DISCUSSION PAPER SERIES

IZA DP No. 3148

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November 2007

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

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ABSTRACT

Testing Bounded Rationality against Full Rationality in Job Changing Behavior*

In this paper we question the hypothesis of full rationality in the context of job changing behaviour, via simple econometric explorations on microdata drawn from WHIP (Worker Histories Italian Panel). Workers' performance is compared at the end of a three-year time window that starts when choices are expressed, under the accepted notion that the main driving forces of job change are future real wages and expected job quality. Bounded rationality suggests that individuals will search for new options capable to attain "satisfactory" targets (aspirations levels, standards, norms), based on conditions prevailing in their own local environments. Our empirical strategy consists of appropriately defining such environments (cells) and observing the *ex-post* individual performance in relation to the degree of dispersion, clustering and mobility within and between cells. Under full rationality the following are to be expected: high inter-cell mobility, large dispersion around the targets, and clustering in the vicinity of the efficiency frontier. None of the above expectations are confirmed in this exploration. Our conclusion is that workers behave according to principles of rationality that seem distant from those of "full rationality" assumed in the vast majority of contemporary empirical (and theoretical) studies. The idea of "bounded rationality" à la Simon provides a better fit to our observations.

JEL Classification: J0, J6, J69

Keywords: bounded rationality, job changes, mobility, testing bounded rationality

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* The authors are grateful to participants to seminars in Tel-Aviv, Jerusalem, Torino and Moncalieri, Collegio Carlo Alberto, for their comments. In particular, we thank Z. Eckstein, Y. Weiss, J. Haltiwanger, D. Mortensen, U.Trivellato and A. Poggi for their helpful observations and suggestions. We owe a special acknowledgement to D. Card who has carefully read and commented an earlier version of this script, pointing out several criticalities. The usual disclaimers apply. This work has benefited from a research grant PRIN 2005 to the University of Torino.

1. Motivation

This paper is not on job changing behaviour *per se*. Nor do we explain how choices take place. It is an empirical exploration aimed at testing a hypothesis of bounded rationality against one of full rationality. Job changing is the context in which our economic agents operate: we observe worker histories after a relatively long time since the decision to move or stay, and assess *ex post* whether the agents – movers and stayers - performed more or less rationally. Our conclusion is that workers behave according to principles of rationality that adhere more to the idea of "bounded rationality" à la Simon than to the principle of "full rationality" assumed in the vast majority of contemporary empirical (and theoretical) studies.

We hypothesize (as Simon did a long time ago, and others have done in the recent past) that individuals set targets / aspiration levels on the basis of "local knowledge", and choose "satisficing" options. Search and choice take place under limited information and computational ability. The agents' happiness depends on the difference between output y and aspiration level y* (*alias* reference point, *alias* norm in Akerlof's terminology). More sophisticated versions of this model embody "loss aversion" with kinked preferences at y*. In this exploration y* consists of a two-dimensional vector of long run wage growth and risk-on-the-job. Recognizing the specific decision rules that lead individual choices is, for the time being, out of reach: while we assume that a "satisficing" option will be selected, we cannot specify whether it will be the first, or second, or n-th option under scrutiny, and how close to y* it will have to be. According to Simon and followers, the aspiration level is evolutionarily updated over time on the basis of performance and learning mechanisms. In this exploration, however, and at least for the time being, we shall neglect the dynamic evolution of individual aspirations.

Our empirical strategy consists of three steps: (i) building the environments in which "local knowledge" may reasonably apply (cells, defined by the intersection of industry, firms size and geography); (ii) defining reference points (aspiration levels) as a vector of wage growth and risk-on-the-job targets relevant to each cell; (iii) observing the *ex-post* individual performance in relation to the degree of dispersion, clustering and mobility within and between cells.

Under full rationality the following are to be expected:

- high inter-cell mobility;
- large dispersion around the reference points;
- clustering in the vicinity of the efficiency frontier.

None of the above expectations are confirmed in this exploration.

We conclude that workers behave according to principles of rationality that seem distant from those of "full rationality". The idea of "bounded rationality" à la Simon provides a better fit to our observations.

More specifically, the performance of movers and stayers is compared at the end of a three-year time window that starts when choices are expressed, under the accepted notion that the main driving forces of job change are future real wages and expected job quality. A rational outcome of the job matching process - not necessarily implying utility-maximizing individuals – implies a positive tradeoff between future wages and risk-on-the-job.

Work histories, mobility, job changes and wages are observed in a large employer-employee linked longitudinal panel (WHIP, Work Histories Italian Panel). Job quality *per se* is not: we use as a reasonable proxy an indicator of job stability (denominated "risk-on-the-job") for which appropriate measures can be obtained. Movers are selected in order to exclude all those who have moved involuntarily, i.e. following or pre-empting collective layoffs.

The exploration is complemented by a quasi-counterfactual, i.e. restricting the comparison of the movers to that of their matching stayers (co-workers of similar skills in the same firm of origin, who have not moved or have decided not to move). This too provides additional strength to our intuitions.

In recent years various papers have provided evidence of bounded rationality in a variety of specific case studies reviewed below. The underlying idea here is along similar lines. The novelty of this paper is that we investigate the presence of bounded rationality by means of simple econometric explorations on panel data that have already been used in the recent past to test standard theories of job changing behaviour.[2] Looking at the data from such perspective, the results appear more consistent with the idea of bounded rationality à la Simon than models of fully rational, utility maximizing agents.

The plan of this article is as follows: par. 2 introduces the idea that unobserved heterogeneity may hide bounded rationality. Par. 3 provides a short survey of examples of bounded rationality reported in recent literature. Par. 4 presents the data, and par. 5 describes how the main performance indicators are measured. In par. 6 we introduce a pseudo utility function used as a benchmark for the definition of reference points and the empirical implementation that follows in par. 7 and 8. In par. 9 we estimate a reasonable tradeoff between wage growth and risk-on-the-job. The quasi-counterfactual analysis on voluntary movers and stayers is illustrated in par. 10, while par. 11 suggests that hints of sound rationality are (fortunately) visible also in our exploration. Par. 12 concludes.

[2] B. Contini and C. Villosio (2005), in B. Contini, U. Trivellato (eds.) "Eppur si muove. Dinamiche e persistenze nel mercato del lavoro italiano", Il Mulino, pp. 567-595.

2. Unobserved heterogeneity or bounded rationality?

Any theory of economic behaviour predicts that workers engaged in a dynamic environment may at some point consider mobility as a profitable alternative to their current position, and will evaluate options on the basis of two main elements: future expected earnings and expected job safety.

In a world of utility maximizing agents, everything unrelated to the arguments of the utility function will be hidden within the black box of unobserved heterogeneity. The standard explanation of why one could observe an efficiency frontier in the wage growth - job safety space reserved to few agents, with all the remaining ones dominated inside the frontier, is that any trade-off, however fragile, is an average regression with large residual variability attributable to unobservable characteristics of the individual workers.

Heterogeneity implies - *inter alia* - that positions strongly dominated in the interior of the wage growth - risk-of-job-loss frontier may correspond to optimal choices derived from unobservable multi-objective individual preferences: Mr. X is a stayer who "loves the amenities of Taormina where he is currently working"; Mr. Y is a mover who has switched to a new job because "he hated his former boss"; Mr. Z does what he does because he is a fool. An alternative explanation runs in terms of unobservable constraints to the actions of each individual (all kind of transaction costs[3], family constraints, etc.). Unfortunately both of these arguments - allowing any point in the wage growth – job safety space to be the optimum of some unknown and sufficiently constrained preference function - leads us trapped in a black box where any empirical argument aimed at understanding how people make choices becomes irrelevant. Rationality is assumed and cannot be disproved.[4]

Considerations other than future pay and job stability may well contribute to explain job changing behaviour: but they simply cannot be so systematically overwhelming as to force any empirical evidence in the black box of unobserved heterogeneity. If one is seriously convinced that additional first order determinants of behaviour enter the picture, then these must be explicitly introduced in the theoretical models of job search. To our knowledge, however, this is seldom been done. A more fruitful - and less demanding - approach suggests that limited rationality (à la Simon and followers) could be the key to this dilemma.

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[3] It is obviously commendable to single out, model and measure varieties of transaction costs. From a normative perspective, this is indeed a must if policy aims at removing or reducing their negative impact. But the normative perspective need not be present in positive studies on how people behave, as the present one.

[4] Empirical practice neglects this question. Instead of testing the predicted effect of utility maximization against the predicted effects of competing theories, economists tend to test against the non-substantive null hypothesis of no effect. In Conlisk's words (1996), this is "something like wrestling a rag doll; it doesn't prove anything, unless the ragdoll wins".

Another related answer, relevant as we move into empirical grounds, is the difficulty of forecasting into the future when one's individual planning horizon is reasonably long. As it would be, in this particular context, the decision of an adult male to accept a new job offer or stick to his old position (especially where the options are scarce as in Italy during the Nineties). Such horizon cannot be too long - certainly a long way from the infinite discounted horizon assumed by theorists of dynamic choice models – nor can it be too short – a myopic one-shot comparison between an outside offer and one's reservation wage, however defined. In this paper we experiment with a three-year horizon, a reasonable compromise, compatible with the available data. Empirical evidence strongly suggests that forecasting future scenarios is a very difficult task, which helps to explain the existence of strongly dominated observations.

In order to provide convincing evidence in favour of bounded rationality, we must engage in a patient job of data cleaning and removing cross and composition effects. The skeptics must be insured that our reading of the data is not contaminated by prior hypotheses out of line with most of today's mainstream contributions.

3. A short review of literature on bounded rationality

The concept of bounded rationality and satisfying behavior was introduced by H. Simon (1955 and 1986) since his early works that earned him the Nobel Prize. R.M. Cyert, J. March, O.E. Willamson were among the first to systematically propound the idea in the Sixties. For almost two decades thereafter economists ignored Simon's lesson. Not until the Eighties, much to the merit of the growing experimental literature, has there been a true revival of interest in Simon's work, and the recognition that "..... when choice problems are hard, people often resort to simple rules of thumb to help them cope"[5] .

