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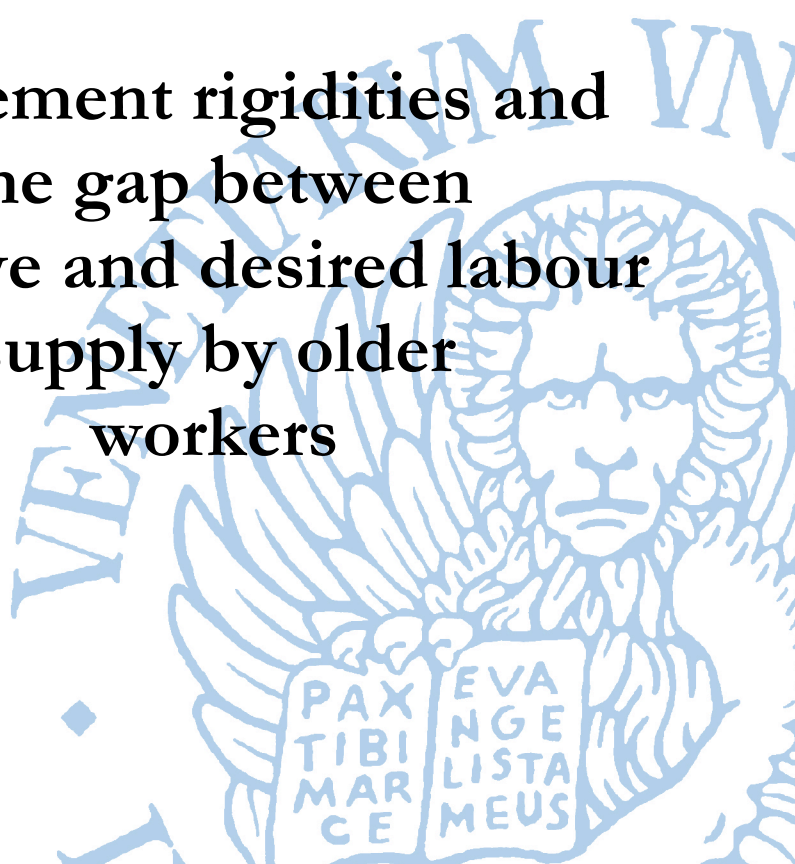
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## Retirement rigidities and the gap between effective and desired labour supply by older workers

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### **Abstract**

Our paper analyses the observed and desired labour supply of older workers and (recent) retirees in a country (Italy) with limited opportunities for exible work schedules. For this purpose, we use a unique dataset drawn from the Bank of Italy's Survey on Household Income and Wealth (SHIW) providing information on both desired and actual working hours. Our empirical analysis documents the gap between older individuals' desired and observed labour supply at both the extensive and the intensive margins and traces it back to gender, education and family composition. The paper provides useful insights into the potential effectiveness of policies such as gradual retirement and part-time work in increasing older workers' employment.

### **Keywords**

Retirement, desired labour supply, exible retirement

### **JEL Codes**

J26, J14

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Retirement rigidities and the gap between  
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February 20, 2018

**Abstract**

Our paper analyses the observed and desired labour supply of older workers and (recent) retirees in a country (Italy) with limited opportunities for flexible work schedules. For this purpose, we use a unique dataset drawn from the Bank of Italy's Survey on Household Income and Wealth (SHIW) providing information on both desired and actual working hours. Our empirical analysis documents the gap between older individuals' desired and observed labour supply at both the extensive and the intensive margins and traces it back to gender, education and family composition.

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## 1 Introduction

Population ageing points to the need to increase the employment rate of older workers in order to guarantee both the sustainability of pension systems and the adequacy of resources in retirement. To achieve this goal, the main strategy of almost all European countries has consisted of increases in the statutory retirement age, the tightening up of minimum requirements and on financial incentives to postpone retirement beyond the minimum (OECD, 2016; Eurofound, 2016; European Commission, 2015). Although some countries (Italy among them) have established an automatic link between longevity and retirement age, the compulsory extension of working life is obviously not an “*ad libitum*” viable policy. The policy, moreover, reflects a rather traditional retirement scenario, typically characterized by full-time work ending abruptly in complete leisure. This retirement pattern may not be what workers, or a significant proportion of them, want. The harsh discontinuity between working life and retirement, when the latter suddenly reduces working hours from full-time to zero, can indeed be regarded as a welfare-decreasing factor. If rigidities in both the pension system and the labour market prevent individuals from doing part-time work, workers

