



**DULBEA**

Département d'Economie Appliquée de l'Université Libre de Bruxelles

**DOCUMENT DE TRAVAIL**

**WORKING PAPER**

**N°11-02.RS**

**RESEARCH SERIES**

**KNOWLEDGE AND JOB  
OPPORTUNITIES IN A GENDER  
PERSPECTIVE: INSIGHTS FROM  
ITALY**

Angela CIPOLLONE  
Marcella CORSI  
Carlo D'IPPOLITI



DULBEA | Université Libre de Bruxelles

Avenue F.D. Roosevelt, 50 - CP-140 | B-1050 Brussels | Belgium

D  
U  
L  
B  
E  
A

# Knowledge and Job Opportunities in a Gender Perspective: Insights from Italy

Angela Cipollone,<sup>\*</sup> Marcella Corsi,<sup>†</sup> Carlo D'Ippoliti<sup>‡</sup>

JEL CODES: J24, J16, C43, J71, C14

KEYWORDS: gender differentials, returns to knowledge, human capital

**ABSTRACT:** By considering the case of Italy we show that despite much rhetoric and expectations about the fact that women have gradually overcome men in terms of educational attainments, they still lack behind in terms of the main skills and competencies that can profitably be used in the market. On the one hand, women lack both general and specific knowledge related to the labour market, on the other hand the skills and competencies they acquire by carrying on unpaid work do not seem to be positively valued by the market. However, women also appear to exhibit higher returns to knowledge, both in terms of returns to education and of returns to work-related knowledge. Women's employment is more determined by the joint impact of care burdens and knowledge-determined opportunities, and their wages are more significantly affected by our indicators of knowledge. More than for men, while specialisation improves "insider" women's wages, it reduces "outsider" women's ability to obtain a job.

## 1. Introduction

It is widely recognised that knowledge is central to the process of growth and job creation, not only in Western countries. Human capital has been on centre stage of economic theory both in mainstream microeconomics, in the wake of the works by Becker (see for example Becker, 1964), and mainstream macroeconomics (especially after the work by Romer, 1990).

The codification of knowledge, that is its transformation into information, makes it more accessible to all economic agents linked to information networks or able to access them. Thus, it is especially on education and schooling that the economic literature has focused so far. However, it is important to stress that this does not necessarily reduce the importance of tacit knowledge, in the form of skills, competencies, etc. While this observation was already raised by Mincer (1974), it is more relevant in contemporary societies where easier and less expensive access to information makes skills and competencies related to selecting and efficiently using such information even more crucial than before. As a consequence, when analysing the determinants of individuals' employment and income it is nowadays current practice to look at (i) formal education and (ii) work-related skills (in the forms of training and learning by doing).

Sex differences have always been considered in this literature. In a sense, differences in the monetary benefits of education have been raised to the demanding job of explaining almost the whole social construction of gender roles by the New Household Economics literature, ever since Becker posited different returns on different forms of human capital as the founding block of the sexual division of labour in the household (Becker, 1985). Besides the issue that such a position may lack realism, in so far as millennial social structures such as a patriarchy and gender-based discrimination are here reduced to a "simple" matter of financial

---

<sup>‡</sup> LUISS Guido Carli, [acipollone@luiss.it](mailto:acipollone@luiss.it)

<sup>†</sup> Sapienza University of Rome, [marcella.corsi@uniroma1.it](mailto:marcella.corsi@uniroma1.it)

<sup>\*</sup> Sapienza University of Rome, [carlo.dippoliti@uniroma1.it](mailto:carlo.dippoliti@uniroma1.it) (corresponding author) Correspondence to: Carlo D'Ippoliti, Department of Statistics, Viale Regina Elena 295/E, Palazzina G, 00171 Rome, Italy.

expediency (and possibly limited to contemporary capitalist societies only), this strand of human capital theory is especially problematic from a feminist perspective since it assumes that (a-gendered) individuals decide on their education and training by rationally weighing the associated prospective benefits and costs.

Indeed, the feminist literature has frequently tout-court dismissed neoclassical explanations of gender roles as unrealistic and irrelevant (see for example the works collected in Barker and Kuiper, 2003; or Ferber and Nelson, 2003). However, in this paper we argue that feminist scholars and activists should not throw out the baby with the bath water, as an opportunely extended notion of knowledge may convey relevant information on gender and gender roles. Indeed, a high level of education is more relevant for the career dynamics of women than of men (for the case of Italy see Cipollone and D'Ippoliti, 2011): women enjoy higher returns to education and training than men, while men exhibit higher returns from their occupational status. However, recent studies show that women receive less training than men in terms of training hours; such a gender training gap may intensify the relative difficulties of women to enter and to remain in the labour market with better job conditions and better career prospects. Especially in the light of the ongoing process of population ageing, which itself is a gendered phenomenon, increasing and updating adults' skills and competencies will become increasingly crucial (Corsi et al., 2010). These facts strongly motivate the use of a more comprehensive indicator of knowledge rather than education only in order to discuss career dynamics under a gender perspective.

We propose a modification and enlargement of the concept of human capital, which we more simply denote as "knowledge" in order to avoid unwarranted assumptions on the rational process of its accumulation. We specifically consider some formal and informal skills to complement the more traditional analyses of education and on-the-job training. By considering the case of Italy we estimate the interrelation and joint impact of education, skills and labour market experience on men's and women's employment status and wages.

Italy is an especially suited case study because knowledge has been put at the centre of European Union (EU) strategy for growth and social cohesion through the "Lisbon Agenda" first, and most recently with the new "Europe 2020" strategy framed by the European Commission "to become a smart, sustainable and inclusive economy" (needless to say, "smart" is here meant as a reference to the role of knowledge in the economy and its identification as the main policy tool to boost economic growth in Europe).<sup>1</sup> Yet, Europe's labor markets exhibit relevant gender differentials in terms of employment, unemployment, activity rates, and labor incomes, and among these, Italy's labor market exhibits even greater gender differentials than the EU-27 average. For instance, the current women's employment rate is the second lowest after Malta, and after Italy failed to reach many of the objectives set by the Lisbon Agenda (especially in terms of women's employment) there are grounds to expect that it will fail to reach some of the objectives set by the Europe 2020 roadmap as well. We test the relationship between knowledge and job trajectories in a gender perspective by using micro-data from the Bank of Italy's Survey of Households' Income and Wealth. The paper is structured as follows: the next section briefly reviews the major evidence on the gendered nature of knowledge; next, a comprehensive indicator is built by integrating several dimensions of knowledge; section 4 reports the main results of several estimations of the

---

<sup>1</sup> Economic and social policy (apart from monetary policy for countries who adopt the euro) are not directly set by the European Union. However, EU Member States used to coordinate their policies through periodic benchmarking and exchange of information (the so called Open Coordination Method). Up to 2010 common objectives and policy tools, together with indicators to measure advancement towards such goals, were defined by the Lisbon Agenda which, among other things, envisaged the target of 60% for women's employment rate in 2010. This year the European Commission proposed a new long-run strategy and a new set of policy objectives named "Europe 2020". More information can be found at the Commission's website: <http://ec.europa.eu/europe2020/>

impact of knowledge on employment and on labour income, and section 5 concludes.

## 2. Gender and knowledge

We propose a multidimensional view of knowledge, whereby we include at least dimensions: education (whether school education, continuing (or adult) education); knowledge acquired on or related to the labour market (on-the-job and off-job training, experience, etc.); economic and financial literacy; ICT skills; and informal knowledge in general, such as basic household management skills. As it turns out, most of these dimensions exhibit relevant gendered features.

During the second half of the twentieth century (and in the twenty-first so far) the educational attainment of women has progressively increased in nearly all industrialised and in many developing countries. However, while women are now more often involved in university education, in most countries they are only a minority of students involved in the highest educational (i.e. graduate) programs (see for example Stalker and Prentice, 1998; Leonard, 2001). What may be even more relevant, is that aggregate figures hide a very high gender segregation in education, which paves the way to the subsequent segregation in the job market. According to an elaboration by the European Commission (2006), while 60% of PhD students in education and pedagogy are women (72% in Italy), only 15% of PhD students in engineering are women (13% in Italy) and only 19% of PhDs in computing (25% in Italy).

The two more specific dimensions of knowledge listed above were selected not only on the basis of data availability, but for their relevant influence on gender inequality and power structures in contemporary societies.

Financial literacy is key to a balanced smoothing of consumption over time, especially in the context of a general move of European pension systems towards pre-funded schemes based on individual decisions to save. In such an institutional environment, the unwillingness or inability to properly plan one's future resources may aggravate the already substantial gender gap in elderly persons' at-risk-of-poverty rates (Corsi et al., 2010). It is thus worrying to note that women exhibit substantially lower financial literacy than men, and that this is related to a lower propensity to plan (Lusardi and Mitchell, 2008). The issue is clearly related to intra-household dynamics as for example Clark et al. (2009) show that women are more likely to rely upon others (i.e. their breadwinner spouses) for their expected welfare in old age. In the case of Italy, Addis (2008) shows that not only many women are unconcerned with financial planning in the family, but a considerable number does not even possess precise information on family's resources (and on their husbands' income in particular). Financial illiteracy is especially diffused among women at a higher risk of exclusion and thus microcredit institutions normally offer a range of financial services and training jointly with their lending facilities. For example, a research focussing on mediterranean countries showed that the impact of microcredit on women's empowerment is associated to their greater participation to decisions concerning investments and savings in the family and enlarged capacity to undertake purchases in autonomy (Corsi et al., 2006).

Information and Communication Technologies are indeed at the core of the European strategy for an economic growth founded on knowledge.<sup>2</sup> The Digital Agenda is one of the main

---

<sup>2</sup> Setting the agenda for the coming decade, the European Commission writes: "The crisis has wiped out years of economic and social progress and exposed structural weaknesses in Europe's economy. [...] Faced with demographic ageing and global competition we have three options: work harder, work longer or work smarter. We will probably have to do all three, but the third option is the only way to guarantee increasing standards of life for Europeans. To achieve this, the Digital Agenda makes proposals for actions that need to be taken urgently [...]" (European Commission, 2010a, p. 3).

initiatives for Europe's economic policy in the coming decade and among its main goals it lists the objective to promote a higher participation of young women and women returners in the ICT workforce. Such focus on women is due to two concurrent causes: on the one hand, women's employment rates across European countries are still significantly lower than men's, and there is thus a greater potential for job growth of the female workforce; on the other hand, on top of the mentioned underrepresentation of women among graduate students in scientific and technological fields there is a more general gender gap also in basic ICT skills. Accordingly, a report by the European Commission notices that among persons of working age there is a 6% difference in the diffusion of internet users between European men and women (61% as opposed to 55%) but the gap among "frequent" users (at least once a day) increases to almost 40% (European Commission, 2010b). Low basic ICT skills are also one of the reasons for the low participation of women in ICT-related tertiary education, thus reinforcing gender segregation and the exclusion of women from one of the few industries that were least affected by the economic crisis (see for a recent review see Anderson et al., 2008). Moreover, while ICTs have the potential to increase participatory relations in organisations and workplaces and to allow for a greater flexibility of working places and times (Soete, 2001), thus possibly facilitating the conciliation of work and family life, it has been shown (Corsi, 2004) that in fact women are more involved than men in the use of e-mail in top-down communication (that is within command-and-control hierarchies) and their introduction does not seem to bring about greater participation of women in decision-making. As the works collected by Walby et al. (2007) report, ICTs brought about a growth of non-standard employment forms beneficial to women's employment, but they also conducted to a "re-gendering" of the ICT workforce by segregating women to the lower tail of the occupational hierarchy in ICT-using and ICT-producing industries.

