



ISTITUTO DI STUDI E ANALISI ECONOMICA

# **Does job security matter for consumption? An analysis on Italian microdata**

by

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## **ABSTRACT**

This paper investigates if labour income uncertainty, particularly as related to the development and diffusion of fixed and short-term work contracts, may have played a role in determining the recent decline of the marginal propensity to consume of Italian households. We analyse this issue in the framework of a standard precautionary saving model, proxing labour income uncertainty with subjective job security measures. Due to the lack of a unique dataset containing all the relevant information, we adopt a two-step two-sample procedure. Estimation results, based on cross-section data for the year 2000, point to a potentially substantial effect of job security perception on household's non-durables consumption. Its actual capability to prompt aggregate consumption adjustments is however likely to be very limited.

Keywords: Consumption, precautionary saving, job security, two-step two-sample estimation.

JEL Classification: D12, E21, C42.

## NON TECHNICAL SUMMARY

This paper investigates if precautionary saving motives may have played a role in determining the recent decline of the marginal propensity to consume out of disposable income of Italian households. Among the factors likely to induce precautionary behaviour, we especially focus on the consequences, in terms of job security perception, of the diffusion of 'atypical' work contracts. Our basic idea is that, because of the way they have been implemented, some Italian labour market reforms aimed at achieving more market flexibility may have caused employees to feel increasingly insecure about their job and, consequently, about their labour income.

We empirically analyse this issue on a cross-section of data for Italian households in the year 2000, in the theoretical framework of a standard consumption model augmented to take into account the effect of labour income uncertainty. Labour income uncertainty is proxied by subjective job security measures. Due to the lack of a unique dataset containing information on both household non-durables consumption and individual job security perceptions, we adopt a two-step two-sample procedure as proposed, among others, by Carrol et al. (2003). First, we use data from the European Community Household Panel Survey (ECHP) to fit an ordered probit model relating the index of job security perception to a number of individual characteristics, including the type of work contract. The estimates obtained in this step are next used to compute a fitted job security perception measure for head of households in the Survey of Household Income and Wealth (SHIW). Finally, a standard consumption model augmented for the fitted measure of job security perception is estimated on SHIW data. The data support our maintained hypothesis that 'atypical' work contracts have a detrimental impact on individual job security perceptions. Moreover, household's head job security perception turns out to be a significant determinant of household consumption. According to our calculations, a 'one-class' decrease of the job security index (e.g. from high to medium) would reduce median non-durables consumption by about 2.4%. Up to now, however, typical variations of the average 'perceived job security' index have been of a much smaller order of magnitude. Consistently with the results obtained, in a somewhat different framework, by Guiso et al. (1992), we conclude that, although in principle changes in job security assessments significantly affect consumption, their actual aggregate effect is likely to be very small.

# **LA PERCEZIONE DI SICUREZZA DEL POSTO DI LAVORO E DECISIONI DI CONSUMO: UN'ANALISI SU MICRODATI ITALIANI**

## **SINTESI**

Lo scopo di questo lavoro è di investigare empiricamente se la diminuzione della propensione al consumo delle famiglie italiane osservata negli ultimi anni possa essere, almeno in parte, spiegata dall'intensificarsi di comportamenti di risparmio precauzionale. Fra i vari fattori che potrebbero indurre tali comportamenti, ci concentriamo specificatamente sulle possibili ripercussioni, in termini di percezioni soggettive di sicurezza del posto del lavoro, della diffusione dei contratti di lavoro 'atipici'. La nostra ipotesi di partenza è che, in conseguenza del modo con cui sono state effettivamente attuate, alcune riforme del mercato del lavoro italiano dirette a migliorarne la flessibilità possano aver accentuato le percezioni di instabilità del posto di lavoro - e, conseguentemente, del reddito - degli occupati italiani. L'analisi empirica si basa su dati cross-section riferiti alle famiglie italiane nell'anno 2000, utilizzati per stimare un modello di consumo di forma standard aumentato per tener conto degli effetti dell'incertezza del reddito da lavoro. Come proxy per l'incertezza utilizziamo un indicatore di valutazione soggettiva di sicurezza del posto di lavoro. In assenza di un'unica fonte statistica per i dati di interesse, ricorriamo ad una procedura di stima 'a due stadi - su due campioni' proposta, fra gli altri, da Carrol et al. (2003).

I risultati ottenuti supportano la nostra ipotesi iniziale riguardo l'esistenza di una relazione significativa fra percezioni di insicurezza del posto di lavoro e contratti di lavoro atipici. Inoltre, la percezione di sicurezza del posto di lavoro del capofamiglia risulta essere una determinante significativa del consumo familiare. Sulla base delle nostre stime, la diminuzione di una classe dell'indicatore di sicurezza del posto di lavoro (per esempio da 'alta' a 'media') comporterebbe una riduzione del valore mediano delle spese per beni di consumi non durevoli pari al 2,4%. Si deve però considerare che le variazioni del valore medio dell'indicatore di sicurezza del posto di lavoro sono state, fino ad oggi, di un ordine di grandezza nettamente inferiore. Sembra quindi ragionevole concludere che altri, più importanti, fattori economici sono alla base della diminuzione della propensione al consumo delle famiglie italiane.

Parole chiave: Consumo, risparmio precauzionale, sicurezza del posto di lavoro, stima su due campioni a due stadi.