may feel constrained to retire earlier than they would have done. People may prefer retirement to full-time work, but they may be willing to continue to work if they have access to a reduced effort level. Policy interventions designed to foster flexibility in the working schedule and to increase the possibility of combining a pension and work, with some sort of gradual retirement, would then be welfare improving. Given workers' heterogeneity, investigating the characteristics of the people who would be better off if they had access to a smoother scheme of retirement is the first step in designing appropriate policies. In this paper, we look at preferences for hours of work expressed by older individuals, whether in employment or already retired, and compare them to their effective working hours (which may be zero in the case of full retirement). The analysis gives us an estimate of the "discouraged" labour supply that older workers could instead deliver, as well as a picture of the characteristics of workers willing to work longer. It also provides an empirical basis for policy measures directed at encouraging workers to postpone their retirement without forcing them to work full-time.

The literature on the desired labour supply is sporadic, given the shortage of individual survey data eliciting this information. Some notable exceptions are Callan et al. (2009); van Soest et al. (2002) and Euwals and van Soest (1999), who use data on preferred labour supply - respectively in Ireland and the Netherlands - to estimate labour supply and the impact of tax reforms and wage elasticities. van Soest and Vonkova (2014) exploit stated preferences about different hypothetical retirement trajectories, with different ages of (par-

tial or full) retirement and different replacement rates, collected by the Dutch CentERpanel. They use this information to estimate parameters of the utility function in order to simulate the sensitivity of retirement decisions to financial incentives, showing substantial differences between results based on observed or desired labour supply.

Our paper adds to the literature and to the policy debate by documenting the gap between the preferred amount of working hours and the observed one, at both the extensive and the intensive margin. To this end, we exploit an ad hoc section of the 2004 wave of the Italian Survey on Household Income and Wealth (SHIW), meant to figure out the “desired” labour supply of both older workers and retirees. Our data testify to a displacement effect on older workers’ observed labour supply.

A non-negligible fraction of retirees would like to work, most of them with a part-time schedule, and older workers declare that they are willing to continue to work, albeit with a lower intensity. The gap between the observed and desired labour supply is likely to depend on factors affecting the disutility of labour and the utility of additional resources. Our results confirm that gender, education and family composition are relevant factors associated with the desired labour supply. The comparison between the observed and the desired labour supply, in its turn, gives a measure of the severity of the displacement effect affecting older workers with respect to their optimal level of work.

The paper is organized as follows. Section 2 provides an overview of part-time jobs as well as of rules for a more gradual retirement in Europe. Section

3 sketches the theoretical framework and Section 4 describes the institutional framework. Section 5 illustrates the data and the variables of interest. Section 6 comments on the empirical findings separately for retirees (6.1) and for workers (6.2). Section 7 concludes and discusses some policy implications of our results.

## **2 Part-time work of older individuals and gradual retirement in Europe: an overview**

How much flexibility is there in Europe for working schedules at older ages? And where does Italy stand within this context? With 14 per cent of older workers (formally) engaged in part-time activities, Italy has the third-lowest number of older (55-65) part-timers in the EU, after Greece and Spain. The number of part-timers differs widely across countries, ranging from 7 per cent in Greece to 49 per cent in the Netherlands (Table 1). This gap suggests that differences in preferences can hardly be the only explanatory variable, leading to the conclusion that both supply and demand side disincentives, as well as binding constraints coming from the legal framework, must play a significant role. Providing evidence of the latent supply of older workers (i.e. desired number of working hours) allows us to rule out the unavailability of older workers to perform part-time work as the main cause of the Italian discrepancy. A remarkable feature of European data is that where the overall incidence of part-time jobs is higher, the percentage of older workers engaged in such jobs is also higher. Conversely, where the incidence of part-time jobs is lower, this

work is concentrated among the younger age groups. A tentative interpretation, which is beyond the scope of the present analysis, is that the latter situation provides an indication of precariousness, while the former suggests a better-performing labour market and more efficient retirement rules (Devicienti et al., 2016). More specifically, in countries where the market is more flexible and workers' preferences can be accommodated, the supply of part-time activities by older workers is higher than/equal to that of younger workers, suggesting that generally older workers prefer to keep working but not in a full-time capacity.

