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by

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1. Introduction

The European (un)employment problem has inspired millions of printed pages. The consensus view emerged since the Eighties was that employment growth in Europe could be achieved only to the extent that labour market flexibility would increase in parallel. The role of aggregate demand was played down inspite of the vast underutilization of human resources. This view is now the object of reconsideration. Since the mid Eighties, monetary policy in Europe was strongly restrictive (and pro-cyclical), with interest rates at their highest in 1992 when growth was approaching zero and turning negative a year later. The fiscal story confirms the restrictiveness of demand policy.

Many recent studies indicate that the European labor markets are more flexible that conventional wisdom implies. At any given moment many jobs are simultaneously created in segments of the economy and destroyed in others. The magnitude of job turnover is surprisingly similar across countries in Europe and in the USA, regardless of net employment growth. The rates of job creation and job destruction in Europe have been around 8 - 11% a year till the mid Eighties, and slightly higher from then on. In the USA they stand above 10%.

Analogously, the magnitude of workers' flows between employment and non-employment, and within employment across firms, is huge also when net job creation is nil. Each year one every three-four workers separates from his post in all the economies object of this study, and about the same number is associated to a new post.

The limit of the studies on job and worker reallocation is that very little is said on the characteristics of the earnings structure, a strictly related argument. A natural line of explanation for the differences in the European and US labor markets is suggested in terms of simple demand and supply. In Europe, where labour markets are highly regulated, the exogenous shocks are borne mainly by the quantities (i.e. labor demand) because prices (wages) are not free to respond. In the USA, instead, the labour market quickly adjusts both on the quantity and on the price side. Thus turnover may be equally high on both sides of the Ocean, inspite of very different institutions.

An increasingly important issue is whether it is possible to have flexibility and sound employment growth on the one hand, without bearing the high costs associated to labor market flexibility on the other hand. In much of the Western world a vast share of the hirings associated to recent job creation take the form of fixed time or temporary contracts, part-time positions, disguised forms of self-employment, work leasing, atypical contracts of various sorts, all aimed at reducing labour costs, making work flexible and increasingly precarious. At the same time employment protection is becoming progressively thinner in most EU member states. The social costs of these developments are serious: increasing inequality and polarization between good jobs and bad jobs, high risk for many individuals of being trapped in the low tail of the earnings distribution, social exclusion.

This study is a preliminary exploration on the extent of labor market segmentation in Europe and the United States, based on data of earnings mobility prepared for the OECD in the late Nineties. Assessing segmentation is important for a balanced view on the pros-and-cons of labor market flexibility.
The punch-line of this study is that the USA and certain European countries appear to be at the extremes of a hypothetical ranking of wage structures, which is, however, far from linear: in the USA coexist a great deal of earnings mobility and an important chunk of labor market segmentation of the least previledged; in Italy, Germany and France earnings mobility is lower, but also the degree of segmentation is smaller than that found in the USA. The UK is somewhat closer to the USA, France follows at distance, while at the opposite extreme stand Germany and Italy.

The paper is organized as follows: par. 1 illustrates the methodology of this approach, and the main results are presented. Par. 2 deals with possible implications of the steady-state distributions calculated from the earnings transition matrices. Par. 3 discusses some open problems with the proposed framework. Par. 4 concludes.

2. Earnings mobility and labor market segmentation

2.1   The basic approach

Earnings inequality is reported to have risen in several OECD countries in the last twenty years.[2] The explanation runs in terms of upward shifting demand and rigid supply of skilled personnel relative to the unskilled, coupled with excess supply of low-skill workers (fig.3). Increasing pay inequality naturally leads on to the question of earnings mobility, for it matters whether particular individuals or groups are trapped in low-paid segments of the labour market or whether low pay is a transient phenomenon.[3]

Earnings mobility is sometimes used as a synonymous of wage flexibility (as in Atkinson, Bourgignon, Morrison, 1992. This definition is utilized by OECD, Employment Outlook, 1996). Earnings mobility, however, is a necessary condition for flexibility, not a sufficient one. Indeed, zero earnings mobility is equivalent to a perfectly rigid wage structure. Consider a general wage growth model like

$$w(it) = f [X(t), w(i,t-1)] + u(it)$$

where X is a vector of exogenous variables, and u is i.i.d. with finite variance. If var(u) = 0 (we are back to perfect wage rigidity), there will be no earnings mobility, as all individuals preserve their ranking in the wage distribution throughout their life. The larger the residual variance, the smaller the number of individuals who stay put. Thus wage rigidity and earnings mobility are negatively correlated, with high wage rigidity leading to low earnings mobility. [4]

The measurement of earnings mobility has not received as much theoretical attention as has the measurement of inequality, and there is no real consensus on what is the most appropriate measure.

Longitudinal data are essential for the estimation of earnings mobility. These may be either retrospective or panel and each has particular problems of its own. Panel data sets raise a number of problems. First, the data only become available over relatively few years and the number of observations over time may be relatively

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[2] Among others: P. Gottschalk and T.M. Smeeding, "Cross-national comparisons of earnings and income inequality", <u>Journal of Economic Literature</u>, vol.XXXV, 1997.

[3] Here we deal with intra-generational earnings mobility. Sociologists are usually more interested in social mobility, i.e. inter-generational mobility, an argument that would deserve a lot more of attention also by economists. With the data currently at hand, this is, unfortunately, out of reach.

[4] The wage-age profile may be steeply rising where tenure and experience are highly valued, and / or where the unions effectively protect their members. But neither will - per se - affect the variance of the profile.   An increasingly larger variance around the mean age-wage profile (one form of heteroskedasticity) may be expected if the human capital accumulated via tenure and experience is not firm-specific, but transferable across firms. Also, if the distribution of initial endowment of basic skills in the working population is widely dispersed (if X(i,t) has a large cross-i- variance), the variance around the wage-age profile will increase in age, reflecting the fact that the most endowed persons will climb the occupational ladder, and the least fortunate will be kept in the humblest jobs all their life.

limited. Second, there is the problem of attrition, which will cause the size of the panel to decline over time and possibly result in attrition bias.

