Università degli Studi di Ancona

DIPARTIMENTO DI ECONOMIA

YOUTH UNEMPLOYMENT AND

SELF-EMPLOYMENT IN ITALY

F. Chelli & L. Rosti

QUADERNI DI RICERCA n. 156

QUADERNI DI RICERCA

Università degli Studi di Ancona

DIPARTIMENTO DI ECONOMIA

YOUTH UNEMPLOYMENT AND
SELF-EMPLOYMENT IN ITALY

F. Chelli & L. Rosti

QUADERNI DI RICERCA n. 156

Novembre 2001

Comitato scientifico:

Renato Balducci
Marco Crivellini
Marco Gallegati
Alessandro Sterlacchini
Alberto Zazzaro

YOUTH UNEMPLOYMENT AND SELF-EMPLOYMENT IN ITALY

'If you don't want to be unemployed, why don't you set up on your own?'

by F. Chelli* and L. Rosti**

Introduction

In 1997, Italy ranked fourth in the European league table of general unemployment rates, standing two percentage points above the average. However, the country moves to the top of the table if one considers solely the younger component (aged between 15 and 34) of unemployment. Indeed, Italy is the only European country in which young people represent more than 70% of total job-seekers: the European average is around 55%, and in Germany it is less than 36% (Figure 1).

A recent survey of OECD countries suggests that unemployment tends to be higher for younger workers in countries where employment protection is stricter (OECD 1999). And in the Italian literature, too, one of the factors most frequently cited in explanation of the high level of youth unemployment is the existence of a wage structure which does not reflect differences in productivity (ISTAT 1998a, p. 230).

Wage rigidity and job protection may have two effects on the occupational choices of young people. Firstly, they may induce a larger number of young people to seek dependent employment, in view of the higher wages and job security available, dissuading them from taking up other options: self-employment, inactivity (students, housewives), and job-seeker status (voluntary unemployment).

On the other hand, wage rigidity and job protection may make self-employment an attractive option for young people who, after repeated attempts, have failed to pass firms' selection processes and find work as employees (Nunziata and Staffolani, 2001). The proportion of Italian young people in total employment is wholly in line with the European average, standing at below 40% (Figure 2), but it is not the same for the two occupational positions: it is fully 10% lower for self-employment than for wage employment (31.62% compared to 42.03%: ISTAT 1998b)[1].

The finding that numerous young people are out of work but only a few of them are in self-employment prompts the question as to why, if this unemployment is involuntary, those who fail to find jobs do not set up on their own. Self-employment, in fact, should in any event be more desirable than (long-term) unemployment even for those who prefer dependent employment or who regard themselves as inadequately endowed with entrepreneurial talent[2].

The following analysis of labour-market flows addresses this problem. It shows that the small number of young people in self-employment is due not to their lack of enterprise but to their low likelihood of remaining in that state. This is consistent with Jovanovic's (1982) proposition concerning the revision of managerial ability over time and Calvo and Wellisz's (1980) proposition concerning learning capacity. However, "longitudinal studies show that the individual's probability of remaining self-employed depend not only on the number of years spent in the business, but on his/her ability as well" (Le 1999, p. 410).

Data and methods

Determining the characteristics of the labour market mobility of young people requires longitudinal data which enable analysis of the entries to and exits from a given condition (or state). In Italy, information of this kind can be obtained from the data published in ISTAT's 'matrix of structural changes in the population between surveys conducted in two successive years'[3].

The method used for the survey was the administration of repeated interviews to the same persons, following the schedule used to rotate the households in the sample for the labour force survey. The surveys discussed here are those

relative to the 1997/1998 *annual* matrix, and they refer to the *average* flows obtained by collating the individual records of a single contingent of respondents interviewed in two corresponding surveys (i.e. surveys conducted in the same month of two successive years).

This elementary information was used to construct the matrix for the population aged 15 to 34 (youth matrix). Considering that young people aged 15-34 make up 36.6% of the total population (ISTAT, 1998b), this age group is of sufficient size to ensure that the corresponding sub-sample does not lose significance.

The data from the general matrix and the youth matrix were used to calculate their respective transition matrices. The horizontal coefficients of a matrix can in fact be read as the probabilities of transition between the states of a finite Markov chain. The probability of transition to any state i at time t is considered to be conditioned solely by the state reached at the time $t-1$ immediately prior to the current one, thereby excluding the individual's less recent history.

Markovian analysis (Blumen, Kogan and McCarthy, 1955) was applied to the labour-market transition matrices to calculate the limiting vector, the mean first passage matrix, and the limiting correlations matrix (Kemeny and Snell, 1960)[4].

Results

One would expect comparison between the horizontal coefficients of the general matrix and those for the youth component alone (Table 1) to show that young people are more likely to pass from N to O, and from N to U, given that these are the entry routes into the active component of the population. Conversely, the adult component of the population should be more likely to exit (due to age) from employment: that is, to pass from O to N and, to a lesser extent, from U to N.