Considering the set of working-related skills more in general, a gender approach to adult training and lifelong learning is relevant because research has shown that while women constitute the majority of workers and jobseekers enrolled in adult education programmes, numerous gendered disadvantages still exist for women learners. On the one hand, research showed that women may struggle to continue or even quit formal education due to unpaid work burdens (Blundell, 1992; Stalker, 2001; Shipley, 1997). On the other hand, due to these gender-specific responsibilities women exhibit more irregular and fragmented careers and thus more than men women returners to the labour market may capitalise on training and lifelong learning opportunities in the transition from unpaid to paid work (see for example Campbell, 1993; Stalker, 2001; Heenan, 2002).<sup>3</sup>

Neoclassical theory especially focuses on the distinction between specific and general knowledge, whereby firm-specific knowledge produces an extra-productivity of workers that result in quasi-rents (Becker, 1964). Given the limited availability of such data, in this paper we try to distinguish the two notions by considering tenure, the time spent by workers working for their current employer, and workers' "effective age", that is time passed since workers' entrance in the labour force. As it turns out, the two variables are highly correlated for men (88% for working age men in 2008), possibly due to Italy's low workers' mobility and very low turnover, but they are considerably less correlated for women (78% for working age women in 2008), mainly due to their more frequent career interruptions. However, as suggested by the feminist literature we do not consider housework and care as unproductive activities (irrespective of they being carried out within the family or for the market) and thus we aim to investigate the relevance of the home as a place of learning (Gouthro, 2005). To do so, we separately consider what we called workers' effective age and the number of years

---

<sup>3</sup> An issue on which further research is needed is the question raised by feminist scholars and pedagogues, on the extent to which gender segregation in education and training and the very content of learning act to reinforce gender roles and stereotypes (Sayman, 2007; Jackson, 2003).

spent in paid employment. As shown in the next section, while the two quantities tend to coincide for men (preventing their joint use in regression analyses, among other things), their difference is informative of women's work trajectories in a life-cycle perspective.

### 3. Expanding the notion of knowledge

To estimate the relevance of knowledge in determining men and women's work trajectories we use multivariate techniques to summarise several dimensions into few variables. We use the 2006 wave of the Bank of Italy's Survey of Households' Income and Wealth (SHIW) because on that occasion a special module on financial literacy and other dimensions of knowledge was included.<sup>4</sup> The sample (representative of Italy's population) is composed of 9,730 persons of "working age", by which we denote, with some modification upon the common practice in EU, between 25 and 60 years old (included). Of these, 4,973 are women and 4,757 are men. We also defined a more restrictive sample of people of prime age, which we define as persons between 25 and 50 years old in order to prevent interference with widespread practices of early retirement. The restricted sample is composed of 3,468 women and 3,309 men.

We mainly focus on the impact of knowledge on employment status<sup>5</sup> and labour income. In the sample 82% of working-age men and 87% of prime aged men are employed, as opposed to 56% of working-age women and 61% of prime aged women. Mean hourly wages in the sample are 8.95€ for working age men (8.59€ for prime aged men) and 8.52€ for working age women (8.33€ for prime aged women).

The first set of variables employed in explaining these gender gaps concern formal education and schooling. We consider six level of educational attainments, ranging from no education to postgraduate training, distinguishing two levels of secondary education in accordance with Italy's institutional setting.<sup>6</sup> However, in order to better highlight the role of education in shaping individuals' job opportunities we also distinguish six broad fields of study: vocational, humanistic and social studies for secondary education degrees and scientific, humanistic and social studies for tertiary and upper educational levels.<sup>7</sup> The distributions of educational attainments, average number of years spent in education, and field of study are summarised in Table 1. As it is shown, the younger prime age individuals are better educated than working age persons, and prime aged women exhibit the highest average number of years of education. Women exhibit a significantly lower participation in vocational training at all ages, while they are overrepresented in the social sciences field (no significant differences emerge in the humanistic and scientific fields).

---

<sup>4</sup> Results for the 2008 wave, the latest available at the time of writing, are not qualitatively different when allowance for missing variables biases is made. Detailed results are available from the authors upon request.

<sup>5</sup> Thus, we take a binary approach to employment: individuals are considered to be employed or not employed. However, we recognise that important issues are also the engagement in part-time work or the distinction between unemployed and inactive population. Moreover, we specifically focus on women's employment rather than women's participation for several reasons. On the one hand, we maintain that among the key labor market indicators the employment rate constitutes the best index of labor market dynamics and functioning. On the other hand, in terms of the reciprocal influence of the key labor market indicators, the employment rate can play the major role. Finally, Italy lags well behind the Lisbon target in terms of women's employment rate and this index constitutes thus a major priority for economic policy.

<sup>6</sup> Up to 1996 it was possible to quit school at age 14, that is (usually) after a minimum of 8 years of education. In 1997 compulsory education was extended up to 16 years old, although in the form of an "individual right to state-financed education". Being enrolled in formal education at least up to 16 years old became a binding obligation only in 2007.

<sup>7</sup> In Italy's educational system scientific studies in tertiary education are jointly classified with humanistic studies under the heading "liceo".

Table 1. Educational attainment and field of study, by sex and age

	Working age		Prime age		Years of education
	M	W	M	W	
Educational attainment					
No education	0,5%	0,7%	0,3%	0,4%	0
Primary ed.	7,5%	11,6%	3,3%	5,2%	5
Lower Secondary	38,5%	32,9%	39,5%	33,2%	8
Upper secondary	42,1%	40,3%	44,8%	44,7%	13
Tertiary ed.	11,0%	14,3%	11,6%	16,1%	17
Post-graduate ed.	0,4%	0,3%	0,5%	0,3%	19/20
Mean edu. Years	10,9	10,8	11,3	11,5	
Field of education					
Sec. vocational	28%	18%	30%	20%	
Sec. humanities	6%	4%	6%	5%	
Sec. social	2%	6%	2%	6%	
Tert. scientific	5%	7%	5%	8%	
Tert. humanities	3%	4%	4%	6%	
Tert. social	1%	8%	1%	7%	
Population	4.757	4.973	3.309	3.468	

Source: SHIW (2007). Note: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. In case of discordance, field of education refers to the highest educational attainment.

Concerning work-related knowledge, our sample does not allow us to account for workers' participation to formal training. However, we are able to distinguish three different measures of the acquired skills and competencies. As mentioned, by effective workers' age we denote the difference between workers' age and their age at the time of first entry in the labour force. The variable is a measure of general work-related knowledge and, as shown in Table 2, it is significantly higher for men than for women both of working and of prime age. In the case of men, this measure of labour-market experience is highly correlated to our second dimension of work-related knowledge, i.e. job experience, the number of years (and months) spent in actual employment. The correlation between the two variables, as mentioned, is significantly lower for women, who exhibit much more frequent career interruptions (in 2006, the correlation was 78% for women as opposed to 87% for men). We also computed a final measure of work-related knowledge, arguably closer to the neoclassical notion of (firm) specific knowledge, that is tenure, the number of years spent working for the current employer. As for the other two variables, women's mean value is significantly lower than men, as a consequence of both women's lower participation in the labour market and women's overrepresentation among the workers employed on flexible and fixed-term work arrangements (Cipollone and D'Ippoliti, 2010).

Finally, work-related knowledge may be acquired in the doing of unpaid work activities, such as productive activities carried on within the family, housework and care work. A relevant question is how tacit skills and competencies acquired at home are valued in the market, and if they may turn useful (possibly in certain industries such as the services to households). Information on unpaid work may partly be ascertained by investigating the

difference between our effective workers' age and their labour-market experience. However, such difference may also imply either involuntary job loss or a (temporary or permanent) withdrawal from the labour force to enjoy more leisure. Thus, in the estimations in the next section we also consider a measure of the demand for unpaid work within the household, proxied by (i) being a long-term affective relationship implying cohabitation (that for reasons of simplicity we denote as "married" status); and (ii) co-living with an elderly person (separately above 70 years old and 80 years old) or having young children (separately below 6 years old and below 3 years old). As suggested by Cipollone and D'Ippoliti (2011), the impact of being married on employment may be considered a measure of traditional gender roles, while co-living with elderly people or children is a proxy of care work burdens. In our sample women appear to face a slightly higher demand for unpaid work in the household, since men more frequently live alone.<sup>8</sup> Due to the prevalence of heterosexual cohabitation in the working age population such difference is however very small (though statistically significant) and living arrangements tend to be on average equal for men and women: by attributing an equal weight (equal to 1) to all the mentioned sources of demand for unpaid labour and summing them up, on average men face a demand equal to 0.94 (that is on average each working age man lives with almost a person in need for care) and women 0.97.

Table 2. ICT skills, financial literacy and labour market related knowledge, by sex and age

	Working age		Prime age	
	M	W	M	W
	Labour market			
Eff. worker's age	22,93	16,54	17,03	12,92
Std. dev.	(12.61)	(14.13)	(9.77)	(10.81)
Job experience	18,21	11,46	13,04	9,08
Std. dev.	(12.22)	(11.69)	(9.49)	(9.25)
Tenure	7,26	5,02	6,00	4,53
Std. dev.	(9.45)	(8.36)	(7.8)	(7.35)
	ICT skills			
Computer use	60,7%	60,1%	60,2%	62,7%
Computer at home	56,3%	55,7%	55,4%	57,8%
Internet use	50,7%	50,1%	50,0%	52,2%
e-buy	14,0%	13,3%	14,6%	14,0%
	Financial literacy (% correct answers)			
Quiz 1	31,2%	30,7%	30,4%	31,4%
Quiz 2	55,3%	56,5%	52,8%	56,9%
Quiz 3	26,5%	25,6%	25,1%	25,9%
Quiz 4	32,3%	32,3%	31,2%	31,3%
Quiz 5	47,9%	50,7%	45,0%	49,7%
Quiz 6	50,9%	53,5%	48,8%	52,7%

Source: SHIW (2007). Note: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. Under the heading ICT skills, percentages denote the proportion of individuals satisfying the requirement. Under the heading Financial literacy, percentages denote the share of individuals selecting the correct answer; questions are listed in Annex.

