

# **THE SOCIAL COST OF UNEMPLOYMENT (A SOCIAL WELFARE APPROACH)**

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# INDICATORS

- What we measure affects what we think

# INTRODUCTION

# BEYOND UNEMPLOYMENT RATES

- The crisis has generated large numbers of unemployed in many countries.
- Yet unemployment has hit asymmetrically the various types of workers, depending on their education, age, sex, sector of activity, type of contract, etc.
- Those asymmetries involve differences in:
  - the *incidence* (unemployment rates);
  - the *severity* (unemployment duration and income losses); and
  - the *hysteresis* (likelihood of remaining unemployed).

# THE CASE OF SPAIN

- Spain is one of the countries that suffered most the crisis.
- Nowadays it exhibits high rates of growth and a substantial reduction of unemployment.
- Yet, the data show that the reduction in unemployment goes together with:
  - An increase in the average length of the long-term unemployed.
  - An increasing share of unemployed workers without access to unemployment benefits (about 60% in 2015 without any compensation).
  - An increasing probability of remaining unemployed for long term unemployed.
- In other words: the incidence is declining while the severity and the hysteresis are increasing.

# THE KEY MESSAGES

- Those elements point out the conformation of a progressively marginalised group of workers that will have extreme difficulties to become employed again.
- And also makes it clear that the unemployment rates are far from capturing the social cost of unemployment.

# THE APPROACH

- Measuring the social cost of unemployment requires:
  - (i) Taking properly into account the three aspects involved: incidence, severity and hysteresis; and
  - (ii) Paying attention to the diversity existing between the different types of workers.
- We propose to deal with this evaluation problem in terms of a social welfare function that captures the society's welfare loss derived from the disutility of the unemployed.
- Since unemployment entails a welfare loss for society it is sensible to compute the size of that loss and not only the incidence of unemployment.

# THE APPROACH

- This perspective is similar to the Dalton-Atkinson-Sen approach to normative inequality measurement.
- It also shares the spirit of those poverty indices that combine incidence and intensity measures.
- The social cost of unemployment is evaluated by a utilitarian social welfare function that takes as arguments the disutility of the unemployed.



# DISUTILITIES

- We model individual agents' disutility of being unemployed, at a given point in time, as a function of the income loss, the unemployment duration, and the probability of remaining unemployed.
- Our approach takes explicitly into account the severity of unemployment depending on the access to unemployment benefits or some social subsidy and the duration of the unemployment.
- We also allow for a non-linear impact of the unemployment length on disutility as long-term unemployed suffer not only because of the accumulation of low income periods but also from a reduction in the probability of leaving their condition, together with a whole array of personal and social difficulties that affect self-respect, social involvement, and social inclusion.

# THE BASIC MODEL

# UTILITY AND DISUTILITY

- We start from a very simple model in which the worker's utility per period is a Cobb-Douglas function of income and leisure,  $u(.) = k y^r$  (where  $k$  is a constant that defines the units in which we measure utility,  $y$  corresponds to income and  $r$  to leisure).
- The worker maximises utility under a time constraint (e.g. hours available per month).
- The optimal choice obtains by dividing equally the available time,  $T$ , between labour and leisure.
- Then, we have:  $u^* = k(T/2)^r w(T/2)$ , where  $(T/2)w = y$ ,  $w$  being the monthly wage.

# UTILITY AND DISUTILITY

- By choosing properly the units, we can express the value function as  $u^* = w$  (i.e. the wage  $w$  is a measure of the agent's utility in equilibrium).
- Consequently, the disutility per period of an unemployed can be measured by the lost income, being that the difference between his wage and the compensation he gets, if any.
- We call  $c(\cdot)$  this cost function, which will be  $(w-s)$  if he gets an unemployment benefit  $s$ ,  $(w-z)$  if he gets a social subsidy  $z$ , or  $w$  if he gets nothing.

# UTILITY AND DISUTILITY

- The disutility of a worker  $h$  unemployed per  $q_h$  months is given by:  $d_h = c_h(.)q_h$ .
- For a given population  $N$  we can write the per capita utility loss due to unemployment as:

$$D = \frac{1}{n} \sum_{h=1}^n c_h(.)q_h$$

# SOCIAL COST OF UNEMPLOYMENT

- We can express the former equation in a slightly different way as follows:

$$D = \frac{n^U}{n} \cdot \frac{\sum_{h=1}^n c_h(.)q_h}{n^U}$$

- I.e. the per capita social cost of unemployment is given by the product of the unemployment rate and the average disutility of the unemployed.
- The first term corresponds to the *incidence* whereas the second one provides a measure of the *severity* of unemployment.