Classificazione JEL: D12, E21, C42.



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# 1 INTRODUCTION AND SUMMARY<sup>1</sup>

The idea that labour income uncertainty may significantly affect individual economic behaviour, particularly as regarding the allocation of income between consumption and saving, is central to theoretical models of precautionary saving. According to the predictions of these models, labour income uncertainty would cause individuals to shift their current income allocation from non-durables consumption to saving, so as to maintain a smooth intertemporal consumption profile. This implication has been empirically tested in a number of studies, providing mixed evidence as to the strength of precautionary effects<sup>2</sup>. The purpose of this paper is to investigate if precautionary saving motives may have played a role in determining the recent decline of the marginal propensity to consume out of disposable income of Italian households. Among the factors likely to induce precautionary behaviour, we especially focus on the consequences, in terms of job security perception, of the diffusion of 'atypical' work contracts. Our basic idea is that, because of the way they have been implemented, some Italian labour market reforms aimed at achieving more market flexibility may have caused employees to feel increasingly insecure about their job and, consequently, about their labour income.

We empirically analyse this issue on a cross-section of data for Italian households in the year 2000, in the theoretical framework of a standard consumption model augmented to take into account the effect of labour income uncertainty. Following Benito (2004), we take subjective job security measures as proxies for individuals' labour income uncertainty. Due to the lack of a unique dataset containing information on both households non-durables consumption and individual job security perceptions, we adopt a two-step two-sample procedure as proposed, among others, by Carrol et al. (2003). First, we use data from the European Community Household Panel Survey (ECHP) to fit an ordered probit model relating the index of job security perception to a number of individual characteristics, including the type of work contract. The estimates obtained in this step are next used to compute a fitted job security perception measure for head of household in the Survey of Household Income and Wealth

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<sup>1</sup> The paper was written while both authors were working at ISAE. The opinions expressed in this paper are the authors' own and do not represent those of either the MEF or the ISAE. We wish to thank Maurizio Bovi, Sergio de Nardis, Aude Le Roy, Marco Malgarini, Carmine Pappalardo and participants to various seminars for useful comments and suggestions. The responsibility for any error or omission rests with the authors.

<sup>2</sup> Cfr., for instance, Guiso et al. (1992), Dynan (1993), Carrol (1994), Lusardi (1997, 1998) and Carrol et al. (2003).

(SHIW)<sup>3</sup>. Finally, a standard consumption model augmented for the fitted measure of job security perception is estimated on SHIW data. The data support our maintained hypothesis that ‘atypical’ work contracts have a detrimental impact on individual job security perceptions. Moreover, household’s head job security perception turns out to be a significant determinant of household consumption. According to our calculations, a ‘one-class’ decrease of the job security index (e.g. from high to medium) would reduce median non-durables consumption by about 2.4%. Up to now, however, typical variations of the average ‘perceived job security’ index have been of a much smaller order of magnitude. Consistently with the results obtained, in a somewhat different framework, by Guiso et al. (1992), we conclude that, although in principle changes in job security assessments significantly affect consumption, their actual aggregate effect is likely to be very small. The paper is organised as follows. In section 1, we briefly review the theory underlying precautionary saving models and report results from the empirical literature. Section 2 describes the datasets used in this study. Section 3 explains the estimation methodology adopted. In section 4 we illustrate and comment our empirical models and results. Section 5 summarizes the main findings and discusses possible future developments of the work.

## **2 MODELS OF PRECAUTIONARY SAVING: THEORETICAL ASPECTS AND EMPIRICAL RESULTS**

Precautionary saving models extend permanent income theory to explicitly address the effect of income uncertainty on consumption choices. Uncertainty effects arise as a consequence of the two fundamental hypothesis of (a) convexity of the marginal utility function and (b) risk adverse individuals. These assumptions cause utility losses due to negative income shocks to be higher than the gains following positive ones, making it optimal for individuals to shift their income allocation from consumption to precautionary saving. For expositional purposes, let’s consider the model proposed by Caballero (1990). Households are assumed to maximize a time-separable expected utility

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<sup>3</sup> The SHIW is run every two years by the Bank of Italy.

function, with an exponential within period utility function with a degree of absolute prudence equal to  $\gamma^4$ . Labour income evolves according to:

$$y_t = y_{t-1} + \varepsilon_t \quad (1)$$

where  $\varepsilon_t$  are i.i.d. innovations<sup>5</sup>. Households choose a sequence of consumption values to maximize the expected utility function subject to a budget constraint:

$$\begin{aligned} \max_{c_{t+i}} U_t &= E_t \sum_{i=0}^{\infty} \left( \frac{1}{1+\rho} \right)^i \left[ -\frac{1}{\gamma} \exp(-\gamma c_{t+i}) \right] \\ \text{subject to} \\ A_{t+i+1} &= (1+r) A_{t+i} + y_{t+i} - c_{t+i} \quad A_t \Rightarrow \text{given} \\ \lim_{j \rightarrow \infty} \left( \frac{1}{1+r} \right)^j A_{t+j} &\geq 0 \quad \text{no Ponzi-game condition} \end{aligned} \quad (2)$$

where  $\rho$  is the intertemporal discount rate,  $r$  is the interest rate (assumed to be constant), and  $A_{t+1}$  is begin-of-period wealth. At the end of each period individuals receive their labour income and consume. Begin-of-next-period wealth is given by end-of-period wealth plus interests plus current period saving. There are no liquidity constraints; therefore wealth can also be negative. However, the 'no Ponzi game' condition ensures that consumers cannot finance their consumption with infinite loans. Substituting the budget constraint into the utility function and imposing the first order maximizing conditions<sup>6</sup> gives the following Euler equation, stating the indifference between consuming today or saving at the interest rate  $r$ :

$$\exp(-\gamma c_t) = \frac{1+r}{1+\rho} E_t \left[ \exp(-\gamma c_{t+1}) \right] \quad (3)$$

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<sup>4</sup> Using an exponential utility, the degree of absolute prudence coincides with absolute risk aversion.

