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Job Gains and Job Losses: Recent Literature and Trends

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JOB GAINS AND JOB LOSSES: RECENT LITERATURE AND TRENDS

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THE OECD JOBS STUDY: WORKING PAPER SERIES

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SUMMARY

This paper reviews recent literature on job gains and job losses. Economies exhibit high rates of gross job reallocation - both high levels of job gains and job losses. For the OECD nations for which data are available, total turnover averaged more than twenty per cent during the 1980s. This is a result of differing behaviour of establishments (firms) in the face of similar general economic conditions.

Two streams have developed in the literature in attempting to characterize the influence of structural change on job turnover. The first sees structural turnover as continuous, and emphasizes the importance of establishment openings as the primary means through which more significant changes in an economy occur. An alternative view emphasizes the concentration of job losses stemming from structural change in cyclical downturns. The timing and pace of structural change can have an important influence on labour market policies.

The behaviour of the four components of job turnover over the cycle gives some indications about how cyclical and structural change are reflected in turnover data. Though limited to four countries, there is evidence that the rate of job gains stemming from the opening of establishments is related to the trend in employment growth, while closure of establishments is correlated with neither the trend nor the cycle. Expansion and contraction of existing establishments is the dominant element in the cyclical pattern of employment change.

The relative stability of openings in several countries during the late 1980s, combined with the expansion of existing establishments (and their reduced contraction) indicates the importance of cyclical conditions in explaining the increase in employment growth over this period. While further evidence is needed, the implication of these findings is that these employment gains were then more subject to loss when cyclical conditions changed than if the growth in employment had taken place through increased entry. These results also point to potential difficulties in trying to increase opening rates, given that they were apparently not heavily influenced by the robust cyclical conditions that prevailed during this period.

New evidence for the manufacturing sector in the U.S. indicates that the rate of employment gain through establishment openings is no higher than that of Canada and of a sample of Nordic countries. Turnover largely reflects movements within industries rather than across industries. More basic factors, such as the technology base of an industry are the principal determinants of turnover [Baldwin, Dunne and Haltiwanger (1993)]. Openness to trade has an impact on turnover in some countries.

There is also evidence that structural change is concentrated in cyclical downturns; however, data limitations do not allow this hypothesis to be fully tested, although turnover did increase in several OECD countries during the most recent recession.

There may be asymmetry in the process of structural change. More extensive allocative shocks, which shift production and employment from one industry to another will produce immediate increases in job losses, perhaps concentrated in cyclical downturns and only gradual increases in job creation through entry of new establishments, perhaps in other sectors [Davis and Haltiwanger (1990)]. The evidence presented in this report is not inconsistent with this view; however, more evidence is needed.

This asymmetry in the process of structural change could have implications for unemployment. Jobs lost due to structural change during downturns may not be replaced during a cyclical recovery which would, strictly speaking, restore jobs lost for cyclical reasons. New jobs would eventually emerge through the gradual opening of new establishments, but this could result in a considerable unemployment gap, especially given the high failure rate of new establishments. From a policy perspective, it is important to distinguish this phenomenon from that whereby cyclically unemployed individuals may become structurally

unemployed. To the extent that structural and cyclical change are coincident, both types of unemployment would come into existence simultaneously. It is also important to have an understanding of the timing of structural change in assessing the progress made in achieving structural adjustment. An assessment made during a cyclical upswing may underestimate the true extent of impending structural changes which would be in the process of accumulating yet would be difficult to measure.

There may be some potential to smooth the cyclical swings of job loss and avoid contemporaneous structural and cyclical change [Caballero and Hammour (1991)]. This largely falls to macro-economic policy, which by smoothing cycles may reduce the cost of closure of older facilities and new investments during upswings which is increased by the unpredictability of demand. Policies designed to mitigate the costs of establishing new production units, such as reducing the congestion effect in the matching process as well as capital installation and labour training costs could also be effective. This type of policy has been advocated before in terms of reducing bottlenecks during upswings.

GAINS ET PERTES D'EMPLOIS : OUVRAGES RÉCENTS ET TENDANCES

RÉSUMÉ

L'auteur présente un tour d'horizon des ouvrages récents qui traitent des gains et pertes d'emplois. Les économies enregistrent des taux élevés de redéploiement brut des emplois -- autrement dit des taux élevés de gains et de pertes d'emplois. Dans les pays de l'OCDE pour lesquels on dispose de données, le taux global de rotation des emplois s'est établi en moyenne à plus de 20 pour cent durant les années 80. En effet, les établissements (ou entreprises) réagissent différemment face à une situation économique similaire.

Deux courants de pensée se sont développés parmi les auteurs qui ont tenté de caractériser l'influence des mutations structurelles sur la rotation des emplois. Selon le premier, la rotation structurelle des emplois est un processus continu et les créations d'établissements sont le principal moyen de diffusion de changements significatifs dans une économie. Le second courant de pensée veut que les pertes d'emplois imputables aux changements structurels se produisent surtout lors d'un ralentissement conjoncturel de l'activité. Le moment et le rythme auxquels interviennent les mutations structurelles peuvent aussi avoir une grande influence sur les politiques du marché du travail.

Le comportement des quatre composantes de la rotation des emplois durant le cycle économique donne certains indices sur la façon dont les mutations conjoncturelles et structurelles se reflètent dans les données sur la rotation des emplois. Bien que limitées à quatre pays, les données disponibles montrent que le taux de gains d'emplois dus à la création d'établissements est lié à la croissance tendancielle de l'emploi, alors qu'il y a aucune corrélation entre la fermeture d'établissements, d'une part, et la tendance ou le cycle, d'autre part. L'expansion et la contraction des établissements existants sont le principal élément de l'évolution cyclique de l'emploi.

La stabilité relative des créations d'établissements dans plusieurs pays vers la fin des années 80, conjuguée à l'expansion des établissements existants (et leur contraction moins fréquente) montre l'importance de la conjoncture pour expliquer la plus forte croissance de l'emploi durant cette période. Des données plus complètes seraient nécessaires, mais on peut déjà en conclure que les gains d'emplois risquaient davantage de diminuer sous l'effet d'un changement de conjoncture que si la profession de l'emploi était imputable à une augmentation des créations d'établissements. Cela laisse aussi entrevoir les difficultés qu'il y aurait sans doute à accroître les taux de création d'établissements, car ces derniers n'ont apparemment guère été influencés par la conjoncture très favorable qui prévalait durant cette période.

Selon de nouvelles données sur le secteur manufacturier aux États-Unis, le taux de gains d'emplois dû aux créations d'établissements n'est pas plus élevé qu'il ne l'est au Canada et dans plusieurs pays scandinaves. La rotation des emplois résulte le plus souvent de mouvements intrasectoriels plutôt qu'intersectoriels. Mais des facteurs plus fondamentaux, comme la base technologique d'un secteur d'activité, sont les principaux déterminants de la rotation des emplois. [Baldwin, Dunne et Haltiwanger (1993)]. L'ouverture aux échanges influe aussi sur la rotation des emplois dans certains pays.

On constate en outre que le changement structurel se produit surtout en période de basse conjoncture; toutefois, faute de données suffisantes, il est impossible de vérifier totalement la validité de cette hypothèse, mais la rotation des emplois s'est bel et bien accélérée dans plusieurs pays de l'OCDE lors de la dernière récession.

Le processus du changement structurel présente parfois une certaine asymétrie. Des bouleversements plus profonds qui entraînent un déplacement de la production et de l'emploi d'un secteur à un autre provoqueront immédiatement un accroissement des pertes d'emplois qui pourront se produire surtout en période de ralentissement conjoncturel de l'activité et une augmentation tout à fait progressive

des créations d'emplois grâce à l'ouverture de nouveaux établissements, éventuellement dans d'autres secteurs [Davis et Haltiwanger (1990)]. Les données présentées dans ce rapport ne sont pas incompatibles avec cette hypothèse ; mais elles sont incomplètes.

Cette asymétrie du processus de changement structurel pourrait avoir des répercussions sur le chômage. Les emplois supprimés sous l'effet des mutations structurelles opérées en période de basse conjoncture pourraient ne pas être remplacés lors d'une reprise de l'activité qui, stricto sensu, devrait rétablir les emplois supprimés pour des raisons conjoncturelles. De nouveaux emplois finiraient par voir le jour grâce à l'ouverture progressive de nouveaux établissements, mais il pourrait en résulter un grave déficit d'emplois, d'autant que le taux de défaillance parmi les établissements de création récent est élevé. Du point de vue de l'action gouvernementale, il importe de distinguer ce phénomène de celui par lequel un chômage conjoncturel risque de se transformer en chômage structurel. Dans la mesure où les changements structurels coïncideraient avec des mutations conjoncturelles, les deux types de chômage apparaîtraient simultanément. Il importe aussi de comprendre à quel moment interviennent les changements structurels pour évaluer les progrès réalisés en matière d'ajustement structurel. Une évaluation effectuée lors d'une reprise de l'activité risque de sous-estimer la véritable ampleur des mutations structurelles imminentes qui seraient en train de s'accumuler, mais seraient difficiles à mesurer.

Il serait peut-être possible d'atténuer les fluctuations conjoncturelles des pertes d'emplois et d'éviter la conjonction de mutations structurelles et de mutations conjoncturelles [Caballero et Hammour (1991)]. Cette tâche incombe essentiellement à la politique macro-économique qui, en lissant les cycles, peut réduire le coût des fermetures d'installations anciennes et de créations d'établissements effectuées en période de reprise que l'imprévisibilité de la demande ne fait qu'accroître. Il pourrait aussi être utile de prendre des mesures pour réduire le coût d'établissement de nouvelles unités de production, par exemple, en atténuant l'effet de congestion qui se produit dans la mise en correspondance de l'offre et de la demande et en diminuant les coûts d'équipement et de formation de la main-d'oeuvre. Ce type de politique a été déjà préconisé pour réduire les goulets d'étranglement en période de reprise.

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A. INTRODUCTION

1. Job creation continues to be one of the most important issues facing OECD economies. The traditional focus on net employment growth hides much of the dynamics of employment creation: regardless of whether net employment is increasing or declining, large numbers of jobs are being created as well as destroyed. For the OECD nations for which data are available, total turnover averaged more than twenty per cent during the 1980s, although net employment growth was generally in the range 0.5 -2 per cent. In other words, each year an average of one in five jobs changed. Zero net employment growth can mask significant job gains and losses. Industries with declining employment can have significant job creation while industries with growing employment can have significant job losses.

2. The purpose of this paper is to examine the dynamics of employment growth, job gains and job losses, with a view towards a better understanding of recent developments underlying employment growth in the 1980s and expected trends in the 1990s. An important distinction which will be made during most sections of the paper is that between the influence of cyclical factors and structural forces. These are important influences on net employment growth, ergo their influence on the full range of labour turnover is equally important. In its last review of the issue, OECD (1987) placed a strong emphasis on the relationship between structural change and the process of job creation and job loss and some of the findings or conclusions drawn at this time will be further explored.

3. The paper begins with an overview of the process of employment turnover and its components in section B. This is followed in Section C by a review of recent literature. This includes the influence of the business cycle on job gain and loss and the potential effects of structural change. The analysis undertaken is presented in Section D while section E concludes the paper with some policy implications stemming from the research.

B. CONCEPTS AND ISSUES

1. Concepts

4. The concepts of both job turnover and labour turnover were reviewed comprehensively in OECD (1987). **Job turnover** measures the creation or disappearance of positions while **labour turnover** measures the movement of workers into (hires) and out of (separations) jobs. In practice, this distinction is not always clear-cut. "Jobs" in this chapter are defined as filled employment positions. Job turnover is based on comparisons of stocks of employment in each establishment or enterprise at two points in time, usually one year apart. This comparison eliminates labour turnover within the establishment during the intervening period and so distinguishes job turnover. However, only net changes in jobs within each establishment are counted, so that true job turnover is under-estimated. In addition, changes in unfilled vacancies are not included.

5. Comparison of each establishment at two points in time allows it to be classified (in Chart 1) into one of four categories: opening (block A), expanding (block C), declining (block D) and closing (block B). Continuing establishments are classified based on net employment change. The sum of these four components (without regard to sign) represents gross change or **job turnover** (block I) or **gross job reallocation**. The net effect of these four categories of change, aggregated across all establishments in the economy, is equivalent to the net change in employment (block J).

6. Turnover is high relative to net employment growth because establishments or firms behave differently. Excess job turnover (reallocation) is the difference between total turnover and the absolute value of net employment growth (in Chart 4.1 block I - block J)[2]. This turbulence in the labour market represents the dispersion of establishment or firm growth rates around the mean rate of employment growth.