The data confirm in fact that the probability of young people moving from N to O is 8.06%, compared to 2.82% for the total, and also that the probability of their moving from N to U is 9.54%, compared to 2.62% for the total. However, expectations concerning exits are borne out to a lesser extent: there are no equally significant differences in the probability of moving from O to N (4.13% for young people compared to 4.59% for the total population), nor in that of moving from U to N (24.69% for young people compared to 25.67% for the total population). If one considers that the aggregate of non active persons includes students and housewives, the disabled and the retired, it is surprising to find that the probability of passing to N differs so little, for young people, compared to the general figure. While for students the mobility from U to N can be explained, at a young age, with a new period of studies, it is more

difficult to understand the flow of young women in the housewives and those of young men in the ritired from the labour force.

On calculating the ratios of composition by age of the gross flows (Table 2), one finds that the value of the ratio in the gross flow from N to O is understandably greater (46.74%), but also that it is too close to the flow in reverse from O to N (45.64%). Similarly, the ratio of composition by age of the gross flow from N to U is, predictably, the highest overall (59.68%), but it is also very close to the value for the flow in reverse from U to N (54.29%).

When the two components of employment – dependent and independent – are examined separately, one finds that, predictably, both the probability of passing from N to OI and the probability of passing from N to OD are, for young people, much higher than the general figure (twice as high in the former case, and more than three times higher in the latter). The probabilities of moving in reverse, however, are once again very similar to the general figure (5.84% for young people compared to 6.37% overall for OI, 3.62% for young people compared to 3.84% overall for OD). In this case, too, one would instead expect young people to have a substantially lower probability of exiting into N, given that they are still a long way from retirement age.

The mobility of young people, both those entering OI and those exiting from OI, is therefore generally greater than that for the total population, while the probability of remaining in OI is much lower: 87.10%, compared to 83.82% for the total population. The probability of remaining in OI, moreover, is markedly

lower than the corresponding probability of remaining in wage employment (87.10% compared to 91.84%), and the gap widens further for young people (83.82% compared to 90.59%). What is it that accounts for this lesser probability of the young self-employed remaining in that state, compared with both self-employed adults and young people in dependent employment?

The difference is manifest, firstly, in the probability of a young person passing from OI to U, this being 2.19% compared with 1.19% for the total population. But it does not differ substantially from the probability of passing from OD to U (2.93% for young people compared to 1.78% for the general population). Secondly, there is the probability of passing from OI to OD: 8.15% for young people as opposed to the 5.33% for the total population. Finally, there is the probability of moving from OI to N, which is lower for young people but still very close to that for the total population (5.84% compared to 6.37%). The probability of passing from OD to N is instead substantially lower, but once again it does not differ greatly by age class (3.84% for young people and 3.62% for the total).

The ratios of composition by age of the gross flows confirm these results. They show that young people are not reluctant to set up on their own: in fact, they constitute 53.02% of the gross flow from unemployment, 32.93% of the gross flow from OD, and 31.98% of the gross flow from N. But the crucial point is that young people do not remain in OI, and they feed the flows in reverse to an equal extent. Outflows from self-employment, in fact, show that the ratio of

composition by age of the gross flow to U is 38.07%, the one to OD is 31.52%, and the one to N is 18.91%. Consequently, only 19.86% of young people manage to remain in OI for more than one year.

The limiting vector is the equilibrium point of a transition matrix for a finite Markov chain. Its components constitute the limiting probabilities of belonging to the states of the system, and they enable study of the population's attitude towards employment in the long period. The limiting vector was calculated for both the general average matrix and for the youth matrix (Table 3).

Comparison among the relative frequencies[5], which can be read as observed probabilities of belonging to a given state, and the predictions of them represented by the limiting vector, yields quantitatively significant results, and of positive sign, for young people. Labour-market participation increases substantially, and the probability that a young person will belong to N falls from 45% to 27%. This greater participation translates into a growth in employment, given that the probability of a young person belonging to O increases from 43% to 63%, while the probability of belonging to U diminishes from 12% to 9%. OI and OD both increase, for young people as well as for the population as a whole; but the most favourable prediction is for young people in OD, who pass from the 32.83% of the probability observed to 48.12% of the limiting vector. Young people in OI are predicted to increase from 9.76% to

15.13%: more specifically, they diminish in IA and rise in both II (from 1.95% to 3.21%) and IS (from 6.43% to 10.69%).

Tables 4-5 show the transition matrix, the mean first passage matrix, and the limiting correlations matrix for both young people and the aggregate.

The mean first passage matrix is a measure of the distance between the states of the system. More specifically, it indicates the time taken to move for the first time from a certain origin to a certain destination. These distances take account not only of the direct routes between states but also of all the possible indirect routes.

The results of the general matrix show that the destination closest to self-employed workers in industry is N, followed by self-employed workers in industry, i.e. a return to the same state, and employees in services. N is also the destination closest to II in the youth matrix, followed by DS, with an almost identical time, and shortly after by DI.

The closest destination for self-employed workers in services is self-employed workers in services, followed by N and employees in the same sector. In the youth matrix the destination closest to IS is again IS, followed by DS and then N. Also to be noted is that the routes from self-employment to dependent employment are shorter than those in the opposite direction, in both the general and youth matrix.