<sup>5</sup> Using a stationary process rather than a random walk to describe the income process does not modify substantially the theoretical result. In this brief section, for simplicity, equation (1) has been preferred.

<sup>6</sup> First order (and transversality) conditions are sufficient and necessary for optimisation if the utility function is an increasing and concave function of consumption, that is if  $u'(c_t) > 0$  and  $u''(c_t) < 0$ .

The exponential utility function satisfies these conditions.

To obtain a close and elegant solution, let's assume that innovations are normally distributed, and, for simplicity, that  $r = \rho$ . It is possible to show that the consumption process:

$$c_{t+1} = c_t + \frac{\gamma\sigma^2}{2} + \varepsilon_{t+1} \quad (4)$$

satisfies the Euler condition and, as such, is a solution to the maximization problem. However, equation (4) does not yet identify the consumption level chosen each period. To get this result, substitute ahead the value of wealth  $A_{t+i}$  from the budget constraint to obtain<sup>7</sup>:

$$c_t = ry^p - \frac{1}{r} \frac{\gamma\sigma^2}{2} \quad (5)$$

Equation (5) shows that the current level of consumption is determined by two components. The first component is equivalent to the solution obtained without precautionary saving, with households consuming the annuity value of permanent income. The second one decreases consumption by an amount proportional to the variance of income: the higher is income dispersion, the higher is uncertainty and, hence, the lower is current consumption.

The implications of theoretical models of precautionary saving have been subject to a number of empirical tests. The evidence concerning the strength of precautionary saving motives is mixed. Based on estimates of a coefficient of relative prudence for the US, Dynan (1993) finds that precautionary motives are an unimportant part of consumer behaviour. Guiso et al. (1992) analyse a cross section of Italian data (1989) obtaining that, although subjective earnings

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<sup>7</sup> Starting from the budget constraint substituting  $A_{t+1}$  ahead and considering the sum for  $i \rightarrow \infty$  the following equation for the budget constraint is obtained (remember that  $A_t$  is given):

$$\frac{A_{t+i}}{(1+r)^i} = A_t + \frac{1}{1+r} E_t \sum_{i=0}^{\infty} \left( \frac{1}{1+r} \right)^i (y_{t+i} - c_{t+i})$$

Using the transversality condition and rearranging we obtain:

$$\frac{1}{1+r} E_t \sum_{i=0}^{\infty} \left( \frac{1}{1+r} \right)^i (c_{t+i}) = \underbrace{A_t + \frac{1}{1+r} E_t \sum_{i=0}^{\infty} \left( \frac{1}{1+r} \right)^i (y_{t+i})}_{y^p}$$

The right hand side is equivalent to the permanent income that is constituted by two components: the human wealth, given by the expected values of all the future labor income (the last part of the right hand side), plus the financial wealth. Substituting equation (4) into the last expression, the level of consumption chosen in every period is obtained.

uncertainty affects saving according to theory's predictions and consistently with decreasing prudence, it fails to explain a large fraction of saving and wealth accumulation. Lusardi (1998) reports a similar result using US data. On the other hand, Lusardi (1997) finds that precautionary wealth accumulation might explain up to 24% of total accumulation of Italian households. Carrol (1994) tests the permanent income hypothesis on US data finding that income uncertainty is a significant and non-negligible determinant of households' consumption. According to his calculations, a one standard deviation increase in income uncertainty would decrease consumption from 3 to 5 per cent.

Two recent studies by Carrol et al. (2003) and Benito (2004) have explicitly addressed the issue of labour income uncertainty as related to individuals' job insecurity. Carrol et al. (2003) take the predicted probability of job-loss as a proxy for labour income uncertainty. They find that increases in unemployment risk are reflected in statistically significant and economically sizeable precautionary effects for US households at moderate and higher levels of income. In particular, a one percentage point increase in the probability of losing one's job would raise the median consumer's wealth by 17% of income. Benito (2004) takes as proxies for labour income uncertainty both subjective job security measures and estimated job-loss probabilities. Based on UK households data he finds that, although subjective job security measures do not significantly affect household consumption, a one standard deviation increase in unemployment risk would reduce consumption by 2.7 per cent.

Our work builds on this last strand of analysis. We directly relate labour income uncertainty to job security perceptions and investigate if and to what extent the recently observed decline of Italian households' marginal propensity to consume may be explained in terms of precautionary behaviour arising from concerns about own employment perspectives<sup>8</sup>. Although we especially focus on the relationship between job security assessments and 'atypical' work contracts, this linkage is clearly not exhaustive of all the complex factors likely to drive individual perceptions<sup>9</sup>.