This reflects differing circumstances facing establishments and implies that establishments within industries, regions and size classes are not homogeneous as is traditionally assumed in economics. As Hamermesh (1993) has pointed out, this means that there is no" representative establishment in an industry". If one assumes that decisions to hire are dependent on the marginal product, turnover data suggest that it is constantly shifting across establishments. If this is true, then, labour demand is a considerably more complex issue than is allowed for in the neoclassical theory of production, useful as that theory has been [Hamermesh (1993)].

7. Among the many ways to analyze job turnover, gains from opening and expansion of establishments (firms) (Chart 1 block E) can be compared with losses arising from closures and contractions (block F). Employment changes due to openings and closures, or net entry (Chart 1 block G) can be seen as distinct from expansion and contraction within a pool of existing establishments (net expansion) (Chart 1 block H). Employment growth stemming from the opening of new establishments can be viewed separately from the performance of existing establishments which consists of expansion, contraction and closure.

8. This report focuses on dependent employees in the private sector excluding primary industries, public administration and non-market services. The self-employed are excluded for reasons of comparability. Analysis was undertaken at the establishment level, the reasons for which are explained in Annex A. Details of coverage by country, which vary due to coverage of the data bases, are also contained in Annex A. For a number of reasons these data cannot be fully standardized, therefore cross-country comparisons must be made with great care.

2. Issues

9. Turnover and its components represent a means of viewing net employment change, both for the whole economy and for particular sectors in a more complete fashion. Some of the key issues are:

- how is the business cycle reflected in job turnover data?
- what is the influence of structural change on job turnover?
- what are the distinctive features of job turnover in industries?
- what factors influence job turnover?

C. LITERATURE REVIEW

10. Data on job turnover help us understand *how* firms generate jobs but as Hamermesh (1993) has pointed out, an understanding of *why* is missing. "While they are extremely interesting in their own right, data on gross flows of jobs tell us nothing directly about the magnitude of the wage or output elasticities of employment changes through the births or deaths of establishments, or growth or contraction in existing establishments. All we can infer is that changes occur and that, by assumption, they must be produced by shocks that change labour demand by existing or potential employers". An important debate with policy implications concerns the degree to which observed job turnover is cyclical, structural or frictional. Turnover that results from aggregate shocks associated with the business cycle which are ultimately reversed is the easiest to identify. Turnover also stems from allocative changes, involving a reallocation of employment across different firms within an industry or across different industries [Blanchard and Diamond (1990)]. Allocative shifts reflect changes in tastes and incomes leading to changes in demand for specific goods and may be temporary or permanent. They also arise from the competitive process and varying efficiencies, over time and across firms, in producing the same goods or services. Sources of

change include the introduction of new technologies, with international developments - the process of globalisation and changes in trade patterns - influencing the reallocation of jobs domestically. Moreover, turnover is not simply a mechanical process but also reflects the timing or pace of responses to changes in demand, as well as the decisions made within firms about how to respond to changes in the market place.

11. Turnover arising from allocative shifts either reflects structural change or is frictional. Structural turnover could be said to comprise permanent allocative shifts, while temporary shifts could be classed as frictional turnover. However, there are two types of permanent allocative shifts: (i) permanent inter-industry shifts which are more easily classified as structural; and (ii) permanent intra-industry changes which include both structural change as well as changes that arise from inherent characteristics of an industry, which though they produce higher turnover, do not lead to a change in industry structure. This latter component could be included in frictional turnover. For example, industries characterized by an unstable fringe will exhibit turnover precisely because successful entry is difficult. An industrial structure in which small firms are subcontractors to large enterprises, best typified by the model of just-in-time production, would also exhibit high turnover. These examples suggest that in empirical estimates, structural change will be difficult to disentangle from frictional turnover.

12. Two streams have developed in the literature in attempting to characterize structural and cyclical influences on turnover. One sees structural turnover as continuous, an integral feature of a market economy. It emphasizes the importance of establishment openings as the primary means through which more significant changes in an economy occur. However, disinvestment leading to the elimination of old jobs is also an important source of productivity growth in addition to investment leading to new jobs [Thurow (1980)]. This being the case, greater attention to job losses associated with structural change (negative structural change) is warranted. An alternative view emphasizes the concentration of job losses stemming from structural change in cyclical downturns.

1. Continuous structural job turnover

13. Differences in the behaviour of the components of turnover, in particular that of entry rates, has led to new insight into the influence of structural change on jobs. Hamermesh (1993) develops an approach that explicitly recognizes differences in the responsiveness of establishment openings and closures to changes in wages, the cost of capital and prices compared to existing establishments. Boeri and Cramer (1992) found that in Germany, for the period 1977-1990, entry was positively correlated with the longer-term trend in net employment growth whereas the expansion of existing firms was more correlated with deviations from that trend or the cyclical component of the change in net employment. They concluded that establishment entry is the driving force behind trend growth.

14. Baldwin and Gorecki (1990), looking at industry growth patterns, arrived at a similar conclusions. A comparison of entry and exit rates to long term trends across industries revealed that entry rates, and exit rates relatively less so, were sensitive to differential employment growth rates. The employment effects of expansion and contraction of existing enterprises was more volatile in the short run than entry and exit. It is evident that many firms which expand during one period may suffer losses in a subsequent period. This suggests that expansion and contraction are more related to cyclical fluctuations, while entry rates are the main means by which differential trends in the growth of industries come to be realized. Robson, Gallagher and Kerr (1993) found that birth rates varied across regions while closure rates did not. Changes in entry rates are important in explaining the adjustment of industries or regions from an aggregate perspective. This suggests that increases (decreases) in the entry rate are a strong indicator of improved (diminished) economic performance over the longer term.

15. By contrast, for the U.S., Kirchhoff and Phillips (1991) found evidence that the net entry rate (openings less closures) of small firms was counter-cyclical, due to variations in opening and closure rates but variation in closure rates had the most impact. Net entry and net employment creation of large firms

accounted for a disproportionate share of employment growth in the later stages of expansion. This pro-cyclical pattern could reflect the reorganisation of establishments owned by large firms during the late 1980s, which might be viewed as an unusual event.

16. OECD (1987) emphasized high non-cyclical turnover which is in part structural. Assuming that the job loss (gain) rate at cyclical peaks (troughs) is determined by non-cyclical factors, the remaining turnover can be regarded as cyclical. The relative stability of opening and closing rates significantly influences non-cyclical turnover, while the cyclical fluctuation of expansion and contraction dominates the cyclical component. Non-cyclical turnover reflects both structural and frictional turnover which does not represent a permanent change. High ongoing turnover largely represents turnover within industries rather than inter-sectoral reallocation. This approach indicated that approximately 80 per cent of all turnover was non-cyclical [OECD (1987)].

17. Studies of turnover in the manufacturing sector in the US [(Dunne, Roberts and Samuelson (1989b); Davis and Haltiwanger (1992); Baldwin, Dunne and Haltiwanger (1993) (Canada and the US)] found high rates of job gain and job loss across all manufacturing sectors and considerable variability in turnover. There was substantial variation in gross job reallocation across categories of establishments defined in terms of age, size, ownership and region. The most important was establishment age (a finding pervasive across two-digit industries), where turnover fell sharply among older plants. Gross job reallocation rates also declined sharply with establishment size. Similarly, gross job reallocation was lower among single unit plants than for plants operated by multi-unit firms[3].

18. US studies [(Dunne, Roberts and Samuelson (1989b) Davis and Haltiwanger (1992)] also found that most turnover is the result of displacement of labour within industries rather than across them. Results are summarized in Baldwin, Davis and Haltiwanger (1993)[4]. These studies focus on the two components on excess job reallocation (job reallocation less the absolute value of net employment growth in Chart 1 block I - block J). Differences in net employment growth in a particular industry relative to the average for manufacturing represent job reallocation among sectors, while the difference between gross job reallocation in a sector and its net employment growth represents excess job reallocation within a sector. Dunne Roberts and Samuelson (1989b) found that for the periods 1972-1977 and 1977-1982, inter-industry shifts accounted for only 7.5 per cent of excess job reallocation, while intra-industry movements accounted for 92.5 per cent. Using a similar method, Davis and Haltiwanger (1992) found that inter-industry shifts (defined at the SIC two-digit level) account for only 1.5 per cent of excess job reallocation. Even when industries were defined more finely (450 groups) they were still only able to explain 12 per cent of excess job reallocation.

19. This analysis was extended to shifts across establishments classified by several characteristics (age, size, ownership, industry and region) simultaneously. Using industry and region, Dunne, Roberts and Samuelson (1989b) explained 20.7 per cent of excess turnover. Their importance as a source of turnover was largest in periods of contraction. When age was added, the importance of shifts between groups rose substantially to 57.3 per cent. Davis and Haltiwanger (1992) found that shifts of jobs across more finely defined groupings of plants (in terms of industry, plant age, size, region and ownership type) accounted for 39 per cent of excess job reallocation. Most of the increase was a result of movements of jobs across age categories. For Germany, Boeri and Cramer (1992) established that variance across industry sectors (81 groups) accounted for less than 0.5 % of total variance in establishment growth rates. Variance across a much smaller number of size classes accounted for 5-6 % of total variance.

20. For Italy (Turin region, manufacturing), Violante and Prat (1992) using a similar methodology to that of Davis and Haltiwanger (1992), found that shifts among groups defined by age, size and three-digit industrial groups accounted for 60 per cent of excess job reallocation. They believe that the measure used by Davis and Haltiwanger (1992) may seriously underestimate the importance of inter-sectoral shifts[5]. An analysis of variance revealed that inter-sectoral shifts explained 70 per cent of gross job turnover, size

and age being the main factors. In general, therefore, turnover is associated with changes in the age size structure of establishments and only slightly affected by changes in the industry employment mix.

21. The process of productivity growth at the establishment level also points to ongoing structural change. Conventional wisdom was that productivity growth was associated with labour shedding. However, recent studies indicate that the process is more complicated. In the United States manufacturing sector, the majority of productivity growth occurs in existing plants rather than entrants and exiters [Baily, Hulten and Campbell (1992)]. Successful upsizers (who both increase productivity and employment) contributed almost as much to productivity growth as successful downsizers (increasing productivity with decreasing employment) [Baily, Bartelsman and Haltiwanger (1994)]. This wide divergence of employment performance of establishments that seems to stem from the process of productivity growth, also suggests that some proportion of inter-establishment flows of workers is a feature of this process. This inference regarding the importance of job and labour turnover is, however, based on results for the U.S. manufacturing sector only. Countries where internal labour adjustment is more significant may show different patterns.

22. As well, there is evidence that much job turnover is permanent. For the U.S., Davis, Haltiwanger and Schuh (1994) found that the average one year persistence rate for jobs created was 70 per cent while the rate for jobs lost was 82 per cent, falling to 54 and 74 per cent respectively over two years. For Italy, Violante and Prat (1992) calculated that the persistence rate after four years for jobs created was 37 per cent while the persistence rate for job losses was 68 per cent.

23. In contrast, there is evidence of unstable growth rates and a tendency for growth patterns to reverse themselves. Leonard (1987) using data for the U.S. state of Wisconsin presents evidence of a regression towards the mean establishment size. Larger size of establishment is associated with slower growth in subsequent years and faster growth in preceding years. Growth rates one year apart are negatively correlated [above (below) average growth is likely to be followed by below (above) average growth]. For Germany, Boeri and Cramer (1992) also find evidence of high instability of the growth rates of existing establishments. Both note the negative correlation between year-to-year growth rates suggesting relatively quick adjustments to changes. Boeri and Cramer find evidence of factors beyond a regression to mean size and to factors causing establishments to remain in particular size bands. Hall (1987) finds large random and largely permanent changes in employment in any one firm from year to year. Baldwin and Gorecki (1990) also find evidence of reversibility of employment gains (losses) among incumbents.

2. Structural job turnover concentrated in cyclical downturns

24. While extensive work has been done to examine the impact that aggregate or transitory shocks have on turnover, the evidence is still mixed, and generalisations must be treated with some caution. In general, one would not expect job turnover to fluctuate over the economic cycle: job gains should be as likely to fall in recessions as job losses are to rise. However, Davis and Haltiwanger (1990 and 1992) and Davis Haltiwanger and Schuh (1994) found evidence of a counter-cyclical pattern in total job turnover in manufacturing in the U.S This is a result of an asymmetry, with larger increases in job losses than declines in job creation during downturns and the reverse during upswings.

25. Others have reached similar conclusions. For Italy, Contini and Revelli (1992) found that turnover appears to be counter cyclical[6]. Violante and Prat (1992) found a weakly significant correlation at the aggregate level but a more strongly significant relationship for manufacturing alone (Turin region) 1978-1989. For Canada, Baldwin and Gorecki (1990) found evidence of counter-cyclical movements in manufacturing during the period 1970-1981. Baldwin, Dunne and Haltiwanger (1993) found a negative correlation between turnover and net employment growth for Canada but not the U.S. Konings (1993) found a negative correlation for a sample of large firms in the manufacturing sector in the United Kingdom.