The features of earning mobility in some countries of continental Europe and the USA can be explored on the bases of transition matrices recently gathered by OECD.
The OECD data relate to earning mobility of dependent workers in the 1985-91 period, with the exclusion of self-employment, the public sector and agriculture.
There are three data sources: household surveys of individual workers (USA, Germany); establishment surveys yielding also worker histories (UK); administrative data-bases (Italy and France, both from Social Security archives). Administrative sources usually cover the whole population (as in France) or very large random samples (as in Italy, where the sampling ratio is 1:90).
I have used the full (6 x 6) matrices - the states being the five income brackets around the median + one state corresponding to "part-time work" (except for Finland where part time work is not observable).
My comments will be confined to the earnings mobility of full-time wage and salary workers only, as this is the only easy way to insure comparability.

My initial hypothesis is that there the USA and continental Europe differ in two respects: (i) upward and downward earning mobility of the relatively better off-fraction of the work-force is higher in the USA than in the European countries; (ii) labor markets segmentation in the low tail of the earning distribution is higher in the USA than in continental Europe.
If the lifetime earning profile of a dependent worker were completely predetermined, she/he would be trapped in the same relative position of the wage distribution where he/she began his/her career. As a consequence, all transition probabilities $P(s,s)$, for any state $s = 1,2 ... S$, would be equal to 1, even if individuals differed at the beginning of their career. Likewise any immobility indicator would be equal to 1.
If our prior hypothesis includes segmentation of some sort, it becomes important to distinguish at which end of the earnings distribution immobility prevails. Persistence in the low tail of the distribution may or may not go hand-in-hand with persistence in the upper tail. Looking at overall immobility ratios may be very misleading if segmentation is an important issue, as it averages out differences where they should instead emerge. Italy, Denmark, UK and USA look almost identical, while - as will be clear in what follows - they are very different.[5]

A very simple method to pursue this line consists in contrasting two immobility indicators, one computed in a partition of North-West cells of the transition matrix (denoting persistence in low earnings), the other in a partition of South-East cells (denoting persistence in high earnings). I have chosen to contrast the probability $P(1,1)$ of persisting in the first earning band (less than 0.65 * median) in the five-year

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[5] The standard immobility ratio calculated from OECD 1986-91 data yield the following results:

France	0.72	UK	0.63
Germany	0.70	USA	0.64
Danmark	0.62	Italy	0.66

which look all but particularly evokative.

period 1986-91, with the immobility index (IM2) calculated from the diagonal in the remaining (4 x 4) matrix, i.e.[6]

$$IM2 = [P(2,2) + P(3,3) + P(4,4) + P(5,5)] / 4.$$

The following results are obtained[7] (F1 – in the third column of Table 5 - stands for the share of low-paid workers on all full-time employees in 1986).

Table 1 Indicators of immobility (and segmentation)

	All workers			male			Female		
	P(1,1)	IM2	F1	P(1,1)	IM2	F1	P(1,1)	IM2	F1
USA	55.8	42.5	27.5	45.4	41.3	16.7	62.5	43.0	42.2
FR	31.6	62.9	11.0	22.7	62.2	7.9	39.7	63.3	39.8
IT	21.8	60.8	10.0	15.7	60.5	6.9	27.9	59.2	16.1
UK	39.0	50.2	17.7	29.2	49.6	9.5	45.6	52.7	34.6
GER	26.0	61.3	18.7	15.4	61.4	10.7	33.7	58.6	35.9
DNK	8.1	56.8	6.0	6.5	55.9	3.6	9.0	52.8	9.6
FIN	36.9	47.9	14.3	42.1	47.3	10.7	33.5	42.9	18.3
SWE	15.4	65.5	4.2	9.1	63.0	2.6	20.0	70.0	7.7

The contrast is strikingly clear: while P(1,1) is much higher for the USA than for the European countries, IM2 is instead lower.
Gross as IM2 may be, it unequivocally points at the fact that upward and downward mobility is higher in the USA for all, except for the least fortunate earners. For the latter, instead, the chance of improving their relative position is very slim in the USA, and somewhat better in Europe. The contrast between P(1,1) and IM2 strongly denotes the existence of labour market segmentation.
The extent of segmentation in the USA is shown also by the fraction of low-paid workers in the 1986-wage distribution (F1): 27.5% of the USA full-time dependent workers earn less than 0.65*median, six times the corresponding fraction of Sweden and Denmark, two-and-a-half times that of France and Italy, one-and-a-half times that of Germany and the U.K. The figure for Germany may look surprisingly high, but it is not: German youth enters employment at the end of the dual education and

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[6] Here and in what follows I will refer to transitions across earning bands around the median, as defined by the OECD. There is a strong methodological drawback in making use of transitions across percentiles (deciles). It can be proved (Revelli, 1997) that, under rather general conditions on the underlying model of individual wage growth, the transition probabilities across percentiles of the earning distribution are independent from the variance of the process. This annihilates almost all of the expected differences among countries, thus making comparisons quite difficult.
[7] A distance (Euclidean metric) between the transition matrices may also be computed. This too hides the contrast found between mobility and labor market segmentation. It yields the following matrix of distances, which confirms the ranking with the USA and Germany/Italy at the opposite extremes:

	USA	FR	IT	UK	GER
USA	0	0.023	0.026	0.013	0.024
FR		0	0.008	0.013	0.006
IT			0	0.015	0.007
UK				0	0.014
GER					0

training system at low entry pay, but destined to catch up in few years. Interestingly, F1 of female workers is comparable, except for Italy: here the difference is due to the scarce diffusion of part-time work, and, consequently, the lower female partecipation.

