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WAGE MOBILITY AND DYNAMICS IN ITALY IN THE 90'S

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ABSTRACT

Inspite of the centralized nature of wage bargaining in Italy, we find some evidence suggesting the existence of firm-wage policies. Firstly, the ratio of the between-firm wage variability relative to total wage variability is sizeable, and not very dissimilar from that reported for other countries. Secondly, the tide raising all boats is quite suggestive: not only do individual wages throughout the whole distribution increase as average firm wages increases, but the spread increases too. Firm wage policy matters in shaping not only the wage level distribution but also the wage change distribution. The within-firm s.d. of wage change is almost as high as that of individual wage change, and much higher than between-firm variability of average change in wages. Worker-based statistics, on the other side, show that relative changes in individual wages follow the business cycle, although different parts of the distribution react in a different way to it, the upper tail having a higher responsiveness. Both facts are at odds with the often reported rigidity of Italian wages. Indeed, the detected flexibility is mainly driven by movers and short tenure workers. The cross-country comparison suggests that the relatively high degree of wage compression in Italy could be associated with higher entry and exit rates.

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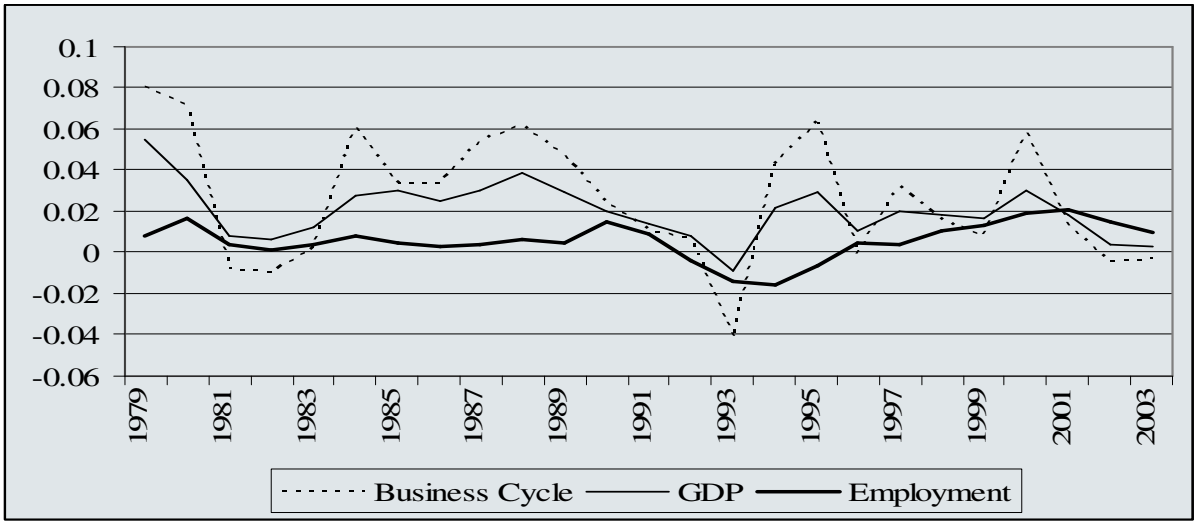
1. Macroeconomic Conditions and long term trends in Employment, Wages and Mobility

1.1 Employment

From the end of the 70's to the early 2000's the employment cycle in Italy had two long periods of growth, from 1983 to 1990 and from 1994 to today, interrupted by a strong recession from 1991-1993. The first growth phase was marked by steady GDP growth accompanied by a very modest increase in employment, with 3-4 percentage points difference in 1984-89 (it was described as "jobless growth"; see figure 1.1). In the early 1990s Italy was hit by the most severe recession since the second world war in terms of job losses. During the crisis of the early 1960s, which put an end to the so called "economic miracle", total employment declined by 640,000 full-time equivalent units; now the cumulative fall reached 1,080,000 units (Brandolini *et al*, 2006). The high drop in employment was not mitigated by job creation in the public administration, nor in State owned companies. Moreover, layoffs were easier – thanks to the 1991 reform of collective dismissals (see below, section 2) – and a drastic restructuring process continued till 1995.

The subsequent recovery, in contrast with what observed in the first growth phase, was marked by strong trends in employment – that took advantage of a period of salary moderation and labour market reforms – and a modest increase in GDP. Fig. 1.1 shows that from 1996 on employment started increasing again, with growth rates similar to the GDP. Beginning in 2000 this trend inverted and the employment growth rate exceeded GDP growth – which, while remaining positive, was clearly in decline. The elasticity of employment to GDP in the years post-1994 was about 0.7%, almost double with respect to 0.38% that characterized the phase of "jobless growth".

Fig. 1.1. Growth rates of GDP, employment and Bank of Italy's coincident indicator of the Business Cycle.

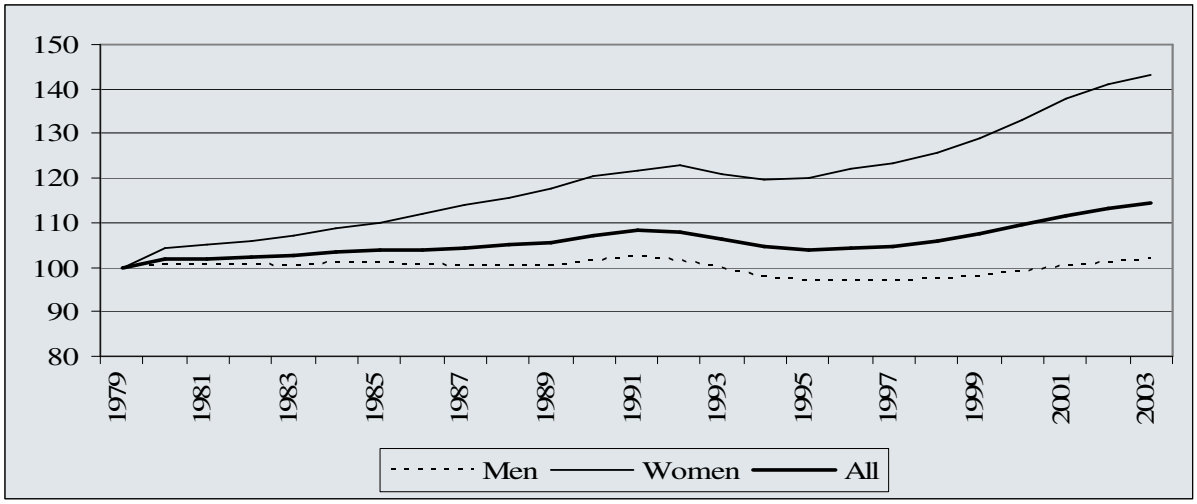


Source: Contini and Trivellato (2005)

Employment growth since the Eighties is almost completely attributed to women (see fig. 1.2). Female employment increased between 1979 and 2003 by 43%, while male employment was nearly stagnant.

The unemployment rate constantly increased till the end of the Eighties. After three years of modest decrease between 1989 and 1991, it increased again until 1996 – when it reached, using the old definition[2], a peak of nearly 16%. It then began to decrease during the years of intense employment growth, which brought it to just above 10% in 2004.

Fig. 1.2. Index numbers of employment by gender, 1979-2003 (1979=100).



Source: Contini and Trivellato (2005)

[2] In table 1.1 two unemployment rate time series are reported, before- and after the revision in the Labour Force Survey methodology and definitions occurred in 1992. In the old definition the criteria by which an individual was classified as a job seeker where looser, including those who compleated inactive search actions, and those who last searched more than four weeks prior. In line with ILO definitions these individuals are currently classified as inactive, belonging to the so called "potential labour force". There is evidence, however, that their characteristics and behaviours are more similar to the unemployed than to the inactive (see Brandolini, Cipollone and Viviano [2006]; Battistin, Rettore and Trivellato [2006]).