26. By contrast, for Italy for the period 1984-1989, Gavosto and Sestito (1992) found that turnover in manufacturing was positively correlated to the business cycle[7]. Boeri (1994) did not find that there was a strong relationship between turnover and net employment growth for 7 OECD countries, likely as a result of intra-industry turnover which remained high through the economic cycle.

27. The difficulty in resolving the issue of the counter-cyclicality of turnover stems partly from the lack of sufficiently long time series to take account of the magnitude of movement over the cycle. The most significant movements in turnover, when structural change may have occurred, took place at only two points -- the recessions of 1981-82 and 1990 or later. However, differences in turnover during these two periods from the remainder of the time series cannot be isolated[8]. Instead, most studies have made use of rank correlations between turnover and net employment growth.

28. There are several possible explanations for the counter-cyclical pattern in job turnover. Major allocative shocks, accompanied by sharp rises in job losses, may be at the root of recessions. Alternatively, as is widely held, recessions may still be caused by aggregate shocks but these may influence the timing of job reallocation. Blanchard and Diamond (1990) concluded that the most likely explanation is that recessions may be a time of cleaning up. Cyclical downturns may be accompanied by structural change in which the increased competition for a dwindling market produces industry restructuring. The budget constraint of firms varies over the cycle. During upswings, it typically becomes softer so that inefficiencies may arise. In downturns, when the budget constrain becomes firmer, firms must deal with these inefficiencies.

29. Could technological change lead to a situation where jobs in old plants are more vulnerable in cyclical downturn? Older plants/jobs have higher marginal costs, however, many costs of established plants are sunk, meaning that entry should be more affected than exit. This suggests that technological change is not an explanation [Blanchard and Diamond (1990)]. If plants do not modernize, they may survive for some time, especially with strong cyclical growth when even antiquated facilities may still be profitable. Given the unpredictability of these expansions, new investment in additional capacity and the closure of existing facilities might involve risk. During a downturn, older facilities may finally be closed and ultimately investments in new plant and equipment made. Hence restructuring due to technological obsolescence could be delayed until downturns.

30. A further explanation is based on the matching function which relates individuals to vacancies in firms [Mortensen and Pissarides (1994)]. The difficulty in filling vacancies, or matching individuals to positions, means job creation, which is measured by filled positions, responds incrementally to positive aggregate shocks. By contrast, job destruction occurs rapidly during cyclical downturns when a proportion of existing jobs cease to be viable. Simulations using a matching model show that aggregate shocks are able to proxy the cyclical behaviour of job creation and loss in the manufacturing sector in the United States [Mortensen and Pissarides (1994)].

31. The nature of the increases in job losses during recessions is indicative of structural change. There is evidence that they are accounted for mainly by increased losses among large older establishments [Davis and Haltiwanger (1992), Davis, Haltiwanger and Schuh (1994), Violante and Prat (1992) and Robson and Gallagher (1993)]. Gross job reallocation rates among young , small single unit plants exhibit little counter-cyclical variation [Davis and Haltiwanger (1992)] or are pro-cyclical [Contini and Revelli (1992) and Violante and Prat (1992)]. If larger firms are able to withstand pressures for structural change better than smaller firms, adjustments will only be made when market conditions deteriorate substantially.

32. Changes in the costs of creating new jobs over the economic cycle may play a role in the timing of structural change [Caballero and Hammour (1991)]. The higher cost of creating establishments during cyclical upswings (e.g. the congestion effect in the matching process as well as capital installation and labour training costs) may mean that firms delay eliminating jobs, ultimately accentuating the concentration of closing or contraction of older establishments in downturns. Similarly, in downturns, it may be costly

to delay the establishment of new facilities and the associated job creation which would mean reducing the rate of new technology adoption, perhaps leading to considerable catchup costs during an upswing. These costs may lead to the scrapping of existing establishments prior to the end of their useful lives. In effect, underlying net employment growth in upswings is too low a rate of job loss, while in downturns, turnover is elevated by rates of job creation and job loss which may both be too high[9]. This argument goes furthest is suggesting that cyclical and structural change are coincident.

33. Using a model to predict job flows in U.S. manufacturing, Caballero (1992) finds that two factors are required to produce greater volatility in job loss: the probability of good periods is higher than that of bad periods; and that bad times are sharper than good times. This produces larger swings in job loss regardless of the model describing the behaviour pattern of individual firms. Underlying this is a dispersion of decision-making involving job creation during good times, contrasted with a synchronization of decisions to eliminate jobs during the brief periods when times turn bad.

34. Blanchard and Diamond (1989) attempted to measure the relative importance of aggregate and allocative shocks in explaining post-war movements in unemployment and vacancies (the Beveridge Curve) in the U.S. Aggregate shocks cause unemployment and vacancies to move in opposite directions. Positive (negative) aggregate shocks or cyclical upswings (downturns) cause movements upwards (downwards) along the Beveridge Curve. Changes in reallocative intensity cause unemployment and vacancies to move in the same direction. Increased reallocative intensity causes outward movement of the curve, while reduced allocative disturbances cause the curve to shift inward. They concluded that aggregate shocks dominate short-and medium-term movements in unemployment and vacancy rates. Changes in allocative intensity tended to dominate long-term movements, resulting in a steady increase in the unemployment rate of 2 percentage points from the late 1960s through to 1984 followed by a decease of 1 percentage point through to 1988. Blanchard and Diamond (1989) conclude that this latter inward shift of the Beveridge Curve indicates that allocative shocks diminished or that the matching process related to these shocks improved. It may also be that structural change was delayed by the strong cyclical conditions of the late 1980s.

35. The two perspectives on structural turnover presented in this section are not incompatible if there is an asymmetry in job dynamics stemming from structural change. More extensive allocative shocks, which involve a shift in production and employment from one industry to another will produce immediate increases in job losses and eventually increases in job creation [Davis and Haltiwanger (1990)]. Job losses stemming from structural change are likely to be dramatic and may coincide with cyclical downturns. Economic changes conducive to new establishment formation are unlikely to have an immediate effect so that there are likely to be delays in job creation. The creation of new jobs and the reallocation of workers is time-consuming. As job creation involves long-term investment decisions in an uncertain environment, there may be delays if uncertainty is expected to decrease in the future [Blanchard and Diamond (1990)]. There is some empirical evidence that some job losses associated with structural change are delayed until downturns and are more concentrated among older establishments, as well as evidence that structural change occurs incrementally through the entry of new establishments.

3. Factors influencing job turnover

i) Industrial structure and competitive forces

36. There is an extensive literature on the determinants of firm entry to and exit from industries and the implications for job creation and job losses. Cable and Schwalbach (1991) summarize results of recent studies of manufacturing using Orr-type models in a number of different countries (Belgium, Germany, Korea, Norway, Portugal and the United Kingdom). Entry of firms responds, at least to some extent, to profit opportunities. Entry barriers, as measured by capital requirements and sunk costs, tend to reduce entry rates. Results for other variables are mixed, though from other studies it would appear that higher firm concentration tends to be associated with reduced entry.

37. Baldwin, Dunne and Haltiwanger (1993) examined the influence of industrial structure on job turnover in the manufacturing sector in Canada and the United States. The factors influencing excess job reallocation in the two countries were basically the same. Both countries exhibited similar turnover after accounting for differences in characteristics measuring industrial structure, indicating that common factors, such as the technology base of an industry, might account for similar plant turnover in both countries. Industry concentration was negatively correlated with excess job reallocation. Higher concentration also led to both lower job gains and losses. The effect was highly significant in both countries. This was primarily a result of variation across industries. Over time increases in plant size were associated with higher turnover though this was not always statistically significant. This may be a result of restructuring associated with an industry's move to a larger average plant size. Changes in labour productivity were associated with higher excess job reallocation, higher job gains and lower job losses, though the relationship was generally only significant for Canada and not for the United States. The impact of unionization was not possible to measure given its very high correlation with plant size used to measure concentration. Davis, Haltiwanger and Schuh (1994) found that job losses were highest in establishments where capital intensity was low.

ii) Trade

38. Increased openness of economies has been put forward as one explanation for less job stability. For manufacturing in Canada (1970-1979), Baldwin and Gorecki (1983) examined entry and exit of firms from industries. This study looked at trade in combination with other variables relating to industrial structure. Distinguishing between domestic and foreign firms, they found that the former were significantly influenced by trade performance while the latter were much less so. Entry was positively correlated with growth in the volume of exports and negatively correlated with growth in the volume of imports. However, entry by plant creation responded less to growth in exports than to growth in domestic sales lending support to the argument that export opportunities require larger firms. Exit was lower the higher the growth in exports and was positively correlated with growth in imports. The effect of balanced changes in trade may have been to decrease the number of domestic firms via the effect of export and import growth on entry and exit[10]. Leonard and Schettkat (1991) suggest that greater product market stability, including greater export market stability, may account for lower turnover in Germany than in the U.S. For Germany, Muller and Owen (1985) found that growth in exports was related to growth in plant size in twelve manufacturing industries. For Norway (manufacturing), Morch von der Fehr (1991) found a statistically significant negative correlation of export market orientation with the firm entry rate while the import share or the domestic market was also negatively correlated though the relationship was not statistically significant. Both variables had been expected to affect entry negatively on the assumption that they were associated with increased risk.

39. Baldwin, Dunne and Haltiwanger (1993) included the effect of trade on job creation and job loss for the manufacturing sector in Canada and the United States. Exports were positively associated with job creation in Canada and the United States though this result primarily reflected variation across industries rather than changes over time. In both countries increases in exports over time led to lower job creation though the effect was only significant in the United States. In the United States, but not in Canada, exports were also associated with increased job losses. Imports were correlated with higher job creation and higher job losses in both countries. This was true in both the short and the long-run. Increasing imports over time have been associated with increased job losses in Canada but not in the United States. Davis, Haltiwanger and Schuh (1994) found that there were not distinct patterns in job creation and loss when industries were grouped according to import penteration and export share, except that in industries with high import penetration ratios, job loss was elevated.

iii) Wages

40. In their comparison of turnover in Germany and the U.S. Leonard and Schettkat (1991) point out that more rigid wages in Germany than the U.S. in a simple theoretical framework, should result in higher turnover in Germany whereas actual turnover is lower. Leonard and Van Audenrode (1993) suggest that wages are higher in industries in which labour turnover is lower though it would appear that job turnover is not significantly different. Boeri (1990) found that for Germany, the lower the variance of wages within an industry, the lower were both opening and closing rates. Bell and Freeman (1991) found that, for industries in the U.S. in the period 1970-1987, wage growth and productivity growth were positively correlated but both were negatively correlated with net employment growth. Extension of this analysis to include job creation and job loss data may shed further light on this process which has been taken as indicating that there is a process of rent-sharing in industries experiencing productivity growth. Bretel, Brunel, Di Carlo and Epaulard (1993) found that the higher the cost of labour (social charges) relative to capital, the lower the rate of job gain and the higher the rate of job loss. Davis, Haltiwanger and Schuh (1994) found that job turnover fell sharply with the relative level of establishment wages.

iv) Legal regulation

41. There has been an ongoing debate about the role of improved flexibility of labour markets and its role in enhancing employment creation. Buechtemann (1989) suggests that the greater employment stability in Germany does not primarily reflect legislative provisions governing the labour market but patterns of firm human resource management practices. Leonard and Schettkat (1991) concluded that while differences between Germany and the U.S. may reflect cross-national differences in institutions and regulations, they do not explain why jobs in Germany are more stable. Burgess (1989) examined the process of adjustment in several industries in the U.K. and found that the value of redundancy payments received influenced employment adjustment and turnover. Employment protection legislation may play a role in delaying the increase in employment stemming from allocative shocks thus lengthening the gap between job loss and job creation [Garibaldi (1994)].

v) Industrial policies (subsidies)

42. Leonard and Van Audenrode (1993) found that industries which received a higher level of government subsidy had lower rates of labour (not job) turnover than those with lower subsidies in a comparison of Belgium and the United States. Their view is that subsidies reduce dynamism in the economy by transferring resources from industries with higher turnover to those with lower turnover. Higher wage industries were more likely to be subsidised. However, the findings regarding the impact of subsidies on job creation and job loss were much less robust and in fact there is a positive relationship between subsidy level and job losses, the reason suggested being that subsidies are targeted towards declining industries. Leonard and Schettkat (1991) did not find the subsidy argument a convincing explanation for differences in turnover between Germany and the U.S. German subsidies are directed at industries, yet most reallocation takes place within industries, suggesting that subsidies are not a good explanation for the slower pace of gross job reallocation in Germany.

43. An emphasis on employment creation through new enterprises implies relatively lower employment stability whereas an emphasis on the preservation of employment in older plants places a greater emphasis on stable employment levels [Dunne, Roberts and Samuelson (1989b)]. If the jobs being preserved are high wage ones then, given that the wage profile of jobs likely to be created in small firms is uncertain, subsidies to established firms may have a strong appeal.