Part-time work at older ages can also be restricted by legal restrictions to combining labour income and pension benefits. In extreme cases (which is the case in Italy as well as in other European countries), after retirement age official work means a hundred per cent taxation of pension benefits. Measures directed at encouraging a more gradual retirement have often been advocated as one of the features that could improve social welfare by allowing workers to work (retire) more in accordance with their own preferences. Gradual retirement comes in various forms, generally consisting of the possibility of combining the accrued pension benefit (or a fraction of it) with work, either full- or part-time, and either with the same firm (phased withdrawal) or through a "bridge job" with a new employer (partial retirement) (Kantarci and Van Soest, 2008; Brunello and Langella, 2013). Various types of gradual retirement have been introduced and tested in different European countries, although the evidence regarding their success, in the sense of a consequent significant reduction of early withdrawals from labour matched by an increase in older workers' em-



ployment rate, is quite modest (Delsen, 1996). Highlighting the reasons behind this lack of popularity is beyond the scope of this paper. They may come from inadequate demand for part-time labour - indeed, a major issue in several European countries (Kantarci and Van Soest, 2008; Brunello and Langella, 2013);<sup>1</sup> from inadequate labour supply from older workers and/or from institutional constraints (pension and labour market regulation). Our purpose here is to look at the discrepancy between the effective and the desired labour supply by older workers, as a prerequisite for the effectiveness of such policies.

### 3 Conceptual Background

Individuals are assumed to face the following inter-temporal maximization problem where utility depends upon consumption ( $c$ ) and leisure ( $l$ ) at each time from  $t$  till the end of life  $T$ .

$$\max_{c_t, l_t} \sum_{s=t}^T u(c_s, l_s) \quad (1)$$

The value function  $V_t$  is then the inter-temporal utility at time  $t$  when optimal choices are taken, as such:

$$V_t = u(c_t^*, l_t^*) + \beta u(c_{t+1}^*, l_{t+1}^*) + \dots + \beta^{(T-t)} u(c_T^*, l_T^*) \quad (2)$$

with  $\beta$  indicating the subjective time discounting factor. Leisure can have values

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<sup>1</sup>Female labour supply, in particular, whose dynamics are strongly affected by the fertility decisions and caring responsibilities (Battistin et al., 2015; Bratti et al., 2016), might be more responsive to a smoother decline of working hours to retirement.

between 0, when working full time, and  $L$ , when not working:  $0 < l < L$ . In the real world, leisure is not that flexible in its planning, as it is more likely that agents have to choose between full time and or no work at all, being the part time option rarely available. Let us focus our attention around the retirement period. After reaching the minimum requisites for retirement (age or age plus seniority) the worker can choose to withdraw and retire, or to engage in another year of (full time) work. The trade-off implies that one additional year at work translates into higher resources at present and higher future pension benefits, but lower immediate leisure.<sup>2</sup> Workers will thus compare the two utilities under the two regimes. If the worker continues in (full-time) work after having become eligible for pension, the intertemporal (time separable) utility she faces is the following:

$$V^w = u(c_R^w, 0) + \beta u(c_{R+1}^w, L); \dots + \beta^{(T-R)} u(c_T^w, L). \quad (3)$$

If she decide to retire, the intertemporal utility is:

$$V^r = u(c_R^r, L) + \beta u(c_{R+1}^r, L) + \dots + \beta^{(T-R)} u(c_T^r, L) \quad (4)$$

where  $V^w$  is the utility when working an extra year and  $V^r$  is utility when retiring.<sup>3</sup>  $L$  is entire leisure after retirement occurs, while leisure is set to zero

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<sup>2</sup>For simplicity, we abstract from modelling directly pension formulas which are not actuarially fair, when increases in the pension benefit do not compensate the forgone year of retirement and the additional year of contributions (Castellino and Fornero, 2001). Implicit taxation of postponement of retirement can be thought as unobservables affecting the utility of working.

<sup>3</sup>We assume here that everyone retire in the next period ( $R + 1$ ). This simplifying assumption does not alter the main message of this stylized theoretical framework. Moreover,

during working life, since workers are constrained to full time. Superscripts in consumption ( $c_t^w$  and  $c_t^r$ ) denote states when the individual is, respectively, working or retired. Consumption  $c_t^w$  is higher than  $c_t^r$ , reflecting higher lifetime resources under the working regime, compared to the retirement one. The option chosen will be the one providing the maximum utility, thus choosing to postpone retirement if the following holds:

$$V^r > V^w \quad (5)$$

If gradual retirement were offered, workers may choose a third option at time  $R$ , with  $l^{wpt} < L$  denoting partial leisure due to part time work. In this case, they get an indirect utility equal to

$$V^{wpt} = u(c_R^{wpt}, l_R^{wpt}) + \beta u(c_{R+1}^{wpt}, L) + \dots + \beta^{(T-R)} u(c_T^{wpt}, L). \quad (6)$$

People would not choose to retire earlier, were gradual retirement offered to them, if<sup>4</sup>

$$V^{wpt} > V^r > V^w. \quad (7)$$

Knowing the ideal number of hours worked, we are able to detect if, and to what extent, there is room for welfare improving policies, offering a more flexible working schedule. Our sample of interest is thus composed by people who are going to retire or have just retired but they would have preferred to stay at retirement is assumed to be an irreversible choice.