Bounded rationality is reported in a wide variety of real instances documented in the beautiful survey by J. Conlisk (1996). Investors often appear not to benefit from the possibility to choose portfolios for themselves (S. Benartzi and R.H.Thaler, 2002). The behavior of US health club attendants is difficult to reconcile with standard preferences and beliefs (S. Della Vigna and U. Malmender, 2006). Similar findings are also reported in studies on consumer behavior in the credit card industry (H. Shui and L.M. Ausubel, 2004), portfolio performance (L. Guiso and T. Jappelli (2007), employee choice of 401(k) plans (B.C. Madrian and D.F. Shea, 2001), purchase of large appliances (J. Hausman, 1979), purchase of flood and earthquake insurance (H. Kunreuther et al. 1978), asset prices (D. Cutler, J. Poterba and L. Summers, 1991), the "winner's curse" in real auctions (A. Roth, 1988; O. Ashenfelter and D. Genesove, 1992). Perhaps the most interesting real

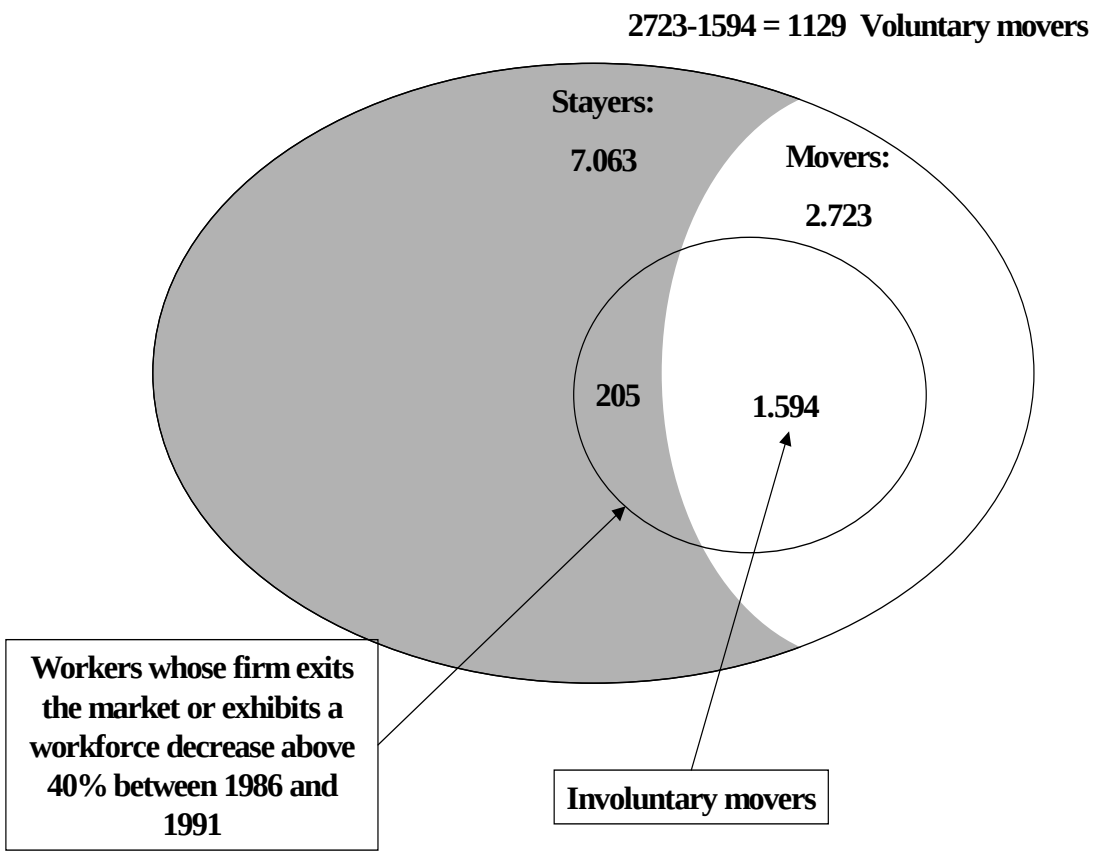
[5] S. Benartzi and R.H. Thaler (2002)

life experiment is reported by E. Fehr and L. Goette (2007): the setting consists of a bycicle messenger service where workers were free to choose hours worked and effort. The authors document a large negative response of hours to wage increase and explain it with reference dependent preferences.

Several factors are indicated as explanation of bounded rationality: overconfidence about self-control and future efficiency, overestimation of future attendance, distaste for psychological transaction costs, limited memory, fallacious commitment devices, time inconsistency, deliberation costs. In a series of by now classic contributions G. Akerlof and co-authors (1982, 1984, 1991) introduce concepts well known to sociologists but ignored by his contemporary economists: cognitive dissonance (the bias of fitting beliefs to convenience), salience (the bias of attaching undue weight to recent events), social norms and gift advantages. In his presidential address to the AEA 2007 G. Akerlof writes "The role of norms can be represented in people's preferences by modifying the utility function to include losses of utility insofar as they, or others, fail to live up to their standards". R.W. Cooper (1999) emphasizes the role of strategic complementarity and strategic substitutability as determinants of aggregate outcomes.

Arguments on learning and adaptation suggest that, if today things have gone wrong, tomorrow they'll go better. Unfortunately there is no general reason to believe that markets automatically render individual decision more rational over time. In long run it may work that way. Learning to improve and re-adapt one's performance – by trial and error – may, however, take minutes or years, depending on the context. In experimental situations adjustment may take place very rapidly (but this evidence involves stylized laboratory settings with small stakes and inexperienced decision makers who devote little effort to their choices); in shopping at the supermarket it may take a few days after buying and tasting a low quality marmelade. But in domains where the planning horizon is long and the stakes are high, like most life cycle decisions as well as technological evolutions of firms, learning and adaptation take time. In the early careers of young persons job changing is frequent for both workers and firms are in search of the right match: here too learning is slow. Finding a job is often costly and risky; "understanding if you like it" could take years; deciding to leave a post for a new one is a hard decision that may have adverse effects on the household's well-being and serenity.

Finally, it deserves recalling that even such "maestri" like A. Goldberger (1989) and K.J. Arrow (1986) noted that the utility maximization hypothesis has little empirical content without strong auxiliary assumptions on the utility function and other model ingredients. And, so they added, stating auxiliary assumptions is often little different from stating empirical predictions



outright, as a sociologist might. In this sense, the utility maximization hypothesis merely "packages" the prediction.

4. Data

Our data are drawn from WHIP (Work Histories Italian Panel), an employer-employee longitudinal random sample of all Italian employees of the private sector, observed at monthly frequency (at the time available from 1985 to 1998, now updated to 2003). The sample-population ratio is 1:90. We use a closed panel of male individuals working full-time in the private sector, aged between 30 and 40 in 1986 (over 7000 individuals), and observe their histories and job changes from 1986 through 1996. Gender, age and working hours restrictions respond to the necessity to minimize heterogeneity of behaviour unrelated to job changing activities (maternity and child care, retirement choices, etc.). The post change performance of movers and stayers is recorded through a sliding three-year window ending in 1996.

Figure 1

5. Measurement issues

5.1 Movers and stayers

Analysis must be restricted to workers who have made an explicit and voluntary decision to change or retain their job in the recent past: individuals currently employed who received no outside

offers, whether after searching or otherwise, should not enter our sample. Upon receiving an outside offer all workers are faced with move or stay decisions. Unfortunately, in the data at hand – for that matter in any microdata from longitudinal employer-employee datasets – there is no information on job offers or other elements that help to distinguish between voluntary and involuntary decisions. Under plausible assumptions, it is possible to single out the voluntary movers from those who have been forced to change job, either because laid off or because they decided to pre-empt a future likely layoff. For the stayers, instead, the distinction between voluntary and involuntary decisions is prohibitive: for this reason we choose to neglect them from much of our analysis. Will such a decision distort our conclusions ? We don't think so. Movers and stayers are individuals with similar characteristics. If the evidence supports the hypothesis of bounded rationality of the movers, there are good reasons to suppose that the same holds for the stayers.

Stringent criteria are used to recognize the voluntary movers from those who switch job for different reasons. Collective layoffs have been frequent in the Eighties and Nineties in the course of industrial restructuring, and are recognizable in our dataset. We have chosen to eliminate all individuals who find a new job after such events: in Italy the large majority will take whatever position is in sight, no matter how bad, rather than staying unemployed (unemployment benefits have been very modest throughout the early Nineties). In addition we select out all individuals who are found on a job in the observation period, but have been – as it were -"forced" to leave a preceding position in order to pre-empt a likely layoff if the industry or firm is facing an unfavourable course. These are individuals who are at work in 1991 after having switched jobs in the 1986-91 period: either (i) leaving firms that had closed and exited the market before 1991; or (ii) had undergone workforce reductions before 1991 in excess of 40% of the 1986 workforce.[6]

We cannot deal in the same way with individual layoffs. This should not, however, pose much of a problem as Italy's employment protection legislation makes them a very rare event.

We assume the planning horizon to be a three-year window that starts when choices are expressed.

Thus "movers" are individuals observed in one firm in 1986 and in a different firm in 1991. Multiple moves between 1986 and 1991 are irrelevant for this definition. If the last relevant job switch occurred before 1991, say in 1990, the time window over which his performance is measured starts in 1990. In most cases, therefore, the movers' *ex-post* performance is observed in the 1991-1994 time window; occasionally in the 1989-1992 and 1990-1993 windows. In such cases the different impact of the changing business cycle will be explicitly considered.

[6] We have also experimented with a more stringent 10% threshold to identify the involuntary movers. The idea was to avoid including quits attributable to fear of losing one's job, at the cost of risking the exclusion of some voluntary movers. This experiment turns out to have very little impact on our results.

"Stayers", instead, are individuals observed in the same firm from 1986 to 1991, although their career may have been interrupted by short unemployment (or temporary layoff) spells in between. Their *ex-post* performance is always observed in the 1991-1994 time window.

5.2 Wage growth and risk-on-the-job

The performance of movers and stayers is assessed at the end of the three-year window that starts when choices are expressed.

Real (long run) wage growth (W)

STAYERS

w3 = average yearly nominal wage earned during the 3-year spell started in 1990:

w1 = average yearly nominal wage earned at the end of 1990.