D. ANALYSIS

1. General patterns

44. Table 1 and Chart 2 show turnover and its components for the second half of the 1980s into the 1990s for ten OECD economies. Turnover ranged from a low of 17 per cent in the Germany to 30 per cent in Denmark (among countries with establishment data). In other words, each year an average of roughly one in five jobs changes. Net employment growth during this period varied from -1.6 per cent annually in Finland to 2.5 per cent in Canada. New Zealand stood out among the countries surveyed, with both high turnover (36 per cent) as well as a marked decline in net employment (-4.1 per cent annually) over the period 1987-1992, as a consequence of a pronounced cyclical downturn and structural change.

45. Some insight into high turnover can be gained by looking at job gains from opening and expansion of establishments (firms) (Chart 1 block E) and job losses arising from closures and contractions (block F). It would not be unreasonable to suggest that economies with higher rates of job gains are in a better position. In Table 1 and Chart 2, the annual rate of job gains ranged from 9 per cent in Germany to 16 per cent in Denmark. However, is it reasonable to conclude for example that Germany was in a relatively weaker position based on this data? The rate of job losses averaged slightly less, ranging from -7.5 per cent in Germany and -14 per cent in Sweden. Following similar reasoning, it would not be unreasonable to view the magnitude of job losses as setting the task, or the target, for the number of new jobs that must be generated if employment is not to decline [OECD (1987)]. In this case, Denmark, France, New Zealand and Sweden could be seen as being under the greatest pressure to create new jobs. However, high job gains and losses also reflect sectoral distribution, the stability of industry markets and behaviour on the competitive margin of an industry with establishments opening and closing. For example high gain rates to some extent imply high loss rates: Germany had both low job gains and losses while the four countries mentioned as having higher job loss rates also had high job gain rates.

46. The rate of expansion of existing establishments was the largest component in the rate of job gains (and in overall turnover) as noted in OECD (1987). It ranged from 4.6 per cent in the United States (followed by 6.0 per cent in the United Kingdom) to 11.2 per cent in Canada[11]. Similarly, the majority of job losses are accounted for by the contraction of existing establishments which ranges from -2.7 per cent in the United Kingdom to -8.8 per cent in Denmark.

47. If establishment opening is related to the trend in employment growth, then are economies in which the rate of employment gain due to establishment openings is higher more dynamic in some sense than other economies? For example, do they then have a stronger long-term trend in employment growth? This is especially interesting in the context of a comparison between Europe and North America given stronger net employment growth in the United States. Within Europe, the rate of change in employment from establishment openings varied widely accounting for gains in employment averaging between 2.5 per cent in Germany to 7.2 per cent annually in France over 1984-early 1990s. Closure of establishments resulted in employment losses in the range of -1.9 per cent in Germany to -7.0 per cent annually in France. This wide disparity in opening and closing rates reflects both differing economic structures as well as measurement differences, and points to the pitfalls in using these data to make cross-country comparisons on the strength of long-term employment growth.

48. However, a limited though more accurate comparison between North America and Europe is possible with several steps. As aggregate data for the United States presented in this chapter are less comparable than those for other countries, Canadian data must serve as a substitute. Data for Canada are more comparable to Italy which also uses firm data and indicate that gains from firm opening rates in manufacturing were lower in Canada for the period 1985-1991. Using different data, at the establishment level, there was not a significant difference in the rate of employment change from establishment opening and closing in manufacturing between Canada with the United States for selected years 1970-1986 [Baldwin, Dunne and Haltiwanger (1993)][12]. Denmark, Finland and Sweden have the most rigorous

definitions of establishment opening. Employment gains through establishment openings in manufacturing in Canada were comparable to those in Finland and below those in Denmark and Sweden. The same is true when one compares establishment closures. It would appear that job gains through establishment or firm openings in manufacturing are not necessarily higher in North America than in European countries. If one considers this as one indicator of dynamism, then as far as can be gauged by this indicator, the manufacturing sector in North America is not more dynamic than a sample of European countries. It should be borne in mind that differences between countries are more complex than can be reflected in turnover data.

2. Cyclical and structural patterns

49. Boeri and Cramer (1992) focused on opening and expansion of establishments and their relationship to the trend and cyclical components of employment change. Their analysis is repeated in this section and is extended to look at the influence of the trend and cycle on contraction and closure of establishments as well as the pattern for different size groups of establishments. The analysis is limited to Canada, Germany and Norway (manufacturing and mining only). Table 3 presents correlation coefficients and their significance for the four components of turnover (opening, closure, expansion and contraction) and the trend and cyclical components of net employment growth. There are four definitions of trend (and consequently cycle). As outlined in Boeri and Cramer (1992) the analysis involves applying the procedure developed in Hodrick and Prescott (1980) to fit a smooth curve through a data series. The shape of the trend line estimated by the Hodrick-Prescott filter is crucially dependent on an exogenous parameter B which embodies a trade-off between the fitting of the series and the smoothness of the trend. Results are based on four values of B which diminish in the extent to which they restrict the estimated trend line. The column titled Trend 1 has the smoothest trend line and corresponds to column Cycle 1 which has the largest cyclical component. Columns to the right have progressively more pronounced fluctuations in the trend line and correspondingly less cyclical variance.

50. For Canada, Germany and Norway, opening rates were positively correlated with the trend in employment growth. In the cases of Norway (manufacturing and mining) and the United States [manufacturing using the Longitudinal Research Database (LRD)], the correlations were poor (negative in the case of the United States). These results may be influenced by poor coverage in the case of the former and exclusion, in the case of the latter, of establishments employing fewer than five persons, perhaps reflecting a downward trend in employment in manufacturing. In addition, the trend in net employment growth in manufacturing was negative in both countries. As data for Canada pertain to firms, expansion of enterprises may involve the opening of establishments, which may account for the correlation of firm expansion with the trend. Closure of establishments tended not to be strongly correlated with either the trend - there was some expectation that it might be - or the cyclical component of growth.

51. In all four countries, expansion of existing establishments (firms) was positively correlated with the cycle (deviations from the trend) while contraction of existing establishments was negatively correlated with the cycle which indicates that these are the dominant factors in cyclical upswings and downturns. The net effect of expansions and contractions is positively correlated with the cycle. This further confirms that the performance of existing establishments is what lies behind cyclical changes in employment.

52. Table 3 extends the analysis to two size categories of establishment, 1-99 individuals and 100 or more individuals. Correlations are with the trend and cycle in employment in that size category. It was expected that large establishments would respond more strongly to cyclical influences or would at least respond differently than small firms. This has been noted by a number of researchers [(Davis and Haltiwanger (1990, 1992), Violante and Prat (1992) and Robson and Gallagher (1993) and Kirchhoff and Phillips (1991)]. Data on size categories were only available for Canada and Norway. In both countries, correlations of opening rates of either size category with the trend in employment in that size category were relatively weak.

53. In Canada and Norway, expansion of both small and large establishments (firms) was positively correlated with the cycle while contraction was negatively correlated. In Norway (manufacturing and mining) but not in Canada, expansion of small establishments was more strongly pro-cyclical while contraction of large establishments was more strongly counter-cyclical. In both Canada and Norway, expansion of small establishments was also correlated with the trend. In Canada this is consistent with the strong role this component played in overall growth.

54. Boeri and Cramer (1992) found that the separation between the trend in employment growth and entry on the one hand and cycle and expansion and contraction on the other, was more pronounced in manufacturing than in services. Similar results are shown in Table 3 for Canada and Germany. The results were reasonably consistent with this view though there were some departures. In Canada as was the case in Norway and the United States, entry in manufacturing was not correlated with the trend in manufacturing employment whereas there was a correlation in Germany. Expansion and contraction of manufacturing were strongly cyclical in Canada, Germany and Norway and the United States. In services, establishment openings were also correlated with the trend though less strongly than manufacturing in Germany while the reverse was true in Canada. Expansion and contraction in services were correlated with the cycle though somewhat less strongly than manufacturing in both Canada and Germany. Expansion of service establishments was correlated with the trend in employment growth in Canada while contraction of services was related to the trend in Germany.

55. While limited to just three countries, there is some evidence that entry is associated with the trend in employment growth, while cyclical developments are dominated by expansion and contraction of existing establishments. This is consistent with past literature - the view that structural change occurs through entry [Baldwin and Gorecki (1990)] and its link to the trend in employment growth [Boeri and Cramer (1992)]. Given this evidence, it is illustrative to compare the expansionary period of 1984-1989 with the longer-term pattern. Unfortunately, data are only available for a sufficiently long period for Canada (1978-1991), France (1978-1992), Germany (1978-1990), Norway (1977-1986 manufacturing and mining) and the United States (1977-1990 for Dun and Bradstreet data and 1973-1988 for the LRD) to draw comparisons. The entry rate in Canada between 1984-1989 remained close to its long-term average, while entry rates in Germany and Norway rose only slightly relative to the increase in net employment growth. Expansion rose above its long term average while contraction declined in almost all years during 1984-1989 in Canada, Germany and Norway and accounted for the majority of the increase in net employment growth. In Canada, expansion of very small firms (less than 20 persons) is the feature that most distinguishes Canadian employment performance from that of the other countries surveyed. In France, increased expansion accounted for the majority of the increase in net growth between the cyclical trough in 1985 and the peak in 1989[13]. In United States using Dun and Bradstreet data, the change in entry accounted for more than the total increase in net employment growth, reflecting unusual cyclical volatility. However, using the LRD, cyclical movements are dominated by expansion and contraction of existing establishments. In the three countries where we have relatively standard data [and supported by the U.S. (LRD) for other periods], the change in the rate of entry did not account for much of the rise in net employment growth during 1984-1989, suggesting that improved employment performance was principally the result of the cyclical upswing.

56. Canada may be a noteworthy example of this phenomenon. The increase in the rate of net employment growth in the late 1980s, which was enough to give Canada a high ranking among OECD countries, was almost exclusively the result of expansion of existing firms, particularly very small firms (less than 20 persons). Entry of new firms contributed relatively little to the increase in employment growth. As recovery from the downturn of 1990-1991 has been much weaker than in the pre-recession period, employment growth has fallen back to its trend rate of increase, which in the case of Canada appears to be quite low.

57. As well as being a steady process, as is evidenced by continued job losses through the upswing, the negative side of structural change may be partly concentrated in larger establishments in downturns [(Davis and Haltiwanger (1990, 1992), Blanchard and Diamond (1990)]. Data in this report can shed some

light on ambiguous results in existing research about the movements of turnover during cyclical downturns. Applying the methodology presented in Table 3 to job turnover, it was found that there was no correlation between turnover and cyclical movements in net employment growth (Cycle 1 to 4 or deviations of net employment change from Trends 1 to 4) for Canada, Germany and Norway (manufacturing). This was true for both small and large establishments as well as for both manufacturing and services. However, this and other analyses summarized here still suffer from the inability to analyze the movements in turnover during the two cyclical downturns in isolation.

58. During the recession of 1981-1982 among the countries for which we have data, there was an increase in Canada but movements in Denmark, France, Germany and Norway (manufacturing) and the United States were not noteworthy. With reference to the most recent recession, Table 2 compares turnover and its components for the period 1984-1989 with 1990-1991(or closest approximation) when economies entered the recessionary period. Among the nine OECD economies, net employment growth declined significantly in most countries except Germany where it increased. The degree of decline in part reflects the onset of recession at different times. Only Canada reached a cyclical trough during the period covered by turnover data witnessing a decline in the rate of employment change of -7.9 percentage points to -3.1 per cent. The net change in employment also became negative in Finland and Sweden. For those countries which entered a recession the increase in turnover was not widespread. However, in Canada and to a lesser extent in Finland, turnover rose significantly. In New Zealand, turnover decreased significantly. The view of the early 1990s as involving more widespread structural change should not be ruled out, given that the remaining countries experienced further declines in employment.

59. The evidence presented in this section provides some support for the view that job creation associated with positive structural change comes about gradually through increased entry, perhaps in other sectors while there is some evidence that negative structural change occurs in downturns. However, these remain tentative conclusions and further research is needed to provide more substantive results.

3. Sectoral analysis

60. High turnover is fairly prevalent across industries reflecting primarily the importance of turnover within industries, the dominant element in overall turnover. Differences in the performance of establishments within each industry are widespread. As with explanations of aggregate turnover, while it is natural to look at factors which influence movement within industries, it is difficult to understand the sources of high levels of turnover. Nonetheless, some features of industry patterns can be elucidated using the aggregate data that are the basis of this paper. There are differences among industries reflecting the influence of factors related to industrial structure though much remains unexplained

i) Industry patterns of job turnover . . . . . .