<sup>4</sup>If instead  $V^{wpt} > V^w > V^r$ , workers may decide to switch from a full-time to a part-time working schedule.

work, under flexible working hours. Knowing the desired working hours and the actual ones makes our analysis feasible.

## 4 Institutional framework

The choice between protracting work and retiring depends on many economic and institutional variables, having to do with regulations in both the labour market and the pension system. One of them is the pension formula, which characterizes the economic pros and cons of the decision, taking into account the constraints on the work. In the case of Defined Contribution (DC) with actuarial adjustments, the continuation of work is not penalized and the worker can freely decide according to her personal preferences, possibly mitigated by firm issues, on the one hand, and family considerations, on the other (Coda Moscarola et al., 2016). When the formula is, instead, of the Defined Benefit (DB) type, it implies an implicit tax on the continuation of work, which can be enough to induce workers to withdraw as soon as possible. Another important feature comes from the possibility of cumulating work and pension. DB pensions are typically associated with strict limitations on work. In the case of retirement as a zero-one choice, the worker is either engaged full-time or a full-time retiree. The DC formula makes the combination of work and pension much easier, and in variable ways, by reducing or cancelling the penalization on the continuation of work.

Since our data concern Italy in the year 2004, we briefly summarize the

situation in what follows. Retirement could be accessed at a relatively young age through the so-called “seniority” pensions, allowing workers to retire after a minimum of 35 years of service, almost irrespective of age, on condition they do no work (or work part-time for the self-employed). Pensions were awarded under a relatively generous (with respect to paid contributions) DB formula, on condition they renounced earning from work (at least officially). Restrictions to earnings were imposed even in the case of the (very rare) DC pensions. For retirement at the statutory age (the so-called “old age” pensions) or for seniority of longer than 40 years, no restriction to work was considered. As for the labour market, part-time work has never been popular in Italy, as it is interpreted as a constraint and not as a free choice. The trade unions were (and possibly still are) in general rather negative or unconvinced and thus inclined to ask for tight regulations on recourse to part-time work by firms, implying administrative/bureaucratic restrictions on firms.

## **5 Data**

The empirical analysis is based on the Bank of Italy’s Survey on Household Income and Wealth (SHIW), and relies on data for the 2004 wave. The SHIW data set is a representative sample of the Italian resident population and covers about 8,000 households in each wave. It collects detailed information on household composition, income, wealth and the labour market status of the household members, including the number of weeks and average weekly working hours they

worked in the previous year. In addition, the 2004 wave includes questions to elicit the respondents' "desired" labour supply. More precisely, all the employed workers (employees, self-employed, members of the profession, family business, etc.) who are interviewed in person are asked the following question:

“ At the same hourly earnings, how many hours would you like to work on average per week?”

Respondents who are not employed (unemployed, first-job seekers, homemakers, pensioners, etc.) report whether they would be willing to work, and, if they answer “yes”, they are asked two additional questions:

“ Considering the conditions generally obtainable nowadays if [name] worked, given age, education and experience, would [name] be willing to accept: Full-time payroll employment for the whole year/Part-time payroll employment for the whole year/Only occasional, seasonal or informal payroll employment/Only free-lance work or self-employment”

and

“ How many hours a week would [name] like to work in this hypothetical job”

We use this information to construct an indicator for the “desired participation” in the labour force (extensive margin) and to measure how many hours per week respondents would like to work (intensive margin). While it is clearly stated that wages for the hypothetical job are either current or market wages,

the assumption that all the other conditions (availability of child and elderly care, etc.) remain the same is implicit. In addition, nothing is explicitly stated about the possibility of gradual retirement, namely the possibility of combining part-time work with cashing in on reduced pension benefits, nor about the value of future pension entitlements under different working choices (more specifically, whether the pension benefit will increase in accordance with an actuarially fair mechanism, or be less, as implied by the adopted DB formula). The assumption underlying our analysis is that respondents refer to the current pension legislation, which - as we have just seen - imposes restrictions on the possibility of cumulating labour income and retirement benefits. For the purpose of our analysis, we restrict our sample to individuals close to retirement age, namely those aged 55-70. Given that we want to focus on retirement choices as opposed to continuing to work, we select individuals who are either still working or retired; we exclude from the sample those who are unemployed, homemakers and those on a different different social insurance scheme (disability/survivor's/social pension). It is worth noting that while this sample selection is not a major issue for male workers, as their participation rate is close to a hundred per cent, more caution is required in the case of women, given their lower participation rate (around 40 per cent). After excluding from the sample observations cases where the dependent variable has a missing value, we end up with 2670 observations, made up of 962 women and 1708 men. Figure 1 shows the distribution of workers and retirees, by gender and age. In our sample, 77 per cent of men and 87