The closest destination for the unemployed is N, then U, and finally DS in the general matrix, and U, N and DS in the youth matrix. For non active persons,

as in the case of the unemployed, the closest destinations are N, U and DS in both the general and the youth matrix. Overall, the most surprising finding is the substantial uniformity between the youth matrix and the general matrix.

We now examine the limiting correlations matrix. The generic element c_{ij} in this matrix measures the relation between the time taken by the process in the i-th and j-th states. Since a long time spent in a state i implies a short time spent in a state j, one may logically expect negative values outside the diagonal: the presence of positive values is instead indicative of a process which passes rapidly from state i to state j and vice versa.

The data show that there is a positive correlation between DI and DS, which reveals an alternation between the two states, and therefore weak attachment to the job, although this does not apply to young people. There is also a strongly negative correlation between DS and N, and this regards both young people, and even more markedly, the total population.

This result also emerges from analysis of the fundamental Z matrix, which allows comparison – for broad values of n – between the amounts of time spent in the destination states (arranged in the columns) and the different states of departure (arranged in the rows).

The data show that, for both young people and the total population, the factor determining the longest periods spent in OI is provenance from (non-agricultural) self-employment itself. For adults, provenance from wage employment, and more specifically employment in the same sector, also results

in longer durations, but this is not equally the case for young people. By contrast, the amounts of time spent in self-employment for persons originating from N are very short, which confirms that staying out of the labour market is always the worst option for a worker, whatever his/her age.

In general, long periods of employment seem to be the privilege of persons who move from one job to another without passing from U or from N. Provenance from these latter states instead indicates a shorter period of time spent in employment.

Conclusions

The allocation of the paid labour force between self-employment and wage employment has emerged as an important aspect of the labour market in recent years (Le, 1999), but longitudinal observations are needed to discover that self-employment and wage employment are not mutually exclusive activities, and that an individual may pursue them sequentially and repeatedly (Evans and Leighton, 1989).

The debate on employment protection has emphasised the negative effects due to the fact that raising firms' firing costs acts as a deterrent against hiring new workers (mainly young) and increases the bargaining power of insiders, the result being higher wages other conditions being equal. On the other hand,

however, one should also consider the positive effects arising from a reduction of the inflow into unemployment and from the stability of the employment relationship: this favours the introduction of new technologies and enhances investment in training and skill formation (OECD, 1999).

The results presented here highlight a further advantage deriving to firms from employment protection: it induces young job-seekers to compete for vacancies, so that selection criteria can be applied to screen the best of them (Clotfelter, 1996). However, this situation distorts the allocation of the paid labour force between self-employment and wage employment, because also less-talented young people fall back on self-employment when they have failed to find wage employment.

The data show that when young people move out of inactivity into employment, they more frequently opt for wage work rather than self-employment: they constitute, in fact, 55.21% of the gross flow from N to OD, compared to 31.98% of the flow from N to OI. Instead, when they leave U, young people opt in equal measure for self-employment and dependent employment (they constitute 53.02% of the flow from U to OI and 56.72% of the flow from U to OD).

Young people therefore consider OD to be more attractive than setting up on their own when they engage in their first-job search, and large numbers of them apply for vacancies in firms. The favourable conditions enjoyed by insiders

attract numerous (heterogeneous) applicants, from whom firms select those whom they wish to hire and reject the rest, who lapse into unemployment.

The data also show that a long spell of unemployment acts as an incentive to setting up on one's own – the intention being to display commitment and enterprise, to give visibility to the negotiable personal resources that the person knows s/he possesses and which firms have spurned. However, the entry of young people into OI is not filtered by a screening process[6]. Consequently, it is not surprising to find that the probability of remaining in employment differs greatly between the two occupational positions: young people make up 28.69% of those who remain in OD, but only 19.86% of those who remain in OI[7].

By contrast, there is a very high probability that young people will leave self-employment for an alternative situation: they may return to unemployment and resume their job search (these constitute 38.07% of the flow from OI to U); they may lapse into inactivity because of discouragement or in order to retrain (18.91% of the flow from OI to N); or they may find wage employment by showing commitment and enterprise (31.52% of the flow from OI to OD).

Necessary as a consequence are economic policy measures, which help young people to plan business initiatives and assess their growth prospects. The aim of these measures should to be to increase both the probability of moving from inactivity or unemployment to self-employment, and the probability of remaining permanently in the latter state.

Notes

* - Dipartimento di Economia - Università di Ancona

** - Dipartimento di Economia Politica e Metodi Quantitativi - Università di Pavia

[1] ISTAT (the Italian national statistics institute) defines a self-employed worker by the legal status of his/her work - that is, by the rules that regulate the employment relationship - so that s/he is characterized as self-employed when "no employment relationship is established and the work is performed as part of an activity whose proprietor is the worker him/herself or a member of his/her family." By contrast, an employee is someone who "performs his/her work on the basis of a relationship established with the proprietor of the enterprise and regulated by a contract or law" (ISTAT, 1984, p. 117). The "Collaborazioni coordinate e continuative" are included. We must consider anyway that: "Si tratta spesso di prestazioni dove il confine tra caratteristiche di lavoro dipendente e indipendente è piuttosto flebile, a tal punto che ... può dipendere da una percezione del lavoratore" (ISFOL, 1998, p. 84).