<sup>8</sup> By contrast women tend to leave alone in old age due to divorce or widowhood (Corsi and Samek, 2010).

Next, exploiting a specific set of questions available in our dataset, we integrate information on education and work-related knowledge with two further dimensions of knowledge: pertaining to economic and financial basic skills, and on the ability to use information and communication technologies. With respect to the former, six questions were asked<sup>9</sup> to measure the respondents' ability to understand the working of inflation, the meaning of basic financial terms such as "bonds" and "shares", and their ability to solve basic financial arithmetic problems (all questions and answers are listed in Annex). For each question we created synthetic dummy variables assuming value 1 if the individual responded correctly and 0 otherwise (descriptive statistics are shown in Table 2). Concerning ICT skills we selected four potential proxies by considering the following questions in the survey: (1) if the person uses a computer at home or at work; (2) if his/her family has a computer at home; (3) if the person uses the internet for emails or web surfing; (4) if the person bought goods or services online. We similarly created a dummy variable for each of these questions.

In order to summarise the information contained in all these proxy variables and to try to retain the relevant information on the person's skills into few meaningful indicators that abstract from other sources of variance (such as the person's financial means), we carried on a factor analysis on the matrix obtained by computing the tetrachoric correlation of all the mentioned dichotomous dummy variables (on the 9187 observations of persons of working age). We followed standard practice in selecting the (two) factors that exhibited an eigenvector greater than one and that contribute to explain a reasonable share of variance, and then rotated the factors according to the varimax method. Results are shown in Table 3. As it emerges, the two factors clearly imply a cluster of financial skills (Factor 1) separated from a second factor summarising ICT skills (Factor 2). Thus, the two factors are liable of straightforward economic interpretation and they allow us to keep more than half the variance of the original variables exception being the financial problem-set questions more heavily implying also other skills (mostly in the field of mathematics, such as the ability to read a graph or to make basic computations).

Table 3. Factor analysis on ICT skills and financial literacy, rotated factor loadings

	Factor 1	Factor 2	Uniqueness
Quiz 1	0,6942		48,8%
Quiz 2	0,6976		48,8%
Quiz 3	0,469		73,0%
Quiz 4	0,632		56,3%
Quiz 5	0,6631		54,1%
Quiz 6	0,5817		65,6%
Computer at home		0,8364	28,1%
e-commerce		0,8366	29,4%
Internet use		0,7957	34,4%

Source: SHIW (2007). Note: Year 2006; sample restricted to working age, defined as the [25-60] age bracket. Blanks represent absolute loadings smaller than 0.3; factor analysis performed on the matrix of tetrachoric correlations.

<sup>9</sup> These special questions were only asked to a random half of the sample, composed of persons whose year of birth ends by an odd number. We imputed predicted answers to the other half by using multiple iterative techniques based on probit analysis (since all variables are dichotomous) employing the ICE module on the software STATA 9. More information is available from the authors upon request.

In conclusion, we were able to gather variables measuring the number of years and the field of education, three dimensions of work-related experience, proxies of the unpaid work burden, and two indexes measuring ICT skills and financial literacy. We excluded the information on the field of study because it cannot be reduced to a quantitative measure and normalised all other variables by subtracting their (working age) population average and dividing by the standard deviation. These normalised variables were then collapsed by means of arithmetic average, to create a synthetic index of *knowledge*. We also created a second index, of *extended knowledge*, constructed as the previous one with the addition of a further dimension related to care burdens, in order to measure the skills acquired by doing unpaid work. This last variable is created by summing the number of people in the household that assumedly imply a demand for care, as described above. This variable is average jointly with the others by means of arithmetic average. In other words, both indexes are constructed attributing equal weight to all the components variables (three for the labour market, one for education, one for ICT skills and one for financial literacy in the standard case, plus a further one for unpaid care work in the extended case).

Descriptive statistics for the two indexes are reported in Table 4, distinguishing between the variance of the knowledge indicators in the population and the variance between the several dimensions of knowledge for a same person.

Table 4. Measures of Knowledge and Extended knowledge, by sex and age

	Working age		Prime age	
	M	W	M	W
Knowledge	0,24	0,06	0,11	0,02
Std. dev.	(0.49)	(0.53)	(0.44)	(0.48)
Extended knowledge	0,20	0,05	0,09	0,03
Std. dev.	(0.46)	(0.47)	(0.44)	(0.43)
Individuals' std.dev. of Knowledge	0,80	0,74	0,74	0,73
Individuals' std.dev. of Ext. knowledge	0,82	0,78	0,78	0,78
Individuals' kurtosis of Knowledge	0,97	0,90	0,90	0,88
Individuals' kurtosis of Ext. knowledge	1,01	0,96	0,96	0,95

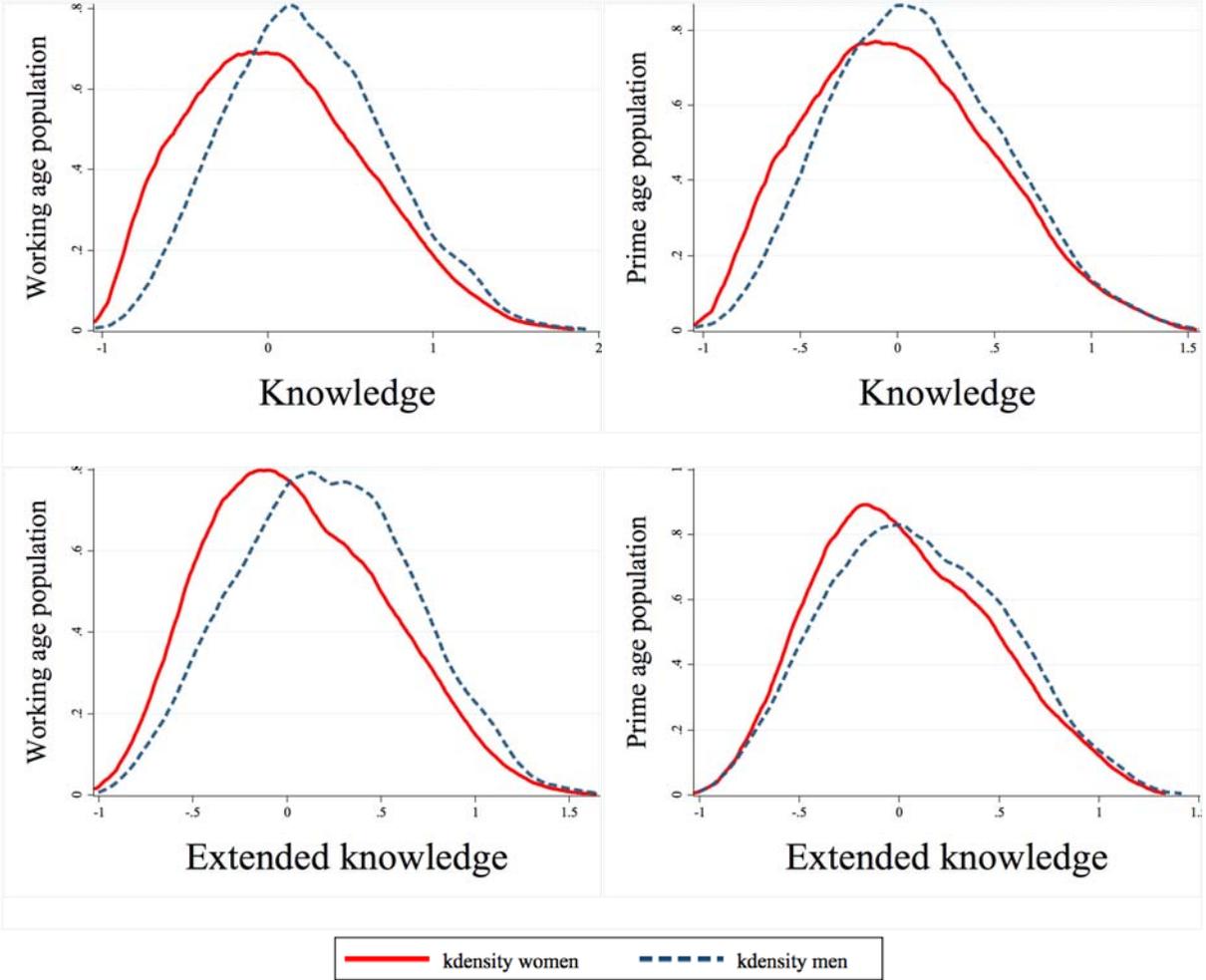
Source: SHIW (2007). Note: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. Standard deviation in parentheses and italics represent between-persons variability of the indexes of knowledge; individuals' std.dev. and kurtosis of the variables Knowledge and Extended knowledge measure, for each person, the variability between his/her different dimensions of knowledge.

As shown in Table 4, women exhibit lower average values of both Knowledge and Extended Knowledge (the difference is again very small but statistically significant). However, men are more similar as a group, as they show a lower variance than women both in the working age population and in the prime age group. Women's lower concentration is graphically shown in Figures 1 to 4, whereby it is evident that a majority of women of working age exhibit values of the both indicators of knowledge smaller than men's (since the distribution approximate Gaussian distributions, mode and median values coincide). Prime aged women partly filled the knowledge gap, but there is still a substantial number of women who cluster at

substantially lower values than men’s and women’s mean values. As shown in Annex, the knowledge gap is substantially lower for prime aged individuals and closed for prime aged persons, when the knowledge indicators are constructed excluding (firm-)specific knowledge, i.e. excluding workers’ tenure.

Finally, as shown in Table 4, for each individual the indicators of knowledge seem to be constructed averaging more heterogeneous skill levels (across the several dimensions) for men than for women. Indeed, both prime aged and working-age men exhibit higher (mean) standard deviation of the Knowledge and the Extended knowledge indexes. However, in reality women’s experiences appear as more diverse through their life course, as men’s high standard deviation is a consequence of single very high values, as evidenced by men’s higher (mean) kurtosis of the two indexes in both age brackets. In other words, men appear to specialise more (often in labour-market experience) than women.

Figures 1 to 4. Distribution of Knowledge and Extended knowledge, by sex and age



Source: SHIW (2007). Note: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. Kernel estimation (Epanechnikov).

4. The economic relevance of knowledge

## 4.1 Employment

We investigated the economic relevance of knowledge in the specific sense of the private returns to knowledge in terms of employment and of labour income. To do so, we first estimated a probit model of the probability of being employed, jointly for men and women (the “pooled” estimation) and then separately. Marginal effects are reported in Table 5.