Table 1.1 Macroeconomic Conditions

	Unemployment rate		GDP (billion euros, 1995 prices)	Change in GDP		
	before LFS revision 1992	after LFS revision 1992		1 year	2 year	5 year
1970	5.3		486			
1971	5.3		495	1.9		
1972	6.3		511	3.2	5.1	
1973	6.2		544	6.5	9.9	
1974	5.3		573	5.3	12.2	
1975	5.8		561	-2	3.1	15.5
1976	6.6		598	6.5	4.3	20.7
1977	7.0		612	2.4	9	19.8
1978	7.1		634	3.7	6.1	16.5
1979	7.5		669	5.5	9.4	16.8
1980	7.5		693	3.5	9.2	23.4
1981	8.3		698	0.8	4.3	16.8
1982	9.0		703	0.6	1.4	14.8
1983	10.0		711	1.2	1.9	12.1
1984	10.7		731	2.8	4	9.2
1985	11.0		753	3	5.8	8.6
1986	11.5		772	2.5	5.6	10.5
1987	12.3		795	3	5.6	13.1
1988	12.4		826	3.9	7.1	16.1
1989	12.4		850	2.9	6.9	16.3
1990	11.3		867	2	4.9	15.1
1991	10.9		879	1.4	3.4	13.9
1992	11.5		885	0.8	2.2	11.4
1993	13.7	10.3	877	-0.9	-0.1	6.2
1994	15.0	11.2	897	2.2	1.3	5.5
1995	15.7	11.8	923	2.9	5.2	6.5
1996	15.9	12.0	933	1.1	4	6.2
1997	15.9	12.1	952	2	3.1	7.5
1998	15.7	12.3	969	1.8	3.9	10.4
1999	15.2	11.8	985	1.7	3.5	9.9
2000	14.4	11.0	1015	3	4.7	10
2001	12.4	9.7	1033	1.8	4.8	10.7
2002	11.8	9.3	1037	0.4	2.2	8.9
2003	11.1	9.0	1040	0.3	0.6	7.3
2004	10.2	7.4	1052	1.2	1.5	6.8

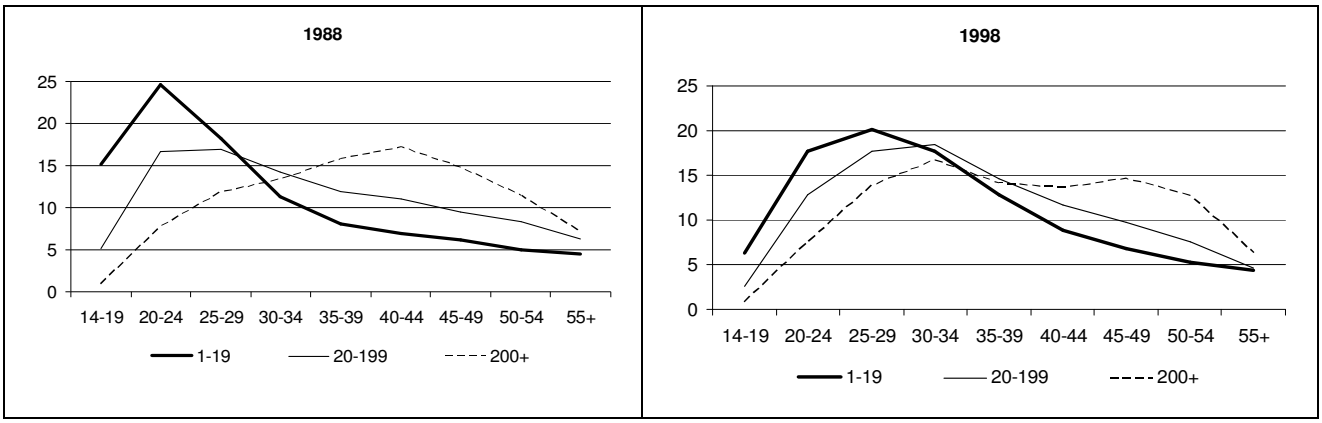
Expansion of the service sector occurred mostly in the Nineties, following, with some delay, the physiological pattern of industrialised countries. Service sector, 43% of total employment in 1970, swells to 66% in 2003, still below the EU average.

A profound transformation in the employment structure has been driven by population ageing, that is currently proceeding at a pace more pronounced than in most other OECD countries (OECD 2006). After the "baby boom" of the 60s and early 70s, the total fertility rate declined steeply: it fell below the replacement rate of 2.1 at the beginning of the 80s, reaching 1.24 in 2000. At the same time, life expectancy is among the highest. Even though a slight recovery in fertility rates is expected in the coming years, the transition process to the new demographic

regime is having, and will have, a profound impact on the economy. In the next two decades, the baby boom generations will reach retirement age, and will be replaced by new cohorts roughly half in size. By 2050, more than one in three Italians will be over the age of 65[3].

Aging affected companies in different wayssince the mature workforce concentrate in larger firms. The shift in the age distribution of employment, though, has been remarkable in all firm sizes: between 1988 and 1998 the mode of the distribution among smaller firms shifted markedly from the 20-24 age-group to the 25-29 group; among larger firms the shift is towards a bi-modal distribution, with one hump at age 30-34 and the other at age 45-49 (Figure 1.3).

Figure 1.3. Workforce age distribution by firm size, 1988 and 1998.

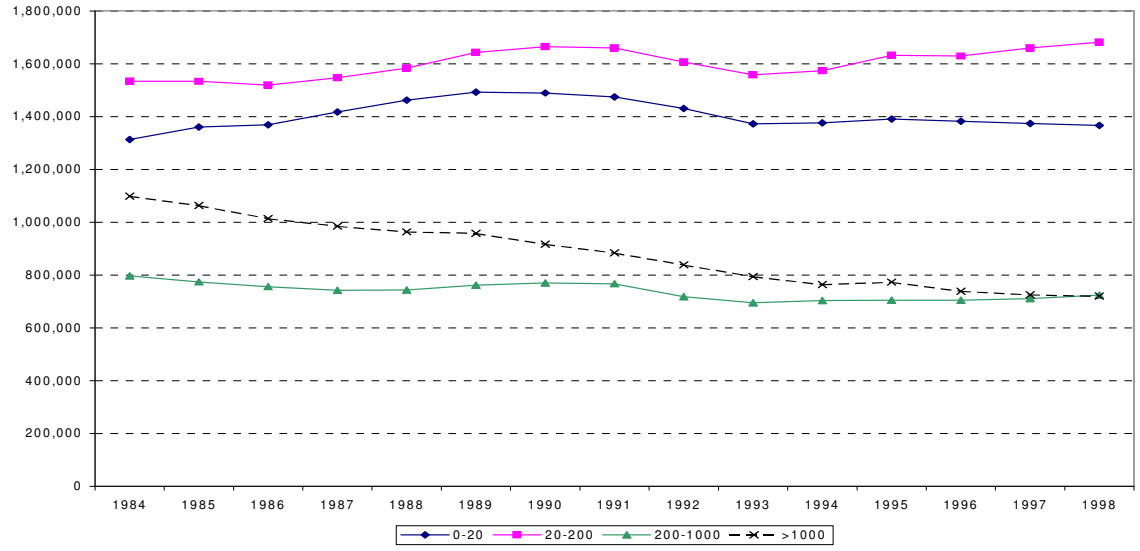


Source: Our calculations based on Whip data, 1988 and 1998.

The distribution of dependent employment by firm size did not change much over the last 15 years: the share of firms with less than 20 employees has held steady at around 40% of total employment; the share of large firms (> 1000 workers) has dropped by almost four percentage points, and that of small-medium firms (20-100 workers) has increased in proportion. In the manufacturing sector the shift has been more huge (see Figure 1.4), with the share of firms > 1000 declining from 23% in the early 80s to 16% in 1998. Large manufacturers went through a profound restructuring process that caused the loss of about 380,000 jobs, only in a small part reabsorbed by small and medium firms: the overall employment lost in the manufacturing was about 250,000 workers.

[3] See the population projections produced by the Italian Statistical Office (Istat), "central" scenario (http://demo.istat.it/index.html).