[2] One reason often cited for this, but not discussed in this article, concerns liquidity constraints and imperfections in the credit market (de Wit 1993; Jovanovic 1989).

[3] See Giacopini Arangio-Ruitz, 1974; Moriani, 1981; Trivellato, 1991.

[4] This essay comments on the results relative to (i) the matrix disaggregated into eight states (henceforth denoted as follows: dependent workers in agriculture: DA; self-employed workers in agriculture: IA; dependent workers in industry: DI; self-employed workers in industry: II; dependent workers in services: DS; self-employed workers in services: IS; unemployed persons: U; non active persons: N); (ii) the aggregate matrices with four states (henceforth denoted as: dependent workers: OD; self-employed workers: OI; unemployed persons: U; non

active persons: N); and (iii) with three states (henceforth: employed workers: O; unemployed persons: U; non active persons: N).

[5] The relative frequencies are obtained as the ratio between the row totals and the general total of the flow matrix.

[6] Access to credit could be regarded as a process which screens business projects, if it were not based more on the real guarantees offered by applicants than on assessment of the growth prospects of new firms.

[7] Also Schiller and Crewson (1997), using data from the National Longitudinal Surveys of Youth, find that there is a "surprisingly high incidence of self-employment, but very low success rates" (p. 523).

References

Blumen I., Kogan M. and McCarthy P.J. (1955), "The Industrial Mobility of Labor as a Probability Process", Cornell Studies in Industrial and Labor Relations, 6, Ithaca, N.Y.

Brown L.A. and Holmes J. (1971), "The Delimitation of Functional Regions, Nodal Regions, and Hierarchies by Functional Distance Approaches", Journal of Regional Science, 11, 57-72.

Calvo G.A. and Wellisz S. (1980), "Technology, Entrepreneurs, and Firm Size", Quartely Journal of Economics, 95, 663-677.

Clotfelter C.T. (1996), "Buying the Best. Cost Escalation in Elite Higher Education", NBER, Princeton, Princeton University Press.

de Wit G. (1993), "Models of Self-Employment in a Competitive Market", Journal of Economic Surveys, 7, 367-397.

Eurostat (1998), "Labour Force Survey, Results 1997", Office for Official Publications of the European Communities, Luxembourg.

Evans D.S. and Jovanovic B. (1989), "An Estimated Model of Entrepreneurial Choice Under Liquidity Constraint", Journal of Political Economy, 97, 808-827.

Evans D.S. and Leighton L.S. (1989), "Some Empirical Aspects of Entrepreneurship", American Economic Review, 79, 519-535.

Giacopini Arangio-Ruitz G. (1974), "Forze di lavoro e flussi di popolazione", Istat, Supplemento al bollettino mensile di statistica, 5, 1-9.

Isfol (1998), "Il lavoro in Italia: profili, percorsi, politiche", Franco Angeli.

Istat (1984), "Rapporto conclusivo della Commissione di studio per un sistema informativo del lavoro", Economia & Lavoro, 4, 117-141.

Istat (1998a), "Rapporto Annuale. La situazione del Paese nel 1998", Roma.

Istat (1998b), "Forze di lavoro, media 1997", Annuario n. 3, Roma

Jovanovic B. (1982), "Selection and the Evolution of Industry", Econometrica, 50, 649-670.

Kemeny J.G. and Snell J.L. (1960), "Finite Markov Chains", New York, Springer-Verlag.

Le A.T. (1999) "Empirical Studies of Self-Employment", Journal of Economic Surveys, 13, 381-416.

Moriani C. (1981) "Forze di lavoro e flussi di popolazione", Istat, Supplemento al bollettino mensile di statistica, 55, 1-9.

Nunziata L. and Staffolani S. (2001) "On Short-term Contracts Regulation", Dipartimento Economia, Università di Ancona, Quaderni di Ricerca,150.

Oecd (1999) "Employment Outlook", Paris.

Schiller B.R. and Crewson P.E. (1997), "Entrepreneurial Origins: A Longitudinal Inquiry", Economic Inquiry, 35, 523-531.

Trivellato U. (1991) (Ed.), "Forze di lavoro: disegno dell'indagine e analisi strutturali", Istat, Roma.

Table. 1 - Horizontal coefficients of the general transition matrix and of the young transition matrix.

General matrix (4x4)

	OI	OD	U	N
OI	87.10	5.33	1.19	6.37
OD	2.53	91.85	1.78	3.84
U	3.99	17.06	53.29	25.66
N	1.03	1.79	2.62	94.56

General matrix (3x3)

	O	U	N
O	93.80	1.61	4.59
U	21.04	53.29	25.67
N	2.82	2.62	94.56

Young matrix (4x4)

	OI	OD	U	N
OI	83.82	8.14	2.19	5.84
OD	2.86	90.59	2.93	3.62
U	3.75	17.15	54.41	24.69
N	2.01	6.04	9.54	82.40

Young matrix (3x3)

	O	U	N
O	93.11	2.76	4.13
U	20.90	54.41	24.69
N	8.06	9.54	82.40

Source: our calculations on Istat data

O	Employed workers
OI	Self-employed workers
OD	Dependent workers
U	Unemployed persons
N	Non active persons

Table. 2 - Ratios of composition by age of the 1997/98 matrix.