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<sup>8</sup> Calculations based on recent data ('Conti nazionali per settori istituzionali', ISTAT, February 2005) show that since 2001 the average propensity to consume of Italian households has been consistently decreasing, moving from an highest of 0.88 in 2000 to 0.86 in 2003.

<sup>9</sup> Consider, for instance, the probably adverse job security effect of ongoing processes of industrial restructuring or privatisation.

### 3 DATASETS USED FOR THE STUDY

The choice to investigate at the micro level the relationship between job security indicators and consumption meets with difficulties related to data availability. For Italy, as for other countries, it does not exist a unique dataset containing all the relevant information. This problem may be dealt with following a two-step two-sample procedure, as proposed by Carroll et al. (2003) and Angrist and Krueger (1990). Conditional on samples being randomly drawn from the same population, the procedure allows imputing information from one dataset to another while ensuring consistent parameter estimates. Carroll et al. (2003), for instance, use US Current Population Survey data to estimate an unemployment probability model. Based on first-step estimated coefficients, they compute fitted unemployment probability measures for individuals in the Survey of Consumer Finances sample. These measures are among the explanatory variables used to fit a precautionary saving model on CSF data.

In this work we use data for Italy from the 7<sup>th</sup> wave of the European Community Households Panel Survey (ECHP, year 2000) to link individual job security perception to a number of observable characteristics. The estimation results are used to compute job security perception indexes for household's head in a dataset that contains detailed information on consumption and wealth, the Bank of Italy Survey of Household Income and Wealth (SHIW, year 2000). We were obliged to a cross section type of analysis because it is only since the year 2000 that the SHIW asks for the work contract typology. Moreover, 2000 is the only year for which data from both surveys are available.

Both the ECHP and the SHIW surveys target the population of all private *de facto* households through the national territory<sup>10</sup>. They both adopt a two-stage sampling procedure with municipalities as primary sampling units and households as secondary sampling units. The main difference between the two surveys is that the ECHP design is essentially longitudinal, although the sample is adjusted to make it cross-sectionally representative. The SHIW is instead largely cross-sectional, although it includes a panel component. Moreover, SHIW's interviews are run during the year following the reference one<sup>11</sup>, while ECHP's interviews are carried on during the same year to which the survey refers. To the best of our understanding, the sample design of the two surveys meets the requirements needed for a correct implementation of the two-sample two-step procedure.

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<sup>10</sup> This part relies on Peracchi and Viviano (2001).

<sup>11</sup> E.g. the 2002 SHIW is based on interviews carried on between February and September 2003.

We choose to work on ECHP data because the survey collects detailed information on labour force behaviour. People are asked to indicate their activity status, the characteristics of the current job and previous job, the month and the year the current job started, to provide information on job changes and on the type of employment contract they have in their current job<sup>12</sup>. Individuals are also asked how satisfied they are with their present job in terms of job security<sup>13</sup>. The information provided by the ECHP on consumption choices is instead extremely limited, as households are only asked if they possess, or would like to, a number of durable items.

The SHIW, on the other hand, being explicitly targeted to the analysis of households' budgets, contains detailed and well-structured information on consumption expenditures. The information concerning labour force behaviour, although appreciable, is in some respects limited. In particular, the information regularly collected does not allow identifying short unemployment spells. Also, the SHIW does not include any question on individual job security perceptions.

For the objectives of this work, the ECHP and the SHIW importantly differ in the definition of activity status<sup>14</sup>. The SHIW asks individuals if, during the year, working was their prevailing condition. The ECHP asks individuals if, at the time of the interview, they are working for at least 15 hours per week and, if not, if they anyway consider working as their main activity. We follow Peracchi and Viviano (2001) in defining as 'employed' all those ECHP respondents working either less or more than 15 hours per week. As we could not envisage any suitable adjustment, our data suffer of the inconsistency due to the different time frames to which activity refers.

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<sup>12</sup> Cfr. Peracchi and Viviano (2001), pag. 13.

<sup>13</sup> More precisely, individuals are asked how satisfied they are with a number of aspects of their present job including job security (question n. 52 of the ECHP questionnaire). Admissible answers range from 1 (not satisfied at all) to 6 (fully satisfied).

<sup>14</sup> Cfr. Peracchi and Viviano (2001).

## 4 ESTIMATION METHODOLOGY

The estimation methodology adopted closely follows the one proposed by Carrol et al. (2003). It consists of two steps. In the first step we estimate, on ECHP data, an ordered probit model relating the index of job security perception to a number of observable individual characteristics. In addition to theoretical reasoning, first step regressors are chosen subject to the constraint that the same type of information is consistently retrievable from the dataset used for the second step.

The estimates obtained in the first step are used to construct a fitted job security perception measure for each head of household in the SHIW. More specifically, the relevant SHIW variables are multiplied by the first-step estimated coefficients to obtain fitted measures for the theoretical latent ordered probit variable in the SHIW sample. These measures are converted into job security perception index values on the basis of their associated probabilities and first step thresholds estimates. In the second step we estimate by least squares a standard consumption model augmented by the fitted job security index on SHIW data. To do this, we first split household total labour income into a permanent and a transitory component, following the procedure proposed by Guiso et al. (1992).

Our modelling strategy is a ‘general to specific’ one: all models are, at first, fitted on the largest set of relevant explanatory variables. Next, they are restricted to include only statistically significant terms.