# CONVEX DISUTILITY

- One may consider that an extra month of unemployment hurts more the longer the previous unemployment (i.e. a disutility convex in duration).
- That is, substituting  $q_h$  by  $f(q_h)$ , with  $f' > 0$ ,  $f'' > 0$
- The reasons for that include the cumulative effect of the income loss on living standards, the reduction of the probability of finding a new job (deterioration of human capital, signalling effect), and the increasing difficulties of personal fulfilment and social inclusion.

# CONVEX DISUTILITY

- The degree of convexity of the duration is related to the curvature of the duration function  $f$  (i.e. to its second derivative, which corresponds to the behaviour of the marginal impact of duration).
- The simplest restriction to control for the degree of convexity is assuming a constant elasticity of the marginal impact of duration.
- In this way we can parameterize the impact of unemployment duration by a single number: the value of the elasticity of marginal disutility,  $v$ .



# CONVEX DISUTILITY

- The function that performs this task can be expressed as ,

$$f(x) = x^{1+n}$$

- Where  $v$  stands for the elasticity of the marginal impact of duration.
- Therefore we would have:

$$d_h = c_h(.)q_h^{1+n_h}$$

# CONVEX DISUTILITY

- Our proposal here is taking  $v_h$  as the probability that agent  $h$  remains unemployed for one additional period.
- The degree of convexity of the disutility function is thus governed by the probability of remaining unemployed.
- This probability is a measure of the unemployment hysteresis.
- Note that with this formulation we establish a clear bound on the admissible degree of convexity, as the exponent of the individual disutility function varies between 1 and 2.

# SOCIAL (CONVEX) COST OF UNEMPLOYMENT

- From this we obtain the following formula for the social cost or unemployment:

$$D = \frac{n^U}{n} \cdot \frac{\mathring{a}_{h=1}^{n^U} c_h(.) q_h^{1+n_h}}{n^U}$$

- That is, as the product of the *incidence* and the *severity* adjusted by the *hysteresis*.

# IMPLEMENTATION (THE SPANISH CASE)

# DATA BASES

- Our empirical work relies on the use of two different databases, one regarding employed workers and the other the unemployed ones.
- The first dataset corresponds to the *Spanish Earnings Structure Survey (SESS)*, and contains detailed micro-data on the characteristics of the employed workers and their wages.
- The demographic characteristics included are gender, age, educational attainment and nationality.
- The labour market characteristics contain information about the type of contract, tenure in the firm, occupation and activity sector, hours worked (including the extra hours), and detailed information on wages, such as the base wage, overtime pay and other complements.

# DATA BASES

- The sample consists of 169,062 full-time workers in the 2014 wave and the survey includes a weighting factor that enables the sample to be weighted to give population figures.
- We use this database to get estimates of the gross hourly wages for the different types of workers. The range of the hourly wage was set between 2 and 60 euros.

# DATABASES

- Our second dataset consists of monthly longitudinal information on all individuals registered with the *Spanish Public Employment Service* (SPES) from January 2011 to September 2017.
- The database includes all the information provided by each individual when registering at the Employment Office, including standard demographic characteristics (gender, age, education level, nationality, postcode and residence, knowledge of other languages), as well as labour market information (previous employment experience, occupational and geographical searches, unemployment duration, etc.).
- The SPES also provides exact information on the unemployment benefits individuals are receiving or the last received and the date of starting and ending of the entitlement.
- Our dataset contains all unemployed individuals in January 2015 (5,520,253).

# COMPUTING THE INCOME LOSS

- The first step to approach the social cost of unemployment is to estimate the lost wage.
- To do so we find the set of characteristics that are common in both databases and define a set of *types* of workers (either employed or unemployed). Those characteristics are: gender (2 groups), age (10 groups), level of education (10 groups), a dummy indicating whether the individual is foreign or native, sector of activity (19 groups) and 2 digit sector of occupation (58 groups).
- We estimate the predicted hourly wages for the different types of employed workers and impute them to the unemployed individuals of the same type.
- According to the imputed wage, the individual information on the type of unemployment benefit and the unemployment duration, we compute the average cost of unemployment for each unemployed (the `c(.)` function).