4x4 matrix

	OI	OD	U	N
OI	19.86	31.52	38.07	18.91
OD	32.93	28.69	47.75	27.41
U	53.02	56.72	57.61	54.29
N	31.98	55.21	59.68	14.26

Source: our calculations on Istat data

3x3 matrix

	O	U	N
O	26.40	45.64	23.92
U	56.02	57.61	54.29
N	46.74	59.68	14.26

O	Employed workers
OI	Self-employed workers
OD	Dependent workers
U	Unemployed persons
N	Non active persons

Table 3 - Relative Frequencies (F.R.) and Limiting vectors (L.V.) of the general and young 97/98 matrices.

8X8 matrix	IA	II	IS	DA	DI	DS	U	N
F.R. General	0.0172	0.0208	0.0650	0.0094	0.0847	0.1520	0.0463	0.6048
F.R. Young	0.0138	0.0195	0.0643	0.0106	0.1388	0.1789	0.1198	0.4543
L.V. General	0.0161	0.0244	0.0765	0.0097	0.0987	0.1841	0.1198	0.5458
L.V. Young	0.0123	0.0321	0.1069	0.0126	0.1968	0.2718	0.0944	0.2731

4x4 matrix	OI	OD	U	N
F.R. General	0.103	0.2461	0.0463	0.6048
F.R. Young	0.0976	0.3283	0.1198	0.4543
L.V. General	0.1170	0.2925	0.0445	0.5458
L.V. Young	0.1513	0.4812	0.0944	0.2731

3x3 matrix	O	U	N
F.R. General	0.3491	0.0463	0.6048
F.R. Young	0.4259	0.1198	0.4543
L.V. General	0.4096	0.0445	0.5459
L.V. Young	0.6325	0.0944	0.2731

Source: our calculations on Istat data

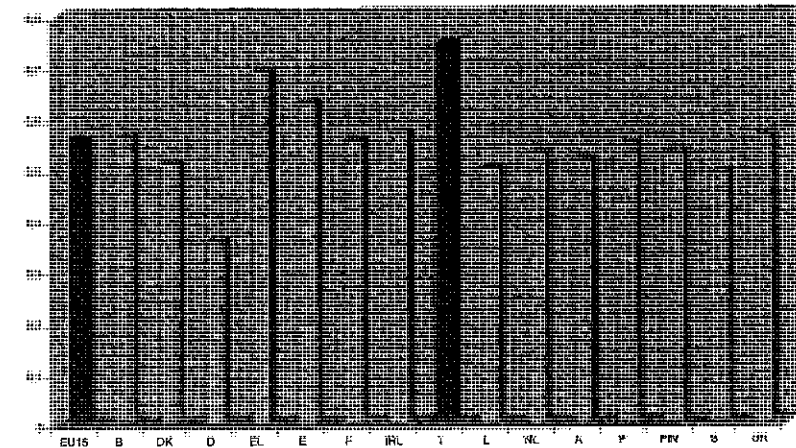| O	Employed workers
OI	Self-employed workers
IA	Self-employed workers in agriculture
II	Self-employed workers in industry
IS	Self-employed workers in services
OD	Dependent workers
DA	Dependent workers in agriculture
DI	Dependent workers in industry
DS	Dependent workers in services
U	Unemployed persons
N	Non active persons

Table 4 - Annual average matrix 1997/98 (General)

Transition matrix

	IA	II	IS	DA	DI	DS	U	N
IA	0.7472	0.0107	0.0237	0.0222	0.0122	0.0149	0.0185	0.1506
II	0.0065	0.7916	0.0897	0.0021	0.0455	0.0112	0.0125	0.0409
IS	0.0072	0.0287	0.8534	0.0012	0.0091	0.0423	0.0099	0.0481
DA	0.0418	0.0039	0.0116	0.6818	0.0421	0.0632	0.0608	0.0948
DI	0.0023	0.0131	0.009	0.0045	0.8573	0.0539	0.021	0.0388
DS	0.0012	0.0021	0.0204	0.0034	0.0296	0.895	0.0134	0.0348
U	0.0077	0.0072	0.025	0.0133	0.0625	0.0948	0.5329	0.2567
N	0.004	0.0012	0.0051	0.0017	0.0063	0.0099	0.0262	0.9456

Mean first passage matrix

	IA	II	IS	DA	DI	DS	U	N
IA	61.94	203.4	86.62	302.1	69.85	47.78	45.7	11.04
II	239.7	40.94	55.69	326.7	57.89	43.74	50.29	20.1
IS	239.2	174.5	13.07	328.4	67.38	39.61	51.03	19.7
DA	215.9	206.4	88.23	103.2	60.88	38.73	40.91	14.72
DI	247.2	194.5	86.26	321.2	10.13	35.16	47.73	20.56
DS	249.4	205.1	81.84	323.6	58.84	5.43	50.24	21.61
U	242.3	206.7	87.79	318.8	61.86	39.45	22.47	11.24
N	243.6	215.4	95.93	328.3	73.51	50.83	43.61	1.83