MOVERS

w3 =average yearly wage earned during the 3-year spell after the job switch

w1 = average yearly wage earned at the end of the period preceding the job switch.

Nominal wages are deflated by CPI (p).

W = real (long-run) wage growth
W = w3/ p / w1/p

Risk-on-the-job (ROJ)

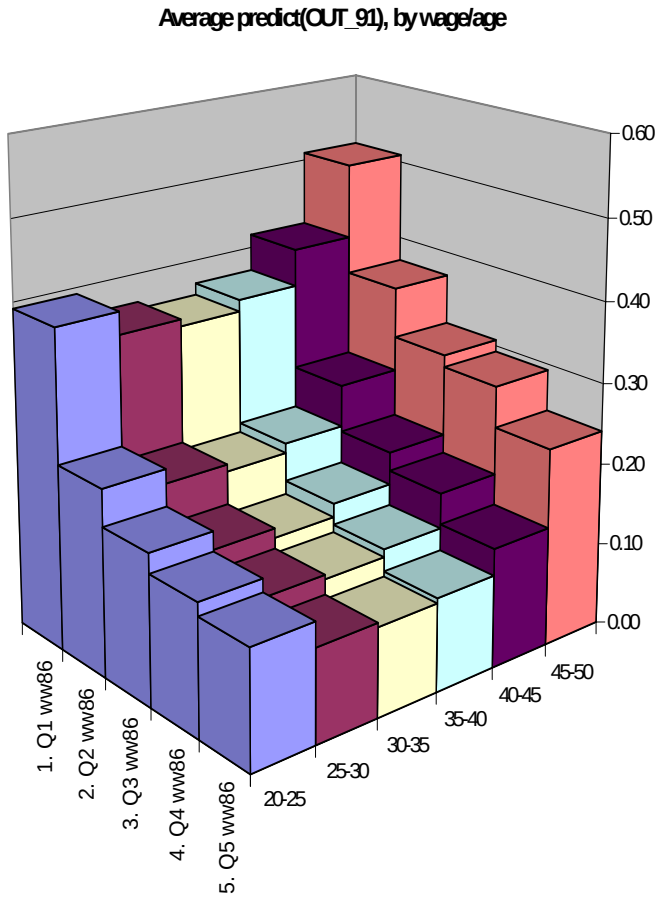
The risk-on-the-job indicator is built on the basis of two elements: the worker-specific predicted likelihood of dismissal in the past 1986-91 time window, and a forward looking firm-specific indicator of employment trend over the subsequent three-year period 1991-94.[7] The former is weighted by the latter as follows:

Risk-on-the-job = ROJ = [predicted individual likelihood of dismissal 1986-91 | individual and firm of origin characteristics] / [firm employment trend 1994 / 1991]

Suppose that Mr. X's predicted likelihood of (past) dismissal is 0.30. If Mr. X stays at his firm of origin and such firm increases employment by 50% in the next 1991-94 period. Mr. X's risk-on-the-job is reduced to 0.30/(1+ 0.5) = 0.20. If he moves to a different firm that cuts employment by 20%, his risk-on-the-job increases to 0.375 = 0.30/(1-0.2).

(a) likelihood of dismissal prior to 1991

[7] The trend is calculated as follows : [E(1994) / E(1991) + 0.25]. Adding 0.25 prevents the ratio (in the denominator of ROJ), from becoming zero when the firm goes bankrupt and/or exits the market.



In order to estimate the likelihood of dismissal, we resort to the open panel 1986-1991, including all full-time male workers aged 20-50. In 1986 the number of workers on payroll is 36,114; of these, only 15,394 are left by 1991. We estimate a logit separately for white and blue collars, against a set of covariates including age and age-square, wage, industry, location, firm size and firm employment trend, initial conditions and various interactions. All the main covariates are highly significant (results are available).

Fig. 2 displays the predictor of dismissal as a function of age and initial pay (by wage quintiles): the predicted likelihood is U-shaped in age and decreasing in wage. Not surprisingly prime-age workers are those at least risk of dismissal, while at high risk we find the low paid independently of age. Under the plausible assumption that wage and productivity are correlated, this strongly suggests that firms in need of downsizing tend to retain their most productive workers. [8]

Figure 2

(b) projected employment trend

Firm employment histories are observed through 1996. The ratio between total employment on each firm's payroll at the end of 1994 and in 1991 provides a simple indicator of firm-specific trends. The movers' ratio E(1994) / E(1991) is measured at the firm that made him a successful offer (around 1991). Nearly two thirds of the observable firms reduce their workforce in the 1991-

[8] P. Gautier et al. (2002) investigate firm downsizing in the Netherlands. Their findings are similar to ours: at each job level it is mainly the lower educated workers who leave during downturns.

94 period that falls around the 1993 recession: this is in line with well known trends of the Italian labor market. A striking 25% of the movers who switched jobs around 1991 end up in firms that exit the market before the end of 1994, while only a more modest 10% of the stayers (who did not make the switch) are in the same position. All the above individuals are at work at the end of 1994, implying that they have switched to a new job after the closure of their previous employer. Not surprisingly, therefore, as will be reflected in ROJ, the movers are much more exposed to the risk of job loss than the stayers: this is an interesting and novel result for which we find no precedents.

6. A pseudo-utility function as a plausible benchmark

As a plausible benchmark (fully rational individuals) we assume a Cobb-Douglas utility function (U) in two arguments: the observed (ex-post) real wage growth over the future 3-year window (W), and a proxy of risk-on-the-job (ROJ)

U = [(W)**n] / [ROJ**m]

Workers accept job offers on the basis of two criteria:

- if the wage offer is "sufficiently high" (i.e. higher than some unknown reservation wage);

- if the offered position is subjectively perceived to be "sufficiently stable" (i.e. with a low probability of being dismissed or forced to leave).

Both arguments imply a subjective judgement on the future evolution of earnings and on the quality of the job. In fact, neither W, nor ROJ are known a priori.

The robustness of the hypothesis of bounded rationality may be tested also by letting n and m take different values.

7. Different performance of movers and stayers

Some results of this investigation are in accord with standard literature, some are not. For instance, as is found in many studies on job changing behavior, movers do somewhat better than stayers in terms of wage growth. But movers are in a worse position in terms of risk-on-the-job. The comparative performance of movers and stayers, measured by a utility function that embodies both elements depends on the relative weight given to each. Unless risk-on-the-job carries a very

small weight compared to wage growth, the stayers appear to be better performers than the movers. The implication (not surprisingly) is that the movers have a higher risk propensity than the stayers.

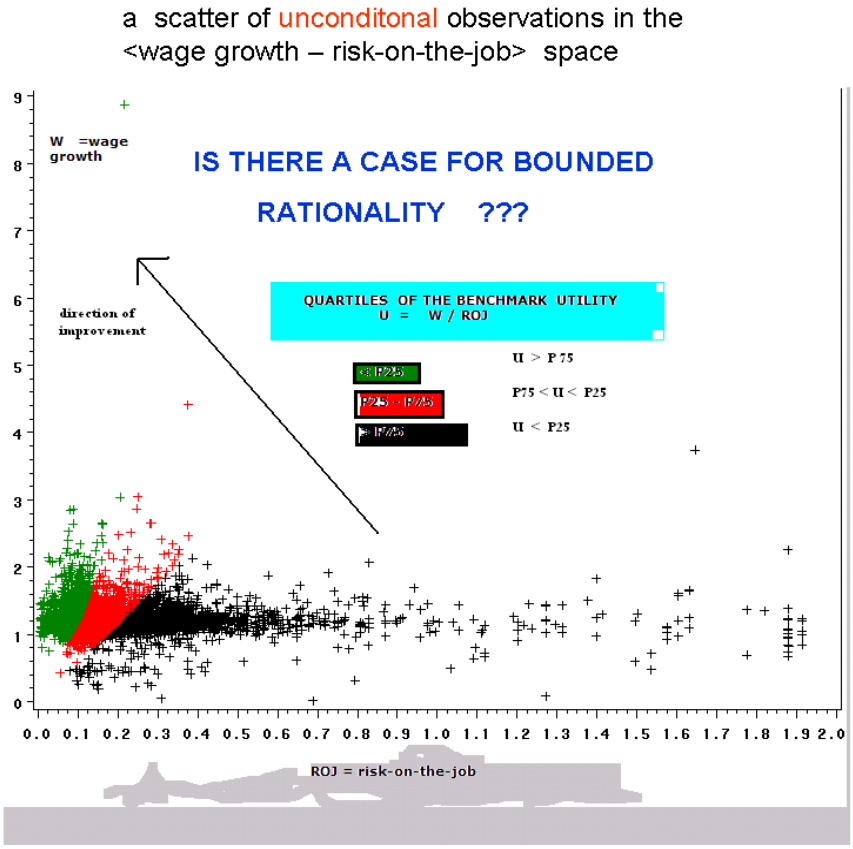


Fig. 0 – Scatter of unconditional observations in the <W- ROJ > space

Previous research on these data– relative to the 1986-91 period - established the following results;[9] (i) the mean initial wage (1986) as well as the mean final wage (1991) of the stayers is higher than that of the movers; (ii) the wage growth of the movers is slightly higher than the stayers'[10]; (iii) movers do better than stayers at young age (20-30), but the difference tends to vanish thereafter; (iv) mover-stayer differentials are larger among white-collars than among blue-collars.

The following differences are illustrated by the cumulative functions of each performance indicator (fig. 3-4):

[9] B. Contini and C.Villosio (2005), "Worker mobility, displacement, redeployment and wage dynamics", ch. 16 in B. Contini and U. Trivellato (2005). Additional findings are reported in: B. Contini, R. Leombruni, L. Pacelli and C. Villosio, "Mobility and wage dynamics in Italy", in E. Lazear and K. Shaw (eds.), The Structure of Wages within Firms: Europe and the United States, Chicago, NBER Series (forthcoming 2007).

[10] (i) and (ii) are widely accepted stylized facts on job changing performance. See Lazear (1998), Topel (1991), and many others who have followed.