Two-step estimation procedures normally suffer from the ‘generated regressors’ problem. As argued by, among others, Carrol et al. (2003) and Greene (1997), failing to take into account the two step nature of the computation<sup>15</sup> may lead to severely underestimate the standard errors of the final regression. The most commonly used methodology to correct for the ‘generated regressors’ problem<sup>16</sup>, however, requires that the two estimation steps are either carried on samples of the same size, or on the same set of regressors. To get samples of the same size, we randomly dropped out individuals from the largest dataset (the ECHP), so that it was possible to correct the second step standard errors.

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<sup>15</sup> E.g. that one or more fitted variables are used as explanatory variables in the second step regression.

<sup>16</sup> See Murphy and Topel (1985).



## 5 ECONOMETRIC MODELS AND RESULTS

### 5.1 The ordered probit model for the job security perception index

The choice of an ordered probit specification to model the relationship between job security perception and individual's observed characteristics was dictated by the ordered multiple response nature of the dependent variable.

The standard ordered probit specification models observed responses  $y_i$  on the basis of a latent variable  $y_i^*$  determined by:

$$y_i^* = x_i' \beta + \varepsilon_i \quad (6)$$

where  $\varepsilon_i$  are independent and identically normally distributed random variables. For  $y_i$  ranging over 3 possible categories, observed responses are determined according to the rule:

$$\begin{aligned} y_i &= 1 \text{ if } y_i^* \leq \gamma_1 \\ y_i &= 2 \text{ if } \gamma_1 < y_i^* \leq \gamma_2 \\ y_i &= 3 \text{ if } y_i^* > \gamma_2 \end{aligned} \quad (7)$$

The model is estimated by maximum likelihood subject to the identifying conditions  $E(\varepsilon_i) = 0$  and  $\text{Var}(\varepsilon_i) = 1$ .

Given our focus on 'atypical' work contracts, we restricted the ECHP sample to those individuals who declared themselves 'employees' at the time of the interview. By doing so, the observations included should also be relatively homogeneous in terms of risk attitude. Following Guiso et al. (1992), we excluded individuals older than 65. The sample was further restricted to include only those individuals with a full record of non-missing answers. After these restrictions, the size of our sample dropped to 4193 observations. However, the restricted SHIW sample only comprises 2918 observations. To make the two sample sizes equal<sup>17</sup>, we randomly excluded 1275 more individuals from the ECHP<sup>18</sup>.

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<sup>17</sup> In our setting, this is a necessary condition to implement the second step standard errors adjustment proposed by Murphy and Topel (1985).

<sup>18</sup> Individuals were randomly extracted using a uniform distribution.

Due to the relatively small number of observations, the range of possible job security index values was reduced to 3 categories (low = 1, medium= 2, high =3) from the 6 original ones. Our wider set of regressors consists of: dummy variables for the individual's economic sector of activity (5 classes), region of residence (3), marital status (4), sex, person being head of the household, type of work contract (2 categories: indefinite term vs. other), part time or full time occupation, educational attainment (3) and a quadratic term in individual's age. The final estimation results, including only significant terms, are reported in tables 1 to 4.

We find evidence supporting our maintained hypothesis that 'atypical' work contracts have a detrimental impact on individual job security perception. Moving from having an atypical work contract to an indefinite term one decreases by about 31% the probability of reporting a low level of job security perception, and by almost 5% the probability of reporting a medium one. The estimated effects of the other variables are also in accordance with our *a priori* expectations: aged employees on part-time jobs, with low educational attainments and living in the South of Italy are found more likely to report a low level of perceived job security. Moreover, we find a significant "industry effect" for business service sector jobs being perceived as more secure than industry sector ones, in our view suggestive of the different strength of competitive pressures in the two domains.

## **5.2 The fitted job security perception index for SHIW head of household**

The estimation results described in the previous section were used to construct a fitted job security perception measure for each head of household in the SHIW. The same restrictions imposed on the ECHP sample were also applied to the SHIW. Consequently, only those SHIW households whose head is an employee aged 65 or less were considered. SHIW responses concerning the individual's economic sector of activity, region of residence, type of work contract, part time or full time occupation and educational attainment were elaborated so as to make them consistent with the categories defined for the ECHP data. Multiplying the SHIW variables by the corresponding coefficient from the first step model gives fitted measures for the theoretical latent ordered probit variable in the SHIW sample. These measures were transformed into job

security perception index values on the basis of the highest associated probability and first step thresholds estimates:

$$\begin{aligned}
 jsec_{i,SHIW} &= 1 \text{ if } Prob(\hat{y}_{i,SHIW}^* \leq \hat{\gamma}_1) \text{ is the highest one} \\
 jsec_{i,SHIW} &= 2 \text{ if } Prob(\hat{\gamma}_1 < \hat{y}_{i,SHIW}^* \leq \hat{\gamma}_2) \text{ is the highest one} \quad (8) \\
 jsec_{i,SHIW} &= 3 \text{ if } Prob(\hat{y}_{i,SHIW}^* > \hat{\gamma}_2) \text{ is the highest one}
 \end{aligned}$$

### 5.3 The consumption model

The consumption model we estimate has a standard consumption function form linearly augmented by the job security term:

$$c_i = a + \Theta_1 y_i^P + \Theta_2 y_i^T + \Theta_3 W_i + \delta jobsec_i + X_i + \varepsilon_i \quad (9)$$

where  $i$  indexes households,  $c$  is non durables consumption expenditures,  $y^P$  is permanent labour income<sup>19</sup>,  $y^T$  is transitory labour income and  $W$  is household's net financial wealth.  $jobsec$  is the fitted value of the job security perception index for the head of the household and  $X$  is a set of household and household's head variables controlling for preferences and composition effects. The transitory component of labour income is computed as the difference of permanent and current earnings. Household net financial wealth is taken from the Bank of Italy SHIW archives and is reported to its beginning-of-period value<sup>20</sup>.