per cent of women are retired.<sup>5</sup> The incidence of retirees is obviously increasing with age. This path is, however, not linear, and we observe a sharp increase in the number of retired individuals around the “typical” retirement ages for private sector employees in 2004, which were 57 and 60 years respectively for women and men.

The regressors we use in our empirical analysis are factors that are likely to affect the disutility of work and the utility of additional resources, along with tastes and different attitudes towards the labour market. We use as independent variables age and educational dummies;<sup>6</sup> indicators for working (or having worked) as self-employed or in the private sector; total net wealth; variables for family composition (an indicator for being married or cohabiting with a partner; a dummy equal to one if the partner, if any, is working; the number of children living in the same or in another family); and two geographical indicators. Descriptive statistics are shown in Table 1.

## 6 Observed and desired labor supply

In this section we document whether, and to what extent, the labour supply differs from the desired one, at the extensive and intensive margin. For this purpose, we first illustrate the desired participation and working hours of pensioners (Section 5.1). In Section 5.2, we focus on the subsample of older workers

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<sup>5</sup>The sample of retirees consists of 2142 observations, while there are 528 working respondents.

<sup>6</sup>Medium-level education captures respondents with a high school diploma; highly-educated respondents are those with a degree or more. The reference category is low-level education (compulsory schooling).



and we analyse the extent to which the intensity in their supply differs with respect to the observed one.

## 6.1 Retirees

A non-negligible fraction of pensioners in our sample declares being willing to work. This percentage is about 3 and 7 per cent for, respectively, female and male retirees. In order to describe their characteristics, we estimate the probability that retirees are willing to work. Probit estimate results are reported in Table 3 for the whole sample (column 1). Since the determinants of labour supply could be different across genders (Peri et al., 2015), we show the results for subsamples of women and men in columns 2 and 3, respectively. Confirming descriptive statistics, male retirees are, on average, 4 percentage points more likely to be willing to work. Looking at the age distribution, we estimate a significant reduction by 7 percentage points in the willingness to work after the age of 65 for men, while we do not find any significant path for women. The desired participation of retirees turns out to be correlated with education. Men with a degree are 4.5 percentage points more likely to be willing to work, possibly reflecting a less physically demanding activity, higher attachment to the job and a substitution effect driven by higher wages (compared to less educated men). For women, the data point to a U-shaped effect of education: the desired participation is lowest for women with a high school degree and highest for those with a college degree. The desired participation of more highly educated women could reflect, along with the effect of high-paid and less physically intensive jobs,

different family models and attitudes to work. Lower resources and pension benefits (linked to past wages) could explain the higher desired participation of less educated women compared to those with a college degree, by 1.6 percentage points. We estimate a positive coefficient for self-employment, while working in the public or private sector turns out to be insignificantly correlated with desired participation. We do not detect a significant effect of household wealth, while family composition plays a role. Married female retirees are less likely to be willing to work than their single counterparts, possibly because they can rely on family resources to support consumption during retirement. Looking at men, we do not find a significant difference between single and married men, while they turn out to be more prone to work if their partner is working. This finding is in line with the literature on joint retirement decisions, which shows that partners show a tendency to retire together (Banks et al., 2010), albeit the majority do not spend more time together, but rather they synchronize leisure (Stancanelli and Van Soest, 2012). Finally, we estimate that the number of children increases desired participation of male workers. This result is consistent with the intention to leave a bequest or to help grown children through inter vivos transfers (Stark and Nicinska, 2015), which are both common in Italy where 80 per cent inherit a house. A further step to illustrate the desired labour supply of retirees is the analysis of the optimal intensity in their labour supply. Figure 2 illustrates the distribution of the preferred number of working hours that retirees are willing to offer.<sup>7</sup> A large fraction of them would work less than the full-time schedule,

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<sup>7</sup>The reduced number of retirees who would like to work and indicate the desired intensity suggests some cautiousness is required in the interpretation of these results.

with a mode of almost 30 per cent of pensioners reporting 20-24 hours per week (which is more than half the normal standard of 36). More than 25 per cent are willing to work less than 20 hours, while more than 70 per cent would supply up to 30 hours per week.