- Wage growth (W)

Movers do better than stayers in terms of wage growth in the 3-year window following 1991, but only beyond the median. In the low tail of the distribution we find a slight prevalence of stayers. The same pattern holds for both blue and white collars (fig. 3/A). The variance of the movers is slightly larger than the stayers'.

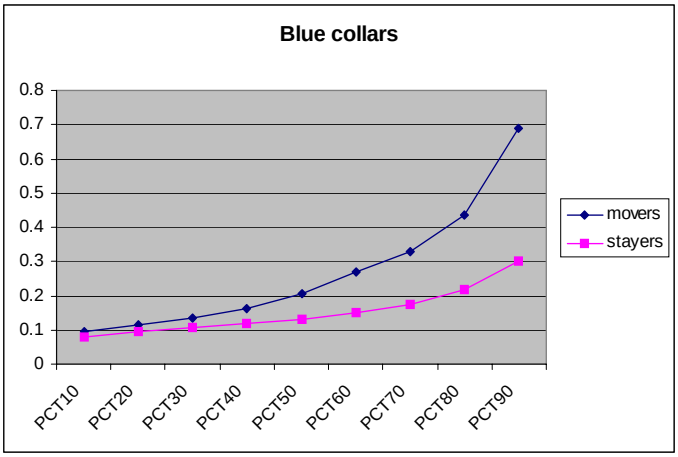
- Risk-on-the-job (ROJ)

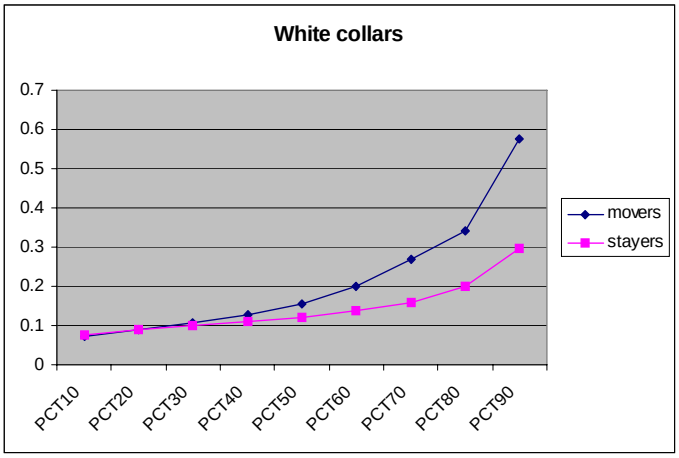
The situation is reversed, with the stayers facing a much lower risk-of-job loss than the movers. Movers appear to be risk-prone, willing to accept a higher pay at considerable cost in terms of job safety. At P50 the stayers' ROJ is 0.12 against 0.16 for the movers among white-collars; 0.12 against 0.20 among manual workers. At P75 the difference increases to 10 p.p. (0.18 vs. 0.28) and 14 p.p. (0.18 vs. 0.32) respectively. Beyond P75 the differences explode (fig. 3/B). The ROJ variance is much larger among the movers.

- Utility U (various parametrizations)

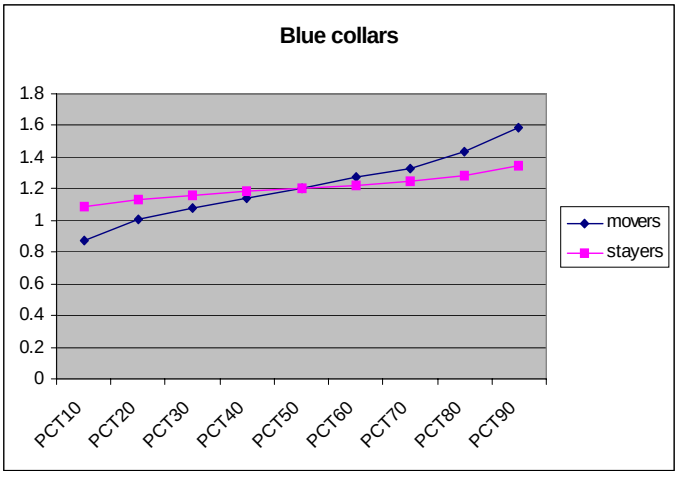
With unit elasticities (+1 and –1 respectively for numerator and denominator, corresponding to m=n=1) the stayers dominate the movers, with the ROJ differential driving the result (fig. 3/C). About 43% of the movers are found in the first quartile of the U-distribution, against 22% of the stayers. Conversely, 26% of the stayers belong to the upper quartile against less than 20% of the movers. If more weight is given to ROJ (Fig. 4, m=1, n=3), the stayers' dominance is complete among the blue-collars, and nearly complete among the white-collars. In the opposite case (more weight to W, with m=3, n=1), the stayers lie above the movers through P80 of the U-distribution among the blue-collars, and slightly P50 among the white-collars.

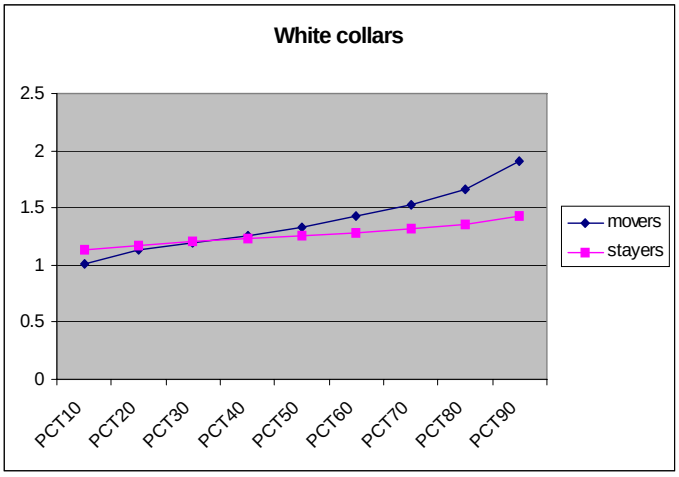
Risk-on-the-job = ROJ (fig. 3 B)



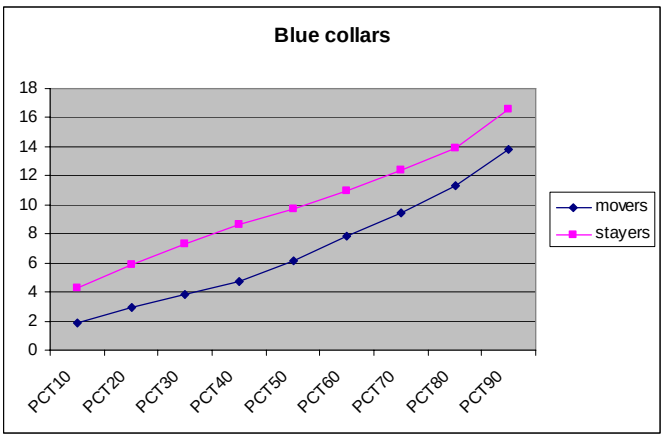


Wage growth = (G-w) (fig. 3 A)





U (fig. 3 C)



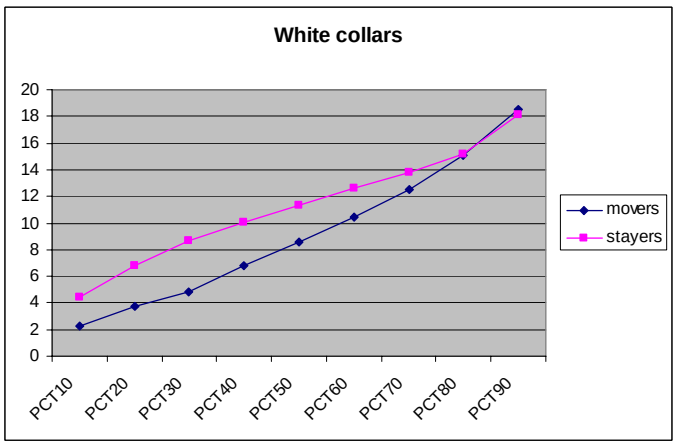
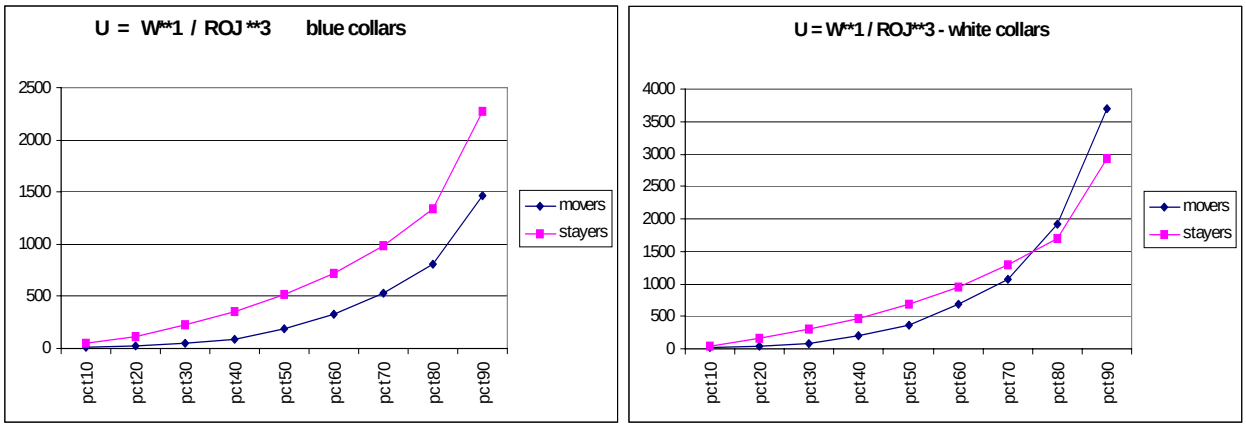


Figure 3 A-B-C

U (n=1; m=3)



U (n=3; m=1)