These results are not independent from the dispersion of the earnings distributions, which differs widely from country to country. Take, for example, the Swedish record of enormous compression of relative wages under centralized "solidarity" bargaining (broken down only in the mid Nineties): in the Eighties the Swedish hourly wage distribution was so dense that a relative wage increase of 30% was enough to carry a worker from the lowest decile of the blue-collar distribution all the way to the highest. A parallel move in the U.K. would have required a relative increase of more than 200%, and for a US manufacturing employee over 400%.[8]

2.2   A closer inspection by age-group

Table 5 may raise doubts on the grounds that the earnings transition matrices for all age groups pooled together, as those utilized above, may hide composition effects: transition probabilities of young workers differ substantially from those of adult and aged people. Unless the age distribution of the sample populations is pretty much the same in all countries under observation, the indications of table 5 could be distorted. As tab. 6 shows, the age distributions are indeed quite different. Two distributions are displayed here: that of full-time wage and salary workers (FTW), and that of the whole OECD samples (ALL). The two may differ if the original sample is one of workers only (as in Italy, France and UK) or if it is representative of a population less restrictively defined (as in USA and Germany).

Table 6
Age distribution (1986) of full-time wage and salary workers (FTW) and of the complete sample populations (ALL)

age groups	USA		ITA		FRA		U.K.		GER	
	FTW	ALL	FWT	ALL	FWT	ALL	FWT	ALL	FWT	ALL
< 25	10	11	23	30	17	29	22	24	22	20
25-34	30	26	29	27	33	29	24	24	25	21
35-49	40	37	36	31	33	29	33	34	34	32
50-64	20	26	12	12	17	13	21	18	19	27
	100	100	100	100	100	100	100	100	100	100

I have, therefore, gone back to the transition matrices for four different age groups, and recomputed the equivalent of table 5 as follows:

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[8] D.A.Hibbs and H. Locking, <u>JOLE</u>, Oct. 2000,

Table 7

age	15-24				25-34				35-49				50-64				//
	P (1,1)	IM2	F2		P (1,1)	IM2	F2		P (1,1)	IM2	F2		P (1,1)	IM2	F2		F2 all
usa	47.9	27.0	27.2		40.4	42.9	17.7		61.6	42.7	13.2		59.9	36.0	6.8		15.4
fra	18.0	34.2	8.0		26.4	53.7	6.0		27.5	61.6	3.9		30.3	57.3	5.3		5.9
ita	13.1	39.2	13.2		21.4	55.4	6.1		32.7	63.3	5.0		44.7	62.7	6.0		7.9
uk	23.6	35.8	21.3		35.6	44.8	5.8		47.6	52.9	12.8		55.4	49.4	8.0		9.8
ger	16.7	31.8	27.7		16.7	54.1	5.6		41.5	63.8	3.2		73.7	19.3	2.6		8.3
fin			19.1				10.4				8.0				6.4		11.4
dk			11.2				3.1				1.2				0.8		3.6

The wage distributions 1986 and 1991 from which I derive table 6 are the original distributions for all age groups together, and not the distributions specific of each age group. If such were not the case, little could be said to either strengthen or weaken our previous conclusions. Notice, for instance, that persistence in low pay, described by P(1,1), is increasing in age in all the European countries (less so in the USA), an indication that mobility is highest at young age and decreases as life goes on. Age-specific transition matrices would not reveal this pattern.

The new indications are very similar to those seen already. As before, and in all but the oldest age group, P(1,1) - stickiness in low pay - is much higher in the USA than in the European countries, while IM2 - the complement of which (1 - IM2) denotes mobility outside the low-pay end of the earnings distribution - is instead lower. Among the European countries, the U.K. looks, here again, the closest to North America. Evidence of labor market segmentation in the USA, compared to continental Europe, is strongly confirmed.

In the 50-64 age group Germany is the exception: persistence is higher at the bottom of the distribution, while there is a lot more mobility in the remaining portion. In Germany, however, F2, the 1986-share of people in low pay, is only 3.2 at age 35-49, and 2.6 at age 50-64, much lower than in the remaining countries. I shall return to the case of Germany in the next paragraph.

2.3   Additional insight on upward and downward mobility

A different facet of segmentation is illustrated by Table 8. It reports the ratio of two probabilities: that of moving up (from any of the five bands around the median) to that of moving down.

Table 7   P(up)/P(down) from any origin

	15-24	24-34	35-49	>50
USA	6.63	3.33	1.02	0.83
UK	7.23	2.50	1.19	0.63
France	4.32	2.59	1.16	0.69
Italy	3.14	2.33	1.65	1.27
Denmark	3.40	1.73	1.19	0.61
Finland	1.95	1.28	0.68	0.48
Germany(a)	13.37	2.48	0.92	0.38
Sweden(a)	9.50	2.19	1.25	0.33

Source: Our calculations on OECD transition matrices.

(a) Results for Germany and Sweden may not be very significant, due to the low number of observations in each cell.

For the young in USA and UK, the frequency of upward mobility is about seven times that of downward mobility (the ratio is even higher in Germany and Sweden, but sample size may not be sufficiently large to insure strong significance). On the other hand, in Finland it is less than twice, in Italy only three times as large.
Not surprisingly, the ratio declines as age increases.
If we turn to oldest workers (> 50), we would expect the ratio P(up) / P(down) to be less than one. We find this to hold in all countries, with the exception of Italy. Where the exit from the labour market is judiciously smoothed by transitions from full-time, full-responsibility positions to various forms of part-time, flex-time work, the ratio is low (Germany and Sweden in first place, where, again, there may be a problem with statistical significance). In Italy the ratio is pathologically high - notice that it is by far the highest also in the 35-49 age bracket - denoting, on the one hand the absence of instruments aimed at smoothing the transition from employment into non-employment, and on the other the excessive protection of escalator-type clauses and/or the diffused free-rider malpractice of increasing pay just before retirement age, in order to secure higher pensions [9]

Additional insight on the flexibility-rigidity of earning structures may be obtained by looking at selected transition probabilities from the full (6 x 6) matrices for each age group – the states being five income brackets around the median + one state corresponding to "part-time work". Caution must be exercised in order to avoid considering transition probabilities that are linearly dependent[10]

Comparisons by age group are made across five countries (FRA, FIN, ITA, UK, USA): other countries (GER, SWE, DK) have low significance at less than the aggregate level. P(a,b) denotes here the probability of moving from state (a) to state (b) in the 1986-91 observation period. All the original transition probabilities have been recalculated on the closed sample of individuals who are present in the 1986-91 period, in order to insure homogeneity across countries (not all states - for instance, unemployment, retirement, military service - are observed everywhere).
A word of caution in reading these numbers: attrition is not a random event, and it is high. Thus the probability of exiting the panel for dependent workers is large (above 30% in Italy and Germany, over two three-year periods 1986-89 and 1991-94) and inversely related to pay levels.[11] Hence upwards mobility is likely to be overestimated and downwards mobility underestimated.