To illustrate which factors are associated with a greater desired intensity in the retirees' labour supply we perform two complementary exercises. First, we exploit information on the desired type of job and we estimate a multinomial logit model (Table 4). Second, we use a tobit model to estimate the number of working hours desired by retirees (Table 5). Table 4 reports estimate results for a multinomial logit model, estimated on the sample of retirees who are willing to work. Potential outcomes for the desired job are: working full-time; working part-time; working occasionally; and self-employment/freelance only. Older retirees (aged 66-70) are less prone to work full-time, and prefer part-time or occasional jobs. Education level is correlated with the probability of being willing to work part-time or being self-employed, as opposed to part-time jobs. Those with a high and low level of education are, respectively, the most and least likely to choose self-employment. This is possibly correlated with different types of jobs within the broad category of self-employment, being more likely to be related to consultancy or professional advice for people with a degree, and more physical jobs for respondents with a low level of schooling. Finally, people who were self-employed declared that they preferred to remain in this type of employment. Table 5, based on tobit estimate results, shows the effect of covariates on desired intensity, given that the desired number of working

hours is positive. As expected, retirees older than 65 would work 5 hours less than younger respondents, with this relationship being significant only for men. Highly educated women would like to work more, possibly because of different types of jobs and their attachment to the labour force. Family composition affects the intensity of the labour supply, mirroring its impact on the extensive margin. Married women would work, on average, 3 hours per week less than single women, while having children increases the labour supply of male retirees. Finally, household wealth has a detrimental effect on the desired intensity in the female labour supply, which is in line with recent literature showing a positive impact of wealth on the labour supply (Picchio et al., 2017; Cesarini et al., 2015; Brown et al., 2010).

## **6.2 Workers**

We now turn to the description of the desired labour supply of respondents who are still in the labour force. The distribution of observed and desired working hours is shown in Figure 3. On average, older workers work 40 hours per week, while they would like to offer less than 37 hours. The weekly working hours are 40 or more hours for almost 60 per cent of these workers, while less than 50 per cent would like such an intensity; the gap between observed and desired hours is even larger if we consider a working schedule of at least 45 hours per week, the percentages being, respectively, 27 and 15 per cent. About 40 per cent would work only a few hours less than the full-time schedule (30-39 hours), and 6.5 per cent would work part-time (20-24 hours). The difference between observed

and desired working hours, for the whole sample and by gender, is shown, respectively, in Figures 4 and 5. Positive values in those graphs reflect situations where the respondent works more hours than he/she would like. About half of the workers are not displaced; almost 40 per cent work more than the optimal level, and for half of them the gap between observed and desired intensity in the labour supply is larger than 10 hours per week. Finally, we estimate the extent to which desired working hours vary according to household and individual characteristics. Table 6 reports OLS estimates, where the dependent variable is the desired intensity of workers' labour supply.<sup>8</sup> We notice a significant correlation between observed and desired working hours, which is, however, lower than 0.5, reflecting a limited correlation between the two variables. The number of desired working hours turns out to be greater for less educated workers, private sector employees, married respondents and those living in northern regions.

## 7 Conclusion

This paper examines the observed and desired labour supply of people close (on both sides) to retirement age, and identifies the individuals who suffer larger displacement effects of their effective labour supply with respect to its optimal level. Our analysis shows that a significant fraction of retirees would be willing to work (3 per cent and 7 per cent for women and men, respectively). Male retirees are, on average, more willing to work than women. A college degree is associated with a higher desired labour supply, both at the extensive and at the

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<sup>8</sup>Sample size issues do not allow this equation to be estimated by gender.

intensive margin. Finally, family composition affects the desired retirees' labour supply, but differently for men and women and according to marital status. Married women want to work less than singles, while men's desired participation in the labour market turns out to be higher when their wife is still working, in line with complementarity in the retirement decisions of couples. Finally, retired men with children are more willing to work than men without offspring. Turning to older workers, their desired labour supply is, on average, lower than the actual one, indicating a preference for reduced labour activity. The evidence on the discrepancy between the observed and desired labour supply suggests that labour and retirement policies do not accommodate the preferred working pattern of older individuals. However, while promoting flexibility in working trajectories at the end of the working life can improve the welfare of workers whose labour supply is displaced, the overall effect on the total working hours is less straightforward. Some workers who chose part-time work would otherwise have retired completely, but others would have kept working full-time, the total effect on the labour supply depending on which of the two effects dominates. However, as pointed out by Kantarci and Van Soest (2008), "previous studies that make the quantitative trade-off of the negative and positive labour supply effects unambiguously conclude that the positive effects dominate: creating more opportunities for gradual retirement can lead to an increase in total labour supply". Along with an impact on the labour force participation of the older population, promoting flexibility in exiting from the labour market has other effects. First, it can increase the job satisfaction and utility of workers at the