61. Existing research has indicated a number of influences that sectors have on the pattern of job gain and job loss. However, as with the aggregate data, it is clear that there are considerable flows of jobs which cannot be explained by the characteristics of a particular sector. OECD (1987) found considerable variation in turnover rates across different sectors for Canada, France, Germany, Sweden and Pennsylvania (USA). While there were apparently significant national differences in turnover in particular industries, there were consistent patterns in the ranking of industries across countries. Generally, turnover was highest in hotels and restaurants, business services, construction, retail trade and wholesale trade. It was usually low in the mining sector, and finance, insurance and real estate. Both job gains and losses were concentrated in the first four industries which accounted for about 50 per cent of each (machinery, construction and retail trade were always among these four).

62. Comparing France and Germany, OECD (1987) found that differences in the industry distribution of employment could only explain approximately 20 per cent of the difference in turnover between the two

countries. The remainder would be attributable to other factors which may be economy-wide such as the overall macro-economic climate and social and institutional arrangements. The higher national turnover rate in France prevailed in almost all sectors suggesting that national differences extend to the industry level. Industry-specific factors were the dominant factor in explaining relative turnover rates within a country.

63. As referred to earlier, Davis and Haltiwanger (1992) found sectoral gross job reallocation rates across all 2-digit sectors primarily counter-cyclical. Counter-cyclical movements across industries were more pronounced for larger or older plants and multi-unit plants. Gross job reallocation rates among young, small single unit plants exhibit little counter-cyclical variation across industries. Large movements in sectoral gross job reallocation rates are associated with movements in total manufacturing employment rather than own sector employment growth.

64. Daly, Campbell, Robson and Gallagher 1992 (UK) noted that for 1987-89 there was a stronger contrast between small and large production firms than between small and large service sector firms. This was based on a comparison of the proportion of job creation accounted for by firms in a size range compared to the stock of employment accounted for by firms in that size range. This is a result of the relatively stronger growth of smaller production firms compared to total growth in production employment (net fertility ratio). The relative fertility index shows job creation relative to stock of employment by size category for services relative to production. It indicates that smaller production firms were more successful in expanding than were their counterparts of comparable size in the service sector but that larger service sector firms created jobs at about 1.5 times the rate of similarly-sized production firms. One striking point is the almost absence of net employment growth among larger production firms. This is a result of high exit rates.

65. One issue is the extent to which rates of job gain and loss are correlated across industries. The coexistence of high gain and loss rates reflects characteristics of industries, for example industries with smaller establishment size should have both higher job gains and losses. Among broad sectors, in Table 4, job gains and job losses were correspondingly high or low in some sectors such as manufacturing, electricity, gas and water, wholesale and retail trade and restaurants and hotels, and transport and communication. There was some tendency for the two to be negatively correlated in some sectors. In Chart 3 job gains and job losses for more detailed 2 digit ISIC industry groups are ranked according to descending order of job gain. There is a positive correlation between job gain and job loss in Germany and Sweden and to a lesser extent in Italy, but not in Finland or Norway (manufacturing only). To some extent, high job loss rates seem to accompany high job gain rates, though the tendency was not as pronounced as was noted in OECD (1987) which found that hotels and restaurants, business services, construction, retail trade and wholesale trade tended to have relatively high rates of both gains and losses. This may reflect the inclusion of the recession of the early 1980s and part of the subsequent recovery. Industries which made up earlier losses would show job large loss rates and large gain rates. The late 1980s represent an upswing so the two components of turnover may have diverged. There is considerable variation across industries in the magnitude of both job gains and job losses.

66. A related issue is to what extent are there similarities in industry patterns across countries. The ranking of industries at the broad sectoral level was consistent across countries. There was a tendency for some broad sectors such as construction, wholesale and retail trade and restaurants and hotels to have a consistently high ranking in terms of both job gains and job losses across all the countries while electricity, water and gas and manufacturing had a consistently low ranking. However, there was no definite pattern beyond this. At a more detailed level, there was some tendency for industries to have a similar ranking across countries with regard to job gains but the tendency was much less evident with regard to job losses. Industries which tended to have high levels of job gains (consistently in the top one-third) across the countries surveyed are: real estate and business services, restaurants and hotels, construction, personal and household services, retail trade, recreational and cultural services and wholesale trade. Industries with low job gains (consistently in the bottom one third) included: coal mining, water works and supply and

manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products. With regard to job losses, only construction, real estate and business services and wholesale trade appeared to have consistently high job loss rates while insurance and manufacture of chemicals and chemical products had low job loss rates. Other industries tended to be more highly variable across countries in their ranking of job losses. OECD (1987) found a stronger correlation in the ranking of industries between Germany and France.

ii) Replacement rates

67. Table 5 introduces replacement rates on a detailed sectoral level. Replacement rates are jobs created divided by jobs lost. They provide a view of the relative capacity of job creation in a sector. Comparisons across sectors and across countries can serve to illustrate the performance of a sector. There are three types of replacement rates: the total replacement rate represents total jobs created divided by jobs lost. The replacement rate for existing firms is the ratio of jobs gained through expansion divided by jobs lost. The replacement rate for new establishments is the ratio of jobs created through establishment openings divided by total jobs lost.

68. For the whole economy, total job replacement rates were generally greater than 1 over 1984-1989, the lowest rate being 1.05 in France and Finland and the highest 1.47 in Canada with most in the range of 1.20. Thus in the late 1980s, all the countries surveyed replaced at least as many jobs as were lost and added in the range of 20 per cent additional jobs. This represents an improvement compared to the results of OECD (1987) which included a major recession in most countries surveyed. For existing establishments, the replacement rate was almost uniformly less than 1, varying from 0.48 for France to 1.15 in Canada, with most countries in the range of 0.75. New establishments make up for the deficit in employment creation in existing establishments and account for the excess of job gains over job losses. The replacement rate for new establishments was fairly consistent across countries ranging from 0.32 in Canada and Germany to 0.57 in France (opening establishments accounted for new employment equal to between 32 per cent and 57 per cent of jobs lost respectively).

69. On an industry basis, there was considerable variation in the total replacement rate across countries. On a broad sectoral basis, the total replacement rate was uniformly greater than 1 in the service sector, tending to be highest in finance, insurance, real estate and business services and community and social services where it was well above 1 extending to 1.7 in Finland and Italy in the case of the former. Unlike OECD (1987) finance, insurance, real estate and business services were the most dynamic sector in all European nations surveyed. Among detailed sectors, the replacement rate was highest in financial institutions, real estate and business services, health care and similar services, insurance, restaurants and hotels and wholesale trade.

70. The total replacement rate tended to be lower in goods-producing industries - mining and quarrying and manufacturing. It was less than 1 in mining and quarrying while in manufacturing it was in the range 1.0 to 1.1[14]. Across countries, manufacturing sectors tended to add an additional 10 per cent of employment beyond those they lost. This is not far below the average for the whole economy. Compared to the results from OECD (1987) the performance of the manufacturing sector improved reflecting the choice of period, OECD (1987) including a major recession, as well as the definition of manufacturing which was likely depressed by the inclusion of mining. Within manufacturing, manufacture of paper and paper products and manufacture of fabricated metal products, machinery and equipments tended to have higher replacement rates though there was considerable variation across countries. Textile, wearing apparel and leather industries and manufacture of food, beverage and tobacco tended to have consistently low replacement rates.

71. The relative role of opening and continuing establishments in contributing to the replacement rate across industries is of interest. In industries with larger establishments and those which are more capital intensive, jobs lost would be less likely to be replaced through opening of new establishments. It is

generally true that the replacement rate for new establishments in goods-producing industries is significantly lower than in services, the exception being Sweden.

72. The replacement rate for new establishments tended to be higher in finance, insurance and real estate and in wholesale and retail trade and restaurants and hotels though there was some variation across countries. The replacement rate for new establishments in manufacturing was relatively low except in Italy and Sweden where it was close to the average for the whole economy. The rate for manufacturing was lowest in Germany and Norway. OECD (1987) also found a high replacement rate due to new establishments in some manufacturing sectors in France and Pennsylvania. Within manufacturing, there was a considerable range. Manufacture of paper and paper products and manufacture of fabricated metal products, machinery and equipments tended to have higher replacement rates through entry, though this was not consistent across all countries. Replacement through entry was low in manufacture of food, beverages and tobacco.

iii) Non-cyclical job turnover

73. Estimates of non-cyclical turnover introduced in OECD (1987) are repeated in this section. These are based on taking the minimum level of job gain (at a cyclical trough) and adding to it the minimum level of job loss (at a cyclical peak). According to new results, shown in Table 6 and Chart 4, between 80 and 90 per cent of turnover is non-cyclical varying from a low of 71 per cent in Canada. to 91 per cent in Italy. The remaining turnover would be cyclical. Estimates are inflated by the absence of a full economic cycle in a number of countries which limits cyclical variation. The longest time series are available for Canada, France, Germany and the United States which accounts for their lower levels of structural turnover. Estimates of non-cyclical turnover are reduced somewhat if one separates the four components of turnover and takes the minimum value of each. The difference is often not great reflecting the tendency for expansion and contraction of existing establishments to move over the cycle while opening and closing of establishments remains more cyclically stable. Bearing in mind the difficulty of making international comparisons, it would seem that European economies have a higher proportion of non-cyclical turnover or alternatively, that turnover fluctuates more over the economic cycle in North America. It would be desirable to allocate non-cyclical turnover into proportions which represent structural change and turnover which is frictional. However, this does not seem possible yet.

74. Across countries, industries varied as to the proportion of turnover that was structural. Among broad groups, community, social and personal services and wholesale trade, retail trade, restaurants and hotels tended to have a relatively high proportion of structural turnover while electricity, gas and water had among the lowest proportion of structural turnover. There was considerable variation across countries in the relative ordering of groups. Manufacturing was relatively close to the overall average with structural turnover varying between 61 and 88 per cent. Among more detailed industry groups, the proportion of structural turnover was consistently relatively high in wholesale trade, personal and household services, retail trade and real estate and business services. It was lowest in the subgroups of mining, communication and water works and supply. Manufacturing industries varied considerably in most countries with structural turnover being highest in other manufacturing industries with manufacture of fabricated metal products at a lower rate and machinery and equipment and basic metal industries having among the lowest proportion of structural turnover. The dispersion across countries in the ranking of the other manufacturing industries was too great to draw any inferences.

iv) Changes in industry structure

75. Changing industrial structure may be measured by changes in the structure of employment by firms. One topical issue is changing economies of scale - as the minimum efficient scale has declined this has allowed the growth of smaller firms. Piore and Sabel (1984) introduce the concept of flexible specialization in which they suggest manufacturing in the economies of developed economies will move

away from mass production of standardized products in large establishments towards more specialized niche production by smaller scale producers.

76. Chart 5 presents an arrangement of industries classified by the components of employment change as originally constructed in OECD (1987). Industries may have either expanding or contracting employment. In the case of the expanding employment, the pool of establishments may be expanding or contracting. If it is expanding, it may be supplemented by expanding average establishment size or offset by declining establishment size. If the pool of establishments is contracting, it must necessarily be offset by expanding establishment size. A similar series of combinations applies if an industry's employment is contracting.

77. In Group A employment growth tends to be relatively strongly based, being supported both by a growing number of establishments and by growth in their average size. In Group B, the decline in establishment size is more than offset by rising establishment numbers. Both A and B benefit from net entry but may reflect differences in the development of establishment structure. Industries in Group C show a greater tendency towards consolidation, with both a decline in establishment numbers as well as a stronger increase in the size of remaining establishments. Groups D through E experience declining employment for opposite reasons. In group D, declining establishment size is the dominant feature, being offset by rising establishment numbers. Group E represents rising defensive concentration, declining establishment numbers being the dominant development with remaining establishments undergoing consolidation. Group F may represent the worst off industries, which are experiencing declining employment arising from a decline in establishments compounded by a decline in the size of remaining establishments.

78. Among broad industry sectors, mining and quarrying tended to fall into group D in the case of Finland and Sweden and F in Italy and the U.S. Both groups were experiencing declining employment and a declining establishment size, though in the former group there was entry while the situation in the latter countries was more negative with a decline in establishment numbers. OECD (1987) found a similar pattern though comparison is difficult as energy and mining were grouped together.

79. Manufacturing as a whole tended to be in groups B (Italy, Norway, Sweden) or in D (Finland, France, U.S.). In both cases average size was declining but net entry was positive. These are indicators of structural change. In the case of B, entry has offset the size decline while in the case of D it has been insufficient. The decline in average size may have come about through the impact of new entrants which tend to be small as well as declining size of continuing establishments. The distribution of manufacturing subgroups was wider. The situation for paper and paper products and printing and publishing and non-metallic mineral products was more positive (mostly A and B) while fabricated metal products, machinery and equipment were somewhat worse off, being in group D in Finland and France. Textile, wearing apparel and leather industries were mostly in group D. Other subgroups tended to vary more widely across categories.