Figure 1.4 Employment trends by firm size in the manufacturing sector



Source: Our calculations based on Whip data.

1.2 Wages

In table 1.2 we report mean and median real wages 1985-99 and a selection of distribution/ inequality indicators. Real earnings constantly increased until the early Nineties. After the recession, and the 1993 collective agreements that reshaped the system of collective bargaining (see chapter 2), real wages stopped growing altogether, and only in 1999 they improve on the pre–recession levels. In subsequent years, while most European countries experienced a long phase of real wage growth, in Italy they remained roughly stagnant.

Wages changed with remarkable differences between the tails and the centre of the distribution. Over the 1985-99 period the median individual faced a modest 3.4% real increase, while at both ends of the distribution growth was much faster. In 1985, P90/P50 was 1.54; by 1999 it increased to 1.83. At the same time P50/P10 dropped from 1.52 to 1.44. Likewise, the P90/P10 ratio increased from 2.34 to 2.60. This points to a reduction of inequality in the low tail of the distribution and an increase in the high tail. Overall inequality measured by Gini, Theil and Var-Logs indexes increased significantly in the period.

Table 1.2 Real wage distribution

	median	mean	percentiles ratios			inequality measures		
			P90/P50	P50/P10	P90/P10	Gini (s.e.)	Theil (s.e.)	var-logs (s.e.)
1985	1424	1532	1.54	1.52	2.34	199 (0.6)	71 (0.5)	133 (0.8)
1986	1407	1529	1.55	1.52	2.36	203 (0.7)	74 (0.6)	136 (0.8)
1987	1427	1569	1.61	1.53	2.45	214 (0.7)	82 (0.6)	147 (0.9)
1988	1424	1572	1.63	1.52	2.47	216 (0.7)	83 (0.6)	149 (0.8)
1989	1435	1620	1.68	1.42	2.38	219 (0.7)	87 (0.6)	146 (0.8)
1990	1449	1671	1.73	1.42	2.46	233 (0.8)	102 (0.8)	160 (0.9)
1991	1503	1712	1.70	1.45	2.46	227 (0.7)	96 (0.6)	156 (0.8)
1992	1498	1719	1.72	1.43	2.47	229 (0.7)	97 (0.7)	156 (0.9)
1993	1499	1724	1.72	1.42	2.44	227 (0.8)	96 (0.7)	152 (0.9)
1994	1484	1711	1.73	1.42	2.46	228 (0.8)	98 (0.8)	153 (1.0)
1995	1444	1672	1.77	1.42	2.52	229 (0.7)	97 (0.7)	155 (0.9)
1996	1433	1673	1.79	1.41	2.52	233 (0.7)	101 (0.7)	159 (0.8)
1997	1461	1710	1.79	1.42	2.54	237 (0.7)	105 (0.7)	164 (0.9)
1998	1470	1723	1.80	1.45	2.60	244 (0.8)	112 (0.8)	170 (1.0)
1999	1473	1768	1.83	1.44	2.63	257 (0.9)	134 (1.2)	187 (1.1)
%change 1985-99	3.4	15.4	19.4	-5.7	12.6	28.9	89.7	41.1

Note: Wages are monthly wages at 1999 prices, private sector only. Part-time monthly wages have been converted into full-time equivalents.
Source: Devicienti (2006).

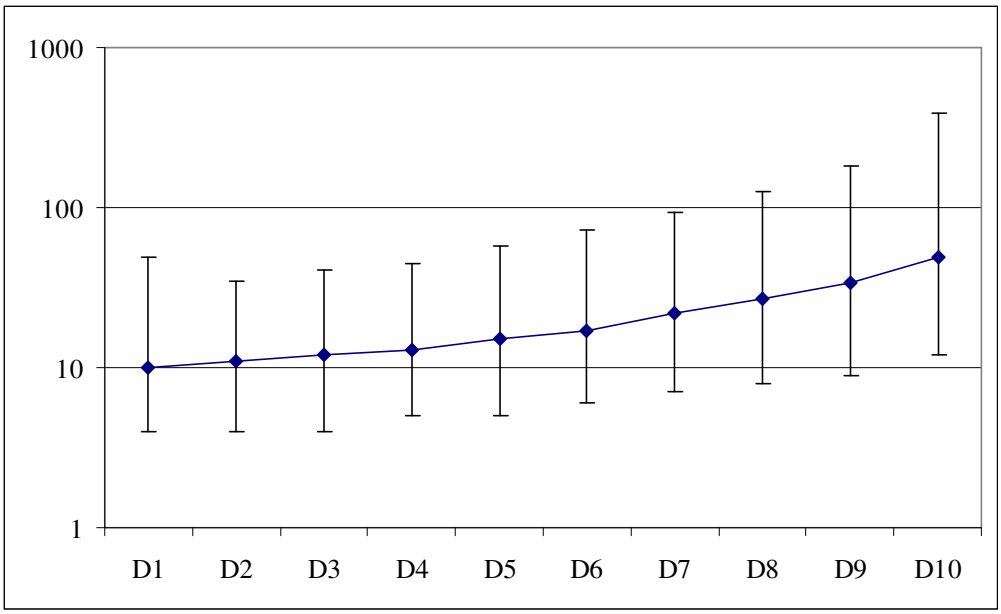
The relationship between wages and firm dimension is clear in Figure 1.5: larger firms on average pay higher wages. The wage-firm size relation explains also the wage dynamics of job changes: workers switching from small to large firms earn wage premiums, while job switches in the opposite direction often lead to wage losses (see Contini and Villosio, 2003, and table 1.3).

Table 1.3. Monthly wages in 1986 and 1991 and wage growth rate 86-91 for movers and stayers

	Movers			**Stayers**		
	N	**Mean**	**S.d**	**N**	**Mean**	**S.d**
Wage 86	9641	1731.2	548.2	20526	1906.7	604.2
Wage 91	9641	2805.2	1138.3	20526	3042.3	1184.5
Wage growth rate	9641	1.6	0.4	20526	1.6	

Source: Contini and Villosio, 2003

Figure 1.5 Firm size distribution(P10, median and P90) by wage deciles – 1999



Source: Our calculations on WHIP data
Note: size in log scale

Table 1.4 displays the results of a decomposition exercise: for all partitions inequality is predominantely explained by its within-group component.

Table 1.4. Inequality decompositions by population subgroups, 1985 and 1996

		Theil index		Shares (%)		Avg monthly wage (1999 prices)		Δ wage (%)	Relative avg wages (all = 1)	
		1985	1999	1985	1999	1985	1999		1985	1999
A	**All**	71	134	100	100	1532	1768	15.4	1	1
B	**Males**	67	138	71	66	1628	1864	14.5	1.06	1.05
	Females	61	115	29	34	1298	1579	21.6	0.85	0.89
	Whithin-group inequality	66	131							
	Beetween-group inequality	5	3							
C	**Apprentice**	49	90	5	6	899	1003	11.6	0.59	0.57
	Blue collar	43	86	65	60	1431	1540	7.6	0.93	0.87
	White collar	71	115	29	33	1828	2212	21.0	1.19	1.25
	Managers	36	34	0.6	0.8	4044	6393	58.1	2.64	3.62
	Whithin-group inequality	53	97							
	Beetween-group inequality	18	37							
D	**North**	68	133	60	61	1535	1797	17.0	1.00	1.02
	Centre	74	140	19	19	1550	1773	14.4	1.01	1.00
	South	74	128	21	20	1508	1669	10.7	0.98	0.95
	Whithin-group inequality	71	133							
	Beetween-group inequality	0.0	0.4							
E	**Age 15-24**	51	79	23	16	1179	1244	5.5	0.77	0.70
	Age 25-34	47	87	28	35	1501	1613	7.5	0.98	0.91
	Age 35-49	68	133	35	36	1716	1984	15.6	1.11	1.12
	Age 50-64	75	168	14	13	1721	2244	30.4	1.12	1.27
	Whithin-group inequality	60	118							
	Beetween-group inequality	10	16							
F	**Manufacturing**	64	149	56	48	1511	1795	18.8	0.99	1.02
	Building	48	66	12	10	1512	1546	2.4	0.99	0.87
	Services	89	129	32	42	1578	1790	13.4	1.03	1.01
	Whithin-group inequality	70	133							
	Beetween-group inequality	0.2	1							
H	**Full-time**	70	133	99	90	1531	1781	16.3	1.00	1.01
	Part-time	104	137	1	10	1639	1651	0.8	1.07	0.93
	Whithin-group inequality	71	134							
	Beetween-group inequality	0.0	0.3							

Note: For the definition of wage see note at table 1.2.
Source: Devicienti (2006).