The relevance of the pooled estimation is twofold. In negative terms, the comparison of the pooled estimation with the sex-specific ones highlights a number of sign reversals and of reversals of the statistical significance of some coefficients (for example concerning the impact of the “care” variable). As a consequence, active policy interventions aimed at boosting employment may be very different according to their targeting at men’s or women’s employment, and sometimes their effects may even be opposite (see Cipollone and D’Ippoliti, 2011). More in general, from a simple comparison of the pooled model and the sex-specific estimates it appears evident that a model based on an “average” a-gendered economic agent (i.e. on a representative agent) may fail to grasp relevant economic dynamics. Thus, men and women cannot simply be conceived of as heterogeneous, and sex-specific theoretical models are needed to understand their behaviour as well as separate empirical models are necessary for empirical analysis (i.e. the notion of “diversity” introduced by D’Ippoliti, 2011).

In positive terms, the pooled estimation allows us to formally test for the hypothesis of some coefficients being different for men and women (through the use of interaction terms), although only under the restrictive hypothesis that all other coefficients be equal.

From table 5 it emerges that knowledge exerts a large and significant impact on individuals’ probability of employment. For women, such an impact is significantly larger than for men. A unitary change in the indicator of knowledge, approximately correspondent to a shift from the mean value to the top 5% of the distribution, corresponds to a probability of being employed almost doubled for men (+80%) and almost tripled for women (+180%). For men, the impact is considerably higher for the population of prime age, while for women the coefficients are approximately the same. Extending the notion of knowledge by considering our indicator of Extended Knowledge increases the impact for men and lowers it for women. This result depends on the critical fact that care burdens are positively associated to men’s employment and negatively to women’s, thus reflecting the traditional division of labour in the household.

Specialisation (for example in the form of high imbalances between work-related knowledge, education, and skills), as measured by the kurtosis of the knowledge indicators, appears to be negatively associated to both men’s and women’s employment, with no significant difference emerging in the value of the coefficient between men and women, nor between the prime age and the working age samples.

Summing up, it emerges that knowledge is a crucial determinant of both men’s and women’s employment, but for women it is significantly more so. However, for women the amount of skills and competencies acquired by practising unpaid work at home does not seem to be valued on the market. On the contrary, the demand for care constitutes a constraint to women’s employment, even when controlling for other variables such regional factors and real or financial wealth.

Table 5. The employment impact of knowledge, marginal effects

	Working age			Prime age			Working age			Prime age		
	M	W	P	M	W	P	M	W	P	M	W	P
<b>Care</b>	43.7% (0.052)**	-26.2% (0.039)**	42.5% (0.051)**	34.3% 0.06**	-26.7% 0.043**	36.7% (0.058)**						
<i>Interaction</i>			-68.5% (0.064)**			-63.8% (0.071)**						
<b>Knowledge</b>	80.0% (0.087)**	181.1% (0.081)**	83.8% (0.081)**	165.4% 0.17**	205.4% 0.104**	180.3% (0.163)**						
<i>Interaction</i>			93.4% (0.106)**			14.5% (0.184)						
<b>Kurtosis Knowledge</b>	-63.2% (0.11)**	-73.9% (0.097)**	-63.6% (0.109)**	-94.1% 0.161**	-93.0% 0.116**	-103.3% (0.161)**						
<i>Interaction</i>			-9.5% (0.148)			17.6% (0.198)						
<b>Ext. knowledge</b>							123.7% (0.096)**	153.1% (0.081)**	109.8% (0.086)**	187.8% (0.186)**	151.9% (0.103)**	199.0% (0.175)**
<i>Interaction</i>									48.3% (0.109)**			-52.0% (0.191)**
<b>Kurtosis Ext. knowledge</b>							-68.3% (0.107)**	-72.0% (0.099)**	-65.7% (0.105)**	-75.6% (0.155)**	-79.4% (0.116)**	-89.0% (0.154)**
<i>Interaction</i>									-8.9% (0.142)			17.6% (0.186)
<b>Woman</b>			-2.7% (0.15)			-48.6% (0.203)**			-66.8% (0.134)**			-123.0% (0.197)**
<b>Observations</b>	4757	4973	9730	3309	3468	6777	4757	4973	9730	3309	3468	6777
<b>Log-likelihood</b>	-1.90E+03	-2.50E+03	-4.40E+03	-933.916	-1.70E+03	-2.60E+03	-1.90E+03	-2.70E+03	-4.70E+03	-942.254	-1.80E+03	-2.80E+03
<b>Chi squared</b>	369.665	898.767	1604.362	267.372	596.843	958.702	360.789	665.706	1355.675	249.428	457.491	791.271
<b>AIC</b>	3894.283	4963.763	8859.574	1917.832	3358.788	5319.122	3929.194	5429.921	9367.799	1932.507	3740.464	5709.311
<b>BIC</b>	4055.967	5126.558	9067.881	2070.442	3512.572	5516.939	4084.411	5586.204	9561.739	2079.013	3888.096	5893.485
<b>Degrees of freedom</b>	24	24	28	24	24	28	23	23	26	23	23	26
<b>Pseudo R2</b>	0.14	0.28	0.272	0.273	0.288	0.328	0.132	0.211	0.229	0.267	0.205	0.277

Source: SHIW (2007). Notes: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. Standard deviation in parentheses. Marginal effects denote the mean variation in individuals' probability of being employed corresponding to an infinitesimal variation of the independent variable, estimated at the mean value of the independent variable; for dummy variables marginal effects denote the average variation in individuals' probability corresponding to the modification of the independent variable from 0 to 1. Control variables include real and financial wealth, age (squared), Regional fixed effects and a constant term. "Interaction" denote the joint impact of each variable of knowledge and the woman dummy variable.

When considering disaggregated variables (Table A1 in Annex), it emerges that it is particularly in the labour market that the returns to knowledge appear as higher for women than for men. Specifically, both workers' effective age and their job experience are positively associated to the probability of being employed, but the former exerts a higher impact for women, and is significantly higher one than for men. Concerning formal education, the returns to secondary education would appear as higher for men than for women, although in the pooled estimation the difference is not statistically significant. Tertiary education, with the exception of the social sciences, appears instead to benefit women more than men.

The specific forms of knowledge considered here appear to exert ambiguous impacts. For women, ICT skills positively increase the probability of employment for the working age population, while financial literacy is never statistically significant. On the contrary, for men of working age financial literacy lowers the probability of employment (though not for prime aged individuals). This peculiar result may be due to an income effect especially in the case of older workers, given the high correlation between financial literacy and accumulated financial wealth.<sup>10</sup>

Finally, concerning care-related variables, significant differences between men and women imply distinctively larger (more negative) impacts for women from having small children and from co-living with an old-aged person (above 80 years old). However, it is especially co-living with a partner to be associated with a significantly higher probability of men's employment and significantly lower probability of women's employment. Such an impact for women is analogous to (and in some cases smaller than) the impacts of other family member who need care. On the contrary, for men the significantly positive sign denotes that women's unpaid work facilitates men's employment in the market by complementing it and making it easier (or in some cases it may be instrumental to it).

#### 4.2 Labour income

We next considered labour income by estimating Heckman models of (the logarithm of) hourly wages, using the previous probit models as selection equations. As shown in Table 6, women appear to benefit from slightly higher returns to knowledge in prime age and slightly lower in working age, though these differences are not statistically significant in the pooled sample (apart from the impact of the Extended Knowledge in the working age sample). Specialisation is rarely statistically significant, but when it is women appear to benefit from it more than men. In the pooled estimations, an unexplained residual confirms previous estimations of the gender pay gap that cannot be accounted for by other observable factors but gender (between 16% and 17% in all estimations).

When considering disaggregated results (table A2 in Annex) such unexplained gender-specific residual remains significant and of the same order of magnitude. It further appears that ICT skills benefit men's and women's hourly wages in the same measure, while financial literacy is associated to higher wages only for working age men. The returns to education are not statistically different between men and women, apart from tertiary education in the humanities (which improves women's wages more), but for women the coefficients of the various educational attainments are more often statistically significant. Finally, women benefit significantly more than men from firm-specific knowledge, as their return on tenure is on average 50% higher than men's.

---

<sup>10</sup> Although in the estimations we control for households' real and financial wealth, a study from the Bank of Italy suggests that these are among the least reliable variables in the sample, given a certain reluctance in the population to uncover such private information in a survey (Biancotti et al., 2004).

Table 6. The labour income impact of knowledge, log. of hourly wages

	Working age			Prime age			Working age			Prime age		
	M	W	P	M	W	P	M	W	P	M	W	P
<b>Knowledge</b>	0,19 (0,02)**	0,154 (0,03)**	0,184 (0,02)**	0,16 (0,025)**	0,187 (0,029)**	0,174 (0,025)**	0,199 (0,021)**	0,108 (0,047)**	0,188 (0,021)**	0,17 (0,026)**	0,157 (0,032)**	0,175 (0,025)**
<i>Interaction</i>			-0,054 (0,033)			-0,014 (0,035)						
<b>Kurtosis Knowledge</b>	0,019 (0,023)	0,035 (0,027)	0,002 (0,023)	0,051 (0,028)*	0,028 (0,032)	0,025 (0,029)						
<i>Interaction</i>			0,056 (0,034)*			0,032 (0,043)						
<b>Ext. knowledge</b>												
<i>Interaction</i>												
<b>Kurtosis Ext. knowledge</b>												
<i>Interaction</i>												
<b>Woman</b>			-0,175 (0,037)**			-0,164 (0,044)**						-0,16 (0,048)**
<b>lambda</b>	-0,154 (0,027)	-0,03 (0,035)	-0,104 (0,028)	-0,15 (0,028)	-0,016 (0,025)	-0,079 (0,021)	-0,155 (0,032)	-0,092 (0,064)	-0,138 (0,029)	-0,142 (0,029)	-0,049 (0,033)	-0,095 (0,023)
<b>Rho ath</b>	-0,521 (0,093)	-0,097 (0,112)	-0,341 (0,093)	-0,538 (0,104)	-0,053 (0,081)	-0,266 (0,072)	-0,524 (0,108)	-0,3 (0,208)	-0,456 (0,096)	-0,509 (0,109)	-0,159 (0,108)	-0,318 (0,079)
<b>In-sigma</b>	-1,132 (0,039)	-1,173 (0,034)	-1,147 (0,028)	-1,186 (0,043)	-1,188 (0,037)	-1,185 (0,028)	-1,132 (0,042)	-1,15 (0,049)	-1,128 (0,033)	-1,192 (0,044)	-1,179 (0,037)	-1,18 (0,03)
<b>sigma</b>	0,322	0,309	0,318	0,305	0,305	0,306	0,323	0,316	0,324	0,304	0,308	0,307
<b>p</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>rho</b>	-0,478	-0,097	-0,328	-0,492	-0,053	-0,26	-0,48	-0,292	-0,427	-0,469	-0,158	-0,308
<b>Observations</b>	3884	4558	8442	2672	3149	5821	3884	4558	8442	2672	3149	5821
<b>Censored observations</b>	945	2282	3227	467	1365	1832	945	2282	3227	467	1365	1832
<b>Log-likelihood</b>	-2,70E+03	-3,10E+03	-5,90E+03	-1,40E+03	-2,20E+03	-3,70E+03	-2,80E+03	-3,30E+03	-6,20E+03	-1,50E+03	-2,40E+03	-3,90E+03
<b>Chi squared</b>	1086	1181	1973	699	842	1312	1085	1179	1997	688	841	1311
<b>AIC</b>	5567	6318	12000	2983	4417	7479	5662	6725	12000	2989	4855	7915
<b>BIC</b>	5837	6595	12000	3237	4678	7812	5925	6995	13000	3237	5109	8235
<b>Degrees of freedom</b>	16	16	19	16	16	19	16	16	19	16	16	19

Source: SHIW (2007). Notes: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. Standard deviation in parentheses. Marginal effects denote the mean variation in individuals' probability of being employed corresponding to an infinitesimal variation of the independent variable, estimated at the mean value of the independent variable; for dummy variables marginal effects denote the average variation in individuals' probability corresponding to the modification of the independent variable from 0 to 1. Control variables include real and financial wealth, age (squared), Regional fixed effects and a constant term. "Interaction" denote the joint impact of each variable of knowledge and the woman dummy variable.