80. Compared to OECD (1987), the position of manufacturing seems to have improved though the former study included a major recession. Manufacturing as a whole fell into group F in France and Germany and in group D in Sweden. Consumer goods industries were identified as particularly weak (F) in OECD (1987). It was suggested that these industries may have come under increasing competitive pressure from trade. The shrinking size of establishments may also be partly explained by the Piore and Sabel (1984) thesis that those firms which remain are moving into more specialized niche production though further evidence is needed. By comparison, in the more recent period, there were relatively few subgroups of manufacturing in group F, the exceptions being in France and Norway.

81. Of interest is the extent of movement across categories. For example movement from D to F signals that an industry has succumbed to competitive pressures. The apparent lack of this tendency between the two surveys could be taken as a positive development, though again, the latter period was particularly strong cyclically which makes comparison more difficult.

82. OECD (1987) identified machinery (overlapping ISIC division fabricated metal products, machinery and equipment) as experiencing increased entry and declining average size but in an environment of overall employment contraction (group D). The dominant influence of contracting establishment size may be evidence of restructuring. From a trade perspective, OECD (1987) suggests this may have been an indication that this sector had responded to international competition through restructuring. In the more recent period, this sector has continued to experience entry of new establishments and a decline in establishment size. In several countries though, employment grew, perhaps influenced by the strong prevailing cyclical conditions. This pattern may still mean a continuation of a declining share of manufacturing employment even if Piore and Sabel (1984) are correct, though if the pool of establishments has continued to expand, the potential for future growth may have been preserved. Overall, this illustrates that declines in employment should not necessarily be taken as a sign of a declining industry.

83. Electricity, gas and water tended to be in group D having experienced declining employment and declining establishment size perhaps reflecting technological change. Employment grew in construction, most likely reflecting the strong cyclical influence in this sector.

84. Most service sector industries fell into groups A and B, experiencing growing employment and growing establishment numbers. The majority of subgroups were in B, having seen declining establishment size. Wholesale and retail trade followed the general pattern for services, being in B except in Italy and France where they were in A. The situation was similar for restaurants and hotels. Transport, storage and communication were in group B with few exceptions[15]. Financial institutions were generally in A and B with the exception of France where they were in D. Insurance was in group B. Real estate and business services were in A and B. The subgroups of community, social and personal services tended to be in A or B. OECD (1987) also found that service sector industries were in these two groups almost without exception.

v) Factors influencing job turnover

85. Since the majority of excess turnover is within industries, it makes sense to analyze whether specific characteristics of industries can influence job turnover, bearing in mind that excess turnover is an establishment level phenomenon. The literature on the determinants of firm entry to and exit from industries has implications for excess turnover. Cable and Schwalbach (1991) summarize the results of recent studies of manufacturing in a number of different countries. Most researchers use a model developed by Orr (1974) in which entry is positively related to profit opportunities (measured as the difference between profits of new firms and the long-run profit rate earned by incumbents), and negatively related to entry barriers. The model used here to test the influence of several industry characteristics on excess job turnover in this section is based on the specification in Baldwin, Dunne and Haltiwanger (1993).

86. Barriers to entry should lead to reduced excess turnover as entry and exit will be less pronounced. Establishment size may reflect barriers such as industry concentration, as well as capital requirements. In addition, industries with fewer and larger establishments would be expected to reflect greater stability among incumbents and inter-establishment adjustment of jobs among multi-establishment firms would be reduced.

87. Volatility in output should be positively correlated with volatility in job turnover [Hamermesh (1993)]. Bretel, Brunel, Di Carlo and Epaulard (1993) found that the rate of output change was positively correlated with the rate of employment change using enterprise data. Variability in establishment output was not available so fluctuations in average output were used instead. Increases in the rate of growth should result in increased dispersion as establishments respond differently, while increases in the rate of decline should also lead to increased dispersion. The rate of gross investment might be positively related to excess job turnover, in that it is an indicator of the introduction of new technologies into the workplace. While an indicator which reflected investment dispersion would have been preferable, average investment

is still of interest in pointing to the success of industry characteristics in trying to explain labour displacement resulting from technological change.

88. It might also be expected that the openness of an industry to international trade would have an influence on excess job turnover. Increased export orientation measured by exports as a percentage of domestic output could result in increased job turnover if it implied greater exposure to market shocks. Alternatively, higher export orientation might also be associated with lower turnover if export markets were more stable than domestic markets. Increased import penetration, measured by the import share of the domestic market, might be expected to result in higher turnover as it would reflect a greater number of competitors. However, because there was a correlation between export orientation and import penetration, openness to trade (defined as the ratio of imports and exports to total demand) could be tested, with the expectation that it would result in higher excess turnover except where export markets were relatively more stable. Export market share was substituted for export orientation and results for this and import penetration are shown in separate specifications for Germany and Italy where they were not multicolinear.

The equation was specified as follows:

$$Y_{it} = \boldsymbol{Z}_{it}\boldsymbol{\beta} + \varepsilon_{it}$$

where Y_{it} (Excess job turnover) is the rate of turnover less net employment growth in industry i at time t (per cent of industry employment) and $\boldsymbol{Z}_{it}$ is a vector of explanatory variables in industry i at time t. The variables included in $\boldsymbol{Z}_{it}$ are:

Z_{1it} =

Average establishment size (employment/establishment)

Z_{2it} =

Output fluctuations (the absolute value of the change in rate of growth of industry value added (national currencies in 1985 prices, percentage points)

Z_{3it} =

Capital investment (gross investment/capital stock (national currencies in 1985 prices)

Z_{4it} =

Openness to trade (Exports + Imports)/ (Total Demand or (Output + imports)) (measured in national currencies in current prices, per cent)

Z_{5it} =

Export market share (Exports of country/Total OECD Exports) (U.S. dollars, current prices, per cent)

Z_{6it} =

Import market penetration (Imports/Domestic market or Output-exports+imports) (measured in national currencies in current prices, per cent)

89. Table 7 contains the results for the estimated equations for Finland, Germany, Italy Norway and Sweden. The equation explained a significant proportion of differences in excess turnover in Italy, Norway and Sweden but relatively little for Finland and Germany. There was a statistically significant negative correlation between average establishment size and excess turnover in Finland, Italy and Norway. Baldwin, Dunne and Haltiwanger (1993) found industry concentration was negatively correlated with excess job reallocation in Canada and the United States. In Sweden the correlation was positive and significant.

90. Fluctuations in average industry output did not exert a significant influence on excess job turnover. Though the correlation was positive as expected in the majority of countries, the relationship was statistically significant only in Italy. The rate of investment produced inconsistent results. There was a positive and statistically significant correlation in Norway as expected, while in Germany and Sweden the correlation was not statistically significant and was negative. Results for Germany, Norway and Sweden for both these variables are shown with a one period lag, though they did not improve substantially. These results indicate that it will be difficult to understand labour displacement without detailed establishment level data.

91. Greater openness to trade was not necessarily associated with higher excess turnover. Only in Italy was there a positive statistically significant correlation , while the correlation was positive in Finland and Norway but not significant. It was difficult to identify the effect of openness on excess turnover in Norway as it was correlated with establishment size. Results for Germany and Sweden were not statistically significant, with the correlation being negative. Where export market share was not correlated with other variables, it was strongly associated with lower excess turnover in Germany while in Italy the opposite was true. Import market penetration was associated with lower turnover in Germany though the effect was small, while in Italy, the effect was significant. The results for Germany may provide some support for the hypothesis of Leonard and Schettkat (1991) that export markets for Germany may provide greater job stability. Baldwin, Dunne and Haltiwanger (1993) found excess reallocation was positively related to both the level of export orientation and import intensity, though generally import intensity had a stronger influence. For Germany, Muller and Owen (1985) found that growth in exports was related to growth in plant size in twelve manufacturing industries. For Norway (manufacturing), Morch von der Fehr (1991) found a statistically significant negative correlation of export market orientation with the firm entry rate while the import share of the domestic market was also negatively correlated, though the relationship was not statistically significant.

92. High turnover is a feature of most industries, reflecting primarily the importance of job reallocation within industries. Shifts across industries contribute relatively little to turnover. While differences in the performance of establishments within each industry prevail, some characteristics associated with industry structure can be identified. Smaller average establishment size was associated with greater excess job turnover. Both volatility in industry output and the rate of investment did not exert much influence, while greater openness to trade was generally not associated with greater excess turnover, with the notable exception of Italy, while in Germany export orientation was associated with greater job stability. The apparent need for establishment data to explain job dynamics indicates that it will also be difficult to understand labour market dynamics without an understanding of differing establishment performance.

E. CONCLUSIONS

93. Data on job turnover show that economies are more dynamic than indicated by data on net employment changes. Establishments behave very differently in the face of relatively similar economic situations. Finding macro-economic or aggregate tendencies in these data is important from a policy perspective; however, this is challenging in that these data indicate there is a range of responses to any particular shock. Analysts have concentrated on examining cyclical and structural influences on job

turnover data and this report has attempted to summarize and examine these in the context of job turnover data for ten OECD nations.

94. Two streams have developed in the literature in attempting to characterize the influence of structural change on job turnover. The first sees structural turnover as continuous, an integral feature of a market economy. It emphasizes the importance and the stability of establishment openings as the primary means through which more significant changes in an economy occur [Baldwin and Gorecki (1990) and Boeri and Cramer (1992)]. An alternative view emphasizes the concentration of job losses stemming from structural change in cyclical downturns [Davis and Haltiwanger (1990, 1992) and Blanchard and Diamond (1990)]. An assessment of these two perspectives is important as the timing and pace of structural change can have implications for labour market policies.

95. As first noted in OECD (1987), a proportion of job turnover stemming from structural change is ongoing as shown by the relatively high proportion of turnover (both job gains and job losses) that persists in many industries through the economic cycle. With the data used in this paper, it was not possible to distinguish what proportion of high ongoing turnover represents true structural change and what part is frictional. The majority of turnover reflects changes within industries as jobs change across establishments of different age and size categories. The industry characteristics measured in this paper do not generally exert a strong influence on turnover though there are exceptions: establishment size influences turnover rates while in some countries trade orientation also has an effect.

96. The behaviour of the four components of job turnover over the cycle gives some indications about how cyclical and structural change are reflected in turnover data. Though limited to three countries, there is evidence that the rate of job gains stemming from the opening of establishments is related to the trend in employment growth, while closure of establishments is correlated neither with the trend nor with the cycle. Expansion and contraction of existing establishments is the dominant element in the cyclical pattern of employment change.

97. The relative stability of openings in several countries during the late 1980s, combined with the expansion of existing establishments (or their reduced contraction) as the main source of employment gains during this period, indicates the importance of cyclical conditions in explaining the increase in employment growth over this period. While further evidence is needed, the implication of these findings is that these employment gains are then more subject to loss when cyclical conditions change than if the growth in employment had taken place through increased entry. Canada may be a noteworthy example of this phenomenon. The increase in the rate of net employment growth in the late 1980s, which was enough to give Canada a high rank among OECD countries, was almost exclusively the result of increased expansion and reduced contraction of existing firms, particularly very small firms (less than 20 persons). Entry of new firms contributed relatively little to the increase in the rate of employment growth. As recovery from the downturn of 1990-1991 has been much weaker than in the pre-recession period, employment growth has fallen back to its trend rate of increase, which in the case of Canada appears to be quite low. It may be difficult to increase opening rates, given that they were apparently not heavily influenced by the robust cyclical conditions that prevailed during the latter 1980s.

98. New evidence for the manufacturing sector in the U.S. establishes that the rate of employment gain through establishment openings is no higher than that of Canada; and the rate of the latter is no higher than that of a sample of Nordic countries. Comparison between the U.S. and Canada revealed that job gain and job loss rates were quite similar in spite of the many differences in the manufacturing sectors of the two countries. This tends to indicate that more basic factors, such as the technology base of an industry are the principal determinants of turnover [Baldwin, Dunne and Haltiwanger (1993)].

99. As the creation of firms may be the crucial element in long-term employment growth, structural or framework policies should address themselves to this. According to Reynolds and Storey (1993) and Llewellyn (1992) the orientation of government should be towards broad policies that affect all firms.

Because economies are so dynamic, only through general policies can one hope to reach the broad range of activity that leads to small firm employment growth. However, though evidence is limited, it may be difficult to alter the rate of employment growth stemming from the creation of new establishments.

100. As to the alternative view of structural change, there is evidence that structural change is concentrated in cyclical downturns; however, this revolves around one of the few apparent general tendencies in turnover data - that turnover increases during cyclical downturns. Unfortunately, time series are not long enough to thoroughly test this hypothesis in most countries, so that tests are mostly rank correlations which cannot distinguish movements of turnover during cyclical downturns from other fluctuations in turnover. In spite of these limitations, there is evidence that turnover did increase in several OECD countries (Canada and Finland) during the most recent recession.