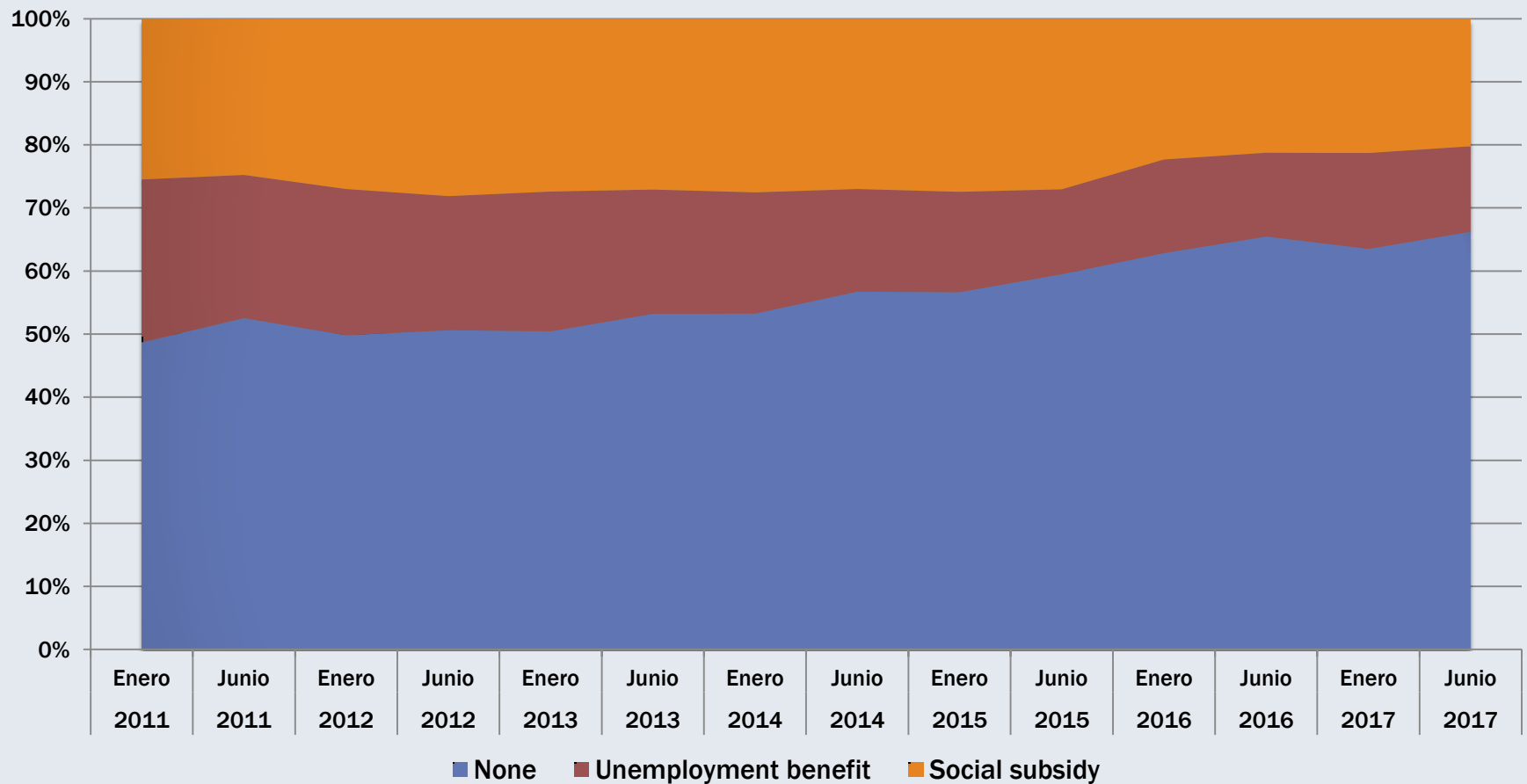
# THE HYSTERESIS

- Next we estimate the probability of finding a job next month (from January 2015 to February 2015).
- To perform this calculation we take into account all observable variables that may affect the employability of those registered with the Public Employment Service:
  - demographic characteristics: gender, age, nationality, disability, education and language skills;
  - job characteristics: unemployment duration, requested occupations, experience, activity in the previous field of work, geographical scope of the new job search and region of registration.