The estimation was carried on the SHIW sample further restricted to include only households with positive net wealth values and non-extreme income values (we dropped households falling in the first and last 0.1 income percentile). After these exclusions, the sample shrinks to 2918 observations. The variables enter the model in levels, as we did not find heteroskedasticity to significantly improve by taking ratios to permanent income or by adopting a semi-logarithmic specification. The model was estimated by least squares and the standard errors are adjusted for the 'generated regressors' effect. Before

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<sup>19</sup> Income measures are net of taxes.

<sup>20</sup> Cfr. Guiso et al. (1992). Due to the high incidence of inconsistent or missing answers, net financial wealth measures reported in the Bank of Italy archives are to some extent based on randomised estimates. More details are in Bank of Italy (2002).

proceeding with the model estimation, however, we had to identify the permanent labour income component.

## 5.4 Estimation of the permanent labour income component

The concept of permanent labour income relates to the individual's expectations of future labour income flows<sup>21</sup>. For its computation we closely followed the methodology proposed by Guiso et al. (1992). They assume that permanent earnings of each household at time  $t$  can be expressed as:

$$Y_i^P(t) = Z_i\beta + \phi(\tau_i) \quad (10)$$

where  $Z$  is a vector of household and head of household characteristics and  $\phi(.)$  is a quadratic function of household's head age. Assuming that the maximum age at which people work is 65 years, and that the rate of productivity growth is equal to the interest rate, estimated permanent earnings at age/time  $\tau_0$  is given by:

$$Y_i^P(\tau_0) = Z_i b + (65 - \tau_{0i} + 1)^{-1} \sum_{\tau_i = \tau_{0i}}^{65} f(\tau_i) \quad (11)$$

where  $b$  and  $f$  indicate, respectively, the estimated coefficients of  $\beta$  and  $\phi$ . The estimation results for equation (11) are reported in table 5.

## 5.5 Consumption model estimation results

The estimation results for the preferred consumption model specification are reported in table 6. The wider set of regressors consisted of permanent and transitory income components, net wealth, dummy variables for head of household characteristics (age and age squared, educational attainment, sex, marital status, position in the occupation, economic sector of activity, type of work contract, full time or part time job, job security index) and dummy variables

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<sup>21</sup> More specifically, it is defined as the sum of the expected discounted flows of future labour income conditional to the information available at the time in which the consumer takes her decisions.

for household characteristics (number of income recipients, number of household's components, region of residence). We tried other specifications including interaction terms between the job security index and household wealth and income variables, but they were rejected by the data.

The consumption model is well identified, as there is at least one regressor specific to each estimation step<sup>22</sup>.

The results indicate that household's head job security perception is a significant determinant of household's non-durables consumption, with consumption increasing in the level of perceived job security. According to our calculations, a 'one-class' decrease in the level of job security perception (e.g. from high to medium) would reduce median non-durables consumption by about 2.4 per cent.

As to the relationship between consumption and human wealth components we find, in accordance with the results obtained by Guiso et al. (1992), an higher estimated coefficient for permanent earnings as compared to the one for transitory earnings.

Overall our results are suggestive of a potentially relevant effect of job security perception on consumption. This finding is however subject to a number of caveats. First, the case of average job security perception experiencing a 'one-class' fall is just a theoretical example made for illustrative purposes. To give an idea of its actual range of variation, calculations on ECHP data indicate that between 1995 and 2000 the average value of the 'perceived job security' index for Italian workers decreased from 2.3 to 2.26. Next, the share of Italian employees on 'atypical' work contracts is still relatively small, at about 10% of all employees. Although important in its own right, and even if job security perceptions are likely to be driven by a variety of factors, this order of magnitude seems unlikely to reflect in substantial shifts in aggregate consumption. Thus, we believe worsening job security perceptions to have played only a marginal, although economically interesting, role in determining the recent decline of the marginal propensity to consume out of disposable income of Italian households.

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<sup>22</sup> These are the full/part-time work and region of residence dummies in the job security model, and the dummies for marital status, sex, occupational position, number of income recipients and region of residence in the permanent labour income model.