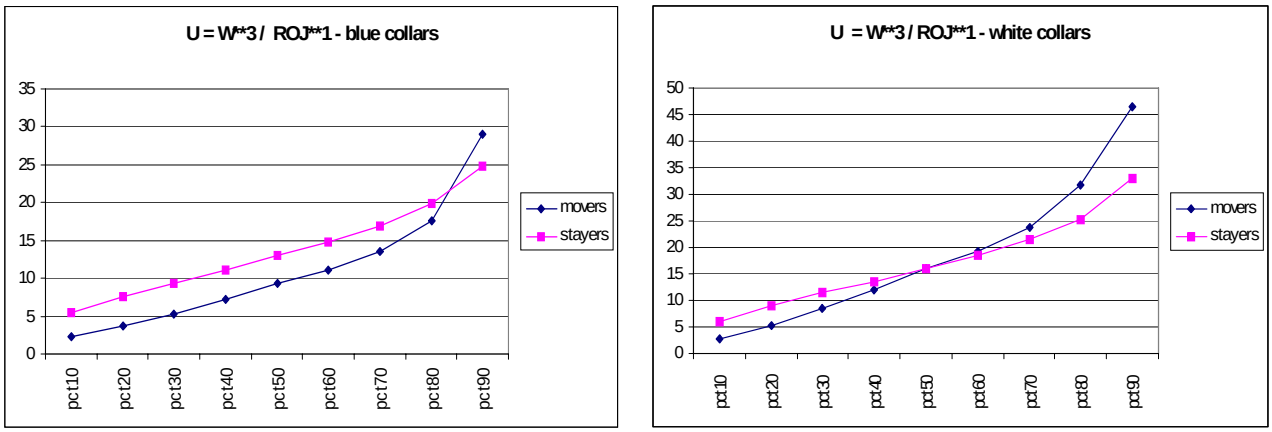


Figure 4 A-B

8. Setting "reference targets" and comparing performance

Bounded rationality suggests that individuals will search for new options capable to attain "satisfactory" targets (aspirations levels, standards, norms), based on conditions prevailing in their own local environments. Our first task consists, therefore, of defining such environments. As a reasonable approximation we build 198 cells defined by the intersection of 11 industries, 3 firm sizes, 2 skill groups, 3 geographical areas. In order to have at least 10 individuals in each cell, we retain only 42 cells, which leaves us with 978 workers out of 1086 in the original sample. Thus each cell yields the "local environment" of all 978 individuals. Reference points reflect conditions – wage growth and risk-on-the-job - prevailing in each person's cell at the beginning of the 3-year time window that defines one's planning horizon.

Reference points may be very ambitious or relatively modest, depending on the personal characteristics and past of each individual. Here we experiment with two sets of targets, the first modest, the second quite ambitious:

- y^* = the medians of W and ROJ within-cell 1991 - distributions
- y^{**} = the 66-th percentile of W, and the 33-th percentile of ROJ within-cell 1991 distributions

We adopt three criteria to compare each individual's ex-post performance with his reference point.

(i) count the frequency of observations contained in circles centered at y^* and y^{**}, proportional to the interdecile range (P90 – P10) of the U = W / ROJ within-cell distribution;

(ii) count the frequency of observations that jointly attain y^* and y^{**} (above both reference points) and its complement, i.e. that fail to attain at least one target (below one reference point);

(iii) measure the average Euclidean distance (D) of all cell observations from y^* and y^{**}.

Each of these criteria helps to ascertain the soundness of the hypothesis of bounded rationality: under BR one would expect a large number of observations close to the reference points and a reasonable number jointly attaining them. There is no reason to expect similar results with fully rational, utility maximizing agents.

8.1 Reference points in <W - ROJ> space

Consider the position of the reference points y* in <W – ROJ> space: it resembles the unconditional scatter of individual observations (fig. 1).[11] The N-W reference points strongly dominate those placed in the S-E region of the plot. Is this a surprising finding ? No, if it the ex-post performance of the individuals belonging to each cell (k) is clustered around y*(k). Yes, if the ex-post performance is sparcely distributed independently of y*(k). As will be seen below, the clustering is much tighter than one would expect under full rationality, where the reference points are irrelevant for individual choice.

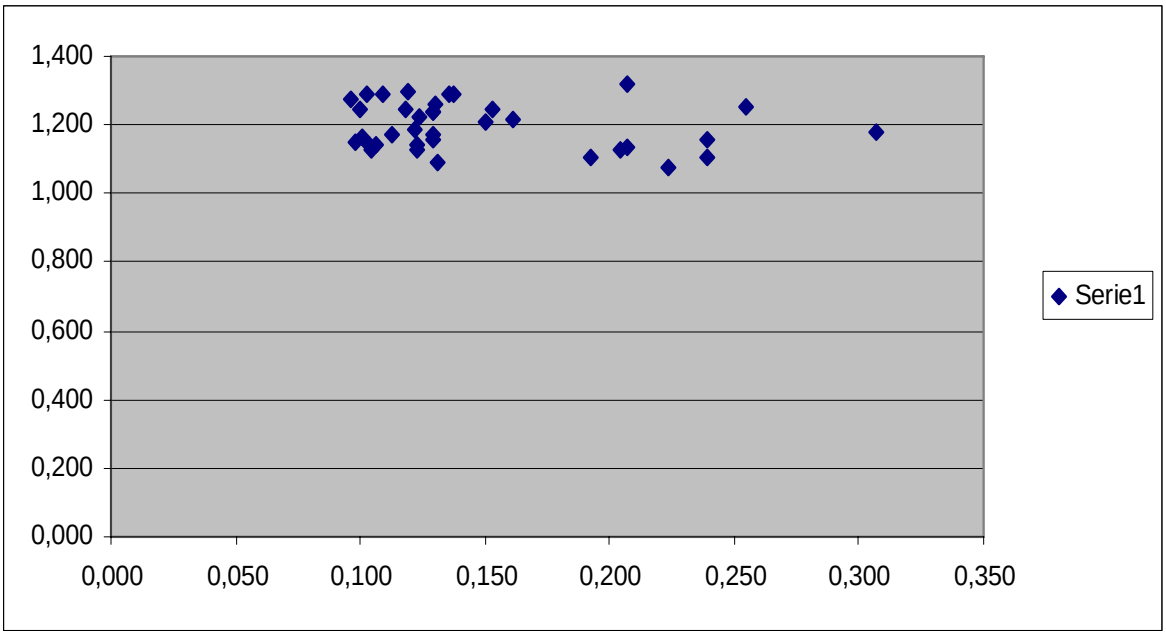


Figure 5

8.2 Clustering around reference points

For each cell we build two sets of circles centered at y* and y** with diameter proportional to the interdecile range (P90 – P10) of the U-distribution of observations belonging to the cell. The size of the circles is the same, whether centered at y* or y**, as they reflect the variability of U within each cell. The position of the circles in the <W-ROJ> space is that of the reference points y* and y** themselves.

[11] The difference with the plot of y** in <W-ROJ> space is a slight N-W displacement of all observations in the latter case.

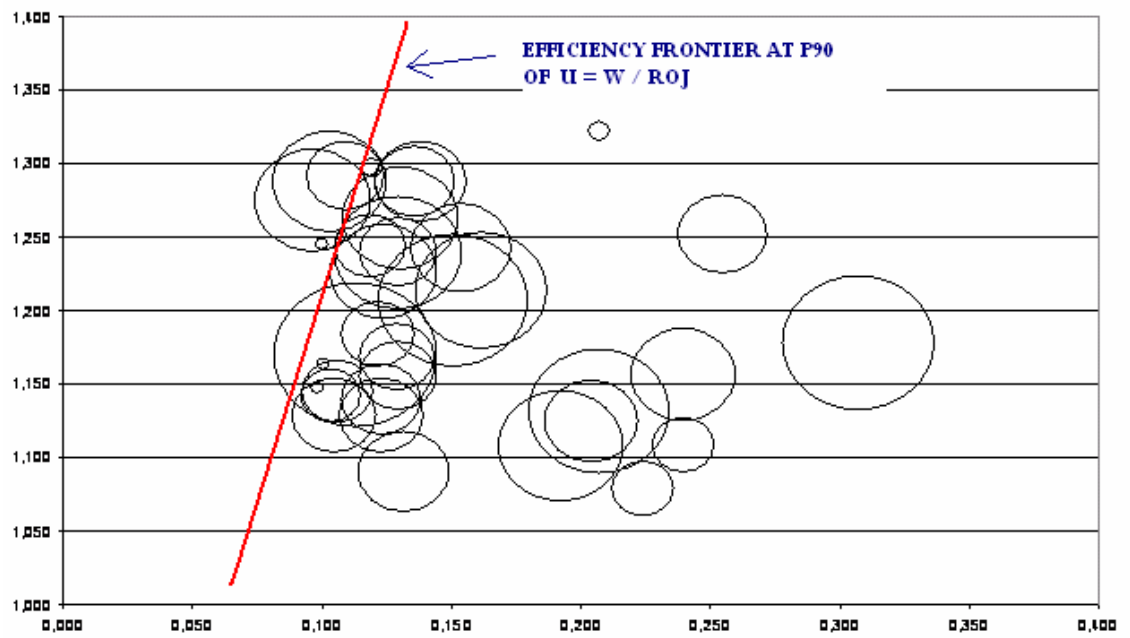


Figure 6

In order to assess the clustering of observations around the relative reference points, we count the observations contained in each circle. The circles centered at y* = [P50(W), P50(ROJ)] contain about 80% of the observations belonging to the corresponding cells, while those centered at the more ambitious y** = [P66(W), P33(ROJ)] include about 90% of the observations.[12] This result suggests a considerable amount of clustering, in line with hypotheses of bounded rationality.

This argument in favour of BR is strengthened by the additional finding that the number of observations found beyond the theoretical efficiency frontier – defined as P90 of the standard U-distribution (m= n= 1), positioned to the left of the graph and cutting across a few cells, is very small. The only exception being those belonging to the banking-insurance industry **(cells 8xy)**, in the N-W of fig. 6. The result holds also for different parameters of the U-distribution (m= 1 and n=3; m=3 and n=1), reported in table 1.

[12] The variability in circles centered at y** is, by construction, larger than in circles centered at y*, as they include more extreme observations. This explains also why such circles contain a larger share of observations.