Nonetheless, interesting evidence emerges especially looking at downward mobility. From the transition matrices (of all age groups pooled together), I have selected one

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[9] Until 1993 Italian pensions were tied to pay at the end of one's career. Today, after the recent partial reforms of the Social Security System, it is proportional to average pay in the last ten years at work.

[10] If P(i,j) is very high, then P(i,k) - for any k=/= j - will be very small, as each row sums to one.

[11] Cfr. B. Contini, L. Pacelli, C. Villosio "Short employment spells in Italy, Germany and UK: testing the *port-of-entry* hypothesis", CEP Working Paper n. 26 (1999).

case of drastic fall in the wage distribution, from highest to lowest - P(5,1) - and three cases of less severe, but not insignificant setback – P(5,3), P(3,1) and P(4,2). Not surprisingly, the probabilities of drastic setback are much lower than the others.

There is one finding common to all: at old age (> 50) the probability of downward mobility is highest in the USA and lowest in Italy. Among the European countries Finland and the UK come close to the USA, while France is not far from Italy at the other extreme. To a lesser extent, the same pattern holds also among adults (35-49). If downward mobility is low at mature age, the immediate implication is that predetermination in the pay structure of dependent workers is high. We have here another strong hint of the rigidity of the pay structure in Italy and France, compared to the flexibility in Finland and UK, and across the Ocean, of the USA.
The correlation refers to full-time workers only. If we could include part-time workers in the analysis, the result would probably be strengthened. This finding from a simple bivariate association, although interesting in its own right, should be taken

with care: in no way does it imply a causal relation between the two phenomena, which could go in both directions.

Figure 1 is also of some interest here[12]: it shows the relation between the share of employed aged>55 and the probability of a downward movement from each position in the wage distribution for workers aged 50-64 during the five-year 1986-1991. The graph shows a strong cross-sectional correlation, suggesting that aged people stay at work especially in countries where earnings decline at the end of one's career.

Table 2 Downward earnings mobility among mature and old workers

Country	Age group	P(5,1)	P(5,3)	P(3,1)	P(4,2)
ITALY	> 50	.00	.03	.02	.05
	35-49	.00	.03	.01	.03
FRANCE	> 50	.01	.03	.05	.05
	35-49	.01	.03	.02	.03
U.K.	> 50	.02	.08	.04	n.g.
	35-49	.01	.07	.02	.05
FINLAND	> 50	.08	.07	.10	.08
	35-49	.04	.07	.06	.07
U.S.A.	> 50	.09	.14	.10	.07
	35-49	.08	.07	.07	.09

Source: Our calculation on OECD transition matrices provided by OECD

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[12] Fig. 1 and 2 are taken from B. Contini and C. Villosio, Analysis of Wage flexibility and mobility, Report for E.C., DG V (1999).

Figure 1 Share of workers aged 55 and over (on total employment) vs. probability of downward earnings mobility
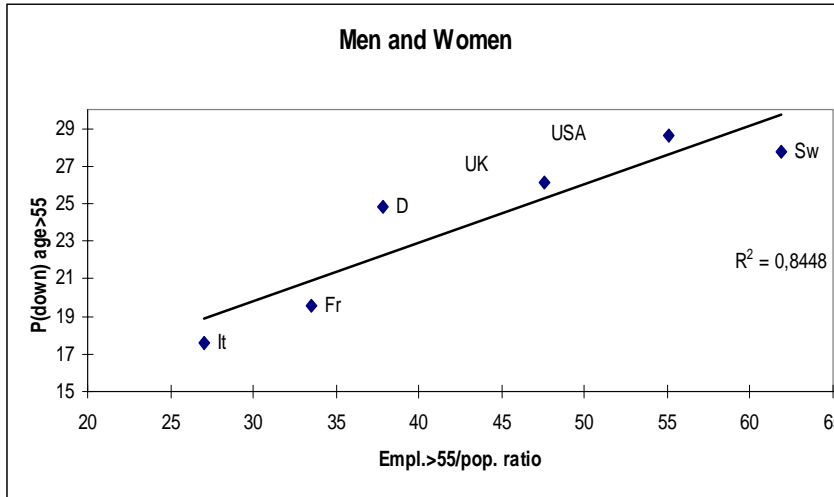

The next graph, of similar nature, shows the relation between the share of older workers and that of short duration jobs (percentage of workers aged 46-60 in jobs lasting less than 1 year). The relation is weaker than the previous one, but it suggests the existence of positive correlation between old workers employment and the frequency of short-time contracts. This too provides some support to the hypothesis that flexible labour market relations (proxied here by short duration jobs) may help the transition from work to retirement.