Limiting correlations matrix

	IA	II	IS	DA	DI	DS	U	N
IA	1	0.0017	-0.0041	0.0963	-0.0624	-0.1011	-0.0158	-0.0535
II	0.0017	1	0.2385	-0.0158	0.0638	-0.0448	-0.0612	-0.2974
IS	-0.0041	0.2385	1	-0.0326	-0.0538	0.0117	-0.1016	-0.4374
DA	0.0963	-0.0158	-0.0326	1	0.0143	-0.0022	0.0422	-0.11
DI	-0.0624	0.0638	-0.0538	0.0143	1	0.0794	-0.0291	-0.506
DS	-0.1011	-0.0448	0.0117	-0.0022	0.0794	1	-0.0929	-0.7008
U	-0.0158	-0.0612	-0.1016	0.0422	-0.0291	-0.0929	1	-0.0296
N	-0.0535	-0.2974	-0.4374	-0.11	-0.506	-0.7008	-0.0296	1

Fundamental Z matrix

	IA	II	IS	DA	DI	DS	U	N
IA	3.896	0.0005	-0.1646	0.2091	-0.6762	-1.577	-0.0296	-0.6586
II	0.0266	4.968	2.202	-0.0294	0.5043	-0.8333	-0.2336	-5.605
IS	0.0341	0.7062	6.464	-0.0454	-0.4324	-0.0715	-0.2667	-5.388
DA	0.4104	-0.0731	-0.288	3.136	0.2092	0.0897	0.1835	-2.668
DI	-0.0943	0.2186	-0.137	0.0239	6.221	0.7471	-0.1198	-5.859
DS	-0.1292	-0.0423	0.2008	0.0007	0.4112	7.222	-0.2315	-6.432
U	-0.0159	-0.0805	-0.2542	0.0476	0.1131	-0.0432	2.004	-0.7712
N	-0.037	-0.294	-0.8768	-0.0449	-1.038	-2.138	0.0633	5.366

Source: our calculations on Istat data

O	Employed workers
OI	Self-employed workers
IA	Self-employed workers in agriculture
II	Self-employed workers in industry
IS	Self-employed workers in services
OD	Dependent workers
DA	Dependent workers in agriculture
DI	Dependent workers in industry
DS	Dependent workers in services
U	Unemployed persons
N	Non active persons

Table 5 - Annual average matrix 1997/98 (Young)

Transition matrix

	IA	II	IS	DA	DI	DS	U	N
IA	0.6321	0.0120	0.0338	0.0240	0.0251	0.0338	0.0491	0.1900
II	0.0085	0.7583	0.0999	0.0023	0.0736	0.0163	0.0178	0.0232
IS	0.0094	0.0295	0.8251	0.0012	0.0159	0.0607	0.0174	0.0408
DA	0.0342	0.0043	0.0114	0.6496	0.0499	0.0883	0.0783	0.0840
DI	0.0023	0.0118	0.0098	0.0056	0.8564	0.0528	0.0287	0.0327
DS	0.0012	0.0029	0.0270	0.0039	0.0419	0.8603	0.0269	0.0361
U	0.0057	0.0069	0.0249	0.0103	0.0608	0.1004	0.5441	0.2469
N	0.0056	0.0024	0.0122	0.0029	0.0225	0.0351	0.0954	0.8240

Mean first passage matrix

	IA	II	IS	DA	DI	DS	U	N
IA	81.18	130.5	49.14	213.6	30.09	20.47	20.46	11.07
II	214.8	31.13	34.43	227.9	25.22	21.95	27.36	21.48
IS	214.2	116.2	9.36	229.3	31.25	18.89	26.88	20.11
DA	202.1	133.2	51.74	79.42	27.59	17.31	20.34	15.45
DI	223	128.3	52.56	223.6	5.08	19.23	25.57	20.62
DS	224	133.2	48.76	226	27.87	3.68	25.77	20.36
U	219.2	132.7	50.65	222.7	27.78	17.76	10.6	11.34
N	218.7	134.9	52.45	225.8	30.21	20.3	17.3	3.66

Limiting correlations matrix

	IA	II	IS	DA	DI	DS	U	N
IA	1	-0.0009	0.0015	0.0704	-0.0913	-0.1229	-0.0014	0.0273
II	-0.0009	1	0.1628	-0.0384	-0.0272	-0.1773	-0.1352	-0.2016
IS	0.0015	0.1628	1	-0.0714	-0.2447	-0.1611	-0.2028	-0.2801
DA	0.0704	-0.0384	-0.0714	1	-0.0342	-0.0574	0.0143	-0.04
DI	-0.0913	-0.0272	-0.2447	-0.0342	1	-0.2595	-0.2157	-0.3888
DS	-0.1229	-0.1773	-0.1611	-0.0574	-0.2595	1	-0.2533	-0.4586
U	-0.0014	-0.1352	-0.2028	0.0143	-0.2157	-0.2533	1	0.2535
N	0.0273	-0.2016	-0.2801	-0.04	-0.3888	-0.4586	0.2535	1