The between-group component is negligible, but for age and occupation partitions. In the former the between component accounts for about 12-14% of aggregate inequality, while in the latter it explains about one forth. This is consistent with a collective wage setting process that relies on seniority (here proxied by age) and occupation.

1.3 Mobility

Gross Worker Turnover in Italy – the ratio of yearly flows of engagements and separations on average employment – hovered about 60% (see table 1.5), indicating that labour force mobility is higher than that of most European countries (Leombruni and Quaranta 2002, 2005). As theory suggests (Blanchard and Diamond, 1990),

GWT appears to move pro-cyclically, with peaks in the expansionary phases, and a through during the recession culminated in 1993.

Table 1.5 Yearly worker flows, four sub-periods.

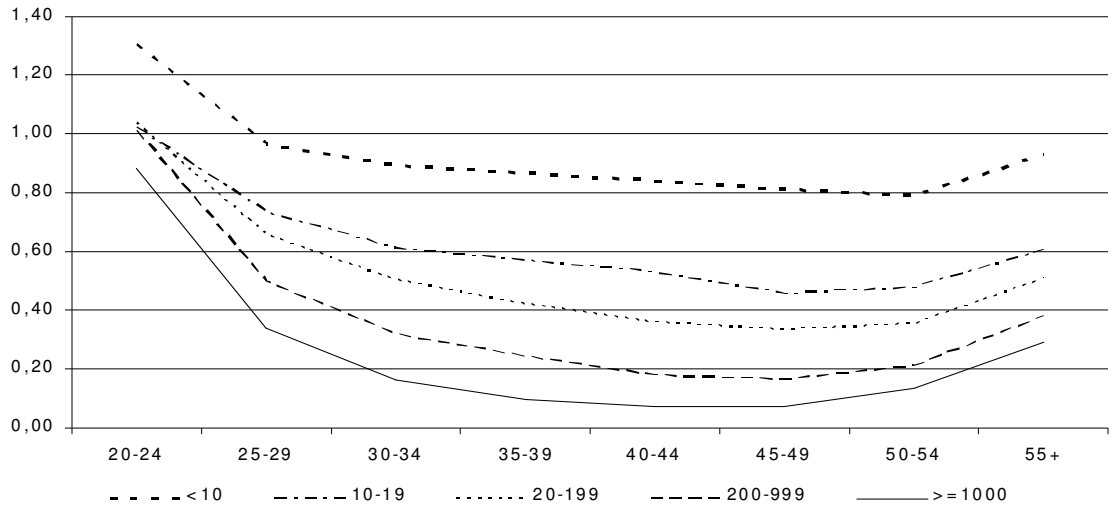
		Separation rate	Engagement rate	Gross worker turnover	Business cycle
Italy	86-90	29.86	32.53	62.39	expansion
	91-93	28.77	28.01	56.78	recession
	94-96	29.68	29.01	58.69	recovery
	97-99	33.00	35.00	68.00	expansion

Note: Percentage values, our calculations based on WHIP data.

The GWT, as most mobility indicators, reflects worker age and firm size (Davis and Haltiwanger, 1999). Young workers are the most mobile: the search for a "good job" translates into many flows in and out of jobs. Worker flows are much higher in small firms, for a variety of reasons: higher birth and death rates, limited internal mobility, few firing constraints due to looser institutional constraints and to the limited presence of unions. Figure 1.6 displays GWT as a function of both variables. Mobility as a function of age is U-shaped in all firm size classes. In small firms it is notably shifted upward compared to the large companies, and has a flatter shape. Most notably, the "small firm" effect dominates the age factor in determining mobility: notice, for example, that individuals 50+ working in small firms (10-19 employees) have a 50% overall turnover, while individuals aged 25-29 employed in large firms (1000+) slightly exceed 30%.

Blue-collar workers are much more mobile than white-collar workers, which in turn are more mobile than managers (but the probability of a direct job-to-job change conditional to a move is much higher for managers, than for any of the other categories). Moreover, the difference in mobility of blue-collar workers with respect to white-collar workers has widened noticeably during the years (Leombruni Quaranta, 2005). While the gross worker turnover for white collars workers has been stable at about 41% in the period, the same rate for blue collars has increased from 69% in 87-89 to 78% in 97-99.

Figure 1.6 Gross worker turnover by worker age and firm size. 1987-1999.



Source: Leombruni and Quaranta (2005).

2. Institutional Aspects of the Italian Labour Market

In the early Eighties, Italian labour market legislation was characterised by an egalitarian mechanism of wage increases, and by restrictions on hirings and firings. Nominal wages were indexed to prices through an automatic mechanism known as *scala mobile* ("escalator clause") whose rules were uniform across sectors. Indexation took place quarterly. Hirings involved almost exclusively open-end contracts; those of manual workers took place mostly from unemployed workers' lists kept by public employment services and not *via* direct selection mechanisms. Individual firings in firms 15+ employees were admissible only within a "just cause" rule. In practice the ruling were bypassed by extra-judiciary settlements *cum* severance pay. Temporary layoffs were possible by way of an earning integration scheme (CIG, *cassa integrazione guadagni*) that was available to large firms during times of industry crises and/or restructuring.

Starting from the mid 1980s several reforms have radically reshaped the regulation of the labour market.

In 1984 restrictions on hirings were markedly reduced with a partial liberalization of direct selection mechanisms; part-time work and work-training contracts (CFL, *contratti di formazione-lavoro*) were introduced. The latter was a mixed contract, aimed at young people 15 to 29, under which employers had to provide workers with appropriate occupational training. Hires via CFL enabled firms to benefit from a hefty 50% rebate on social security contributions. In addition, it was a fixed-term contract, with a predetermined duration of no less than 18 months, and no longer than 24. At termination of the contract the firm had the right, but no obligation, to upgrade the CFL contract into an open-ended one, taking advantage of favourable tax treatment for one additional year[4].

[4] CFL underwent several reforms during the years, that progressively reduced their advantages in terms of social security rebates and flexibility. They were finally abolished in 2003.

In 1986 the automatic indexation of wages via *scala mobile* was reduced from quarterly to twice a year, and definitely abolished in 1992.
In 1991 collective dismissals were introduced by means of "mobility lists" – which granted to laid-off workers long term unemployment benefits, and fiscal incentives for firms re-employing them – while CIG was extended also to small and medium firms in the manufacturing sector (CIGS, *cassa integrazione guadagni straordinaria*). The latter, in principle, was still designed for temporary layoffs, but in practice it allowed mass layoffs at very low costs, since it could be extended several times, and then converted into a mobility list provision.

In 1993, at the peak of recession, the unions, Confindustria (the Italian Manufacturers' Association) and the government pledged to act in concert to improve the conditions of the labour market. A new two-level bargaining system was agreed upon, which is still in rule today. At the national level, wages are set according to the inflation rate targeted by the Government for the following 24 months. The difference between actual and targeted inflation is not automatically recovered, and is to be taken into account at the start of a new bargaining round. At the regional or firm level, additional wage components are introduced and are to be geared by profit sharing considerations. In few years, firm level bargaining spread in the majority of large firms, whilst it is still negligible in the small firm sector.