Figure 2 Share of workers (male) aged 55 and over vs. the percentage of short duration jobs (<1 year) for workers aged 46-60
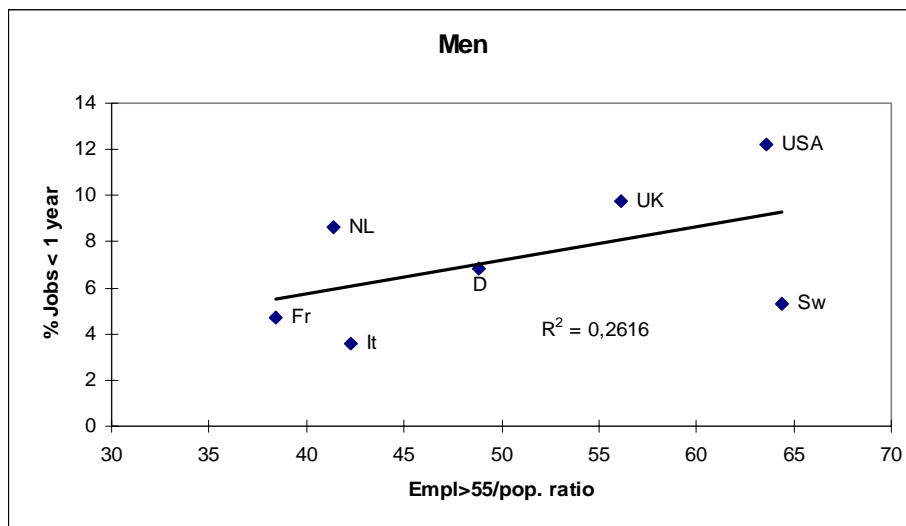
Upwards earnings mobility among young workers is investigated by looking at three transition probabilities**:** P(1,3), P(2,4) and P(4,5). Here we find some confirmation of our previous hypothesis on the extent of labor market segmentation in North America vis-à-vis Europe: (i) leaving the lowest end of the wage distribution for young workers (15-24 and 24-34) is easier in Europe, especially in Italy and Finland; (ii) moving upwards towards the highest tail of the distribution is a very likely event in North America, especially among the youngest; in Europe it is not uncommon, but Italy and Finland trail well behind France and the U.K.

Table 3 Upwards earning mobility among young and prime-age workers

Country	Age group	P(1,3)	P(2,4)	P(4,5)
ITALY	15-24	.15	.05	.19
	24-34	.17	.05	.38
France	15-24	.12	.05	.34
	24-34	.09	.03	.33
U.K.	15-24	.18	.13	.34
	24-34	.10	.10	.41
FINLAND	15-24	.19	.09	.19
	24-34	.18	.06	.28
U.S.A.	15-24	.09	.16	.64
	24-34	.08	.09	.51

Source: Our calculation on OECD transition matrices provided by OECD

3.   *Any implication from the steady-state distributions ?*

The representation of wage dynamics by means of one-period transition matrices is simple and convenient. Nor does it imply, in itself, the assumption that wage dynamics is governed by a Markov process. Multi-period dynamics and steady-state equilibrium are immediately evoked as transition matrices are at hand. Is this a reasonable association ? Aside from the usual Markovian hypotheses that must be satisfied, there is one crucial pre-requisite: the age distribution of the population from which transition probabilities are computed should be in demographic equilibrium, with young workers systematically replacing the old, retiring, ones.
We have seen already that the age distribution of full-time wage and salary workers differs in the two sides of the Ocean. In addition, as is (known to be) the case for many European countries, the observation period over which earnings mobility is measured is one of ageing population and work force (1986-91). It is easy to predict that, as time is allowed to flow, the wage distribution will shift to the right, i.e. there will be more people in upper tail of the wage distribution, and less in the lower tail.
It is immediate to see that this is, indeed, the case, in the European countries. I display here the 1986 and 1991 wage distributions, as well as a pseudo steady-state earnings distribution, on the meaning of which I return immediately

.EARNINGS DISTRIBUTION: PSEUDO STEADY-STATE
VS. 1986 AND 1991

| | ALL | | | | |
	Less 0.65	0.65 to 0.95	0.95 to 1.25	1.25 to 1.55	1.55 +
USA					
1986	24.19%	20.27%	17.92%	14.08%	23.55%
1991	22.25%	20.35%	18.09%	13.93%	25.37%
S.S.	**17.05%**	**17.89%**	**17.52%**	**14.88%**	**32.67%**
FRANCIA					
1986	7.55%	32.74%	27.76%	13.43%	18.53%
1991	7.10%	29.54%	27.81%	14.23%	21.31%
S.S.	**3.90%**	**17.49%**	**22.07%**	**16.14%**	**40.40%**
ITALIA					
1986	7.03%	29.08%	36.40%	16.08%	11.42%
1991	3.57%	31.00%	32.36%	16.56%	16.50%
S.S.	**1.79%**	**19.84%**	**23.09%**	**16.50%**	**38.79%**
UK					
1986	14.43%	26.39%	24.58%	16.06%	18.55%
1991	10.72%	26.11%	23.10%	17.62%	22.45%
S.S.	**4.64%**	**17.07%**	**20.45%**	**19.97%**	**37.86%**
GERMANIA					
1986	13.45%	26.44%	32.15%	13.40%	14.56%
1991	7.27%	27.75%	31.69%	16.10%	17.19%
S.S.	**2.59%**	**14.79%**	**25.45%**	**20.30%**	**36.87%**

| | MALE | | | | |
	Less 0.65	0.65 to 0.95	0.95 to 1.25	1.25 to 1.55	1.55 +
USA					
1986	15.51%	17.72%	18.80%	16.72%	31.24%
1991	14.54%	18.07%	17.67%	15.82%	33.90%
S.S.	**13.47%**	**16.94%**	**16.46%**	**15.42%**	**37.71%**
FRANCIA					
1986	5.50%	29.04%	27.97%	14.27%	23.21%
1991	4.35%	26.17%	28.28%	14.86%	26.34%
S.S.	**2.51%**	**15.15%**	**21.53%**	**15.68%**	**45.13%**
ITALIA					
1986	5.03%	22.93%	38.34%	19.25%	14.46%
1991	1.98%	25.20%	34.10%	18.52%	20.21%
S.S.	**1.01%**	**16.47%**	**23.78%**	**16.96%**	**41.79%**
UK					
1986	8.19%	21.93%	26.50%	19.13%	24.24%
1991	5.82%	21.95%	24.62%	18.97%	28.64%
S.S.	**3.96%**	**17.35%**	**21.81%**	**19.13%**	**37.75%**
GERMANIA					
1986	7.74%	23.02%	35.85%	15.66%	17.74%
1991	2.53%	23.48%	33.61%	18.53%	21.85%
S.S.	**0.99%**	**12.41%**	**23.70%**	**20.37%**	**42.53%**