Table 1: % frequency of observations beyond efficiency frontier (defined as P90 of U - functions, with m, n = 1, 3)

cell	U=W/ROJ**3	U=W/ROJ	U=W**3/ROJ
2LB	3	3	5
2LW	15	18	27
2MB	4	4	4
2MW	21	21	26
2SB	0	0	8
3LB	7	7	5
3LW	10	14	25
3MB	7	11	13
3MW	13	16	26
3SB	2	2	9
3SW	18	18	18
4LB	6	13	38
4LW	7	13	33
4MB	12	18	21
4MW	20	23	29
4SB	0	0	4
4SW	13	0	13
6LW	29	29	29
6MB	4	4	8
6MW	16	16	24
6SB	0	2	6
6SW	10	10	21
7LB	9	0	0
7LW	0	13	13
7MB	0	0	0
7MW	0	0	0
7SB	0	0	9
8LB	50	50	0
8LW	30	26	33
8MB	15	15	23
8MW	56	64	64
8SW	40	40	40

8.3 Attainment of the reference points

Consider now the degree of joint attainment of the reference points.[13] A quick glance at tab. 2 suggests that it is not as high as might have been expected. Often in the order of between

15% and 35% of the cases with respect to y* (column 1 - only 3 cases out of 42, above 50%), somewhat less with respect to the more ambitious target y** (column 2). Joint attainment is slightly higher among the white-collars (last cell digit of cell denomination is W).

Table 2: Frequencies of joint attainment of reference points

	Y** = [P60(W), P40(ROJ)]		Y*= [P50(W),P50(ROJ)]		hypothetical y* with ROJ (1991-94) = ROJ (1986-91) Y****= [P50(W),P50(ROJ$_{t-1}$)]	
cellfront	below	above	below	above	below	above
1LB	100	**0**	83	**17**	83	**17**
1LW	83	**17**	83	**17**	83	**17**
1MB	100	**0**	100	**0**	100	**0**
1MW	100	**0**	100	**0**	100	**0**
2LB	92	**8**	87	**13**	72	**28**
2LW	85	**15**	73	**27**	67	**33**
2MB	85	**15**	85	**15**	81	**19**
2MW	84	**16**	74	**26**	74	**26**
2SB	92	**8**	75	**25**	75	**25**
3LB	91	**9**	85	**15**	80	**20**
3LW	75	**25**	68	**32**	56	**44**
3MB	91	**9**	84	**16**	82	**18**
3MW	83	**17**	73	**27**	70	**30**
3SB	96	**4**	87	**13**	87	**13**
3SW	64	**36**	64	**36**	64	**36**
4LB	88	**13**	75	**25**	69	**31**
4LW	80	**20**	80	**20**	47	**53**
4MB	84	**16**	72	**28**	66	**34**
4MW	77	**23**	71	**29**	71	**29**
4SB	76	**24**	62	**38**	62	**38**
4SW	38	**63**	38	**63**	38	**63**
6LW	43	**57**	43	**57**	43	**57**
6MB	75	**25**	71	**29**	71	**29**
6MW	84	**16**	80	**20**	80	**20**
6SB	88	**12**	83	**17**	83	**17**
6SW	72	**28**	66	**34**	66	**34**
7LB	100	**0**	91	**9**	91	**9**
7LW	50	**50**	50	**50**	50	**50**
7MB	100	**0**	92	**8**	92	**8**
7MW	100	**0**	100	**0**	100	**0**
7SB	100	**0**	96	**4**	96	**4**
8LB	100	**0**	100	**0**	100	**0**
8LW	67	**33**	67	**33**	74	**26**
8MB	92	**8**	85	**15**	85	**15**
8MW	76	**24**	68	**32**	72	**28**
8SW	100	**0**	60	**40**	80	**20**

[13] If the ex-post performance were symmetrically distributed around y* - uniform and independent normal distributions, among others, would be the case – one would expect 25% of the observations to jointly attain both reference points. Under the symmetry hypothesis, the expected share of performances attaining y** is 1/9 = 11%. There is no reason, however, to expect symmetry. As a matter of fact, we find a positive tradeoff between wage growth and risk-on-the-job also at the cell-level (par. 9), implying that the dispersion around the reference points is positively sloped.

The low frequency of joint attainment can be explained by the fact that recession began to creep in the Italian economy in 1992, reaching its trough in 1994. Employment took a downturn in many industries, well below what could have been reasonably expected at the beginning of the Nineties. Many individuals who decided to change job in those years may have expressed over-optimistic predictions of risk-on-the-job, and such optimism affected performance relative to their reference targets. Tab.2 (col. 3) displays also the hypothetical joint attainment of y* if employment trends in 1991-94 were the same as in the preceding 1986-91 time-window: here, therefore, ROJ is held constant at the pre 1991-level. Not surprisingly the attainment frequency would have been higher in all cells, except the few where, inspite of the recession, employment increased beyond the 1991-level.

It is worth noticing that, with few exceptions, the share of observations jointly above the reference points is not drastically different across cells, independently of the fact that some strongly dominate others. This suggest that, in relative terms, individuals obtain similar degrees of satisfaction vis-à-vis the attainment of reference points, whether their own environment (and only their own) is a favourable one or not.

8.4 Distance from reference points

A different measure of within-cell variability is the Euclidean distance computed as follows:

$$D(k) = \text{sqrt}\,[1/n\ \Sigma\ (W(i,k) - W(k)^*)^{**}2 + (ROJ(i,k) - ROJ(k)^*)^{**}2]$$

where n is the number of observations in the k-th cell.

In fig. 7 D(k) is plotted against the utility [U = W/ROJ] associated with the reference points of each cell U[y*(k)]. The higher U[y*(k)], the closer the reference point to the theoretical efficiency frontier in <W – ROJ> space.

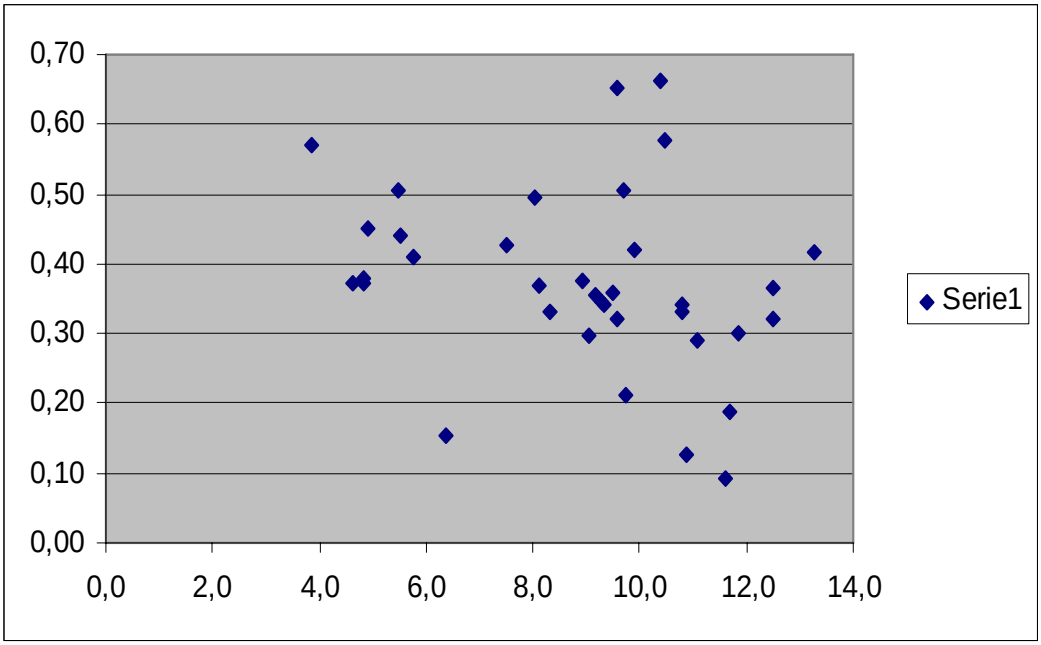


Figure 7 : D(k) in the ordinate, U[y*(k)] in the abscissa.

The large U – differentials among the D(k) reflect the position of the reference points in <W – ROJ> space, and the relative dominance of some cells over others. The plot reveals a slight negative association between D(k) and the utility U[y*(k)] associated with the k-th reference point. In cells with high U[y*(k)], closer to the theoretical efficiency frontier, there seems to be less variability (distance) than in cells removed from the frontier. Alternatively we might say that "small" clusters appear to be closer to the efficiency frontier than the "large" ones. This is, however, a fragile finding, for which we have no satisfactory explanation.

8.5 Inter-cell mobility

Bounded rationality suggests that individuals will search for new opportunities in their own specific environment. In this exploration the local environment of each agent is defined by his cell. Mobility across cells is indeed somewhat limited: 40% of the movers do not change cell; 65% of the movers do not change industry, although they move within each industry across firms of different size class; 88% of the movers from manufacturing sectors do not leave manufacturing; 76% of the movers from service industries remain in the services. In addition, less than 4% of all movers change geographical area.

Bounded rationality may be one answer to low inter-industry mobility, but it is not the only one. The theory of (specific) human capital would predict similar observations.

8.6 Is all this sufficient evidence in favour of bounded rationality ?

This question is the crucial one. Let us review what might be reasonably expected under the hypothesis of full rationality:

- greater dispersion around reference points. Reference points are irrelevant for utility maximizing agents, unless utility is reference-based.[14] But if this is the case, we are already stepping in the field of bounded rationality;

- more clustering in the vicinity of the efficiency frontier. We have argued that resorting to unobserved heterogeneity in order to justify the vast majority of dominated observations in the <W – ROJ> space leads into a black box where any empirical argument aimed at understanding how people make choices becomes irrelevant. Full rationality is assumed and cannot be disproved.

- possibly, high(er) inter-cell mobility, reflecting substantial search activity across industries and firm sizes. This argument is tempered by the fact that the mere existence of specific human capital would lead to predictions similar to the ones suggested by bounded rationality.

None of the above expectations are confirmed in this exploration. Thus our conclusion is all in favour of the hypothesis of bounded rationality.

The rest of the paper is devoted to pointing out that hints of sound individual rationality are (fortunately) all but absent even in the data under scrutiny here.