## 6 CONCLUSIONS

The aim of this paper is to investigate if precautionary saving motives, particularly as related to the development and diffusion of 'atypical' work contracts, may have played a role in determining the recent decline of the marginal propensity to consume of Italian households. We empirically analysed this issue estimating, for a cross section of Italian households, a standard consumption model augmented to take into account the effect of labour income uncertainty. While closely following and, in some sense, updating the analysis of Guiso et al. (1992), our work importantly differ in the estimation technique adopted and in the definition of uncertainty. We took subjective job security measures as a proxy for labour income uncertainty and modelled job security perceptions in terms of the work contract typology and other individual characteristics. Due to the lack of a unique dataset containing information on both households' non-durables consumption and individuals' job security perceptions, we adopted a two-step two-sample procedure using information from the European Community Household Panel Survey and the Survey of Household Income and Wealth. Our results point to a potentially substantial effect of job security perception on household's non-durables consumption. Its actual capability to prompt aggregate consumption adjustments is however likely to be very limited due to the relatively small order of magnitude of both typical variations of the job security index and the share of Italian employees on atypical work contract. There are two main research avenues along which our work could be extended. The first one would entail a more precise assessment of the relationship between income risk and atypical work contracts, particularly as concerning the wage impact of short unemployment spells and job changes<sup>23</sup>. The second one would investigate the effect of labour income uncertainty on durables consumption taking into account both pure uncertainty effects and credit rationing phenomena.

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<sup>23</sup> Cfr., for instance, Nickell et al. (2002).

## APPENDIX

### Estimation results

**Tab. 1** **Ordered Probit Estimation Results**  
**Dependent variable: Job security index (1 = low, 2 = medium, 3 = high)**

	Coef.	Std. Err.	z	P> z	[95% Conf.	Interval]
<i>Economic sector of activity</i>						
Agriculture	-0,194	0,13109	-1,48	0,139	-0,4506491	0,0632257
Other Services	0,551	0,05604	9,83	0,000	0,4408663	0,6605418
Business Services	0,159	0,05700	2,78	0,005	0,0468271	0,2702775
<i>Region of Residence</i>						
North	0,122	0,06166	1,98	0,048	0,0012499	0,2429541
South	-0,170	0,06200	-2,75	0,006	-0,2919355	-0,0488832
<i>Educational attainment</i>						
Low	-0,113	0,04842	-2,33	0,02	-0,2076108	-0,0178029
High	0,223	0,07204	3,1	0,002	0,0820957	0,3644689
Age	-0,038	0,01555	-2,43	0,015	-0,0682244	-0,0072521
Age squared	0,001	0,00019	2,73	0,006	0,0001471	0,0008981
Full time job	0,165	0,10549	1,56	0,119	-0,0422286	0,3712921
Indefinite term work contract	1,092	0,07201	15,16	0,000	0,9504934	1,232786
					(Ancillary parameters)	
_cut1	-0,519	0,31861				
_cut2	0,863	0,31888				
Log likelihood	-2637,74					
Number of obs	2918				LR chi2(11)	522,19
Prob> chi2 =	0,000				Pseudo R2 =	0,0901

Benchmark characteristics are: industry for the economic sector of activity, Centre for the region of residence, medium for the level of educational attainment

**Tab. 2 Marginal effects after Ordered Probit Estimantion**

$$y = \Pr(\text{jobsec}=1) = 0.10800427$$

	dy/dx	Std. Err.	z	P> z	C.I. ]	Mean
<i>Economic sector of activity</i>						
Agriculture*	0,04006	0,02999	1,34	0,18200	-0,01871 0,09884	0,03290
Other Services*	-0,09581	0,00960	-9,98	0,00000	-0,11462 -0,07699	0,39548
Business Services*	-0,02806	0,00965	-2,91	0,00400	-0,04697 -0,00916	0,25874
<i>Region of residence</i>						
North*	-0,02236	0,01116	-2,00	0,04500	-0,04424 -0,00049	0,41021
South*	0,03222	0,01198	2,69	0,00700	0,00874 0,05571	0,41330
<i>Educational attainment</i>						
Low*	0,02125	0,00929	2,29	0,02200	0,00304 0,03946	0,38794
High*	-0,03731	0,01082	-3,45	0,00100	-0,05851 -0,01611	0,12749
Age	0,00700	0,00289	2,42	0,01500	0,00134 0,01267	39,2104
Age squared	-0,00010	0,00004	-2,72	0,00700	-0,00017 -0,00003	1645,31
Full time job*	-0,03342	0,02332	-1,43	0,15200	-0,07914 0,01229	0,95613
Indefinite term work contract*	-0,30621	0,02583	-11,85	0,00000	-0,35684 -0,25558	0,88314

(\*) dy/dx is for discrete change of dummy variable from 0 to 1.



**Tab. 3 Marginal effects after Ordered Probit Estimation**

$$y = \Pr(\text{jobsec}=2) = 0.44922363$$

	dy/dx	Std. Err.	z	P> z	[ 95%	C.I. ]	Mean
<i>Economic sector of activity</i>							
Agriculture*	0,03500	0,01968	1,78	0,07500	-0,00357	0,07358	0,03290
Other Services*	-0,12035	0,01338	-8,99	0,00000	-0,14658	-0,09412	0,39548
Business Services*	-0,03477	0,01311	-2,65	0,00800	-0,06047	-0,00907	0,25874
<i>Region of Residence</i>							
North*	-0,02589	0,01328	-1,95	0,05100	-0,05192	0,00014	0,41021
South*	0,03482	0,01244	2,80	0,00500	0,01045	0,05920	0,41330
<i>Educational attainment</i>							
Low*	0,02314	0,00980	2,36	0,01800	0,00394	0,04235	0,38794
High*	-0,05141	0,01802	-2,85	0,00400	-0,08674	-0,01609	0,12749
Age	0,00790	0,00327	2,41	0,01600	0,00148	0,01431	39,210
Age squared	-0,00011	0,00004	-2,71	0,00700	-0,00019	-0,00003	1645,31
Full time job*	-0,03058	0,01704	-1,79	0,07300	-0,06399	0,00282	0,95613
Indefinite term work contract*	-0,05324	0,01244	-4,28	0,00000	-0,07763	-0,02884	0,88314

(\*) dy/dx is for discrete change of dummy variable from 0 to 1.