# COMPENSATIONS

- Once we have estimated the imputed wage and the probability of being unemployed for one more month, depending on her/his characteristics for each unemployed individual (4,988,632 agents in our dataset in January 2015), we consider three different groups of unemployed workers:
  - (1) Those who receive unemployment benefits (UB);
  - (2) Those who receive social subsidies (SS); and
  - (3) Those who do not receive any income (N).

# DISTRIBUTION OF THE UNEMPLOYED DEPENDING ON COMPENSATIONS



# PRELIMINARY RESULTS

# THE MOST FAVOURABLE CASE

- We analyse here the most favourable case, in order to obtain a lower bound for the social cost of unemployment. This case is built according to the following simplifications:
  - Ignoring the hysteresis (that is, setting  $v = 0$  for all  $h$ ), which makes the disutility linear in duration.
  - Assuming that all unemployed workers with duration  $q < q^*$  that receive a social subsidy have been receiving the subsidy from the very beginning. And also that those unemployed receiving a subsidy, with a duration  $q > q^*$ , have received previously unemployment benefits.
  - Assuming that those unemployed for more than two years who receive no compensation have received unemployment benefits for 24 months.

# MAIN FINDINGS

- The average probability of remaining unemployed is extremely high (0.957 for the whole population of unemployed, with values above 0.9 for all types of unemployed).
- The average unemployment duration is very high in general (more than 20 months) with extreme values for those unemployed for more than two years (more than 50 months), which represent almost one third of all unemployed.
- Unemployment duration varies substantially between the different types of unemployed. Women's duration is about 22% higher than that of men. Much larger are the differences by national origin (72% higher in natives) and by age (older unemployed almost triplicate the duration of the younger). Differences by level of studies are relatively small.

# MAIN FINDINGS

- The estimated (gross) income loss per month exhibits the expected pattern and reflects the differences in wages and other features of the labour market for the types of workers.
  - Women income loss is 6% lower than that of men.
  - Foreigners loss is 27% smaller than that of natives.
  - Younger loss is some 36% lower than that of the older.
  - Low educated unemployed suffer a loss 44% smaller than those with higher education.
- Almost 60% of the unemployed population do not receive any compensation.

# DURATION, INCOME LOSS AND PROBABILITY OF REMAINING UNEMPLOYED BY DEMOGRAPHIC GROUPS (SPAIN, 2015)

		Shares of population subgroups	Duration (months)	Income loss (€/month)	Probability
Total		100,0%	23,13	1766,48	0,966
Gender	Female	51,1%	25,18	1717,76	0,970
	Male	48,9%	20,98	1827,51	0,961
Nationality	Native	88,6%	24,23	1801,46	0,966
	Foreign	11,4%	14,54	1312,78	0,968
Age	< 25	5,7%	9,69	1193,92	0,956
	25 - 45	46,8%	16,69	1630,69	0,955
	> 45	47,5%	31,08	1859,89	0,978
Education	Low	46,2%	23,98	1503,32	0,972
	Medium	39,0%	23,36	1781,40	0,964
	High	14,7%	19,80	2719,56	0,954 <sup>32</sup>



# DURATION, INCOME LOSS AND PROBABILITY OF REMAINING UNEMPLOYED BY DEMOGRAPHIC GROUPS (SPAIN, 2015)

		Shares of population subgroups	Duration (months)	Income loss (€/month)	Probability
<b>Unemp. duration</b>	< 1year	46,9%	4,27	1627,72	0,946
	1 - 2 years	17,3%	16,96	1626,26	0,976
	> 2 years	35,8%	50,84	1804,45	0,987
<b>Unemp. benefits</b>	UB	16,6%	10,42	1337,96	0,940
	SS	25,1%	28,43	1558,83	0,975
	None	58,3%	24,46	1922,50	0,970

# SOCIAL COST OF UNEMPLOYMENT IN THE MOST FAVOURABLE CASE

		Value	Relative value
<b>Total</b>		40.852	100,0
<b>Gender</b>	Female	43.249	105,9
	Male	38.349	93,9
<b>Nationality</b>	Native	43.647	106,8
	Foreign	19.089	46,7
<b>Age</b>	< 25	11.574	28,3
	25 - 45	27.224	66,6
	> 45	57.812	141,5
<b>Education</b>	Low	36.054	88,3
	Medium	41.622	101,9
	High	53.860	131,8