101. These two perspectives on structural turnover are compatible if there is asymmetry in the process of structural change. Structural change, involving shifts in employment will produce immediate increases in job losses, perhaps concentrated in cyclical downturns, but only gradual increases in job creation through entry of new establishments, perhaps in other sectors. The evidence presented in this report is not inconsistent with this view; however, it is based on observations using aggregate data. There is as yet no research using this data which has linked the disappearance of jobs in one set of establishments to the creation of new jobs in different establishments.

102. This asymmetry in the process of structural change could have implications for unemployment. Jobs lost due to structural change during downturns may not be replaced during a cyclical recovery which would, strictly speaking, restore jobs lost for cyclical reasons. Adjustment for displaced workers could be difficult given evidence that job losses are concentrated in large older plants which may use old technologies. New jobs would eventually emerge through the gradual opening of new establishments, but this could result in a considerable unemployment gap, especially given the high failure rate of new establishments. The key issue here is the effect of this asymmetry on the structure of jobs, whether or not displaced workers wait for these new jobs. In the aftermath of a cyclical downturn, a set of stable jobs would have been lost, to be replaced by similarly stable jobs only in the long-term. This process could contribute to the ratchet effect, whereby unemployment only gradually returns to pre-recession levels after a downturn.

103. From a policy perspective, it is important to distinguish this phenomenon from that whereby cyclically unemployed individuals may become structurally unemployed. To the extent that structural and cyclical change are coincident, both types of unemployment would come into existence simultaneously. It is also important to have an understanding of the timing of structural change in assessing the progress made in achieving structural adjustment. An assessment made during a cyclical upswing may underestimate the true extent of impending structural changes.

104. There may be some potential to smooth the cyclical swings of job loss and avoid contemporaneous structural and cyclical change [Caballero and Hammour (1991)]. This largely falls to macro-economic policy, which by smoothing cycles may reduce the costs of closure of older facilities and new investments during upswings which is increased by the unpredictability of demand. Policies designed to mitigate the costs of establishing new production units, such as reducing the congestion effect in the matching process as well as capital installation and labour training costs could also be effective. This type of policy has been advocated before in terms of reducing bottlenecks during upswings.

105. A review of the process of job creation and job loss provides a framework through which to examine the process of net employment creation. Many of the factors, including policy recommendations, which have been discussed in the context of net employment growth, do so by operating on gross job turnover. Further research may confirm some of the hypotheses that have been put forward in recent literature.

Notes

1. I should like to thank Beatrice du Boys, Sandrine Duschene and Pascal Marianna for statistical assistance, and Peter Schwanse, Norman Bowers and Tito Boeri for comments.

2. Excess turnover is so named because it assumes that job turnover equal to net employment growth is all that is needed to achieve this growth.

3. Davis and Haltiwanger (1992) attempt to explain the cross-sectoral and other variability of gross job reallocation using a model which emphasizes age, assuming that all gross job reallocation in excess of that in mature plants reflects learning about initial conditions (the model also takes account of differing net employment growth across sectors). This framework explains a considerable proportion (one third) of cross-sectoral variability. It is, however, not successful in explaining gross job reallocation in manufacturing, accounting for only 11-13 per cent. Learning about initial conditions explains only a small proportion of gross job reallocation.

4. The description that follows is largely that of Baldwin, Dunne and Haltiwanger (1993). Using a different methodology, for the manufacturing sector in Canada, these authors find that industry shifts account for less than 25 of the total change in employment share by establishment.

5. According to Violante and Prat (1992), Davis and Haltiwanger (1992) assume that workers within sectors are perfectly homogeneous while workers in different sectors are heterogeneous. This allows a priority matching of jobs destroyed and created within the same sector. Apparently this is valid when net employment growth is low but during more volatile periods it would lead to an underestimation of the importance of inter-sectoral shifts. The estimate of Davis and Haltiwanger (1992) could be considered as a lower bound estimate. As a counterpoint to this approach, assuming all workers are homogeneous, shifts between age groups accounted for 58 per cent of gross job reallocation, while shifts among industries and shifts among size classes accounted for 81 per cent and 76 per cent respectively.

6. Contini and Revelli (1987) note that jobs created through expansion are more cyclical than separations.

7. This is based on regression analysis, turnover being measured in terms of deviations from its mean time trend and the rate of change in manufacturing production in terms of deviations from its time trend used as a proxy for demand (cyclical fluctuations).

8. Moreover, use of changes in filled employment positions may reduce estimates of underlying job turnover. Estimates of filled positions may under-estimate job creation during upswings because unfilled positions stemming from skill shortages, are not counted. This might be more prevalent among smaller firms who typically might be expected to have greater difficulty recruiting. In downturns, firms may be obliged to retain workers longer than the underlying positions as a result of labour contracts and legal requirements or may retain workers for labour hoarding. As a result job losses during downturns may be understated. This would more likely tend to be true among larger firms which are more heavily unionized and whose large redundancies are more likely to be subject to regulation.

9. Using the same data as Davis and Haltiwanger (1990), Caballero and Hammour (1991) found a small elasticity of costs with respect to the speed of adjustment was sufficient to mute fluctuations in job creation and produce relatively large swings in job losses.

10. This conclusion is treated with caution by the authors. There are two alternative methods for calculating the impact of a balanced increase in exports and imports. The first shows an increase in the number of firms while the second leads to a decrease. The difference arises from the perverse effect of imports reducing the rate of exit which the authors suggest is related to policies of industrial assistance.

11. In terms of the distribution of job turnover accounted for by expansion and contraction of existing establishments versus opening and closure of establishments, the United States stands out as having the opposite pattern from all other economies surveyed. In all others, the majority of job creation is accounted for by expansion of existing establishments. Similarly, job losses are for the most part accounted for by contraction of existing establishments. By contrast, in the United States, openings account for the majority of gains while closures account for the majority of losses. For reasons listed in Annex A, the United States is not included in all comparisons.

12. An estimate of the rate of employment gain from establishment openings for Canada is required to compare with most European countries. The stability of the rate of employment gain from firm opening rates between 1978-1986 and 1984-1989 in Canada suggests that the estimated rate of employment gain from establishment opening rate for Canada of 2.4 per cent for selected years 1970-1986 from Baldwin, Dunne and Haltiwanger (1993) remained reasonably unchanged in 1984-1989.

13. There are several breaks in the time series for France which do not permit analysis over a longer period. There is also a break in the data in 1988 however, it is apparently less significant.

14. There were several exceptions. Finland had a replacement rate of 0.85 (in other words by 1989 manufacturing had failed to replace 15 per cent of jobs lost) though this reflects deterioration late in the period 1986-1989. In France, the replacement rate for the main sub-groups of manufacturing ranged from 0.50 to 0.91. In New Zealand, the replacement rate for 1987-1989 was 0.66.

15. In the U.S. transportation and public utilities experienced declining employment though this industry grouping included categories with increasing employment (transport, storage and communication) and decreasing employment (electricity, gas and water) in other countries.

Annex A

SOURCES, DEFINITIONS AND METHODS OF DATA COLLECTION ON JOB GAINS AND JOB LOSSES

Overview

This section describes the various national data sources used in this paper. These differ not only in the methods of collection but also in their employment coverage and sectoral classification. Administrative sources such as social security or unemployment insurance schemes, taxation and business registers are a primary source of data supplemented, in some cases, by business surveys.

Data refer to establishments except for Canada, Italy and the United Kingdom where data refer to firms. The establishment is the preferred unit of analysis for several reasons. First, it represents the smallest level of aggregation for which useful data are available. Second, the large majority of firms are single establishment. Third, it represents the production unit while the enterprise represents the ownership unit so that changes at the establishment level may more accurately reflect real changes. Inter-establishment transfers of jobs within an enterprise are frequently accompanied by changes in location, type and overall number of jobs. They would be lost if data were aggregated at the enterprise level. Fourth, establishments can be classified by sector more easily than enterprises as they usually produce a narrowly defined range of products. Fifth, scale economies are more associated with establishments so that changes over time in the size distribution of establishments are more likely to reflect changing scale economies [Carlsson, (1987)].

Comparison of the status of each establishment between consecutive years (t and t+1) result in the classification of each establishment and associated employment change according to standard establishment dynamics: opening, closing and among continuing establishments, expanding, contracting and those with unchanged employment. Data are in effect cross-sectional comparisons of stocks of employment longitudinally linked at the level of establishment/firm and in some cases offering the possibility of a longitudinal profile of workers. Comparison at the establishment level provides the dynamics that characterise this data. The majority of administrative sources used do not distinguish between job slots and the individuals filling those positions. Use of employment counts at the same time each year eliminates the intervening labour turnover in these job slots. However, aggregation at the establishment level means that some job turnover is missed because gross job gains and losses within the establishment are netted out, while those between establishments are counted. Measures of job turnover may be influenced by the business cycle and the difficulty in filling or eliminating positions. Job creation may be understated during cyclical upswings if enterprises have increased difficulty filling positions which are then not counted. Job losses in downturns may be understated, due to employment protection legislation or restrictions imposed by collective bargaining which require enterprises to retain individuals.

An opening is recorded when the first dependent employee is hired, while a closing establishment is one that has laid off all its dependent employees. Transitions from (to) self-employment are counted as openings (closures). Movements to and from industries included in the sample are also counted as openings and closures. For example, privatisations would be counted as openings. For continuing establishments, gains and losses by establishment size group are distributed according to establishment size at time t. There are many other subtleties which influence opening and closing rates described in the sections for each country.

Coverage depended in large measure on the coverage and treatment of the relevant administrative systems or surveys. While data could not be standardized, an attempt was made to define data in similar terms. Thus, analysis in this report is limited to dependent workers in the private sector excluding public administration and establishments providing non-market services unless otherwise stated. Self employed individuals and domestic workers were excluded. Data on the self-employed were not available for

Canada, France, Germany the United Kingdom and the United States so they were excluded from the remaining countries surveyed. The primary sector except for mining and quarrying was excluded. The coverage of agriculture was limited or it was excluded in a number of countries. The remaining primary sector (hunting, trapping and game propagation, forestry and logging and fishing) was not covered in Finland, Italy and New Zealand and was limited in France, so it was decided to exclude it from the remaining countries to improve comparison (Canada, Denmark, Germany, United States). With regard to the public sector, ISIC 91 (Public administration) was excluded from all countries. There was, however, difficulty with regard to other public services: ISIC 931(Education services), ISIC 933 (Medical, dental, other health and veterinary services) and ISIC 934 (Welfare institutions). Public sector institutions in these sectors were not included in Denmark, France, Italy, United Kingdom and the United States. As in most of these countries, the public sector would dominate these industry groups, these entire industries were excluded in the cases of Canada, Finland, Germany, New Zealand and Sweden. This had a significant effect on the samples.

In Finland (1986-1988 only), the United Kingdom and the United States, changes are reported over a two-year period. Changes are annualised for comparison with other countries; as a consequence annual changes may be understated to a certain extent. The remainder of this Annex outlines the key features of the data by country.

CANADA

Overview: Longitudinal information on individual firms but not on individual workers based on taxation records. Unique method of estimating employment using total wage bill and average wages.

Sources: Small Business and Special Surveys Division, Statistics Canada. Tax information filed yearly by all employers with Revenue Canada

Period: 1978-1991

Coverage peculiarities: Data are available for all sectors, both the private and public sectors. Data on primary industries, and equivalents to ISIC 931 (education services), ISIC 933 (medical, dental, other health and veterinary services) and ISIC 934 (welfare institutions) have been excluded for this study. The file contains information on wages for all dependent workers earning at least $500 from any one employer in the course of a given calendar year.

Classification: Industries are classed on the basis of the Canadian Standard Industrial Classification of 51 two-digit groups. These can be regrouped into the ISIC classification scheme.

Definition of enterprise: The Central Frame Data Base (CFDB) contains data on business entities: economic transactors having the responsibility and authority to allocate resources in the production of goods/services thereby directing and managing the receipt and disposition of income, the accumulation of property, the borrowing and lending of capital, and the maintenance of financial statements accounting for their responsibilities. It is composed of both operating and legal entities The operating entity organizes and controls the production of goods and/or services. The legal entity is the legal representation of the business entity. Legal entities own directly or indirectly production entities. To be included, a legal entity must be legally incorporated and have dependent employees. Data are not available on units below the level of business entity. The CFDB uses the "statistical entity" which is the complete compositional unit of the business entity.

Methodology: Firms are compared in consecutive years and a standard comparison is made to calculate job turnover. Continuing firms are divided only into expanding or contracting; firms with unchanged employment are not separated. Employment estimates are annual average, "full-year equivalent person-years", computed in two stages: i) each firm’s total annual wage bill is estimated; and ii) the number

of"full-year equivalent employee-years" is then calculated for each employer by dividing the firm's total annual wage bill by the appropriate average annual wage in the sector and province. Statistics Canada's Survey of Employment, Earnings and Hours provides wage data. In sectors for which the survey does not provide information on average wages (e.g. banking), the average annual wage for all sectors that are covered by the survey for the province and year in question is used. Changes by size class are attributed to the firm's category in time t.