## 5. Conclusions

While the relevance of knowledge as a driver of individuals' economic opportunities has become a commonplace in Europe, the gender dimension of it are most frequently neglected. By reviewing available evidence from Italy, in this paper we showed that despite much rhetoric and expectations about the fact that women have gradually overcome men in terms of educational attainments, they still lack behind in terms of the main skills and competencies that can profitably be used in the market. On the one hand, women lack both general and specific knowledge related to the labour market, on the other hand the skills and competencies they acquire by carrying on unpaid work do not seem to be positively valued by the market.

However, women also appear to exhibit higher returns to knowledge, both in terms of returns to education and of returns to work-related knowledge. Women's employment is more determined by the joint impact of care burdens and knowledge-determined opportunities, and their wages are more significantly affected by our indicators of knowledge. More than for men, while specialisation improves "insider" women's wages, it reduces "outsider" women's ability to obtain a job.

On the whole, a note of optimism may come from evidence that gender differentials in the accumulation of knowledge are smaller for the younger population, although prime aged individuals appear to be as affected by traditional gender roles (as measured by the patriarchal sexual division of labour) as older cohorts are.

## References

- Addis, E. (2008), "Dentro la scatola nera. Il reddito tra caratteristiche sociali e difficoltà a parlarne", in Facchini, C. (ed.), *Conti aperti*, Bologna: il Mulino.
- Anderson, N., Lankshear, C., Timms, C., Courtney, L. (2008), "'Because it's boring, irrelevant and I don't like computers': Why high school girls avoid professionally-oriented ICT subjects", *Computers & Education*, vol. 50, pp. 1304–1318.
- Barker, D.K., Kuiper, E. (ed.) (2003), *Toward a Feminist Philosophy of Economics*, London: Routledge.
- Becker, G.S. (1964), *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*, Chicago: University of Chicago Press.
- Becker, G.S. (1985), "Human Capital, Effort, and the Sexual Division of Labor", *Journal of Labor Economics*, vol. 3, n. 1, pp. S33-S58.
- Biancotti, C., D'Alessio, G., Neri A. (2004), "Errori di misura nell'indagine sui bilanci delle famiglie italiane", *Temi di discussione del Servizio Studi*, n. 520, Bank of Italy, Rome.
- Blundell, R. (1992) "Labour supply and taxation: a survey", *Fiscal Studies*, Institute for Fiscal Studies, vol. 13, n. 3, pp. 15-40.
- Campbell, A. (1993), *Men, women and aggression*, New York/London: Basic Books.
- Cipollone, A., D'Ippoliti, C. (2011), "Women's Employment: Beyond Individual Characteristics vs. Contextual Factors Explanations", *American Journal of Economics and Sociology*, forthcoming.
- Cipollone, A., D'Ippoliti, C. (2010), "Discriminating Factors of Women's Employment", *Applied Economics Letters*, vol. 17, n. 11, pp. 1055-1062.

- Clark G.L., Knox-Hayes J., Strauss K. (2009), "Financial sophistication, salience, and the scale of deliberation in UK retirement planning", *Environment and Planning A*, vol. 41, n. 10, pp. 2496 – 2515.
- Corsi, M., Samek L. (eds.) (2010), *Active Ageing and Gender Equality Policies*, Report for the European Commission, DG Employment, Social Affairs, and Equal Opportunities, Brussels.
- Corsi, M., Botti, F., Rondinella, T., Zacchia, G. (2006), "Women and Microfinance in Mediterranean Countries", *Development*, vol. 49, n. 2, pp. 67–74.
- Corsi, M. (2004), "The gender dimension of using e-mail at work", Presentation made at the Gender & ICT symposium: Working for Change, Brussels (Belgium), 20 January 2004.
- D'Ippoliti, C. (2011), *Economics and Diversity*, London and New York: Routledge.
- European Commission (2006), *She Figures 2006. Women and Science Statistics and Indicators*, Directorate-General for Research, Science and Society, Brussels.
- European Commission (2010a), *A Digital Agenda for Europe*, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM(2010) 245 final/2, Brussels.
- European Commission (2010b), *Women and ICT Status Report 2009*, DG Information Society and Media, Brussels.
- Ferber M.A., Nelson, J.A. (2003), *Feminist Economics Today: Beyond Economic Man*, Chicago: University of Chicago Press.
- Gouthro, P.A. (2005), "A critical feminist analysis of the homeplace as learning site: expanding the discourse of lifelong learning to consider adult women learners", *International Journal of Lifelong Education*, vol. 24, n. 1, pp. 5–19.
- Heenan, D. (2002), "Women, access and progression: an examination of women's reasons for not continuing in higher education following the completion of the Certificate in Women's Studies", *Studies in Continuing Education*, vol. 24, n. 1, pp. 39-55.
- Jackson, S. (2003), "Lifelong Earning: working-class women and lifelong learning", *Gender and Education*, vol. 15, n. 4, pp. 365-376.
- Leonard, D. (2001), *A Woman's Guide to Doctoral Studies*, Buckingham and Philadelphia: Open University Press.
- Lusardi, A., Mitchell, O.S. (2008), "Planning and Financial Literacy: How do Women Fare?", *American Economic Review: Papers & Proceedings*, vol. 98, n. 2, pp. 413–417.
- Mincer, J. (1974), *Schooling, Experience, and Earnings*, New York: Columbia University Press.
- Romer, P.M. (1990), "Human capital and growth: Theory and evidence", *Carnegie-Rochester Conference Series on Public Policy*, vol. 32, n. 1, pp. 251-286.
- Sayman, D.M. (2007), "The Elimination of Sexism and Stereotyping in Occupational Education", *Journal of Men's Studies*, vol. 15, n. 1, pp. 19-30.
- Shipley, A. (1997), "Most College Funding Goes to Men's Sports; Study: Money for Women's Programs Lags", *The Washington Post*, Tuesday, 29 April.
- Soete, L. (2001), "ICTs, Knowledge Work and Employment: The Challenges to Europe", *International Labour Review*, vol. 140, n. 2, pp. 143–163.
- Stalker, J., Prentice, S. (eds.) (1998), *Illusion of Inclusion: Women in Post- secondary Education*, Halifax: Fernwood Publishing.
- Stalker, J. (2001), "Misogyny, women and obstacles to tertiary education: A vile situation", *Adult Education Quarterly*, vol. 51, n. 4, pp. 288-305.
- Walby, S., Gottfried, H., Gottschall, K., Osawa, M. (2007), *Gendering the Knowledge Economy: Comparative Perspectives*, London: Palgrave.

## ANNEX

### A1. Financial literacy: special module of the questionnaire in the SHIW 2006 survey

#### QUIZ1

Suppose you receive this statement of account from your bank; can you tell me what sum of money is available at the end of May?

- amount in euros € |\_|\_|\_|\_| ..... 1
- don't know ..... 2

(the interviewer shows a separate figure, available online at the URL

[http://www.bancaditalia.it/statistiche/indcamp/bilfait/docum/ind\\_06;internal&action=\\_setlanguage.action?LANGUAGE=en](http://www.bancaditalia.it/statistiche/indcamp/bilfait/docum/ind_06;internal&action=_setlanguage.action?LANGUAGE=en))

#### QUIZ2

Imagine leaving 1,000 euros in a current account that pays 1% interest and has no charges. Imagine also that inflation is running at 2%. Do you think that if you withdraw the money in a year's time you will be able to buy the same amount of goods as if you spent the 1,000 euros today?

- Yes ..... 1
- No, I will be able to buy less ..... 2
- No, I will be able to buy more ..... 3
- Don't know ..... 4

#### QUIZ3

This figure shows the value of two different investment funds over the last four years. Which fund do you think produced the largest return in that period?

- fund 1 ..... 1
- fund 2 ..... 2
- the funds earned the same ..... 3
- don't know ..... 4

(the interviewer shows a separate figure, available online at the URL

[http://www.bancaditalia.it/statistiche/indcamp/bilfait/docum/ind\\_06;internal&action=\\_setlanguage.action?LANGUAGE=en](http://www.bancaditalia.it/statistiche/indcamp/bilfait/docum/ind_06;internal&action=_setlanguage.action?LANGUAGE=en))

#### QUIZ4

Imagine leaving 1,000 euros in a current account that pays 2% annual interest and has no charges. What sum do you think will be available at the end of 2 years?