9 The trade-off between real wage growth and risk-on-the-job

9.1 OLS estimation

The existence of a trade-off between real wage growth and risk-on-the-job is to be expected not only among fully rational agents, but also among boundedly rational ones. Among the latter, however, we would also expect a trade-off between deviations of wage growth and risk-on-the-

[14] It could be argued that the reservation wage of standard job matching theory is likely to be related to the reference points of the model of bounded rationality under scrutiny here, although in empirical work it is often measured by the unemployment benefits, which are, however, equal for all. This argument may be have some truth, but it does not affect our contention.

job from the relevant reference points. We estimate the tradeoff with the following linear model on all the (voluntary) movers:

(1) **[(W(i,k) - W*(k)] = α + β [ROJ(i,k)- ROJ*(k)] + γ X(i,k) + d I(k) + e INTER(i,k) + u(i)**

where the i-th mover belongs to the k-th cell. X(i,k) are numerical covariates: age & age-square, last wage (in the firm of origin for the movers, in 1991 for the stayers), number of working days reported during last job spell, number and timing of job switches before the last move, length of unemployment spells between jobs, initial conditions 1986 (proxied by the ratio of individual wage to average firm wage); I(k) dummy of cell indicators: 2 skill groups, 9 industries, 4 geographical areas, 3 firm sizes; INTER(i,k): all relevant interactions.[15] Endogeneity of ROJ should not be much of a problem, as ROJ is estimated from worker-specific covariates prior to 1991, and forward looking firm-specific elements. We return to this problem in the next paragraph.

9.2 Removing individual fixed effects from wage growth

Equation (1) is estimated on a cross-sectional sample in the 1991-94 time window. It would be inappropriate – in addition to being unfeasible given the nature of the data - to perform fixed individual effects estimation on this specification. A "within" estimate would show the trade-off of the individual agents through time, with no explanation left for the enormous dominance relations that we observe across individuals. What we need is a "between" estimator that emphasizes such differences.

There are, nonetheless, reasons to suspect that fixed individual characteristics are present in the l.h.s. variable (W-W*) *per se*: individual wage growth is, to some extent, "negotiated" between employer and employee, and the latter's own characteristics will affect the bargain. Fixed individual effects are, instead, under control in (ROJ – ROJ*): ROJ is the ratio between the individual likelihood of dismissal in the 1986-91 window, and the firm-specific employment trend between 1991 and 1994. The numerator has been estimated with appropriate controls for initial conditions, while the denominator contains only firm-specific elements.

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[15] This model – aside from the fact that it is expressed in deviations from a reference point - is similar to the specification derived from theoretical equilibrium conditions of job search theory:

ln wage (i) = f (B, theta, nu, r) + g (X(i)-controls) + residuals (i)

ln individual wage is the l.h.s. In the r.h.s. we find B = unemployment benefits, a proxy of the reservation wage, theta = labor market thickness (or arrival rate of a job offer); nu = bargaining strength, a shift factor; r = a discounting factor incorporating all future dynamics. B, theta, nu, r are estimated and/or calibrated cross section and/or time varying average values. "Theta" and our "risk-on-the-job" convey similar (but opposite) concepts of job stability / instability. Thus, the implicit tradeoff between wages and job stability is negative, while it is positive according to our formulation.

Removing fixed effects from wage growth is feasible as both individual W and ROJ are observable in the 1991-94 window as well as in the previous 1986-91 period.[16] We use first difference estimation on a standard specification of W that includes the covariates present in (1), Let W(0,i) be the wage increase of the i-th individual in the time window 1986-81, and W(1,i) in the next 1991-94 window.

We use the specification used in the OLS version, with X numerical covariates and I dummy-indicators, and take differences:

$$W(0,i) = \alpha(i) + \beta * X(0,i) + \gamma * I(0,i) + res(0,i)$$
$$W(1,i) = \alpha(i) + \beta * X(1,i) + \gamma * I(1,i) + res(1,i)$$

$$\Delta W(i) = W(1,i) - W(0,i) = \beta * [X(1,i) - X(0,i)] + \gamma * [I(1,i) - I(0,i)] + [res(1,i) - res(0,i)]$$

which allows to retrieve $\beta\hat{}\hat{}$ and $\gamma\hat{}\hat{}$ coefficients non contaminated by individual effects.

We obtain non-contaminated predictors of W(1,i) as follows:

$$W(1,i)\hat{}\hat{} = \beta\hat{}\hat{} * X(1,i) + \gamma\hat{}\hat{} * I(1,i) + mean[W(0,i)]$$

and re-estimate (1) with $W(1,i)\hat{}\hat{}$ in place of W(i)

(2) $$\mathbf{[(W(i,k)\hat{}\hat{} - W^*(k)] = \alpha + \beta\,[ROJ(i,k) - ROJ^*(k)] + \gamma\, X(i,k) + d\, I(k) + e\, INTER(i,k) + u(i,k)}$$

We display here the OLS estimates of the two trade-offs, the first one with (W-W*) in the l.h.s., and the second one with the non-contaminated $(W - W^*)\hat{}\hat{}$. Both dependent variables, as well as (ROJ – ROJ*) have been normalized.

Table 3: Estimation of trade-off equations (1) and (2)
Reference point W* = [P50(W), P50(ROJ)]

	OLS estimates	after elimination of fixed individual effects in W
White	- 0.182	- 1.098 ****
(ROJ - ROJ*)	- 0.027	0.078 **
(ROJ - ROJ*) x white	- 0.119 *	0.053
Small firm 1991	0.070	- 0.073
Large firm 1991	0.010	1.920 ****
Moves	0.390 ***	0.094 *
Ineq86	- 0.479 **	- 0.660 ***
Ineq86 x white	0.400 **	0.145
Industry dummies 1991	n.s.	yes ***
Age & age**2	n.s.	n.s.
R*2	0.14	0.52

[16] ROJ 1986-91 is estimated simply as the predicted likelihood of layoff in that period, setting the denominator equal to (1 + 0.25). See footnote ( ).

Note: */ ** / *** / ****/ significant at 0.90, 0.95, 0.99 and 0.999 confidence levels.

The comparative size of Adj R-square (0.14 vs. 0.52) simply reflects the much smaller variability of the non-contaminated predictors (W^^ - W*) used as dependent variable, compared to the (W-W*) inclusive of individual effects.

The trade-off between wage growth and risk-on-the-job deviations, consistent with rational behaviour, must be positively sloped because higher wage growth compensates for higher risk of job loss. It is observable and robustly positive in the non-contaminated (W^^- W*) version - the estimated coefficient is 0.078, and possibly somewhat larger for the white-collars - while it is below significance (and negative) in the standard OLS version.[17]

Additional and interesting indications from equation [2] are to be mentioned: (i) the white-collars are severely penalized vis-à-vis manual workers in terms of wage growth deviations from the reference target. This result, at first sight surprising, suggests a certain dose of overconfidence on potential targets among white-collar workers, unmatched among the blue-collars. As a matter of fact, long run wage growth, *per se* - i.e. not its deviation from W* - is higher among the white-collars; (ii) the large firm-size effect - explaining the two clusters of observations (fig.--) – with large firm employees (in 1991) ending up much better than movers from small firms; (iii) the INEQ86 indicator of initial conditions, pointing to the fact that the attainment of the wage growth target is, *ceteris paribus*, more problematic the higher one's initial wage relative to the average wage paid by their 1986 - firm; (iv) the "moves" dummy (number of job switches), suggesting that individuals who made more than one job change – a rational choice following bad outcomes with the first switch (see par. 11) - improve their chances of wage growth attainment;

(v) the high significance of industry and skill dummies is counter-intuitive. All observations, once expressed in deviations from relevant targets, are compressed towards the origin. Thus, the impact of cell-specific dummies may be expected to vanish. But, as fig. 7 shows, the dominance of some cells is still very evident: white-collar cells are dominated; some industries and large firms outperform others.

Estimation has been performed also on wage growth and risk-on-the-job in levels, and not only on deviations from the reference points. Results are available, but not displayed here. Differences are

[17] As previously explained, the argument on the potential endogeneity of ROJ (on the grounds that it may be weakly, yet jointly determined with W) is a fragile one. We have, nonetheless, estimated a TSLS version of the tradeoff, with ROJ replaced by its predictor from a reduced form that includes all cell dummies. The results differ only marginally from those reported above, with ROJ losing some of its significance. If, instead, the tradeoff were estimated regressing ROJ against W^^ and covariates, the procedure would be equivalent to TSLS estimation. Also these results are available and yield conclusions similar to the ones reported here.

minor. The only interesting one relates to the white-collar dummy, which – as expected – does not show any penalization of the white-collars as the one reported for wage growth expressed in deviations from the reference point.

10. A quasi-counterfactual analysis: movers vs. matching stayers

It would be enlightening if we could respond to the question "how would the (voluntary) movers have performed had they decided not to move ?". Direct evidence is, obviously, not available. But the data allow to observe the history and performance of a certain number of individuals of the same skill group, co-workers in the firm from which the movers' job switch originated.[18]

We link each mover to his observable stayer co-workers. This can be done in two ways: firstly by linking to stayers in the same firm of origin; secondly by linking to stayers in the same cell of origin. In principle the first linkage is more correct than the second. But it leads to a much smaller sample size: 220 groups with at least 3 individuals observed contemporarily (out of 1594 movers in the whole panel). The second is less accurate but the linkage can be done for each mover. We illustrate the results of the second linkage, which turns out to be very similar to the first one.

The stayer co-workers ("matching stayers") of the same skill group represent a quasi-counterfactual: they are as similar as possible to the movers at the beginning of the observation period. There is, however, an important qualification which turns out to strengthen our conclusion: as explained in par. 5.1, we cannot single out the “voluntary” stayers, i.e. those who have been faced with options similar to those offered to his colleague mover (and have turned them down) from the “involuntary” ones. Thus the set of “matching stayers” is more inclusive than what we would like to have: this implies that we are about to compare the performance of voluntary movers with individuals who are somewhat worse off than we would like to have as a comparative group. This, as will be seen, strengthens our conclusions.