# SOCIAL COST OF UNEMPLOYMENT IN THE MOST FAVOURABLE CASE

		Value	Relative value
<b>Unemp. duration</b>	< 1year	6.953	17,0
	1 - 2 years	27.576	67,5
	> 2 years	91.736	224,6
<b>Unemp. benefits</b>	UB	13.939	34,1
	SS	44.310	108,5
	None	47.030	115,1

# SOCIAL COST OF UNEMPLOYMENT

- Female workers, natives, older workers, those with high education, those with longer duration, and those without unemployment subsidies face the greatest social costs of unemployment relative to their reference groups.
- In relative terms, there are some 12 points of difference between men and women, about 60 between natives and foreign, 113 between older and younger, about 44 between high and low educated workers, more than 207 points between those unemployed more than two years and those unemployed less than one year, and 81 points between those with unemployment subsidy and those without any income.

# SHARES OF THE TOTAL COST

		Cost Share	Difference cost and population share
<b>Total</b>		100%	0,0%
<b>Gender</b>	Female	54%	8,3%
	Male	46%	-8,3%
<b>Nationality</b>	Native	95%	8,0%
	Foreign	5%	-8,0%
<b>Age</b>	< 25	2%	-5,0%
	25 - 45	31%	-23,8%
	> 45	67%	28,8%
<b>Education</b>	Low	41%	-4,3%
	Medium	40%	1,8%
	High	19%	2,5%