end of their career, by allowing them to work at an intensity that is closer to the optimal. Second, gradual retirement may prevent the use of alternative routes to exit from the labour market, such as disability pensions or unemployment (especially the so-called Cassa Integrazione Guadagni), which is particularly relevant in the Italian context. Finally, it is worth noting that flexibility in the working schedule may come at some cost for employers, particularly where older workers are concerned. This issue goes beyond the scope of our analysis, but is extensively discussed in Kantarci and Van Soest (2008).

## **8 Declarations**

The authors declare that they have no competing interests. The three authors contributed to the implementation of the research, to the analysis of the results and to the writing of the manuscript. This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 655770 (Trucchi). We thank Marco Disarò for research assistance with macro data.

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## Figures and Tables

Figure 1: Distribution of working and retired respondents, by age

**Notes:** 2670 observations (962 women and 1708 men).

Figure 2: Distribution of desired intensity for retirees who would like to work

**Notes:** 81 observations.

Figure 3: Distribution of observed and desired hours for workers

**Notes:** 527 observations.

Figure 4: Distribution of difference between observed and desired hours for workers

**Notes:** 527 observations.

Figure 5: Distribution of difference between observed and desired hours for workers

**Notes:** 527 observations: 128 women and 399 men.

Table 1: Incidence of part timers across European countries (% points)

	IT	FL	SW	NO	DK	GE	NL	UK	FR	ES	PO	GR	EU 18
<b>Age 55-64</b>													
Men	6.7	13.4	12.6	13.2	11.4	10.9	25.4	16.1	11.3	4.4	12.2	4.5	10.5
Women	24	18	35.9	41.6	34.8	51.9	81.1	48.9	34.7	20.2	17.7	11.6	38.7
Total	13.8	15.8	23.9	26.7	22.4	30.2	49.2	31.2	23.1	11.4	14.8	7.3	23.4
<b>Age 15-64</b>													
Men	8.2	10.0	13	14.9	16.8	9.4	26.2	11.3	7.4	7.6	6.8	6.9	9.4
Women	32.7	20.2	35.6	38.0	36.9	46.5	76.4	40.8	29.8	24.1	12.1	13.7	36.2
Total	18.5	14.9	23.9	26	26.4	26.7	49.7	25.2	18.2	15.1	9.5	9.8	21.7

Source: Eurostat 2016

Table 2: Summary statistics

Variable	Mean	Std. Dev.
Age 61-65	.339	.474
Age 66-70	.33	.47
Medium educ.	.243	.429
High educ.	.273	.446
Self-employed	.17	.375
Private sector	.728	.445
Net wealth	.147	.175
Married/Cohab.	.817	.387
Nb. children (in/out)	1.83	1.238
Working partner	.134	.341
South	.252	.434
Center	.249	.432

Notes: 2670 observations.

Table 3: Desired participation (probit), retired

	All	Women	Men
Male	0.532*** (0.102) [0.042]		
Age 61-65	-0.027 (0.108) [-0.002]	0.374 (0.285) [0.014]	-0.125 (0.124) [-0.014]
Age 66-70	-0.654*** (0.134) [-0.051]	-0.476 (0.359) [-0.015]	-0.657*** (0.146) [-0.070]
Medium educ.	-0.088 (0.148) [-0.007]	-0.682** (0.290) [-0.016]	0.059 (0.176) [0.007]
High educ.	0.427*** (0.158) [0.045]	0.834*** (0.296) [0.049]	0.338* (0.185) [0.045]
Self-employed	0.286** (0.135) [0.029]	0.447 (0.288) [0.022]	0.286* (0.154) [0.038]
Private sector	-0.030 (0.117) [-0.003]	-0.193 (0.249) [-0.007]	-0.003 (0.135) [-0.000]
Net wealth	-0.042 (0.276) [-0.004]	-0.503 (0.683) [-0.017]	0.166 (0.273) [0.019]
Married/Cohab.	-0.559*** (0.125) [-0.065]	-0.908*** (0.196) [-0.053]	-0.273 (0.184) [-0.037]
Nb. children (in/out)	0.109*** (0.034) [0.009]	0.071 (0.073) [0.002]	0.111*** (0.040) [0.013]
Working partner	0.275** (0.133) [0.028]	-0.239 (0.436) [-0.006]	0.308** (0.144) [0.042]
South	-0.004 (0.118) [-0.000]	-0.743** (0.303) [-0.016]	0.150 (0.136) [0.018]
Center	0.183* (0.111) [0.017]	-0.071 (0.229) [-0.002]	0.272** (0.133) [0.035]
Constant	-1.711*** (0.198)	-1.378*** (0.366)	-1.529*** (0.234)

**Notes:** Observations: 2142 (834 women and 1308 men). \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Table shows estimated coefficients, standard errors in brackets and marginal effects in squared brackets; other variables are at their mean value.