	FEMALE				
	Less 0.65	0.65 to 0.95	0.95 to 1.25	1.25 to 1.55	1.55 +
USA					
1986	37.94%	24.29%	16.52%	9.89%	11.36%
1991	33.51%	23.67%	18.71%	11.18%	12.93%
S.S.	**22.15%**	**20.19%**	**20.97%**	**14.55%**	**22.14%**
FRANCIA					
1986	11.45%	39.79%	27.34%	11.83%	9.59%
1991	12.06%	35.61%	26.97%	13.10%	12.27%
S.S.	**7.22%**	**23.27%**	**23.79%**	**17.66%**	**28.07%**
ITALIA					
1986	11.85%	43.92%	31.72%	8.43%	4.09%
1991	7.37%	44.81%	28.24%	11.91%	7.67%
S.S.	**4.10%**	**30.58%**	**22.45%**	**15.86%**	**27.01%**
UK					
1986	29.82%	37.40%	19.83%	8.47%	4.49%
1991	21.15%	34.97%	19.87%	14.75%	9.25%
S.S.	**4.76%**	**12.65%**	**12.56%**	**24.01%**	**46.02%**
GERMANIA					
1986	29.09%	35.80%	22.03%	7.23%	5.85%
1991	19.30%	38.59%	26.80%	9.95%	5.36%
S.S.	**9.13%**	**25.54%**	**35.96%**	**16.55%**	**12.81%**

Source: our calculations on transition matrices provided by OECD

Employment outflows are observed in the OECD panels, but inflows are not: in particular, the replacement of young work-force in place of the retiring (or otherwise withdrawing) old is missed altogether. This is seen by comparing the 1986 and 1991 earning distributions: the weight of the left-most wage bracket decreases and the weight of the top one increases everywhere.

The transition matrices are defined over a five-year period 1986-91. In order for the limit distribution to be meaningful, the same transition matrix must apply as time moves on. For this to hold, the stability of the age distribution is necessary: more precisely, the process of demographic replacement (young vs. old) must preserve the age composition at the beginning of each five-year period. This being the case, a representation of earnings dynamics in terms of simple Markov chains, without explicit modelling of the entry-exit process, will not hinder the interpretation of the limit distribution. I have already pointed out that this may not be the case. Accordingly, I call the latter a pseudo limit distribution, that yields, with all necessary *caveats*, additional insight on the differences between Europe and USA: the pseudo steady-state of the EU-countries is heavily displaced toward the right, with less weight in the lowest and central brackets, and much more in the highest. For the USA, instead, the 1991 earnings distribution (especially male earnings) is quite similar to the pseudo limit distribution. This is an additional confirmation that in Europe today's age structure of the work-force is in a traverse, ageing at rather quick pace. In the USA, instead, the 1991 distribution is closer to its long run

equilibrium. The latter is flat compared to those of Europe (17% of the working population confined in the lowest tail, whereas in Europe it varies between 2% and 5%). This is not surprising: if the segmentation hypothesis is grounded and if the initial endowments of skills and innate abilities in the working population is the same on both sides of the Ocean, we would expect many of the least priviledged to remain such all their life in the USA, while in Europe a larger fraction will benefit from the protection that the system affords, and will have better chances to make their way upwards.[13]

4. Open problems (nearly all, not all, measurement problems)

In this paper I propose a very simple and rough set of indicators of labor market segmentation. Much more remains to be done in order to have a clean picture of this phenomenon. I will briefly mention some of the complicated measurement problems that will have to be addressed in the next future.

4.1 In some EU - countries, especially of Southern Europe, labour market segmentation is hidden in the black economy, which develops also, although not only, as a reaction to tight regulation and high taxation. There, flexibility of earnings and of working hours is total, employment protection is nil. Statistical indicators are inadequate to trace it. Thus in countries like Italy, Spain, Greece (and others too) labour market flexibility is higher than statistics show, with inequality and labour market segmentation being, with all likelihood, higher too.

The increasing degree of labour market flexibility and deregulation in Europe pose additional problems *per se.* To the extent that we may not be in a position to observe earnings and tenure related to many of the new flexible jobs, the measurement of earnings mobility may be distorted. A vast share of new hirings takes the form of fixed time or temporary contracts, part-time positions, disguised forms of self-employment, work leasing, atypical contracts of various sorts, all aimed at reducing labour costs and making work flexible. Do the data at hand catch all these new forms ? In some countries they probably do, but in some they certainly don't. Italy is one example, but certainly not the only one. Where the data originate from administrative sources some atypical forms of work may not be officially reported. This being the case, the measurement of earnings mobility is distorted, with all likelihood in the direction of underestimating persistence in low pay and overestimating upwards mobility.

4.2 These arguments help to explain an interesting and not-so-obvious cross-sectional relation between the extent of labor market segmentation [measured by: s = P(1,1) - IM2. This is a rough indicator: the higher s, the extent of LM-

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[13] There is an additional problem that may cloud the issue here: the states of the original transition matrices 1986-91 are defined as bands around the median of the earnings distribution in 1986 (origin) and 1991 (destination). As we look into the dynamics of the process, it would be appropriate to have the states redefined each five-year period (i.e., after one iteration, the states ought to be bands around the median in 1991 (origin) and in 1996 (destination); and so on after n iterations). As we compute the pseudo-limit distribution, instead, the states are always those defined over the 1986-91 observation period. This has no drawbacks only if the (real) wage distribution is stable over time.

segmentation (as defined here), the higher the employment / population ratio (E/P), a highly stable indicator of labor market performance at large. We find a positive relation (with two Scandinavian outliers, Denmark and Sweden): in the USA, followed by UK and Finland, LM-segmentation is high, and so is E/P; in continental Europe (Italy, France, Germany) LM-segmentation is low, and so is E/P. The position of Denmark and Sweden may be largely explained by the incidence of public expenditure in LM-programs as a percentage of GDP, which is highest in this group of countries. The positive relation found here between the extent of labor market segmentation and the employment-population ratio at large is in line with what I have previously pointed out in relation to the cross-sectional association between downward earnings mobility at mature age and the share of aged peope at work (fig. 1). Soft landing into retirement helps to keep people at work at the cost of some downward adjustment of their pay.