Fundamental Z matrix

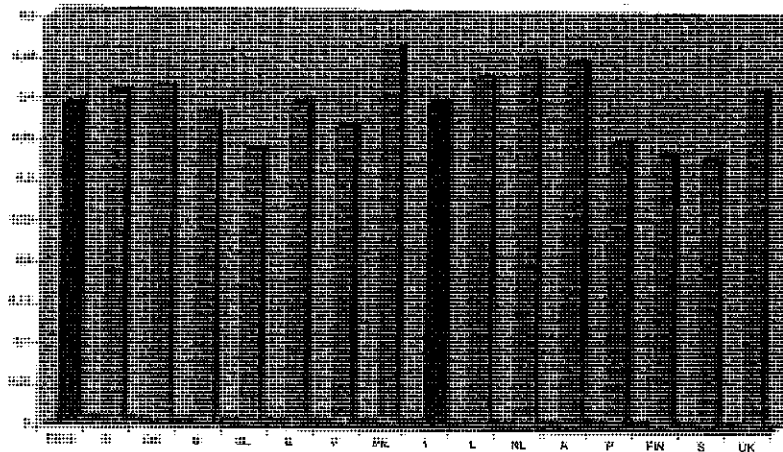|	IA	II	IS	DA	DI	DS	U	N
IA	2.692	-0.0954	-0.3282	0.1254	-1.136	-1.433	0.1476	1.027
II	0.0458	4.096	1.243	-0.0542	-0.1766	-1.836	-0.5032	-1.815
IS	0.0532	0.3644	4.923	-0.0717	-1.365	-1.003	-0.4588	-1.443
DA	0.2025	-0.1827	-0.6064	2.815	-0.6449	-0.5737	0.1588	-0.1685
DI	-0.0547	-0.0242	-0.6947	0.0001	4.785	-1.095	-0.335	-1.582
DS	-0.0673	-0.1822	-0.2881	-0.031	-0.6999	4.131	-0.354	-1.509
U	-0.0088	-0.1659	-0.4899	0.011	-0.6818	-0.6974	2.078	0.9547
N	-0.0024	-0.2379	-0.6822	-0.0279	-1.159	-1.387	0.4459	4.051

Source: our calculations on Istat data

O	Employed workers
OI	Self-employed workers
IA	Self-employed workers in agriculture
II	Self-employed workers in industry
IS	Self-employed workers in services
OD	Dependent workers
DA	Dependent workers in agriculture
DI	Dependent workers in industry
DS	Dependent workers in services
U	Unemployed persons
N	Non active persons

Fig. 1 - Share of unemployed persons 15-34 in total unemployment - MF - 1997

Source: Eurostat 1998.

Fig. 2 - Share of employed workers 15-34 in total employment - MF - 1997

Source: Eurostat 1998.

QUADERNI DEL DIPARTIMENTO DI ECONOMIA degli ultimi 5 anni

106 **Renato BALDUCCI,** *Concertazione tra le parti sociali e disoccupazione,* maggio 1998.

107 **Maura FRANCESE, Maria Teresa MONTEDURO,** *Does the functional form matter? A sensitivity analysis of female labour supply in the U.K and italy,* maggio 1998.

108 **Roberto ESPOSTI,** *Stochastic Technical Change and Procyclical TFP The Italian Agriculture Case,* ottobre 1998.

109 **Alessandro STERLACCHINI,***Do innovative activities matter to small firms in non-R&D-intensive industries? An application to export performances,* novembre 1998.

110 **Stefano STAFFOLANI,** *Contratti di lavoro con informazione asimmetrica bilaterale: chi paga i bonus condizionali?,* dicembre 1998.

111 **Davide CASTELLANI, Antonello ZANFEI,** *Multinational experience and the creation of linkages with local firms. Evidence from the electronics industry,* dicembre 1998.

112 **Roberto ESPOSTI,** *Spillover tecnologici e origine della tecnologia agricola,* aprile 1999.

113 **Luca PAPI, Debora REVOLTELLA,** *Foreign Direct Investment in the Banking Sector: a Transitional Economy Perspective,* aprile 1999.

114 **Roberto ESPOSTI, Franco SOTTE,** *Territorial Heterogeneity and Institutional Structures in Shaping Rural Development Policies in Europe,* luglio 1999.

115 **Renato BALDUCCI,** *Crescita endogena e ciclo,* luglio 1999.

116 **Antonio G. CALAFATI,** *Evoluzione dei sistemi locali e conservazione nei Parchi naturali,* luglio 1999.

117 **Renato BALDUCCI, Stefano STAFFOLANI,** *Distribuzione e crescita in un modello di contrattazione con impegno endogeno,* agosto 1999.

118 **Marco CUCCULELLI,** *Competizione sui mercati internazionali e misure del potere di mercato. Il caso dell'industria italiana dell'elettrodomestico,* agosto 1999.

119 **Riccardo LUCCHETTI,** *Analytic Score for Multivariate GARCH Models,* ottobre 1999.

120 **Alberto BUCCI,** *Horizontal innovation, market power and growth,* ottobre 1999.

121 **Riccardo LUCCHETTI, Luca PAPI, Alberto ZAZZARO,** *Efficienza del sistema bancario e crescita economica nelle regioni italiane,* ottobre 1999.

122 **Francesco TROMBETTA,** *Quanto costa controllare la natura? Il caso Mississippi,* ottobre 1999.