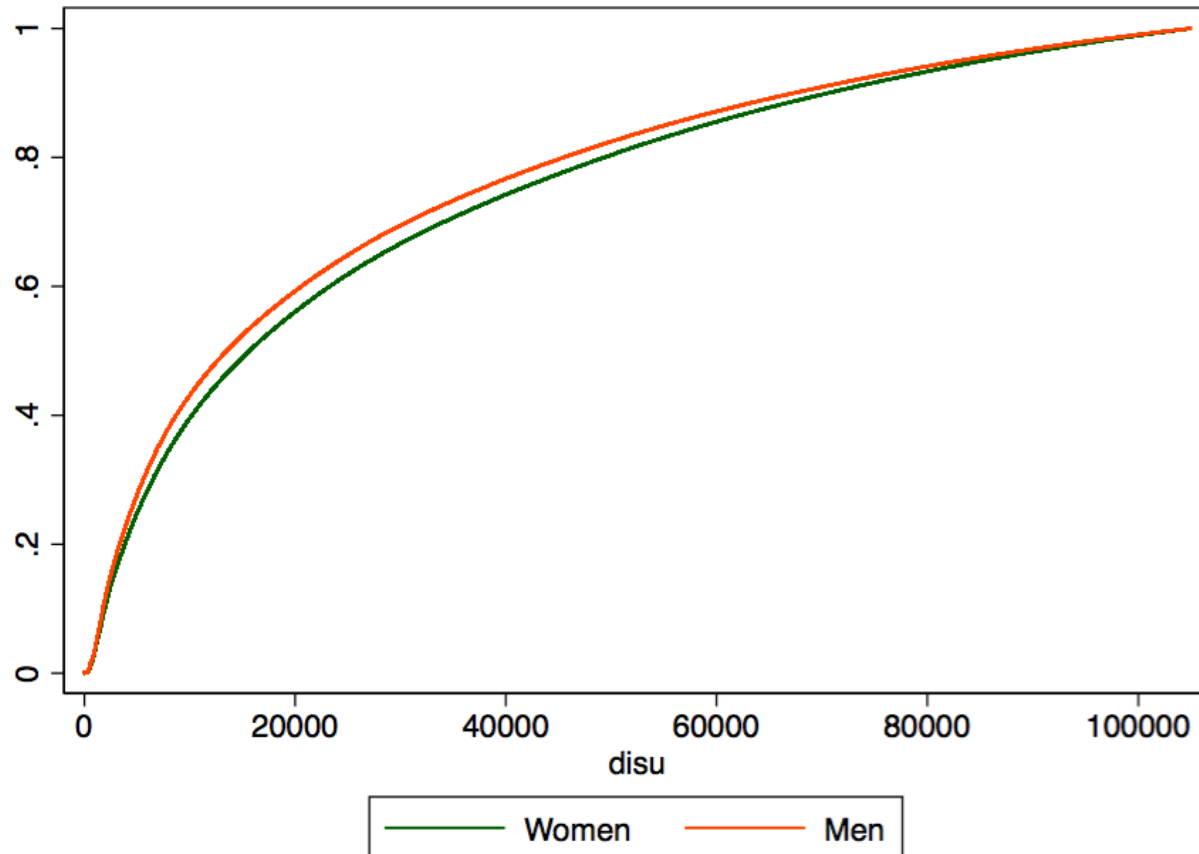
# SHARES OF THE TOTAL COST

		Cost Share	Difference cost and population share
<b>Unemp. duration</b>	< 1year	8%	-46,1%
	1 - 2 years	12%	-13,9%
	> 2 years	80%	60,0%
<b>Unemp. benefits</b>	UB	6%	-12,4%
	SS	27%	3,8%
	None	67%	8,6%

# SOCIAL COST OF UNEMPLOYMENT

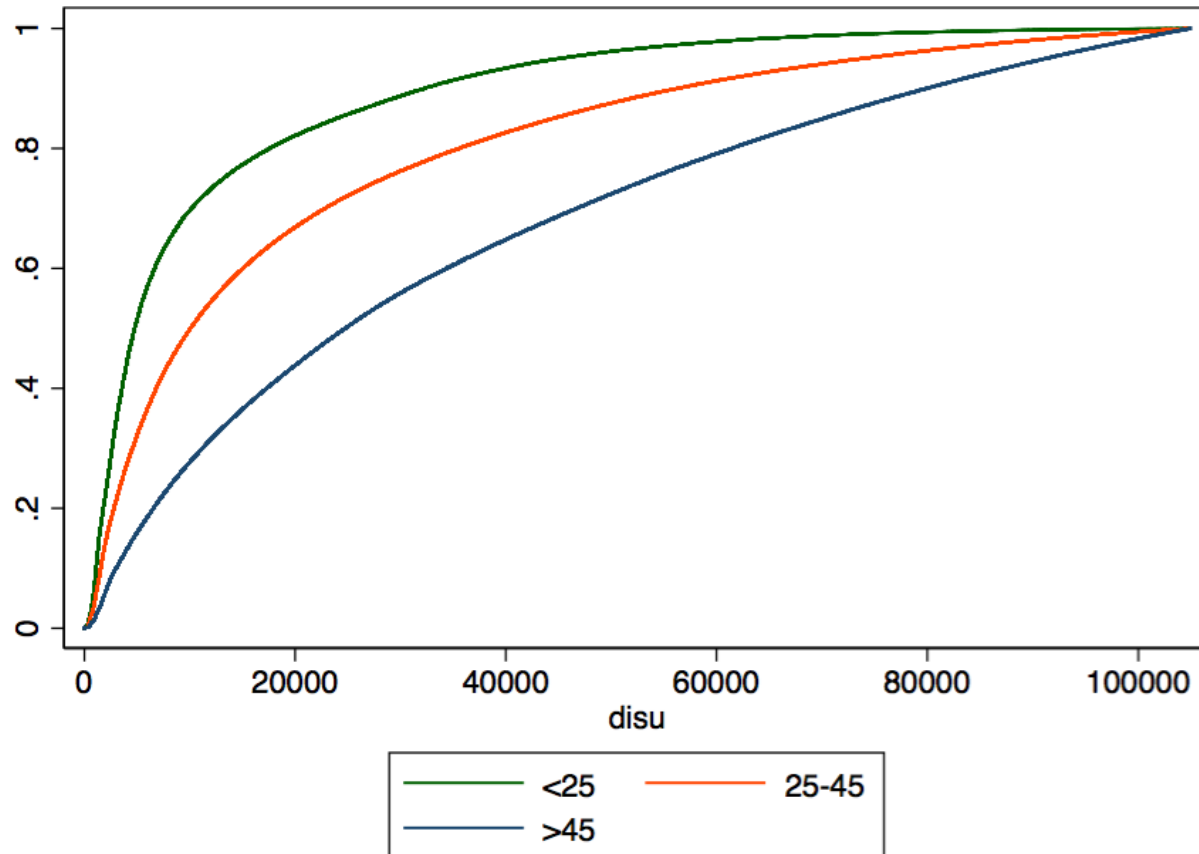
- Most of the burden of the social cost of unemployment is supported by natives who have been unemployed for more than two years, most of which are above 45 years old and receive no compensation.
- It is also interesting going beyond the average values of the different types of workers and look at how those costs are distributed within the types.
- We shall consider now this aspect by comparing the cumulative distributions of the types.