If, we put the unemployment rate (u) in place of E/P, we find - not surprisingly - a negative relation with s (with only Sweden as outlier). My own preference is for E/P, because it is much less cyclically sensitive than u, as is s itself. [14]

This having said, the morale of the story appears to be deceptively simple: where (almost) everyone is at work, there we'll find a great deal of LM-segmentation: in continental Europe fewer people are at work, and segmentation is not such a big problem; in USA things go the other way.

But there might be another, subtle, interpretation: if the measurement problems related to (i) the black economy; (ii) the new flexible jobs, are grounded, it means that - for different reasons - there exist in some European economies many jobs that statistics fail to catch. A vast majority of them are "bad" jobs, with scarce perspectives of upwards mobility. If they entered the employment count, we would see a higher E/P, and, I would guess, a higher s. This amounts to say that the distance between the labor markets of continental Europe and that of the USA could be smaller than the usual statistics lead us to believe.

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[14] By now several researchers have observed a trade-off between unemployment and wage inequality and indicate explanations not dissimilar to the one I propose here: R.M. Blank (1997) discusses a "unified theory" of labor market outcomes, where institutions and economic shocks interact to produce differing outcomes. Bertola, Blau, Kahn (Comparative Analysis of Labor Market Outcomes, The Russel Sage Foundation, 2001) suggest that where collective bargaining and LM institutions tend to reduce wage inequality, this will effectively truncate the underlying distribution across individuals and jobs, eliminating employment opportunities for low-wage workers: "... if unemployment primarily affects those at the bottom of the skill distribution, then there will be a mechanical positive relationship between unemployment and the observed wage median".
C. Pissarides [Scottish Journal of Economics (Sept. 1999)] observes, instead, a trade-off between the increase in unemployment and the increase in inequality in OECD countries in the late Eighties and early Nineties. His explanation is more sophisticated and runs in different terms: the combination of generous unemployment compensation systems (protecting mainly the low-skilled) and generous employment protection (protecting mainly the skilled employees) will generate - in equilibrium - more unemployment inequality across skill groups, and less wage inequality.

4.3   In par. 2.3 I have already mentioned some problems related to attrition observable in panel data. An additional problem, unrelated to attrition when the data originate from surveys on individuals, independent of their status in the labor force, very much related to attrition when the data come from certain administrative sources, is how to treat people who have no wage. There is quite a high turnover from one year to the next between those at the bottom of the wage distribution and the unemployed (the low-pay no-pay cycle).[15]   The measures of P(1,1) – persistence in low pay -   utilized in this paper, refer to individuals who are at work both in 1986 and in 1991, regardless of their position in between. Those who have become unemployed sometime after 1986 and are still unemployed in 1991 are not accounted for. I have chosen to leave them out altogether (to improve cross-country comparability), although, in a few cases, the information could have been retrieved. My choice is justified also by the fact that P(1,1) indicates persistence in low pay, and not persistence in low income.

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[15] I am grateful to S. Jenkins for reminding me of this problem.

L.M. segmentation (S) and the employment ratio

L.M. segmentation (S) and unemployment (u)
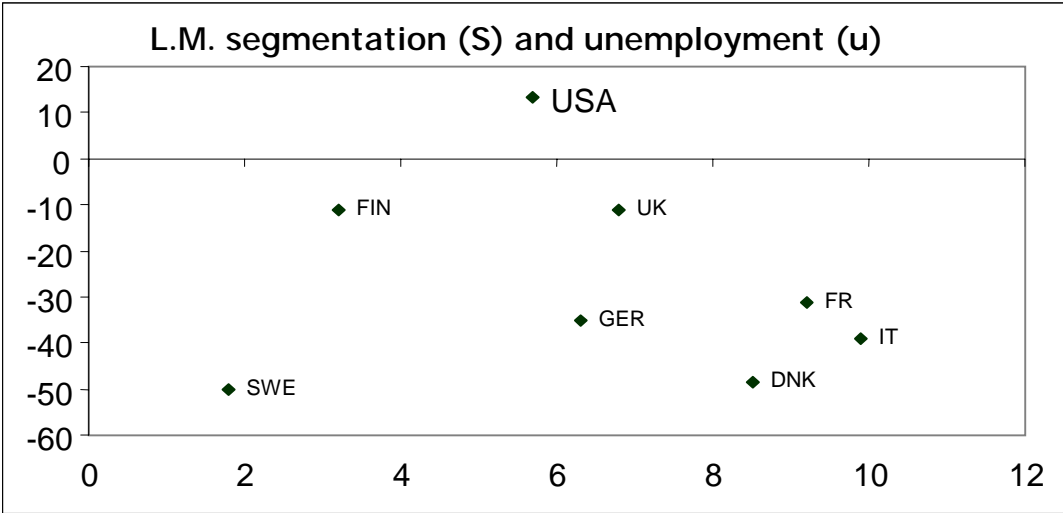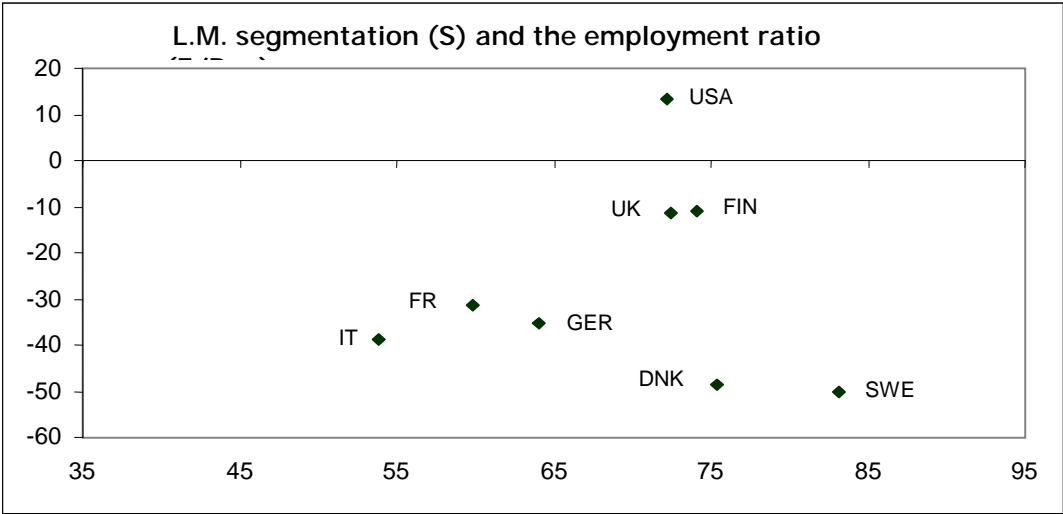
	P(1,1)	IM2	S	U	Empl/Pop	LM-Exp/GDP
USA	55,8	42,5	13,3	5,7	72,2	0,5
FR	31,6	62,9	-31,3	9,2	59,9	3,2
IT	21,8	60,8	-39	9,9	53,9	2,5
UK	39	50,2	-11,2	6,8	72,4	2,6
GER	26	61,3	-35,3	6,3	64,1	3,8
DNK	8,1	56,8	-48,7	8,5	75,4	6,6
FIN	36,9	47,9	-11	3,2	74,1	5,6
SWE	15,4	65,5	-50,1	1,8	83,1	5,5