- less than 1,020 euros ..... 1
- exactly 1,020 euros ..... 2
- more than 1,020 euros ..... 3
- don't know ..... 4

#### QUIZ5

Imagine you have only equity funds and stock market prices fall. Are you...? (The interviewer reads the answers aloud)

- better off ..... 1
- less well off ..... 2
- as well off as before ..... 3
- don't know ..... 4

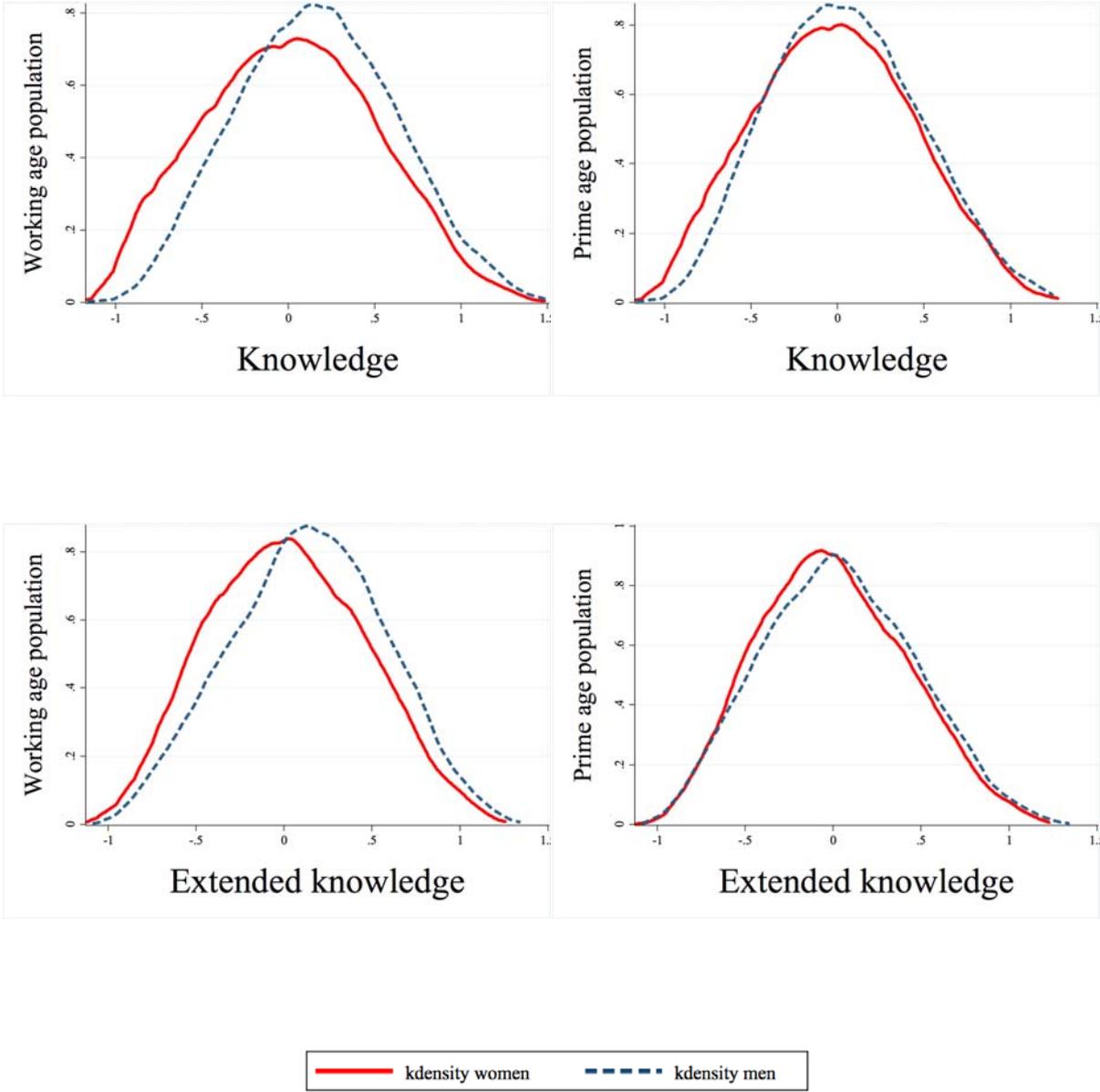
#### QUIZ6

Which of the following types of mortgage do you think will allow you from the very start to fix the maximum amount and number of instalments to be paid before the debt is extinguished?

- floating-rate mortgage ..... 1
- fixed-rate mortgage ..... 2
- floating-rate mortgage with fixed instalments ..... 3
- don't know ..... 4

A2. Measures of Knowledge and Extended knowledge, excluding individuals' tenure

Figures A1-A4. Distribution of Knowledge and Extended knowledge without tenure, by sex and age



Source: SHIW (2007). Note: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. Kernel estimation (Epanechnikov).

### A3. The economic impact of Knowledge, disaggregated variable

Table A1. The employment impact of knowledge (disaggregated variables) on the probability of employment, marginal effects

	Working age			Prime age		
	M	W	P	M	W	P
	Unpaid work					
Partner	81,4%	-22,0%	62,9%	60,4%	-36,1%	51,6%
	(0.079)**	(0.075)**	(0.067)**	(0.129)**	(0.094)**	(0.113)**
Interaction			-71,1%			-86,4%
			(0.074)**			(0.127)**
Child (3 yo)	6,8%	-24,6%	11,1%	-1,4%	-22,3%	-0,1%
	(0.134)	(0.097)**	(0.13)	(0.171)	(0.11)**	(0.167)
Interaction			-39,0%			-23,1%
			(0.16)**			(0.198)
Child (6 yo)	19,2%	-12,3%	23,2%	12,2%	-10,9%	11,1%
	(0.138)	(0.098)	(0.133)*	(0.161)	(0.112)	(0.158)
Interaction			-37,3%			-22,2%
			(0.165)**			(0.193)
Elderly (70 yo)	6,3%	5,1%	-1,4%	-9,8%	13,6%	-13,9%
	(0.123)	(0.128)	(0.118)	(0.16)	(0.144)	(0.174)
Interaction			17,2%			31,7%
			(0.17)			(0.229)
Elderly (80 yo)	19,3%	-39,5%	7,4%	-4,3%	-56,0%	-6,5%
	(0.178)	(0.143)**	(0.167)	(0.26)	(0.217)**	(0.243)
Interaction			-35,7%			-42,1%
			(0.215)*			(0.319)
	Education					
Sec. vocational	58,1%	35,9%	45,1%	60,6%	42,2%	56,7%
	(0.085)**	(0.079)**	(0.077)**	(0.127)**	(0.097)**	(0.111)**
Interaction			-2,4%			-14,4%
			(0.104)			(0.14)
Sec. humanities	72,7%	29,6%	56,6%	64,9%	38,3%	59,8%
	(0.151)**	(0.106)**	(0.14)**	(0.198)**	(0.12)**	(0.18)**
Interaction			-20,3%			-22,8%
			(0.17)			(0.211)
Sec. social	118,2%	47,3%	59,6%	57,5%	64,8%	69,7%
	(0.515)**	(0.167)**	(0.162)**	(0.595)	(0.207)**	(0.204)**
Interaction			-			-
			-			-
Tert. scientific	78,9%	81,1%	61,1%	89,7%	97,8%	89,1%
	(0.168)**	(0.14)**	(0.151)**	(0.188)**	(0.16)**	(0.179)**
Interaction			30,6%			9,0%
			(0.2)			(0.237)
Tert. humanities	25,8%	61,8%	10,1%	42,8%	80,7%	41,2%
	(0.226)	(0.119)**	(0.218)	(0.238)*	(0.15)**	(0.241)*
Interaction			62,7%			39,1%
			(0.242)**			(0.28)
Tert. social	71,2%	64,7%	51,9%	86,0%	85,5%	79,7%
	(0.157)**	(0.141)**	(0.149)**	(0.193)**	(0.152)**	(0.185)**
Interaction			21,6%			4,8%
			(0.198)			(0.235)
	Labour market					
Eff. worker's age	5,2%	3,2%	4,0%	4,3%	2,9%	4,0%
	(0.007)**	(0.005)**	(0.005)**	(0.008)**	(0.006)**	(0.006)**
Interaction			-0,6%			-1,2%
			(0.006)			(0.008)
Job experience	2,5%	7,3%	2,4%	8,8%	12,3%	9,2%
	(0.004)**	(0.005)**	(0.004)**	(0.01)**	(0.009)**	(0.009)**
Interaction			4,9%			3,0%

			(0.006)**			(0.012)**
	Specific skills					
Financial literacy	-19,3%	8,0%	-11,8%	-19,2%	5,3%	-17,3%
	(0.083)**	(0.078)	(0.08)	(0.13)	(0.099)	(0.126)
Interaction			0,137			0,201
			(0.111)			(0.159)
ICT skills	6,3%	31,1%	18,8%	12,7%	9,8%	19,4%
	(0.123)	(0.103)**	(0.119)	(0.204)	(0.132)	(0.192)
Interaction			0,5%			-13,7%
			(0.149)			(0.227)
Statistics						
Observations	4757	4973	9730	3309	3468	6777
Log-likelihood	-1,80E+03	-2,10E+03	-4,00E+03	-792,097	-1,30E+03	-2,10E+03
Chi squared	461,837	841,983	1319,529	391,691	754,168	1202,581
AIC	3670,888	4372,129	8064,387	1658,194	2687,967	4349,707
BIC	3910,18	4613,065	8430,719	1884,057	2915,566	4697,593
Degrees of freedom	36	36	50	36	36	50
Pseudo R2	0,196	0,37	0,341	0,383	0,437	0,457

Source: SHIW (2007). Notes: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. Standard deviation in parentheses. Marginal effects denote the mean variation in individuals' probability of being employed corresponding to an infinitesimal variation of the independent variable, estimated at the mean value of the independent variable; for dummy variables marginal effects denote the average variation in individuals' probability corresponding to the modification of the independent variable from 0 to 1. Control variables include real and financial wealth, age (squared), Regional fixed effects and a constant term. "Interaction" denote the joint impact of each variable of knowledge and the woman dummy variable.

Table A2. The impact of knowledge (disaggregated variables) on log. of hourly wages

	Working age			Prime age		
	M	W	P	M	W	P
	Education					
Sec. vocational	0,062	0,04	0,045	0,046	0,055	0,044
	(0.018)**	(0.024)*	(0.019)**	(0.02)**	(0.023)**	(0.02)**
Interaction			-0,013			0,014
			(0,028)			(0,03)
Sec. humanities	0,046	0,072	0,032	0,076	0,08	0,075
	(0,035)	(0.035)**	(0.035)	(0.04)*	(0.035)**	(0.041)*
Interaction			0,033			0,008
			(0,048)			(0,053)
Sec. social	0,09	0,043	0,044	0,144	0,074	0,087
	(0,08)	(0,033)	(0,033)	(0,099)	(0.036)**	(0.037)**
Interaction			-			-
			-			-
Tert. scientific	0,239	0,199	0,194	0,215	0,229	0,199
	(0.047)**	(0.058)**	(0.048)**	(0.056)**	(0.06)**	(0.056)**
Interaction			0,015			0,044
			(0,069)			(0,079)
Tert. humanities	0,114	0,13	0,035	0,114	0,15	0,087
	(0,073)	(0.037)**	(0.056)	(0,086)	(0.039)**	(0,059)
Interaction			0,103			0,071
			(0.055)*			(0,061)
Tert. social	0,195	0,131	0,15	0,144	0,153	0,119
	(0.061)**	(0.054)**	(0.063)**	(0.064)**	(0.055)**	(0.064)*
Interaction			-0,007			0,049
			(0,08)			(0,084)
	Labour market					
Eff. worker's age	0,003	0,002	0,002	0,002	0,005	0,003
	(0.002)*	(0,002)	(0,002)	(0,002)	(0.002)**	(0,002)
Interaction			0			0,002