The new catch phrase of subsequent policies was "increasing flexibility on all fronts". As a matter of fact, most of the action took place in the labour market, while little was achieved in terms of product market flexibility.
In 1996 the so called "pacchetto Treu" extended the range of possible work contracts, by introducing temporary work, by extending the applicability of part time and fixed-term contracts, and by regulating "parasubordinato" work, a form of dependent self-employment. The portfolio of available contracts, in 2003, was further extended into 21 different typologies, including job sharing, project work and staff leasing.
As a consequence, from 1996 on the standard open end contracts lost importance in favour of "atypical" ones, which started to represented the most widespread channel for entry into the labour market. In 2002 the share of workers with a fixed term contract already accounted for 10% of total employment – against a EU15 average of 13% (European Commission, 2003).

3. Results

The tables presented in this paragraph have been computed using the *Work Histories Italian Panel* (WHIP), which is based on administrative data from the Italian Social Security (INPS) archives.
Wages are average daily earnings paid to the worker, at 1990 prices, expressed in Italian Liras (,000), gross of income taxes and payroll taxes paid by workers, and net of payroll taxes paid by employers[5].

[5] This is the so called "base wage", on which social security and pension contributions are calculated. It includes basic wage, cost-of-living allowance, residual fees, overtime plus back pay, bonuses, supplements holiday pay, sick pay.

Worker-based statistics: we selected all blue and white collar workers with a job spell active during the month of May of the year of interest, working full-time, in firms employing at least 20 employees.
Firm-based statistics: WHIP is a 1:90 random sample of workers. Hence we do not have a representative sample of the workforce in small and medium sized firms. This is not an issue for tables in paragraph 3.3 on mobility indicators: the monthly employment stock and the average wage of each firm are reported in WHIP, yealding good approximations of entry and exit rates. For tables in paragraph 3.1 and 3.2, in contrast, we pooled together firms into cells – called "synthetic firms" – in order to have enough individual observations to compute firm wage and wage change distributions. The 800-cells grid used is based on the following partition:

- Geography: 20 Italian regions;
- Firm size: 5 classes (20-49, 50-99, 100-199, 200-499, 500+ workers);
- Sector of activity: 44 classes (Nace-70 2-digit sectors).

More details on the data and a discussion on the syntetic firm approach can be found in the Methodological Appendix.

3.1 Structure of wages between and within firms

Table 3.1 includes two sets of statistics: worker-based (referred to as "observation = a person") and firm-based (referred to as "observation = a firm").
Worker-based statistics confirm several stylized facts well known in the literature. Average individual wage and standard deviation increase with worker age, reflecting the wider range of career paths experienced as workers grow older. The dispersion of individual wages in Italy is in line with the other countries included in this book. It is not far from that of Norway and Sweden, but it is high with respect to Denmark and Finland: in Italy the P90/P50 ratio is 1.7, and P10/P50 is 0.7 (in Denmark and Finland these statistics are much closer to 1).

Firm-based statistics introduce new hints. Average firm wage is lower than average individual wage, reflecting the fact that small firms pay (on average) lower wages than large ones. The ratio of between firms wage variability relative to the country's average wage is 13%, similar to other countries included in this book, except Netherlands and United States (see fig. 5 in the Introduction of the book). Within-firm wage variability represents about two thirds of total variability (25.87 against 33.36 in 1998), and is larger than between-firm variability (12.52 in 1998)[6].
The ratio of the between-firm wage variability relative to total wage variability is sizeable in all countries, and Italy is no exception (see fig. 4 in the Introduction of the book). In Italy it is sizeable also with respect to other decompositions (see chapter 1.2). Characteristics like gender, geographical area, industry account for a negligible

[6] The true difference between the two, however, may be upward biased, since statistics on synthetic firms tend to underestimate between-firm variability and overestimate within-firm variability, as a consequence of attributing to "within cell" the variability "between firms belonging to the same cell" (see the methodological Appendix).

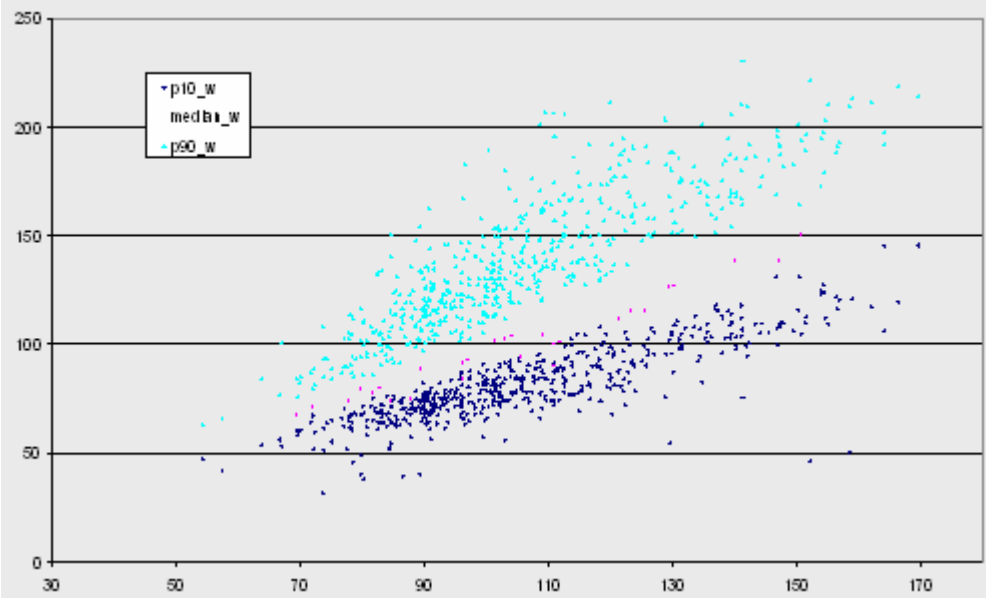
part of the total variance of wages. The results presented in chapter 1.2 are not directly comparable with table 3.2, as the one displayed in the latter is not an exact decomposition[7]. However, this is an indication of the importance of firm wage policies in shaping the wage distribution, a point that seems to overrule the importance of individual observable characteristics.

Figure 3.1 adds to the point. Panel (a) shows P10, P50, P90 of the within-firm wage distribution (based on firms – here not synthetic firms – of which we observe at least 10 workers), ranked by firm average wage. Indeed "the tide lifts all boats", as all percentiles increase with average firm wage. In addition the spread becomes larger with increasing average wage, especially in the P90 band. Workers receiving "low" wages (P10) from a high-wage firm are paid more than many workers receiving "high" wages (P90) from a low-wage firm. This is true not only in large firms, like those included in Panel (a), but also among small firms, as shown in Panel (b), which refers to firms employing 10+ workers of two Veneto provinces for which we have population data (see Appendix for details). This finding strongly suggests that firms do not follow a pay compression model in their wage policy.

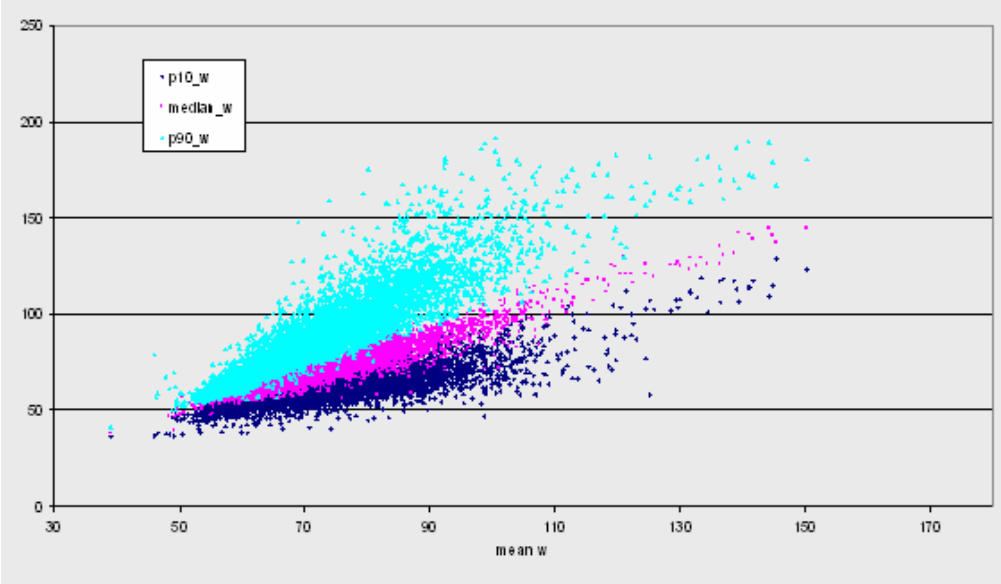
[7] Total variability do not decompose into the within and between components reported in table 3.2, although it is positively correlated with both. An exact decomposition, for instance, is that reported in formula (1) in the introduction to the Book.