Table 4: Type of job, retirees willing to work. Multinomial logit

	Full-time	Part-time	Occasional	Self-empl.
Male	0.011 (0.063)	-0.217 (0.127)*	0.172 (0.138)	0.033 (0.106)
Age 61-65	0.026 (0.058)	-0.068 (0.099)	0.117 (0.103)	-0.075 (0.083)
Age 66-70	-0.687 (0.253)***	0.298 (0.156)*	0.404 (0.162)**	-0.015 (0.159)
Medium educ.	0.031 (0.047)	0.361 (0.107)***	-0.148 (0.122)	-0.245 (0.100)**
High educ.	0.010 (0.042)	-0.334 (0.130)**	-0.001 (0.136)	0.324 (0.124)***
Self-employed	0.008 (0.057)	-0.143 (0.137)	-0.296 (0.141)**	0.432 (0.102)***
Private sector	0.052 (0.071)	-0.060 (0.093)	-0.026 (0.101)	0.033 (0.090)
Net wealth	-0.182 (0.304)	-0.270 (0.300)	0.146 (0.284)	0.305 (0.198)
Married/Cohab.	-0.003 (0.060)	0.017 (0.158)	-0.182 (0.140)	0.168 (0.139)
Nb. Children	0.001 (0.016)	-0.001 (0.046)	0.009 (0.043)	-0.009 (0.051)
Working partner	-0.016 (0.075)	-0.082 (0.120)	0.124 (0.114)	-0.025 (0.093)
South	0.024 (0.062)	0.090 (0.116)	0.005 (0.115)	-0.119 (0.112)
Center	0.019 (0.067)	-0.123 (0.102)	0.124 (0.096)	-0.020 (0.085)

Notes: Observations: 120. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Table 5: Desired working hours (Tobit), retired

		Women	Men
Male	3.147 (0.843)***		
Age 61-65	-0.602 (0.890)	1.508 (0.978)	-1.530 (1.043)
Age 66-70	-4.929 (1.269)***	-1.610 (1.750)	-5.233 (1.412)***
Medium educ.	0.553 (1.139)	-1.770 (1.143)	1.497 (1.318)
High educ.	2.403 (1.243)*	3.368 (1.406)**	1.796 (1.426)
Self-employed	3.269 (1.111)***	2.644 (1.283)**	3.351 (1.134)***
Private sector	-0.314 (0.957)	-0.062 (1.173)	-0.519 (1.092)
Net wealth	-0.800 (2.446)	-6.870 (3.142)**	2.155 (2.082)
Married/Cohab.	-2.878 (0.959)***	-3.177 (0.629)***	-0.204 (1.626)
Nb. Children	0.752 (0.262)***	0.373 (0.326)	0.728 (0.308)**
Working partner	0.976 (1.035)	0.240 (1.578)	0.877 (1.116)
South	-0.110 (0.961)	-22.468 (3.856)***	1.360 (1.066)
Center	0.527 (0.944)	-0.253 (0.921)	0.935 (1.096)

**Notes:** Observations: 2103 (827 women and 1276 men). \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .  
Dummies for macro-areas are also included. Table shows marginal effects on  $E(dh|dh > 0)$ ,  
where  $dh$  is the number of desired hours. Other variables are at their mean value.



Table 6: Desired working hours, workers

	All
Male	1.589** (0.776)
Observed hours	0.434*** (0.044)
Wage	-0.018 (0.047)
Age 61-65	-0.001 (0.645)
Age 66-70	-0.179 (1.465)
Medium educ.	1.266 (0.817)
High educ.	-1.546* (0.872)
Self-employed	-0.317 (0.790)
Private sector	1.558** (0.706)
Net wealth	1.291 (1.362)
Married/Cohab.	1.697** (0.768)
Nb. children (in/out)	0.137 (0.231)
Working partner	0.126 (0.822)
South	-1.739** (0.765)
Center	-1.492** (0.697)

**Notes:** Observations: 527. \* $p < 0.1$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ . Estimated coefficients are reported. Standard errors (in brackets) are robust to heteroskedasticity. Dependent variable: desired working hours.