123 **Massimo TAMBERI,** *Nel mosaico economico delle marche: origini e trasformazioni,* novembre 1999.

124 **Stefano SANTACROCE,** *Graduates in the Labour Market, Determinants of Employment Success,* dicembre 1999.

125 **Massimiliano BRATTI,** *A study of the differences across universities in students' degree performance: the role of conventional university inputs,* dicembre 1999.

126 **Davide BERLONI, Roberto ESPOSTI,** *Scelte residenziali e mercati locali del lavoro. Il caso delle marche,* dicembre 1999.

127 **Davide TICCHI,** *Investment and uncertainty with recursive preferences,* gennaio 2000.

128 **Fabio FIORILLO, Stefano STAFFOLANI,** *To redistribute or not? Unemployment benefit, workfare and citizen's income in a dual labour market,* marzo 2000.

129 **Davide IACOVONI, Alberto ZAZZARO,** *Legal System Efficiency, Information Production, and Technological Choice: A Banking Model,* aprile 2000.

130 **Riccardo MAZZONI,** *I fattori di competitività dei settori tradizionali italiani: sintesi di un dibattito,* aprile 2000.

131 **Antonio G. CALAFATI,** *How Do Collective Agents Think?,* aprile 2000

132 **Antonio G. CALAFATI,** *Albert O. Hirschman on Economic Evolution,* aprile 2000.

133 **Antonio G. CALAFATI,** *On Industrial Districts,* aprile 2000.

134 **Alberto BUCCI,** *On Scale Effects, Market Power and Growth when Human and Technological Capital are Complements,* maggio 2000.

135 **Luca PAPI, Alberto ZAZZARO,** *How Does the EU Agenda Influence Economies Outside the EU? The Case of Tunisia,* giugno 2000.

136 **Roberto ESPOSTI,** *Public R&D Design and Technological Spill-Ins. A Dynamic Model,* giugno 2000.

137 **Alessandro STERLACCHINI,** *L'accesso alle professioni regolamentate: un' analisi empirica sui laureati degli atenei marchigiani,* luglio 2000

138 **Alberto BUCCI, H. Cagri SAGLAM,** *Growth Maximizing Patent Lifetime,* luglio 2000.

139 **Riccardo MAZZONI,** *Alcuni vincoli del processo di accumulazione,* agosto 2000.

140 **Riccardo LUCCHETTI,** *Inconsistency Of Naive GMM Estimation For QR Models With Endogenous Regressors,* luglio 2000.

141 **Alberto BUCCI, Fabio FIORILLO, Stefano STAFFOLANI,** *Can Market Power influence Employment, Wage Inequality and Growth?,* ottobre 2000.

142 **Alessandro STERLACCHINI,** *The determinants of export performance: A firmlevel study in Italian Manufacturing,* ottobre 2000.

143 **Renato BALDUCCI, Stefano STAFFOLANI,** *Quota del lavoro e occupazione in presenza di contrattazione efficiente,* ottobre 2000.

144 **Giorgio BARBA NAVARETTI, Enrico SANTARELLI, Marco VIVARELLI,** *The Role of Subsidies in Promoting Italian Joint Ventures in Least Developed and Transition Economies,* dicembre 2000.

145 **Roberto ESPOSTI, Pierpaolo PIERANI,** *Building the Knowledge Stock: Lags, Depreciation and Uncertainty in Agricultural R&D,* gennaio 2001.

146 **Francesco TROMBETTA,** *Il sistema economico locale di Fabriano e le sue articolazioni funzionali,* febbraio 2001.

147 **Antonio CALAFATI, Francesca MAZZONI,** *Conservazione, sviluppo locale e politiche agricole nei parchi naturali,* marzo 2001.

148 **Maria Rosaria CARILLO, Alberto ZAZZARO,** *Innovazione, ricerca della rendita e prestigio sociale: verso una teoria dinamica delle professioni,* maggio 2001.

149 **Marco GALLEGATI, Mauro GALLEGATI,** *European Business Cycles: 1960-1998,* maggio 2001.

150 **Luca NUNZIATA, Stefano STAFFOLANI,** *On Short-term Contracts Regulations,* maggio 2001.

151 **Massimiliano BRATTI,** *Oltre la scuola dell'obbligo. Un'analisi empirica della decisione di proseguire nell'istruzione post-obbligo in Italia,* maggio 2001.

152 **Massimiliano BRATTI, Stefano STAFFOLANI,** *Performance accademica e scelta della facoltà universitaria: aspetti teorici e evidenza empirica,* giugno 2001.

153 **Fabio FIORILLO, Giulio PALOMBA,** *Un modello CGE per l'analisi del federalismo fiscale all'italiana,* giugno 2001.

154 **Massimiliano BRATTI,** *Labour Force Participation and Marital Fertility of Italian Women: The Role of Education,* settembre 2001.

155 **Riccardo LUCCHETTI, Alessandro STERLACCHINI,** *Factors Affecting the Adoption of ICTs Among SMEs: Evidence From an Italian Survey,* ottobre 2001.

156 **F. Chelli, L. Rosti,** *Youth Unemployment and Self-Employment in Italy,* novembre 2001.