The PREMIUM for the i-th individual mover, defined as the ratio between his own performance indicator (benchmark utility, wage growth, risk-on-the-job) and that of his median matching stayers:

PREMIUM [U(i)] = U[mover(i)] / U[med (matching-stayers(i))]

PREMIUM [W(i)] = W[mover(i)] / W[med (matching-stayers(i))]

[18] The WHIP sample is drawn from the population of individual workers, the sampling ratio being approximately 1:90. This procedure leads to a modest oversampling of the large firms vs. the small ones: on average we observe 10 workers on the payroll of a company with 900 employees, but only 1 worker employed by firms with less than 50 employees (if at all).

PREMIUM [ROJ(i)] = ROJ[mover(i)] / ROJ [med(matching-stayers(i))]

indicates the relative performance of the i-th mover vis-à-vis his median matching stayers.

The following fig. 8-10 summarize the information derived from the PREMIUM-percentiles, computed separately for blue and white-collars. Among the manual workers, the median mover performs worse than his median matching stayer: in about 60% of the cases we observe PREMIUM < 1. Among the white-collars, instead, the comparative performance is split at the median (PREMIUM reaches 1 at P50).

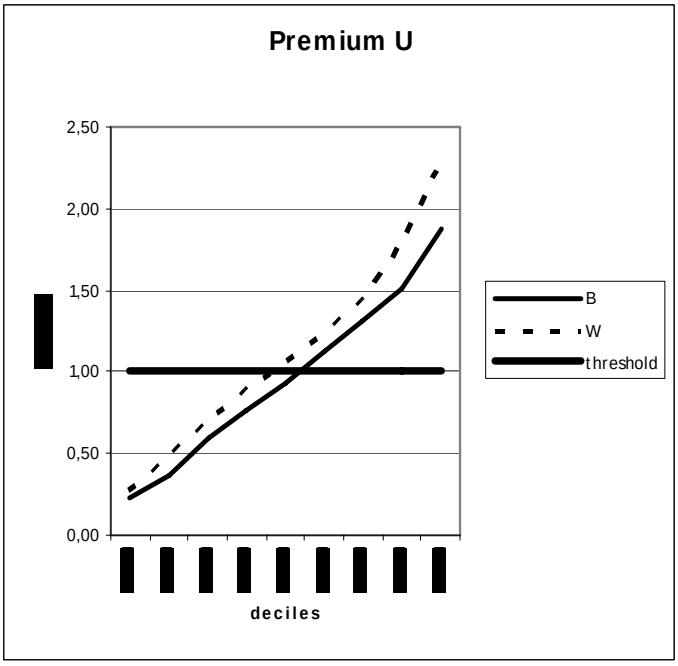
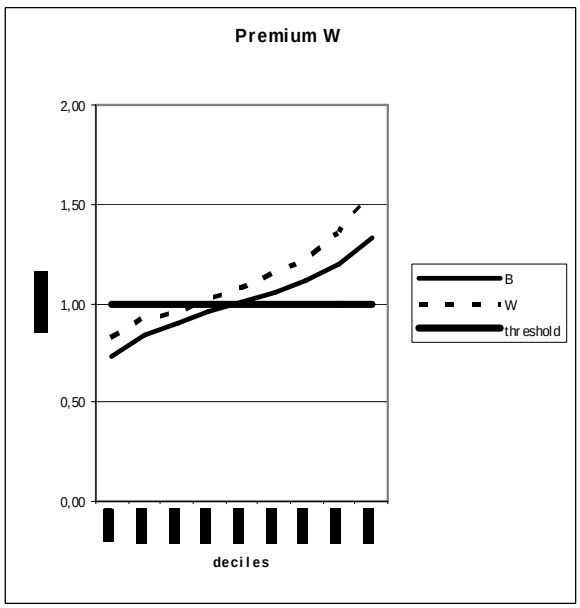


Figure 8: A quasi counterfactual analysis: Premium Utility = W / ROJ



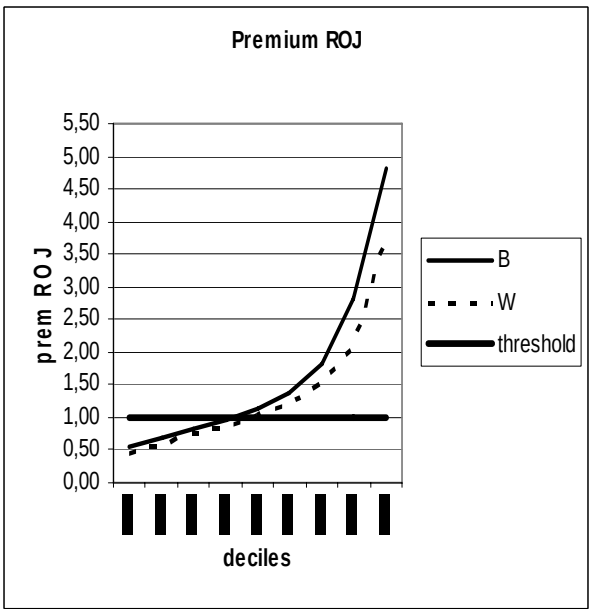
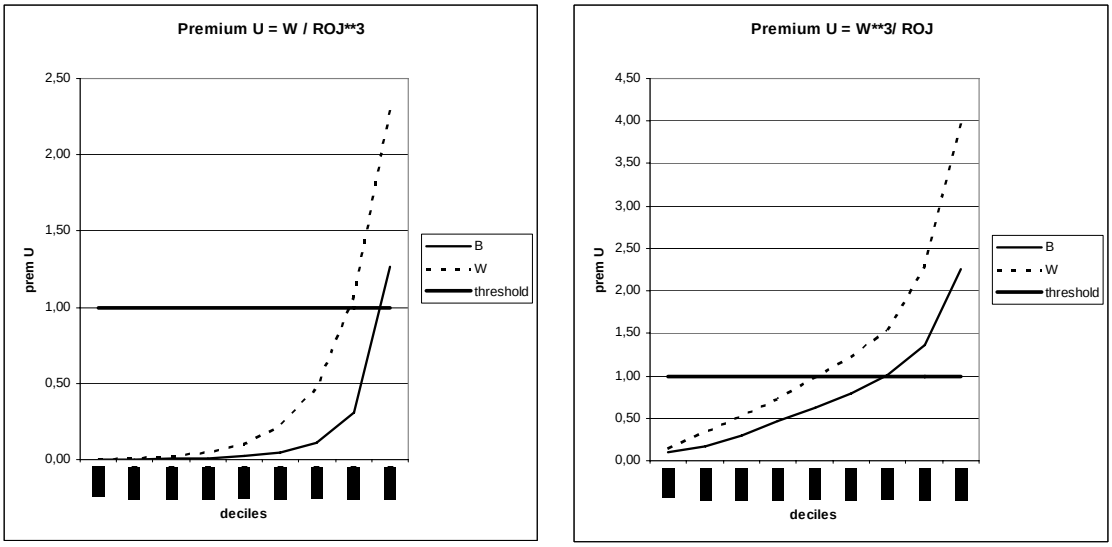


Figure 9: A quasi counterfactual analysis: Premium = IND (movers) / IND (matching stayers)

PREMIUM (UTILITY) with varying parameters *m* and *n*



MATCHING STAYERS BETTER OFF THAN MOVERS UNDER ALTERNATIVE PARAMETRIZATION OF UTILITY

Fig. 10 A Fig. 10 B

This leads us to conclude that the evidence of "sound" decisions of the (voluntary) movers relative to their matching stayers is rather weak, whether blue or white-collars. The answer to the question "how would the movers have performed had they decided not to move" would have to be "often times they might have performed better".

Two arguments reinforce the claim: (i) our matching stayers include the “involuntary” ones, i.e. those who have not been faced with any option other than sticking to their post. Thus the median stayers’ utility, as defined here, is lower than that of the median “voluntary” stayers which would have provided a more precise counterfactual. Despite this qualification, our results suggest that the matching stayers often do better than the movers; (ii) alternative parametrizations of the benchmark utility either improve the relative performance of the matching stayers (fig. 10 A; m=1, n=3), or change it only marginally (fig.10 B; m=3, n=1).

11. ...But there are also hints of rational response following unpleasant events

Hints of rational response (fortunately) appear among the movers when the events take a downturn after the first job switch. Low wage growth and / or big employment losses at the firm level elicit attempts to search in new directions and make additional moves in the three-year

window following the first switch. Likewise behave individuals who have been at (paid) work only a few number of days in recent years. This could be subjectively interpreted as a signal of forthcoming dismissal. A simple probit regression of the probability of job change suggests a robust causal link between low values of W and high ROJ in the r.h.s., and the likelihood of a new job change among the blue-collars, and even more pronounced among the white-collars. Results are not displayed, but are available on request.

12. Conclusion

In this paper we explore the performance of Italian workers along a decade (1986-1996) and assess the degree of "rationality" of individuals who have been faced with outside options and have voluntarily decided to make a job change. Bounded rationality, as opposed to the full rationality of utility maximizing agents, suggests that individuals will search for new options capable to attain "satisfactory" targets (aspirations levels, standards, norms), based on conditions prevailing in their own local environments. Our empirical strategy consists of appropriately defining such environments (cells) and observing the *ex-post* individual performance in relation to the degree of dispersion, clustering and mobility within and between cells.

Under full rationality the following are to be expected:

(i) high inter-cell mobility,

(ii) large dispersion around the reference targets;

(iii)clustering in the vicinity of the efficiency frontier.

None of the above priors are confirmed in this exploration. In addition, our estimates confirm the existence of a trade-off between real wage growth and risk-on-the-job, which is to be expected not only among fully rational agents, but also among boundedly rational ones. Finally, a counterfactual analysis of the voluntary movers' performance vis-à-vis the stayers' provides additional support to our intuition.

Our conclusion is that workers behave according to principles of rationality that seem distant from those of "full rationality" assumed in the majority of contemporary empirical (and theoretical) studies. The idea of "bounded rationality" à la Simon provides a better fit to our observations.

If this assessment is correct, the implications are powerful: are there reasons to believe that such patterns are found only in the context of job search and worker mobility and not in more general instances of economic behaviour ? Our survey of recent literature on bounded rationality strongly suggests the contrary. Why, then, should economists leave unchallenged and unchallengeable the hypothesis of full rationality ?

It is our hope to have drawn attention to methodological issues that look important, and that may provide plenty of good food for future and innovative research.

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