Figure 3.1 Tide raises all boats

Panel a) Mean vs p10-p50-p90. Italy, firms employing more than 1000 workers



Panel b) Mean vs p10-p50-p90. Treviso and Vicenza, firms employing more than 10 workers



Also the widening of within-firm wage differentials as average wages increase is at odds with the hypothesis that firms are homogeneous with respect to human capital (all workers alike in terms of skills, productivity, effort). It rather points to a substantial amount of worker heterogeneity rewarded according to human capital, at least among the medium-large firms. It is also consistent with the impact of a bargaining system which is not completely centralized. In Italy, almost all large firms bargain over wages with unions at the firm level, holding the nation-wide industry contract as a benchmark. This is less frequent among small firms, which at times refer to local agreements at the district level. In addition, both the correlation between firm average wages and within-firm s.d. (0.59 in 1998), and the average coefficient of variation increasing from P10 to P90 (tab. 3.1) confirm that job

heterogeneity increases with firm size. In general, the task of ascertaining the source of the firm specific wage policy (the firm itself or the bargaining process with unions) is hard, but the conclusion still holds: firm wage policy shows its relevance in all of these statistics.

Table 3.2 Structure of wages between and within firms

	1990	1993	1998
Average Wage, observation = a person	94.67	97.76	95.15
(s.d.)	33.42	34.77	33.36
c.v.			0.35
90%-ile	139.99	144.50	140.31
75%-ile	109,57	112,70	111.26
median	86,75	89,36	87.44
25%-ile	71,63	74,01	72.23
10%-ile	61.48	63.68	61.75
[N – workers]	54794	51777	47173
Average of firm average wage, observ = a firm	83.61	86.44	85.53
(s.d.)	12.74	12.61	12.52
c.v.	0.15	0.15	0.15
90%-ile	96.97	99.71	99.77
75%-ile	90,07	92,32	90.97
median	84,12	86,01	85.26
25%-ile	76,85	80,25	78.10
10%-ile	66.65	69.28	70.90
[N – firms] (cells)	822	781	775
Average N of workers per cell (unweighted)	60.88	60.77	57.32
Average std of N of workers per cell	69.24	65.71	56.85
Average of s.d. of wage, observ = a firm	25.36	26.21	25.87
(s.d.)	6.92	7.56	7.12
90%-ile	33.86	35.50	34.76
75%-ile	29.43	30.73	31.10
median	25.32	25.88	25.76
25%-ile	20.38	21.53	21.53
10%-ile	16.48	17.30	16.77
[N – firms]	763	732	731
Average Coefficient of variation of wages (observ = a firm)	0.30	0.30	0.30
(s.d.)	0.0007	0.0007	0.0007
90%-ile	0.38	0.38	0.40
75%-ile	0.34	0.34	0.33
median	0.30	0.30	0.30
25%-ile	0.34	0.34	0.25
10%-ile	0.22	0.21	0.22
[N – firms]	763	732	731
Correlation(average wage, s.d. of wage), observ = a firm	0.63	0.69	0.59
p-value	0.0001	0.0001	0.0001

Table 3.1, continued

Average Wage for workers between 25 and 30, observation =			
a person	85.03	86.66	83.74
(s.d.)	25.02	24.73	23.97
90%-ile	117.17	116.70	115.08
75%-ile	97.34	98.46	95.03
median	80.14	81.81	79.32
25%-ile	68.21	70.53	68.58
10%-ile	59.77	62.33	59.76
[N – workers]	10365	10487	9318
Average Wage for workers between 45 and 50, observation =			
a person	102.57	106.76	105.80
(s.d.)	35.70	37.60	35.54
90%-ile	153.15	160.74	154.64
75%-ile	119.68	124.88	124.51
Median	94.53	97.86	99.00
25%-ile	77.76	80.79	81.16
10%-ile	66.25	68.40	67.38
[N – workers]	7844	8343	7489

3.2 *Wage Dynamics*

Table 3.2 displays year to year absolute and relative wage changes computed for individuals working both in May *t* and in May *t-1*[8].

Average relative changes in individual wages roughly follow the business cycle: 3% in 1990, 0.3% in 1993 and 2% in 1998. The whole distribution of individual wage changes follows the same pattern, although different parts of the distribution react differently, the upper tail showing a higher responsiveness to the business cycle. In the low tail, the large negative wage changes observed among movers and short tenure workers stay within 20-22% and 12-14% respectively all over the period.

Average relative changes are higher for movers than stayers, and for low tenure than high tenure workers. This is consistent with an increasing and convex wage profile over seniority[9] and can be observed in all countries included in this book. Also the s.d. of wage changes is larger among movers, decreases among low tenure workers and is smaller among long tenure workers. Different past career paths generate heterogeneity of wage changes at the beginning of the career within a firm; while, once they become insiders, workers follow a much more predetermined wage path, described mostly by seniority and occupation.

Firm-based statistics in table 3.2 show that average change in firm wages is very close to the average change in individual wages. This means that individuals employed in small firms and in large firms enjoy the same average wage growth (recall that this does not hold for wage levels, discussed in the previous chapter). The distribution of

[8] Relative changes are $\ln W_t - \ln W_{t-1}$.

firm wage changes is more compressed than that of individual wage changes, as expected, and it is also somewhat more compressed in Italy than in other countries: in 1998 the firm wage change distribution is 5% for P90, is -1% for P10, while in Denmark (year 2000) the same figures are 10% and -3%, in Finland (same year) they are 8% and -2%, in Germany 5% and 3% – very compressed and positive.

The between-firm variability of wage change (0.03 in 1998) is lower than the variability of individual wage change (0.13 in 1998). The within-firm s.d. of wage change (0.11 in 1998) is almost as high as that of individual wage change. The two statistics are of the same order of magnitude in most countries (compare figures 10 and 11 in the Introduction in this book). Most of the discussion on wage levels applies here as well. Firm wage policy matters in shaping not only the wage level distribution but also the wage change distribution.

Table 3.2 Wage dynamics

	logs			levels		
	89-90	92-93	97-98	89-90	92-93	97-98
Average change in wage, observation = a person	0.03	0.003	0.02	3.58	0.21	2.20
(s.d.)	0.14	0.12	0.13	11.88	10.26	10.25
90%-ile	0.16	0.11	0.14	16.36	10.78	13.09
75%-ile	0.08	0.04	0.06	8.01	4.06	5.84
Median	0.03	-0.00	0.02	2.29	-0.01	1.47
25%-ile	-0.02	-0.04	-0.02	-1.58	-3.93	-1.93
10%-ile	-0.08	-0.10	-0.08	-7.34	-10.26	-7.65
[N – workers]	50244	48871	43377	50244	48871	43377
Average of firm average change in wage, observ = a firm	0.03	0.005	0.02	2.86	0.47	2.07
(s.d.)	0.03	0.02	0.03	2.32	1.84	2.20
90%-ile	0.06	0.03	0.05	5.48	2.43	4.78
75%-ile	0.04	0.02	0.04	3.89	1.56	3.28
median	0.03	0.01	0.02	2.64	0.57	2.14
25%-ile	0.02	-0.01	0.01	1.51	-0.38	0.54
10%-ile	0.00	-0.03	-0.01	0.48	-2.08	-0.62
[N – firms] (cells)	791	761	734	791	761	734
Average N of workers per cell (unweighted)	52.81	55.45	49.91	52.81	55.45	49.91
Average std of N of workers per cell	63.23	63.35	51.66	63.23	63.35	51.66
Average of s.d. of change in wage, observ = a firm	0.13	0.11	0.11	9.75	8.76	8.50
(s.d.)	0.05	0.03	0.04	2.54	2.10	2.09
90%-ile	0.19	0.15	0.16	13.17	11.40	10.99
75%-ile	0.14	0.12	0.12	10.93	10.06	9.57
median	0.12	0.10	0.10	9.58	8.57	8.32
25%-ile	0.10	0.09	0.09	8.17	7.41	7.30
10%-ile	0.08	0.07	0.07	6.81	6.41	5.99
[N – firms] (cells)	739	713	687	739	713	687

[9] It must be recalled that movers are also included in the "short tenure" group.