			(0,002)			(0,003)
Job experience	0,003	-0,001	0,001	0,003	0,001	0,005
	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)	(0,002)**
Interaction			-0,002			-0,005
			(0,002)			(0,003)
Tenure	0,005	0,007	0,004	0,004	0,006	0,003
	(0,001)**	(0,001)**	(0,001)**	(0,002)**	(0,001)**	(0,002)*
Interaction			0,004			0,004
			(0,002)**			(0,002)*
Specific skills						
Financial literacy	0,037	-0,019	0,035	0,02	-0,023	0,02
	(0,02)*	(0,022)	(0,02)*	(0,021)	(0,025)	(0,021)
Interaction			-0,047			-0,041
			(0,03)			(0,033)
ICT skills	0,099	0,06	0,094	0,1	0,081	0,094
	(0,03)**	(0,028)**	(0,03)**	(0,034)**	(0,03)**	(0,035)**
Interaction			-0,022			-0,001
			(0,042)			(0,048)
Woman			-0,151			-0,168
			(0,028)**			(0,031)**
Statistics						
lambda	-0,167	-0,09	-0,14	-0,143	-0,029	-0,067
	(0,024)	(0,045)	(0,031)	(0,024)	(0,025)	(0,017)
Rho ath	-0,575	-0,299	-0,469	-0,518	-0,098	-0,227
	(0,087)	(0,149)	(0,104)	(0,091)	(0,085)	(0,058)
ln-sigma	-1,136	-1,17	-1,137	-1,202	-1,203	-1,202
	(0,038)	(0,042)	(0,033)	(0,043)	(0,037)	(0,029)
sigma	0,321	0,31	0,321	0,301	0,3	0,301
p	0	0	0	0	0	0
rho	-0,519	-0,291	-0,437	-0,476	-0,098	-0,223
Observations	3884	4558	8442	2672	3149	5821
Censored observations	945	2282	3227	467	1365	1832
Log-likelihood	-2,60E+03	-2,90E+03	-5,90E+03	-1,30E+03	-1,80E+03	-3,20E+03
Chi squared	1170	1209	2031	845	899	1558
AIC	5364	5872	12000	2720	3709	6541
BIC	5765	6284	13000	3097	4096	7047
Degrees of freedom	25	25	36	25	25	36

Source: SHIW (2007). Notes: Year 2006; working age is defined as the [25-60] age bracket, prime age is [25-50]. Standard deviation in parentheses. Heckman estimation on the natural logarithm of hourly wages. For the wage equations, control variables include occupation, industry, firm size, contractual arrangement and yearly hours worked. Selection equations are the same as the probit estimates reported in Table A1. "Interaction" denote the joint impact of each variable of knowledge and the woman dummy variable.

## **DULBEA Working Paper Series**

### **2011**

- N°.11-02.RS Angela Cipollone, Marcella Corsi and Carlo D'Ippoliti « Knowledge and Job Opportunities in a Gender Perspective: Insights from Italy » February 2011.
- N°.11-01.RS Stephan Kampelmann and François Rycx « Task-Biased Changes of Employment and Remuneration: The Case of Occupations » January 2011.

### **2010**

- N°.10-09.RS Enrico Casadio Tarabusi and Giulio Guarini « An Aggregation Method for Composite Indicators with Unbalance Adjustment: an Application to the Index of African Governance » November 2010.
- N°.10-08.RS Benoît Mahy and Mélanie Volral « Firm Training and Labour Demand in Belgium: Do Productivity Dominate Cost Effects? » June 2010.
- N°.10-07.RR Hafsatou Diallo, Güngör Karakaya, Danièle Meulders and Robert Plasman « Raming van de belasting fraude in België» May 2010.
- N°.10-06.RR Hafsatou Diallo, Güngör Karakaya, Danièle Meulders and Robert Plasman « Estimation de la fraude fiscale en Belgique» May 2010.
- N°.10-05.RS Marcella Corsi, Carlo D'Ippoliti and Federico Lucidi « Pluralism In Economics And The Evaluation Of Economic Research In Italy » March 2010.
- N°.10-04.RS Marcella Corsi, Chiara Crepaldi and Manuela Samek Lodovici « facing gender inequality: A close look at the European Strategy for Social Protection and Social Inclusion and its Gender Equality Challenges after 2010 » March 2010.
- N°.10-03.RS Danièle Meulders and Sîle O'Dorchai « Revisiting poverty measures towards individualisation » March 2010.
- N°.10-02.RS Danièle Meulders and Sîle O'Dorchai « A re-evaluation of the financial consequences of separation: Individualising concepts and definitions » February 2010.
- N°.10-01.RS Ariane Szafarz « How Did Financial-Crisis-Based Criticisms of Market Efficiency Get It So Wrong? » January 2010.

### **2009**

- N°.09-13.RS Marcella Corsi and Giulio Guarini « What Does Progress Mean? A Tentative Answer Following a Classical Approach » December 2009.

- N°.09-12.RR Kim Fredericq Evangelista, Danièle Meulders , Sîle O’Dorchai , Robert Plasman, François Rycx, Zouhair Alaoui Amine « Revenus individuels et dépendance financière des femmes et des hommes dans neuf pays européens en 2006 », August 2009.
- N°.09-11.RS Sîle O’Dorchai « Do women gain or lose from becoming mothers? A comparative wage analysis in 20 European countries », April 2009.
- N°.09-10.RS Bernhard Michel and François Rycx « Does Offshoring of Materials and Business Services Affect Employment? Evidence from a Small Open Economy », April 2009.
- N°.09-09.RR Kim Fredericq Evangelista, Danièle Meulders, Sîle O’Dorchai , Robert Plasman, François Rycx, Zouhair Alaoui Amine « Analyse de la répartition des revenus entre les femmes et les hommes et de la dépendance financière en Belgique sur base des données du SILC-Belge 2006 », March 2009.
- N°.09-08.RS Danièle Meulders and Sîle O’Dorchai « Gender and flexibility in working time in Belgium », March 2009.
- N°.09-07.RS Benoît Mahy, François Rycx and Mélanie Volral « Wage Dispersion and Firm Productivity in Different Working Environments », February 2009.
- N°.09-06.RS Güngör Karakaya « Long-term care: Regional disparities in Belgium », February 2009.
- N°.09-05.RS Güngör Karakaya « Dependency insurance in Belgium », February 2009.
- N°.09-04.RS Güngör Karakaya « Early cessation of activity in the labour market: impact of supply and demand factors », February 2009.
- N°.09-03.RS Charles Paiglin « Exploratory study on the presence of cultural and institutional growth spillovers », January 2009.
- N°.09-02.RS Thierry Lallemand and François Rycx « Are Young and old workers harmful for firm productivity », January 2009.
- N°.09-01.RS Oscar Bernal, Kim Oostelinck and Ariane Szafarz « Observing bailout expectations during a total eclipse of the sun », January 2009.

## **2008**

- N°.08-24.RS Leila Maron, Danièle Meulders and Sîle O’Dorchai « Parental leave in Belgium », November 2008.
- N°.08-23.RS Philip De Caju, François Rycx and Ilan Tojerow « Rent-Sharing and the Cyclicity of Wage Differentials », November 2008.

- N°.08-22.RS Marie Brière, Ariane Chapelle and Ariane Szafarz « No contagion, only globalization and flight to quality », November 2008.
- N°.08-21.RS Leila Maron and Danièle Meulders « Les effets de la parenté sur l'emploi », November 2008.
- N°.08-20.RS Ilan Tojerow « Industry Wage Differential, Rent Sharing and Gender in Belgium », October 2008.
- N°.08-19.RS Pierre-Guillaume Méon and Ariane Szafarz « Labor market discrimination as an agency cost », October 2008.
- N°.08-18.RS Luigi Aldieri « Technological and geographical proximity effects on knowledge spillovers: evidence from us patent citations », September 2008.
- N°.08-17.RS François Rycx, Ilan Tojerow and Daphné Valsamis « Wage differentials across sectors in Europe: an east-west comparison », August 2008.
- N°.08-16.RS Michael Rusinek and François Rycx « Quelle est l'influence des négociations d'entreprise sur la structure des salaires ? », July 2008.
- N°.08-15.RS Jean-Luc De Meulemeester « Vers une convergence des modèles ? Une réflexion à la lumière des expériences européennes de réforme des systèmes d'enseignement supérieur », July 2008.
- N°.08-14.RS Etienne Farvaque and Gaël Lagadec « Les promesses sont-elles des dettes ? Economie Politique des promesses électorales », June 2008.
- N°.08-13.RS Benoît Mahy, François Rycx and Mélanie Volral « L'influence de la dispersion salariale sur la performance des grandes entreprises belges », May 2008.
- N°.08-12.RS Olivier Debande and Jean-Luc Demeulemeester « Quality and variety competition in higher education », May 2008.
- N°.08-11.RS Robert Plasman, Michael Rusinek and Ilan Tojerow « Les différences régionales de productivité se reflètent-elles dans la formation des salaires ? » April 2008.
- N°.08-10.RS Hassan Ayoub, Jérôme Creel and Etienne Farvaque « Détermination du niveau des prix et finances publiques : le cas du Liban 1965-2005 », March 2008.
- N°.08-09.RS Michael Rusinek and François Rycx « Rent-sharing under Different Bargaining Regimes: Evidence from Linked Employer-Employee Data », March 2008.
- N°.08-08.RR Danièle Meulders and Sîle O'Dorchai « Childcare in Belgium », March 2008.
- N°.08-07.RS Abdeslam Marfouk « The African Brain Drain: Scope and Determinants », March 2008.

- N°08-06.RS Síle O'Dorchai « Pay inequality in 25 European countries », March 2008.
- N°08-05.RS Leila Maron and Danièle Meulders « Having a child: A penalty or bonus for mother's and father's employment in Europe? », February 2008.
- N° 08-04.RR Robert Plasman, Michael Rusinek, François Rycx, Ilan Tojerow « Loonstructuur in België », January 2008.
- N° 08-03.RS Caroline Gerschlager « Foolishness and Identity: Amartya Sen and Adam Smith », January 2008.
- N° 08-02.RS Michele Cincera « Déterminants des oppositions de brevets: une analyse micro-économique au niveau belge », January 2008.
- N° 08-01.RR Robert Plasman, Michael Rusinek, François Rycx, Ilan Tojerow « La structure des salaires en Belgique », January 2008.

## **2007**

- N° 07-22.RS Axel Dreher, Pierre-Guillaume Méon and Friedrich Schneider « The devil is in the shadow Do institutions affect income and productivity or only official income and official productivity », November 2007.
- N° 07-21.RS Ariane Szafarz « Hiring People-like-Yourself: A Representation of Discrimination on the Job Market », November 2007.
- N° 07-20.RS Amynah Gangji and Robert Plasman « Microeconomic analysis of unemployment in Belgium », October 2007.
- N° 07-19.RS Amynah Gangji and Robert Plasman « The Matthew effect of unemployment: how does it affect wages in Belgium », October 2007.
- N° 07-18.RS Pierre-Guillaume Méon, Friedrich Schneider and Laurent Weill « Does taking the shadow economy into account matter to measure aggregate efficiency », October 2007.
- N° 07-17.RS Henri Capron and Michele Cincera « EU Pre-competitive and Near-the-market S&T Collaborations », October 2007.
- N° 07-16.RS Henri Capron « Politique de cohésion et développement régional », October 2007.
- N° 07-15.RS Jean-Luc De Meulemeester « L'Economie de l'Education fait-elle des Progrès ? Une Perspective d'Histoire de la Pensée Economique », October 2007.