**Tab. 4 Marginal effects after Ordered Probit Estimantion**

$$y = \Pr(\text{jobsec}=3) = 0.4425721$$

	dy/dx	Std. Err.	z	P> z	[ 95%	C.I. ]	Mean
<i>Economic sector of activity</i>							
Agriculture*	-0,07507	0,04956	-1,51	0,13000	-0,17221	0,02208	0,03290
Other Services*	0,21616	0,02155	10,03	0,00000	0,17393	0,25839	0,39548
Business Services*	0,06283	0,02263	2,78	0,00500	0,01848	0,10718	0,25874
<i>Region of Residence</i>							
North*	0,04825	0,02437	1,98	0,04800	0,00048	0,09602	0,41021
South*	-0,06705	0,02428	-2,76	0,00600	-0,11463	-0,01946	0,41330
<i>Educational attainment</i>							
Low*	-0,04439	0,01901	-2,33	0,02000	-0,08165	-0,00713	0,38794
High*	0,08873	0,02865	3,10	0,00200	0,03257	0,14488	0,12749
Age	-0,01490	0,00614	-2,43	0,01500	-0,02694	-0,00286	39,210
Age Squared	0,00021	0,00008	2,73	0,00600	0,00006	0,00036	1645,31
Full time Job*	0,06401	0,04028	1,59	0,11200	-0,01494	0,14295	0,95613
Indefinite term work contract*	0,35945	0,01733	20,74	0,00000	0,32549	0,39341	0,88314

(\*) dy/dx is for discrete change of dummy variable from 0 to 1.

**Tab. 5 Permanent Labour Income Estimation Results**

Dependent variable: household labour income

Estimation method: least squares

White Heteroskedasticity consistent standard errors and covariance

	Coefficient	Std. Error	t-Statistic	Prob.
Sex	2.613	0.953541	2.74	0.0062
Age	0.611	0.108287	5.65	0.0000
Age squared	-0.004	0.001388	-3.22	0.0013
Marital status	11.419	0.703880	16.22	0.0000
Indefinite term work contract	6.712	1.028510	6.53	0.0000
<i>Economic sector of activity:</i>				
Agriculture	-6.765	1.161031	-5.83	0.0000
Other services	-4.341	0.824825	-5.26	0.0000
<i>Educational attainment:</i>				
Low	-3.628	0.680162	-5.33	0.0000
High	9.081	1.607265	5.65	0.0000
<i>Position in Occupation:</i>				
Manual worker	-16.645	1.826952	-9.11	0.0000
Clerk	-8.828	1.775876	-4.97	0.0000
Teacher	-10.707	2.133097	-5.02	0.0000
Manager/Director	19.581	3.381541	5.79	0.0000
<i>Household characteristics</i>				
Number of income recipients	10.827	0.466749	23.20	0.0000
<i>Region of residence:</i>				
North	5.173	0.776718	6.66	0.0000
South	-3.569	0.798327	-4.47	0.0000
Number of obs.	3349		Mean dependent var.	42.48607
R-squared	0.479035		S.D. dependent var.	24.51508
Adjusted R-squared	0.476690		Akaike info criterion	8.593638
S.E. of regression	17.73424		Schwarz criterion	8.622859
Sum squared resid.	1048240.		Durbin-Watson stat.	1.847777
Log likelihood	-14374.05			

Benchmark characteristics are: industry for the economic sector of activity, Centre for the region of residence, medium for the level of educational attainment, 'Quadro' for position in occupation.

**Tab. 6**                      **Consumption Model Estimation Results**

Dependent variable: household's non durables consumption expenditures

Estimation method: least squares

Adjusted standard errors\*

	Coefficient	Std. Error	t-Statistic	Prob.
Constant	4.643	1.457242	3.19	0.001458
Permanent income	0.471	0.016833	27.97	0.0000
Transitory income	0.231	0.013797	16.73	0.0000
Net non-human wealth	0.014	0.000612	22.37	0.0000
Number of household's components	1.475	0.193791	7.57	0.0000
<i>Head of household characteristics</i>				
Age	0.079	0.023862	3.30	0.000973
Job security perception	0.880	0.368493	2.39	0.016991
<i>Educational attainment:</i>				
Low	-1.239	0.523861	-2.36	0.018132
High	0.539	0.697787	0.77	0.440277
Number of obs.	2918		Mean dependent var.	38.96435
R-squared	0.539996		S.D. dependent var.	17.07802
Adjusted R-squared	0.538730		Akaike info criterion	7.742769
S.E. of regression	11.60072		Schwarz criterion	7.761209
Sum squared resid.	391357.5		Durbin-Watson stat.	1.971616
Log likelihood	-11287.70		F-statistic	426.8564

(\*) Standard errors corrected for the 'generated regressors' effect (Murphy and Topel (1985) and Greene (2000) adjustment).

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