Average Coefficient of variation of change in wages, observ = a firm	9.03	6.33	0.004	5.50	3.13	4.64
(s.d.)	0.76	0.58	0.53	0.18	0.64	0.43
90%-ile	14.42	23.07	14.82	11.91	21.17	14.82
75%-ile	5.76	8.63	5.16	4.88	8.80	4.83
25%-ile	2.38	-6.37	1.61	2.37	-4.90	1.72
10%-ile	1.28	-17.35	-9.42	1.57	-22.82	-6.00
[N – firms] (cells)	739	713	687	739	713	687
Avg change in wage for people who change firm, observ = a person*	0.06	0.02	0.06	4.91	1.53	3.75
(s.d.)	0.25	0.22	0.24	18.17	16.23	16.52
90%-ile	0.35	0.27	0.33	28.40	22.39	25.43
75%-ile	0.17	0.13	0.17	14.25	10.43	13.54
median	0.05	0.01	0.04	3.69	1.08	3.11
25%-ile	-0.06	-0.09	-0.07	-4.90	-7.60	-6.02
10%-ile	-0.20	-0.22	-0.21	-16.50	-19.23	-17.40
[N – workers]	4775	3344	3496	4775	3344	3496
Avg change in wage for people with tenure < 3 years, observ = a person	0.05	0.02	0.04	4.50	1.48	3.22
(s.d.)	0.19	0.16	0.17	14.06	12.30	12.33
90%-ile	0.23	0.17	0.21	20.57	15.48	17.68
75%-ile	0.12	0.08	0.10	10.02	6.60	8.48
median	0.04	0.01	0.03	3.22	0.90	2.39
25%-ile	-0.02	-0.04	-0.03	-1.64	-3.63	-2.01
10%-ile	-0.12	-0.14	-0.12	-9.70	-12.05	-9.98
[N – workers]	13305	11133	10782	13305	11133	10782
Avg change in wage for people with tenure >= 3 years, observ = a person	0.03	0.00	0.02	3.25	-0.16	1.87
(s.d.)	0.12	0.10	0.11	10.97	9.54	9.44
90%-ile	0.14	0.09	0.11	14.87	9.37	11.50
75%-ile	0.07	0.04	0.05	7.29	3.40	5.08
median	0.02	0.00	0.01	2.03	-0.24	1.27
25%-ile	-0.02	-0.04	-0.02	-1.56	-3.99	-1.91
10%-ile	-0.07	-0.09	-0.07	-6.66	-9.77	-7.09
[N – workers]	36939	37738	32595	36939	37738	32595

Notes: * These are true firm changes, since we don't need to pool together observations into synthetic firms.

3.3 *Mobility*

Focus: firm data, turnover and legal transformations

In WHIP firm archive the monthly employment stock and average firm wage are reported. The employment stock counts all workers, including part time, apprentices and managers, that were excluded from the previous tables.

We use the monthly employment series to approximate worker flows: positive monthly changes in employment are entries and negative changes are exits. The sum of monthly entries (exits) relative to the average yearly employment is the firm entry (exit) rate.

There are two sources of measurement error. The first is that we miss across-month churning: if a worker exits during a given month and her position is filled in the following month, we do not measure any monthly change in the employment stock, since the latter is measured as the number of heads present in the payroll in a given month. The second one is that we cannot easily control for legal transformations. We handle with this computing monthly changes from January to November only and reweighting them to twelve months, since most legal transformations take place between December and January (end of the Italian fiscal year). Furthermore, we exclude entry and exit rates above 200%. However, the exclusion of spurious movements remains imperfect.

The firm average wage refers to white and blue collar workers only. We select firms employing at least 20 employees.

The sum of entry and exit rate measured on worker data yealds a gross turnover of about 47% in 1998. This is the turnover rate relative to people working in firms above 20 employees[10]. When computing the same statistics with firm data we tend to overestimate all rates. The overestimate in entry and exit rates is larger during the 1993 downturn, while they are more precisely estimated in 1998 and 1990. The imperfect control of legal transformations may explain the upward bias when many reorganizations took place (see Box).

Low wage firms show almost always the highest positive net flows, which is consistent with what observed in other countries. This is explained by the correlation between average firm size and firm wages, since in Italy most job creation occurs in the small firm sector. Top decile firms have higher net flows then top quartile ones, due to the better growth performance of firms with a high skilled workforce. The positive correlation between average firm size and firm wages explains also the ranking in turnover levels, with low wage firms showing the highest turnover.

Finally, correlation between firm size and individual seniority in the firm is positive, and exit rates decline as wages increase. All this is consistent with the size of the internal labour market that provides opportunities for advancement without leaving the firm, and with declining external wage offers that can dominate the current wage as the current wage increases.

[10] The same figure is about 60% considering all firms, see chapter 1.3.

Table 3.3 Mobility (former "Table 4")
panel A

	entry			exit			net		
	1990	1993	1998	1990	1993	1998	1990	1993	1998
Rate (person)	0.22	0.16	0.24	0.21	0.19	0.23	0.01	-0.03	0.01
Rate	0.26	0.25	0.25	0.20	0.25	0.20	0.05	0.01	0.04
s.d.	0.29	0.30	0.27	0.23	0.30	0.23	0.27	0.28	0.25
Rate, top decile of firm wages	0.28	0.24	0.21	0.16	0.23	0.15	0.12	0.01	0.06
s.d.	0.36	0.33	0.28	0.24	0.32	0.22			
Rate, top quartile of firm wages	0.25	0.22	0.20	0.17	0.23	0.16	0.08	-0.01	0.04
s.d.	0.32	0.29	0.25	0.23	0.31	0.22			
Rate, bottom quartile of firm wages	0.30	0.31	0.33	0.23	0.29	0.25	0.07	0.02	0.08
s.d.	0.31	0.34	0.32	0.23	0.31	0.25			
Rate, bottom decile of firm wages	0.34	0.37	0.38	0.25	0.33	0.29	0.09	0.04	0.09
s.d.	0.34	0.39	0.37	0.24	0.35	0.28			

panel B

	1990	1993	1998
Employees	90.62	87.85	88.25
s.d.	745.67	670.58	603.96
Correlation (exit rate, average wage)	-0.06	-0.03	0.00
p-value	0.00	0.00	0.56
corr-size-tenure[11], obs: person	n.a.	n.a.	0.199
p-value			0.00
exit-90%wage, obs: person	0.170	0.174	0.192
exit-median-wage, obs: person	0.172	0.189	0.183
exit-10%-wage, obs: person	0.430	0.378	0.511

4. Conclusions

Inspite of the centralized nature of wage bargaining in Italy, we find some evidence suggesting the existence of firm-wage policies. Firstly, the ratio of the between-firm wage variability relative to total wage variability is sizeable, and not very dissimilar from that reported for other countries. In Italy it is sizeable also with respect to other decompositions: characteristics like gender, geographical area, industry account for a negligible part of the total variance of wages. Secondly, the tide raising all boats is also quite suggestive: not only do individual wages throughout the whole distribution increase as average firm wages increases, but the spread increases too as we

[11] Elapsed tenure may 1998, truncated at 161 months

move from P10 to P90, indicating that the rewards of high pay individuals are highly differentiated even within the same employer. This is coherent with the detected positive correlation between firm size and firm wages. In Italy, almost all large firms directly bargain over wages with unions, holding the nation-wide industry contract as a benchmark. This is less frequent among small firms, which at times refer to local agreements at the district level.