4.4 The observation periods (here 5 years) may be too short to catch the true dynamics of earnings mobility. Long transitions could be more appropriate. Only in few instances, however, do we have information on P(1,1) observed at long distance, let alone on other transition probabilities.

P(1,1) observed over short and long time intervals

	short transitions (5 years)	long transitions
USA	0.56	0.44 (17 years) *
Italy	0.22	0.17 (10 years) **
Finland	0.37	0.26 (11 years)
		0.14 (21 years) ***
Denmark	0.08	0.10 (11 years) ***

* P. Gottschalk, 1999 ; ** B. Contini et al. , 2000; *** R. Asplund, P. Bingley, N. Westegaard- Nielsen, 1998.

Long persistence in low pay is a lot higher in the USA as compared to Denmark, Finland (not surprisingly) and to Italy (somewhat less obvious).

4.5 Compensation policy. Where pay (often, but not always reserved to high management) takes the form of stock options, the description of earnings dynamics restricted to monetary outlays becomes much weaker. This may not be a diffused phenomenon yet, but it is bound to increase rapidly in years to come.

5.   *Concluding remarks*

Recent years have produced a great deal of comparative research on the determinants of persistence in low pay [by and large, focussed on P(1,1)]. The results are surprisingly similar across European countries, as witnessed by numerous contributions of the LOWER network.

Persistence in low pay is not sufficient for labor market segmentation, as defined here. Segmentation implies that, while there has to be a large share of workers stuck in bad jobs or no job at all, there is, at the same time, a vast segment of working population that is very mobile, upwards or downwards, within one's own working life or across generations. The USA appears to provide the best example of a highly segmented labor market.

Other forms of LM-segmentation are quite conceivable: for instance, one in which immobility prevails everywhere in the earnings distribution: the poor stay forever poor, the rich forever rich, no matter what they do. Examples might be drawn from the Middle Age-economies, with landlords on one side, and serfs on the other, or - even today - from some Latin American or Asian countries run by ruthless authoritarian regimes. Hopefully, such examples should not be with us in Europe.

Increasing inequality is not, in itself, sufficient to generate labor market segmentation. It will do so, unless the possibility of enhancing one's human capital is guaranteed for all workers, either via public investment in education and training, or via private channels with finance made available to the more endowed as well as to the less endowed workers. As of today, we don't know if increasing inequality has translated also into deeper labor market segmentation. Long panel data necessary to observe trends of earnings mobility are not available.

There are, however, reasons to believe that the extent of labor market segmentation may be increasing:

1   policies aiming at helping entry of youth into employment. Payroll tax rebates, lower firing costs (both come together with fixed duration - one or two-year - contracts) increase the dualistic features of the labor market as firms find it advantageous to change the mix of skilled / unskilled workforce in favor of the latter [cfr. Blanchard-Landier (2000); Boeri (1999); Contini et al. (1998)]. Worker turnover increases in parallel, and the incentives (by firms and workers) to invest in human capital will be reduced. Thus, while the "good & lucky" workers may have better chances to enhance their human capital, the "bad" ones will not. As a result, dualism - which could be, in principle, a transitory stage for the new entrants in the labor market - will consolidate into persistent segmentation.

2   the e-economy is in its early stages, hi-tech, skilled-labor intensive, with human capital being the crucial factor of production. The economic miracle of Silicon Valley may not be a typical story, but is illustrative of what may take place in other expansion areas. Silicon Valley has probably created more wealth in a shorter time period than virtually any other place in history. But, at the same time, average wages for low-end workers are 10% lower than a decade ago, while living costs are 40% higher than in the rest of the US and housing prices have gone up by

65% since 1995. The key reason lies in the high tech's heavy reliance on outsourcing and subcontracting, a model that helps higher skilled workers thrive, able as they are to hop from one employer to another, jacking up their pay in every move. But for the less skilled, outsourcing only serves to hold wages down. This gives high-tech firms maximum flexibility in a fast-moving industry. It also creates a highly contingent workforce: part-timers, temporary job holders, contract (as well as illegal piece-wise) workers, and the self-employed have jumped from 19% of Santa Clara's workforce in the Eighties to 42% today (by contrast, the share of contingent workers in the US as a whole has climbed from 27% to 33% in the same period). Because the skill gap in high-tech is so vast, the less-skilled employees are likely to benefit less from the upward mobility that allows many low-skilled workers to achieve middle-class status in the country (see Business Week, March 27, 2000)

Figure 3 - Shifts in relative supply and demand

Skilled/unskilled wage (W^s/W^u)

Skilled/unskilled   employment (L^s/L^u)