# CD OF THE SOCIAL COST OF UNEMPLOYED MEN AND WOMEN (SPAIN 2015)

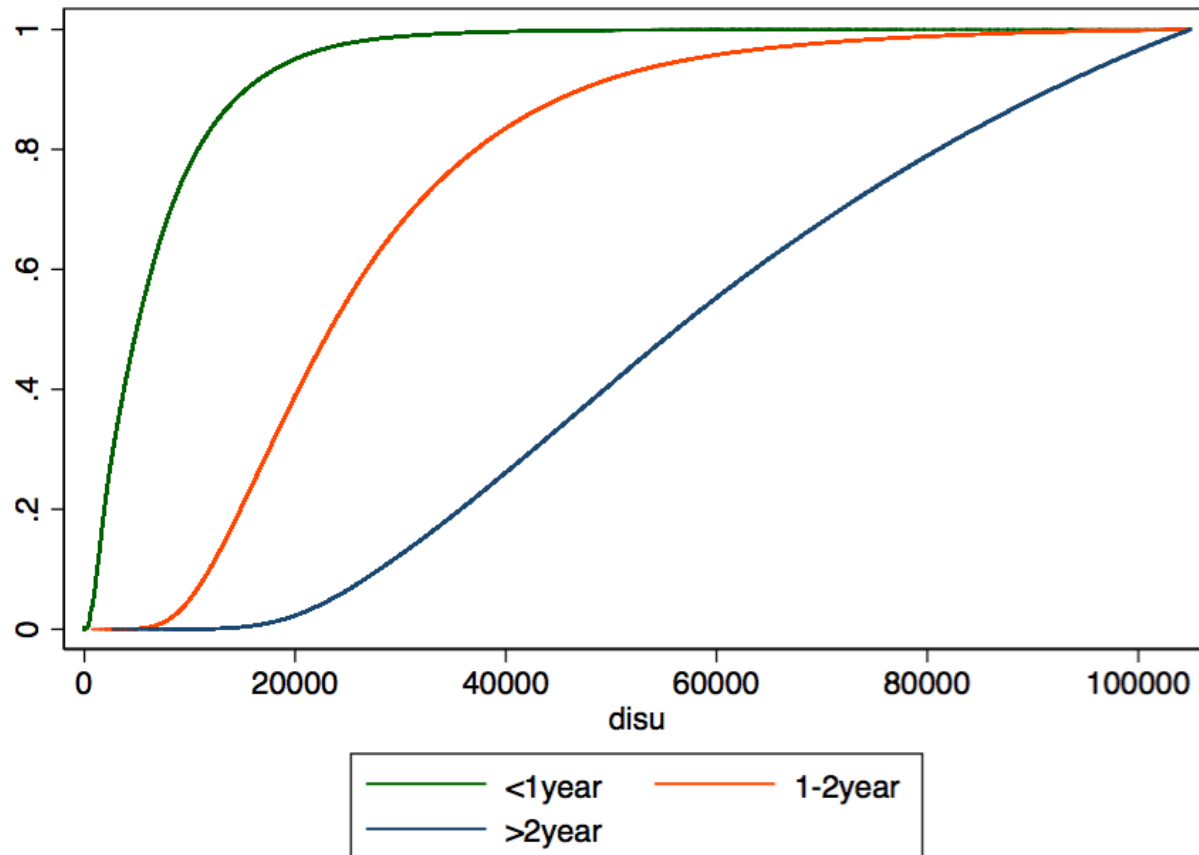




# CD OF THE SOCIAL COST OF UNEMPLOYED BY AGE (SPAIN 2015)



# CD OF THE SOCIAL COST OF UNEMPLOYMENT BY DURATION (SPAIN 2015)



**THANKS FOR YOUR  
ATTENTION**