Firm wage policy matters in shaping not only the wage level distribution but also the wage change distribution. The within-firm s.d. of wage change is almost as high as that of individual wage change, and much higher than between-firm variability of average change in wages. Worker-based statistics, on the other side, show that relative changes in individual wages follow the business cycle, although different parts of the distribution react in a different way to it, the upper tail having a higher responsiveness. Both facts are at odds with the often reported rigidity of Italian wages. Indeed, the detected flexibility is mainly driven by movers and short tenure workers, who show higher and more dispersed relative wage changes. Different past career paths generate heterogeneity of wage changes at the beginning of the career within a firm; while, once they become insiders, workers follow a much more predetermined wage path, described mostly by seniority and occupation.

The above results, and the simple comparisons between stayers and movers wage careers (see table 1.3), are in line with well established facts: wage growth (on impact) is often higher among movers, while wage levels are lower compared to stayers', before and, often, also after the job switch. Along similar lines suggested by Lazear and Shaw, we find that negative wage growth is more common among movers and short tenure workers. In addition, worker entry and exit rates are higher at low-pay firms, and lower at high-pay firms. This stylized fact is, however, of more difficult interpretation, as composition effects due to the high correlation between firm size and wages may hide the conclusion. Nor do we have any direct evidence that voluntary mobility is higher where wage compression is high. The cross-country comparison suggests that the relatively high degree of wage compression in Italy could be associated with higher entry and exit rates, but, as Lazear and Shaw stress in the introduction, we must be cautious in this comparison as the different data sets used in this book measure exit over different time intervals and types of jobs.

5. Methodological Appendix

5.1 Data Used

In order to produce the tables presented, we used the *Work Histories Italian Panel* (WHIP), a database developed at the LABORatorio R. Revelli based on administrative data from the Italian Social Security (INPS).
For the purpose of this chapter we used the WHIP section on dependent employment, which is a Linked Employer Employee Database made up of a 1:90 sample of employees over the period from 1985 up to 2001. Details on the database, and a public use file of it can be found at http://www.laboratoriorevelli.it/whip.

5.1.1 Treatment of legal transformations, mergers and acquisitions

The use of administrative data on firms poses the problem of the treatment of legal transformations. Administrative archives treat events such as ownership transfers**,** bequests, donations, and legal transformations as they were firms' start ups and closures, even if these events do not produce a real interruption in the life of a firm. These events generate "spurious" flows of firms, jobs and workers.

The WHIP data base detects and corrects legal transformations firstly through a longitudinal firm identification algorithm, that builds directly on the firm data provided by Inps. This algorithm is particularly suited to correct for mergers and acquisitions involving establishment or plants.
Moreover, the linkage between employees and the firms for which they are working enable to detect other legal transformations tracking simultaneous flows of workers between two or more firms. The key is to discriminate between "normal" movements, deriving from workers' decisions to change jobs, and "spurious" movements. It is intuitively unlikely that "many" workers of a company independently and simultaneously decide to move together to another firm, whereas this event will take place if all, or part of the activities of the first firm are transferred to the second firm, or if the second firm is just a legal transformation of the first. In order to identify spurious components a threshold for the intensity of such movements has been established. Given WHIP sampling ratio, the observation of two workers moving within one month from the same firm (call it A) to a same firm (call it B) would statistically mean that on average firm A has handed over about 180 workers to firm B. Thus, if we observe in the same month at least two workers move from firm A to firm B we call it a spurious movement. Once we detect spurious movements in this way, we proceed by keeping connected the job spells of every worker who has made the same movement in the months before or after.

5.1.2 The synthetic firm approach

Since WHIP is a 1:90 random sample of workers, for all small and medium sized firms we do not have a representative sample of their employees. In the firm archive, moreover, we observe the average wage paid to blue and white collars, but not the s.d. Only if the firm is sufficiently large, is the number of observed workers sufficient to estimate the s.d. of wages. For 99% of firms recorded in WHIP we have less than 10 workers belonging to the same firm; for 83% of them we have just one worker.

In order to compute firm-based statistics in chapter 3, then, we had to pool together firms into cells – that we called "synthetic firms". Using the latter instead of true firms, though, leads to an underestimation of between-firm variability and to a parallel overestimation of within-firm variability, since we attribute to "within cell" the variability "between firms belonging to the same cell". To limit this bias we had to choose the finest grid, that still granted a sufficient number of observations per cell. After several explorations we ended up with an 800-cells grid along the following partitions:

- Geography: 20 Italian regions;
- Firm size: 5 classes (20-49, 50-99, 100-199, 200-499, 500+ workers)[12];
- Sector of activity: 44 classes (Nace-70 2-digit sectors).

Each cell has been weighted with the actual number of firms with the same characteristics in the population, as published by "Osservatorio INPS", the official aggregate statistics on the population produced by INPS.

The validity of the "synthetic firm" approach is tested using a dataset that covers the whole population of workers and firms located in two provinces of Veneto, in the Italian North-East (Treviso and Vicenza). On this dataset we mimicked the sampling procedure that generates WHIP, and then we pooled the resulting firm sample using three different synthetic firm definitions. This way we evaluate how within and between variance estimates vary at increasing levels of cell disaggregation, and how far we are from the statistics measured in the firm population.

Results are as follows:

1. Worker-based statistics computed in the sample are pretty close to true values (and, obviously, do not change at different synthetic firm definitions);
2. As expected, between firm variability is always underestimated in synthetic firms with respect to population values, while within firm variability is overestimated. This problem should become smaller the smaller the cells are. Comparing the three definitions we have that as cells become smaller the bias decreases. This is particularly true for the between firm variability, that goes from 7.32 to 10.11 (the true value being 13.89).
3. The correlation between average wage and s.d. of wage, at the highest level of disaggregation, is almost equal to the correlation computed at the firm level.

[12] Firms under 20 employees have been excluded for cross country comparability.

Table 4.1: Structure of wages between and within firms, year 1990, Vicenza and Treviso

	Synthetic firms on sample data			Firm population
	Definition (I)	Definition (II)	Definition (III)	
Average Wage, observation = a person	78.87	78.87	78.87	79.11
(s.d.)	**23.64**	**23.64**	**23.64**	**24.11**
(90%-ile)	109.37	109.37	109.37	108.66
(10%-ile)	57.34	57.34	57.34	57.43
[N – workers]	2075	2075	2075	194095
Average of firm average wage, observ = a firm	**76.21**	**76.10**	**76.11**	**73.45**
(s.d.)	**7.32**	**8.46**	**10.11**	**13.89**
(90%-ile)	84.47	88.48	88.48	90.74
(10%-ile)	68.34	67.28	62.40	58.44
[N – firms] (cells)	**28**	**52**	**95**	**4502**
Average N of workers per cell (unweighted)	**74**	**40**	**22**	**43**
Average std of N of workers per cell	**91**	**49**	**26**	**106**
Average of s.d. of wage, observ = a firm	**21.62**	**21.03**	**19.81**	**14.70**
(s.d.)	6.68	8.69	10.03	8.72
(90%-ile)	30.61	28.74	29.49	26.80
(10%-ile)	16.82	15.27	9.40	4.72
[N – firms]	28	50	91	4481
Correlation (avg wage, s.d. of wage), observ = a firm	**0.38**	**0.61**	**0.66**	**0.68**

Note:
Definiton (I), cells are by 8 1-digit Nace-70 sectors and 5 firm size classes;
Definiton (II), cells are by 8 1-digit Nace-70 sectors, 5 firm size classes and two provinces;
Definiton (III), cells are by 44 2-digit Nace-70 sectors, 5 firm size classes and two provinces.

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