- N° 07-14.RS Jérôme de Henau, Leila Maron, Danièle Meulders and Sîle O’Dorchai « Travail et Maternité en Europe, Conditions de Travail et Politiques Publiques », October 2007.
- N° 07-13.RS Pierre-Guillaume Méon and Khalid Sekkat «Revisiting the Relationship between Governance and Foreign Direct Investment», October 2007.
- N° 07-12.RS Robert Plamsan, François Rycx and Ilan Tojerow « Wage Differentials in Belgium : The Role of Worker and Employer Characteristics », October 2007.
- N° 07-11.RS Etienne Farvaque, Norimichi Matsueda and Pierre-Guillaume Méon« How committees reduce the volatility of policy rates », July 2007.
- N° 07-10.RS Caroline Gerschlager «Adam Smith’s Account of Self-Deceit and Informal Institutions », May 2007.
- N° 07-09.RS Marie Pfiffelmann « Which optimal design for lottery linked deposit », May 2007.
- N° 07-08.RS Marc Lévy « Control in Pyramidal Structures », May 2007.
- N° 07-07.RS Olga Bourachnikova «Weighting Function in the Behavioral Portfolio Theory», May 2007.
- N° 07-06.RS Régis Blazy and Laurent Weill « The Impact of Legal Sanctions on Moral Hazard when Debt Contracts are Renegotiable », May 2007.
- N° 07-05.RS Janine Leschke «Are unemployment insurance systems in Europe adapting to new risks arising from non-standard employment? », March 2007.
- N° 07-04.RS Robert Plasman, Michael Rusinek, Ilan Tojerow « La régionalisation de la négociation salariale en Belgique : vraie nécessité ou faux débat ? », March 2007.
- N° 07-03.RS Oscar Bernal and Jean-Yves Gnabo « Talks, financial operations or both? Generalizing central banks’ FX reaction functions », February 2007.
- N° 07-02.RS Sîle O’Dorchai, Robert Plasman and François Rycx « The part-time wage penalty in European countries: How large is it for men? », January 2007.
- N° 07-01.RS Guido Citoni « Are Bruxellois and Walloons more optimistic about their health? », January 2007.

## **2006**

- N° 06-15.RS Michel Beine, Oscar Bernal, Jean-Yves Gnabo, Christelle Lecourt « Intervention policy of the BoJ: a unified approach » November 2006.

- N° 06-14.RS Robert Plasman, François Rycx, Ilan Tojerow « Industry wage differentials, unobserved ability, and rent-sharing: Evidence from matched worker-firm data, 1995-2002»
- N° 06-13.RS Laurent Weill, Pierre-Guillaume Méon « Does financial intermediation matter for macroeconomic efficiency? », October 2006.
- N° 06-12.RS Anne-France Delannay, Pierre-Guillaume Méon « The impact of European integration on the nineties' wave of mergers and acquisitions », July 2006.
- N° 06-11.RS Michele Cincera, Lydia Greunz, Jean-Luc Guyot, Olivier Lohest « Capital humain et processus de création d'entreprise : le cas des primo-créateurs wallons », June 2006.
- N° 06-10.RS Luigi Aldieri and Michele Cincera « Geographic and technological R&D spillovers within the triad: micro evidence from us patents », May 2006.
- N° 06-09.RS Verena Bikar, Henri Capron, Michele Cincera « An integrated evaluation scheme of innovation systems from an institutional perspective », May 2006.
- N° 06-08.RR Didier Baudewyns, Benoît Bayenet, Robert Plasman, Catherine Van Den Steen, « Impact de la fiscalité et des dépenses communales sur la localisation intramétropolitaine des entreprises et des ménages: Bruxelles et sa périphérie», May 2006.
- N° 06-07.RS Michel Beine, Pierre-Yves Preumont, Ariane Szafarz « Sector diversification during crises: A European perspective », May 2006.
- N° 06-06.RS Pierre-Guillaume Méon, Khalid Sekkat « Institutional quality and trade: which institutions? which trade? », April 2006.
- N° 06-05.RS Pierre-Guillaume Méon « Majority voting with stochastic preferences: The whims of a committee are smaller than the whims of its members », April 2006.
- N° 06-04.RR Didier Baudewyns, Aynah Gangji, Robert Plasman « Analyse exploratoire d'un programme d'allocations-loyers en Région de Bruxelles-Capitale: comparaison internationale et évaluation budgétaire et économique selon trois scénarios », April 2006.
- N° 06-03.RS Oscar Bernal « Do interactions between political authorities and central banks influence FX interventions? Evidence from Japan », April 2006.
- N° 06-02.RS Jérôme De Henau, Danièle Meulders, and Sile O'Dorchai « The comparative effectiveness of public policies to fight motherhood-induced employment penalties and decreasing fertility in the former EU-15 », March 2006.

N° 06-01.RS Robert Plasman, Michael Rusinek, and François Rycx « Wages and the Bargaining Regime under Multi-level Bargaining : Belgium, Denmark and Spain », January 2006.

## **2005**

N° 05-20.RS Emanuele Ciriolo « Inequity aversion and trustees' reciprocity in the trust game », May 2006.

N° 05-19.RS Thierry Lallemand, Robert Plasman, and François Rycx « Women and Competition in Elimination Tournaments: Evidence from Professional Tennis Data », November 2005.

N° 05-18.RS Thierry Lallemand and François Rycx « Establishment size and the dispersion of wages: evidence from European countries », September 2005.

N° 05-17.RS Maria Jepsen, Sile O'Dorchai, Robert Plasman, and François Rycx « The wage penalty induced by part-time work: the case of Belgium », September 2005.

N° 05-16.RS Giuseppe Diana and Pierre-Guillaume Méon « Monetary policy in the presence of asymmetric wage indexation », September 2005.

N° 05-15.RS Didier Baudewyns « Structure économique et croissance locale : étude économétrique des arrondissements belges, 1991-1997 », July 2005.

N° 05-14.RS Thierry Lallemand, Robert Plasman, and François Rycx « Wage structure and firm productivity in Belgium », May 2005.

N° 05-12.RS Robert Plasman and Salimata Sissoko « Comparing apples with oranges: revisiting the gender wage gap in an international perspective », April 2005.

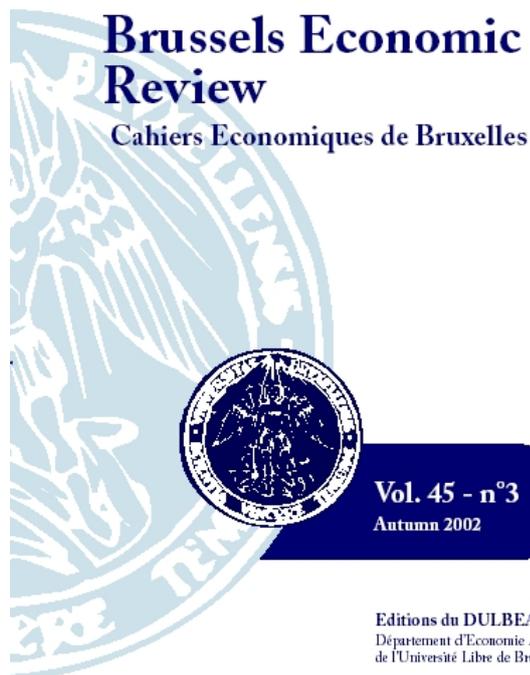
N° 05-11.RR Michele Cincera « L'importance et l'étendue des barrières légales et administratives dans le cadre de la directive 'Bolkestein' : Une étude comparative entre la Belgique et ses principaux partenaires commerciaux », April 2005.

N° 05-10.RS Michele Cincera « The link between firms' R&D by type of activity and source of funding and the decision to patent », April 2005.

N° 05-09.RS Michel Beine and Oscar Bernal « Why do central banks intervene secretly? Preliminary evidence from the Bank of Japan », April 2005.

N° 05-08.RS Pierre-Guillaume Méon and Laurent Weill « Can Mergers in Europe Help Banks Hedge Against Macroeconomic Risk ? », February 2005.

- N° 05-07.RS Thierry Lallemand, Robert Plasman, and François Rycx « The Establishment-Size Wage Premium: Evidence from European Countries », February 2005.
- N° 05-06.RS Khalid Sekkat and Marie-Ange Veganzones-Varoudakis « Trade and Foreign Exchange Liberalization, Investment Climate and FDI in the MENA », February 2005.
- N° 05-05.RS Ariane Chapelle and Ariane Szafarz « Controlling Firms Through the Majority Voting Rule », February 2005.
- N° 05-04.RS Carlos Martinez-Mongay and Khalid Sekkat « The Tradeoff Between Efficiency and Macroeconomic Stabilization in Europe », February 2005.
- N° 05-03.RS Thibault Biebuyck, Ariane Chapelle et Ariane Szafarz « Les leviers de contrôle des actionnaires majoritaires», February 2005.
- N° 05-02.RS Pierre-Guillaume Méon « Voting and Turning Out for Monetary Integration: the Case of the French Referendum on the Maastricht Treaty », February 2005.
- N° 05-01.RS Brenda Gannon, Robert Plasman, Ilan Tojerow, and François Rycx « Interindustry Wage Differentials and the Gender Wage Gap : Evidence from European Countries », February 2005.



Publiés avec l'aide financière de la Communauté Française de Belgique

### Brussels Economic Review

University of Brussels  
DULBEA, CP140  
Avenue F.D. Roosevelt, 50  
B-1050 Brussels  
Belgium

ISSN 0008-0195

Apart from its working papers series, DULBEA also publishes the *Brussels Economic Review-Cahiers Economiques de Bruxelles*.

### Aims and scope

First published in 1958, *Brussels Economic Review-Cahiers Economiques de Bruxelles* is one of the oldest economic reviews in Belgium. Since the beginning, it publishes quarterly the Brussels statistical series. The aim of the Brussels Economic Review is to publish unsolicited manuscripts in all areas of applied economics. Contributions that place emphasis on the policy relevance of their substantive results, propose new data sources and research methods, or evaluate existing economic theory are particularly encouraged. Theoretical contributions are also welcomed but attention should be drawn on their implications for policy recommendations and/or empirical investigation. Regularly the review publishes special issues edited by guest editors.

Authors wishing to submit a paper to be considered for publication in the *Brussels Economic Review* should send an e-mail to Michele Cincera: [mcincera@ulb.ac.be](mailto:mcincera@ulb.ac.be), with their manuscript as an attachment. An anonymous refereeing process is guaranteed.

Additional instructions for authors and subscription information may be found on the *Brussels Economic Review's* website at the following address:

<http://homepages.vub.ac.be/~mcincera/BER/BER.html>