesis, Almeida (2006) analysed telework from a skills perspective and focused on constraints and necessities of telework, such as the need for suitable communication and management tools. The study applied a method that includes the evaluation of a prototype and research objectives, by users with different digital literacy in controlled sessions, followed by two written questionnaires and an interview. The results confirmed that digital literacy can be a constraint to the use of telework, and also indicate that the global availability of a system adapted to the needs of teleworkers can contribute to the adoption of telework practices (Almeida, 2006).

There are two other research outputs that briefly mentioned telework, although as a lateral topic. The first one is the annual statistical report on employment that addressed the limitation related to work and need of special care in the population with health problems and/or difficulties. According to Instituto Nacional de Estatística (2012, p.40), in 2011, out of the special needs of care, the main activities (16.2%) referenced by the population with at least one long-term health problem and/or one difficulty in a basic activity, were the special types of work, such as development of sedentary activities, telework, flexible hours and less strenuous tasks. Second, in a conference proceedings (Alexandre, 2013) briefly analysed virtual work from the parenthood point of view. The author considered that the option of a parent to stop working, choose to do virtual work or to work part-time does not seem to be the solution that respondents idealised, showing that they do not intend to give up their profession to the detriment of custody of their children, and they intended to entrust this task to family members (grandparents or others) or to the educational infrastructure.

Besides the studies mentioned above, there was a study about telework by sectors published in 2003 (Urze et al., 2003) that revealed information about the software sector, as well as the sectors of Textile, Shoemaking and Metal Engineering. The authors revealed the existence of mobile work in 65% of the textile sector, 80% of the metal engineering sector and, significantly, 100% of the software sector. There are differences between the sectors: On average, the software sector has more mobile workers with over 50% of the total number of workers; the metal engineering sector has 6% to 20% of mobile workers; and the textile and shoemaking sector has 5% of mobile workers.

Glória Rebelo published extensively about telework particularly from a legal perspective (Rebelo 1994, 2002, 2004a, 2004b, 2017 and 2019). In 2017, the author identified the main political developments and initiatives of the context of telework in Portugal. In 2019, the Rebelo described the difficulties to determine subordination or autonomous virtual work. In this latest work, the author identified problems with the lack of managerial control and difficulties with state inspection related to the inviolability of households. In relation to the former Rebelo (2019) reported that the labour code attenuates the loosening of control of the teleworker through the naming of the employer's premises and the manager responsible for the worker. In relation to the latter, the International Labour Organization (ILO, 2018) argued that it may be necessary to provide more training to labour inspectors and the judicial system on how to ensure the implementation of measures relating to teleworking, so that they can properly understand and balance the needs of workers and employers in the rapidly evolving field in the world of work<sup>9</sup>. Last, Rosário Ramalho (2019) wrote a review of the legal framework and labour relations related to digitalisation and telework in Portugal. The report confirms that the low expression of the special contract of *teletrabalho* stands out among all employees.

<sup>9</sup> In this respect, the government approved the National Strategy for Equality and Non-Discrimination (Resolução do Conselho de Ministros no 61/2018), with the global and structural action targets by 2030 to achieve equality and non-discrimination regarding egalitarian, inclusive and future-oriented scientific and technological development. It strategically sets virtual work as a relevant tool to promote the promotion of equality in innovation and scientific and technological development, training and capacity building as tools for equality and full and equal participation in digital progress.

## 6. Conclusion

This paper started with an introduction to the concept of telework discussed in wide scientific literature, and also in Portugal, and explained how it has evolved through time. It can now be referred to as virtual work to encompass new possibilities arising from technology developments that allow work to be carried in many more locations and forms than the traditional household. After, the text contextualised the legal framework of telework in Portugal. We reported that legal experts agree on the existence of significant difficulties with the current legislation related to telework.

The article also identified the main quantitative and qualitative findings about telework and virtual work in Portugal. First, it addressed the development and present levels of telework in the country. Databases indicate that in 2005 there were 1.8% of Portuguese workers involved in telework in at least 25% or more of their worktime, and 0.5% involved 'almost all of the time'. In 2010, virtual work was in decline, with less than 3% of workers engaged in this work arrangements. In 2015, it increased to 8.2% of employees engaged in virtual work. The sector of computer programming, consultancy and related activities had 5% and 4% of the workers engaging daily and several times a week in locations where virtual work can occur (EU27 average was 6% and 8%, respectively); in the sector of Financial activities, 0% and 4% engaged daily and several times a week (EU27 was 2% and 3%); and in the sector of human health activities, 0% and 3% engaging daily and several times a week (EU27 was 3% and 3%). Furthermore, an analysis of period 2010 to 2015-6 reveals a declining trend in both telework contracts and places of work. In the same period, increasing trends were detected in relation to the mobility of workers and their ICT-usage, which might indicate a potential to increase the use of virtual work.

We also identified that the main empirical research about working conditions of teleworkers in the last decade was published as PhD theses and Master theses. The work of Gil (2015) concluded that the number of subordinate teleworkers has increased, albeit modestly, in recent years, not keeping pace with the growth of independent teleworkers. The author pointed that the "chaotic" statistics about telework and the labour law need to deal with the tendency of many employers to hire service providers rather than subordinate workers. Susana Gil argued that the main problem of the legal framework is related to the reference to a fixed and determined place.

To both Gil (2015) and Crueira (2015), Portugal is a country with a culture of presence at work, with little opening to teleworking. One of the main obstacles to the implementation of flexible work is the organisational culture, since companies have traditional methods that defend the physical presence of the worker. Crueira referred that this culture, embedded in the systems, hierarchies and mentalities of workers, leads to a difficult change, being one of the reasons why Portuguese companies do not adhere to telework. Almeida (2006) indicated that digital literacy can be a constraint to the use of telework services. Rebelo (2019) reported on the difficulties to determine subordination or autonomous virtual work in the Portuguese legal framework and identified problems with the lack of managerial control and difficulties with state inspection related to the inviolability of households.

There appears to be a considerable degree of management resistance to permitting telework in many organizations – including those that already have teleworking or telecommuting policies in place. The studies, international and national ones, also agree that this resistance is due mainly to a cultural dimension, where the traditional "command

and control” style of management is not possible with telework, and many managers fear this loss of control. Rebelo reported also that the national labour code attenuates the loosening of control of the teleworker through the naming of the employer’s premises and the manager responsible for the worker.

Considering this assessment, the two main factors hindering the growth of virtual work are the legal framework and the organisational aspects of work, including the organisational culture, as our study could find. The legal aspects are still bounded to the difficult definition of limits of labour dependency and the autonomy of the job, which may conflict with the living conditions.

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