Openings/closures: Based on creation (opening) or disappearance (closure) of a Business Register Identifier (BRID). A new BRID number is assigned when both the Payroll Deduction number and the legal name of the firm are changed. Changes in business organisation (incorporation, acquisition, merger, incorporation) can lead to a change in the BRID and so could be recorded as openings and closures. In 1989-1990 the Business Register was replaced by the Central Frame Database (CFDB). At the same time, a procedure to screen openings and closures was introduced which takes account of similarities in firm names, continuity of PD numbers and continuity of employees. Screening was previously manual. For a new firm, the wage bill covers only that part of the year when the firm existed but it is used in the calculation of employment as if it were covering the whole year. The resulting downward bias in estimates of job creation through openings is corrected by doubling the employment estimate, assuming that, on average, all new firms had half a year of existence.

Comments: Calculation of employment is based on average wages: to the extent that changes in wages are dispersed around the industry average change, they may be interpreted as employment changes; employment in smaller firms (which have lower wages) may be underestimated;

DENMARK

Overview: A comprehensive, longitudinal data base for both establishments and individuals based on several administrative sources.

Sources: The *Integreret Database for Arbejdsmarkedsforskning* (IDA) (Integrated Database for Labour Market Research) of *Danmarks Statistik*, is based on various administrative sources. The core sources are the Salary Information Register established by the tax authorities and the Business Register of Danmarks Statistik. Additional sources include other tax registers, the Central Population Register, the Register for Unemployed Persons and the register-based workplace statistics.

Period: 1980-1988

Coverage peculiarities: Data are available using the ISIC Rev. 2. classification for 9 Major Divisions. Data on self-employment are also available. For this report, all public sector establishments were excluded and industry data were only available at the one-digit ISIC (Rev. 2) level.

Classification: Data are available using the ISIC Rev. 2. classification for 9 Major Divisions.

Definition of enterprise and establishment: Enterprise is the legal unit, which is close to but not identical, to enterprise as defined by Eurostat. A minimum turnover threshold is established at 15 000 ECU. Establishment is the unit based on location and industry.

Methodology: This is a true longitudinal data set for both individuals and establishments. Data on individuals are linked to establishments in the last week of each November to determine their employment situation using the Salary Information Register. Each individual has a unique identifying number. Comparison is then made between each November to calculate job turnover data.

Openings/closures: A comprehensive definition using four criteria: ownership, workforce, industry and location. For an establishment to be considered the same from year to year, one of three conditions must be met: i) same owner and same industry; ii) same owner and same workforce; or iii) same workforce and the same location or industry. "Same workforce" is defined as a situation where at least 30 per cent of employees remain common to the establishment. This ensures that either workforce or ownership and one additional criterion must change for an establishment to be counted as new, i.e the establishment is defined in labour market rather than physical terms.

Comments: This is a comprehensive database, having separate longitudinal information on both firms and employment that is linked. Some adjustments were made in the standard tabulations for Denmark to ensure greater consistency with other countries. This involved distributing all changes included in the category "Other" (firm internal openings and closures) among openings, closures, expansions and contractions and unchanged employment. Lack of industry detail cannot be improved upon given confidentiality requirements.

FINLAND

Overview: A longitudinal data base for establishments but not for individuals, based on several administrative sources and a survey.

Sources: The data are from the Enterprise and Establishment Register of *Tilastokeskus* (Central Statistical Office of Finland) based on various administrative files from the registers of the tax authorities for enterprise data, supplemented by annual surveys on establishments.

Period: 1986-1991

Coverage peculiarities: Data on primary industries, public administration and the public components of education services, health and medical services and social welfare services are not available. Data on self-employment are available

Classification: Finnish SIC (1988) classification system (63 groups) which is based on the ISIC Rev. 3 classification.

Definition of enterprise and establishment: Enterprise is compatible with the Eurostat definition. To be included, firms must operate for at least six months and have a turnover of at least 45 000 Fmk (1991).

Methodology: Tax registers contain enterprise data but not information on establishments and individuals. Establishment data are based largely on enterprise surveys which collect data on employment, branch of economic activity, location and information on takeovers. Verification of information included in the tax register is also obtained. Surveys are sent to all new and existing enterprises covering: all multi-establishment enterprises; all single-establishment enterprises employing more than 20 persons; and a portion (on a rotating basis) of remaining enterprises. To be included, firms must operate for at least six months and have a turnover of at least 45,000 Fmk (1991). Employment estimates are annual averages, though in enterprises which are not surveyed, establishment employment is estimated by dividing the wage bill by average industry wages. In these cases, employment would be full-time equivalents. Among continuing establishments, there is not a separate category for those with unchanged employment.

Openings/closures: Openings and closures are based upon receipt and termination of, or changes in an establishment identification number. Apart from newly formed establishments, this occurs if certain conditions are met. Where ownership changes, if either address or detailed industry group also change, this is counted as a new establishment. If there has not been an ownership change, there must be a change in broad industry section or in both detailed industry group and address.

Comments: This database deals with changes in establishment ownership in a more restrictive way than others. Further information is lacking in order to make a more critical assessment.

FRANCE

Overview: A longitudinal database for establishments but not for individuals based on unemployment insurance records.

Sources: Data are based on the register of establishments of the *Union Nationale pour l'Emploi dans l'Industrie et le Commerce* (UNEDIC), a joint body managing the national unemployment insurance scheme.

Period: 1978-1992

Coverage peculiarities : The data available covers the private sector only. Agriculture is included though coverage is limited and does not affect overall results. Public sector institutions in education services, health and medical services and social welfare services, and publicly owned national enterprises are excluded. Coverage across sectors is uneven as a result of the exclusion of major national enterprises.

Classification: Data were only available using the national French industrial classification system (NAP, 15 to 100 groups depending upon year).

Definition of establishment and enterprise: Establishment is identified as the SIRET unit which refers to the physical means of production used by one SIRENE unit, or enterprise in a particular location. Système Informatique pour le Repetoire des Entreprises et des Etablissements (SIRENE) is developed by the Institut National de la Statistique et des Études Économiques (INSEE).

Methodology: UNEDIC annually produces employment data for year t and revised data for year *t*-1. Changes in the firm's characteristics are incorporated in the revised data for year *t*-1. This makes it possible to determine an establishment's workforce in *t*-1 from its characteristics in year *t*. The point of comparison is between the 31st December *t*-1 and 31st December *t*. Changes between consecutive years are attributed according to their size at the beginning of the year (at the end of the year for the new establishments [See also OECD (1987)].

Openings/closures: Measurement of establishment openings is based on the registration of at least one UNEDIC-affiliated employee in year *t*, when none were recorded in *t-1*. Establishment closure is symmetrical. The count of new establishments is affected by changes in ownership, location or activity (industry) which result in a new registration number. Data on openings are generally available later than those on closures, and the number of new establishments and the jobs thereby generated may thus be slightly understated.

Comments: There are breaks in the time series: data for 1978-84 come from OECD (1987). Data for 1980 were unavailable as preliminary and revised data could not be paired. For 1985-1988 data were taken from published figures in the *Bulletin de liaison* of UNEDIC. Firm size data are not available for 1985-1988. From 1989-1991 a different methodology was adopted by UNEDIC. As a result, data on expansion and contraction of existing establishments are not available having been replaced by movements to and from different size classes. In addition, calculation of gains and losses by firm size category are not strictly comparable to other countries because they are attributed to establishment size at the end rather than at the beginning of the period.

GERMANY

Overview: A longitudinal database for establishments but not individuals, based on social security records.

Sources: Data are from the Employment Statistics register of the *Bundesanstalt für Arbeit* (BA) (Federal Office of Labour). Data are collected via the Social Insurance Scheme notification procedure.

Period: 1977-1990

Coverage peculiarities: All industries, both the private and public sectors are covered. Persons in limited employment, i.e. those working less than 15 hours a week or who are employed only for short periods and whose monthly wage is less than a minimum specified each year, are excluded. As best possible public administration and equivalents to ISIC 931 (education services), ISIC 933 (medical, dental, other health and veterinary services) and ISIC 934 (welfare institutions) were excluded for this report.

Classification: National industry sector classification system used by the Federal Office of Labour which differs from that used by the statistical office (94 groups). This was converted into the ISIC Rev. 2 classification.

Definition of establishment: Administrative unit (Betrieb) which comprises single or groups of establishments that are both in the same municipality and same industry (two digit). Establishment refers to physical location where similar work is carried out. The term "establishment" in the Employment Statistics register is not very strictly defined, reflecting firms' staff management practices rather than an official ruling. The legal definition of limited employment changed over the period introducing some incompatibility over time.

Methodology: Comparisons in consecutive years are made for each establishment to determine job turnover. The number of employees in an establishment is tabulated at 30th June annually. Stock estimates in different periods are consistent.

Openings/closures: Plant openings and closures are identified by comparing the number of employees of individual plants each June 30th. Opening (closing) establishments are those which had no (some) registered workers at t, but some (no) dependent employees at t+1. The treatment of changes in ownership is ambiguous. In some cases, the establishment's identification number remains unchanged. In others, e.g. because of a change in the sickness insurance scheme, a new number will be issued and an opening/closure will be recorded.

Comments: The term "establishment" in the Employment Statistics register is not very strictly defined, reflecting rather firms' staff management practices than an official ruling. The legal definition of limited employment changed over the period introducing some incompatibility over time.

ITALY

Overview: Longitudinal data for both firms and workers based on social security administration data.

Sources: The data are from records of the *Istituto Nazionale Previdenza Sociale* (INPS) (National Institute for Social Security) which collects social security contributions from both firms and workers, and administers retirement benefits, various wage supplements and unemployment benefits. INPS is also responsible for contributions to the National Health Service and the fund related to disability pensions.

Period: 1985-1991

Coverage peculiarities: Data are available for all employees in the private sector, excluding the primary sector. All public employees including those in the equivalents of ISIC 931 (education services), ISIC 933 (medical, dental, other health and veterinary services) and ISIC 934 (welfare institutions) and in state owned firms are excluded.

Classification: Data are available using the national classification system (ISTAT of the National Institute of Statistics (52 groups)) and was converted to the ISIC Rev. 2 classification.

Definition of enterprise and establishment: The unit of observation is the "posizioni assicurative" (insurance record) which may refer to a firm, establishment or to a fraction of a firm's employment (uncommon). As records can always be aggregated into firms the database is organised in this fashion.

Methodology: A standard comparison between consecutive annual observations of employment in each firm is made to determine job turnover between the end of period t+1 and the end of t. Firms temporarily operating without dependent workers are retained in the data file and are counted as having 0 employees. This is a more accurate reflection of enterprise turnover than in some other countries.

Openings/closures: New registration of businesses with INPS are counted as openings. However, legal changes resulting in the formation of "new" firms, hence the receipt of a new identification number, are also counted. It is not possible, therefore, to directly differentiate changes in ownership from the opening of a new business. Delays in data processing affects counts of closures, especially among small firms. To compensate, INPS applies estimated closure probabilities to periods of absence of reported data.

Comments: The data set used in this study is made up of two data sets received from the INPS. One covers the period 1985-1990 while the second 1987-1991.

NEW ZEALAND

Overview: Longitudinal establishment database based on taxation records and survey data.

Sources: The data are from the Business Demography Database of the Department of Statistics, developed from the central Business Directory. Sources include administrative records of the Goods and Services Tax (VAT tax) and the Annual Business Directory Survey.

Period: 1987-1992

Level: Activity unit is used and is defined as a separate operating unit engaged in predominantly one economic activity from a single physical location. This approximates an establishment.

Coverage peculiarities: The database covers all activity units in the public and private sectors, excluding agriculture, forestry and fishing. For this report, public administration, education services, medical, dental, other health and veterinary services and welfare institutions were excluded. Data on the self-employed are available.

Classification: Data are available on an industry basis using the ISIC Rev. 2 classification.

Definition of enterprise/establishment: An enterprise is a business entity incorporating at least one activity unit. An activity unit is a separate operating unit engaged in one or predominantly one kind of economic activity from a single location or base. This approximates a local unit or perhaps, the local kind of activity unit, depending on the ability to separate different activities at the local level.

Methodology: The database is longitudinal for activity units. Employment data are not longitudinal but are based on counts of employment derived from information collected from activity units.

Part-time positions are counted as half full-time positions. In terms of dynamics, changes between time t and t+1 are based on comparisons conducted between February of each year when the database is updated through the Annual Business Directory Survey. Activity units are linked through their identification numbers. Changes are classified by size category based on the size groupings at time t.

Openings/closures: Openings and closures are recorded with changes in the unique identifying number assigned to each activity unit, based on changes in industry and location. They are not recorded if there is a change in ownership or a minor change in location. However, privatisation of activities which had been public is counted as openings.

Comments: This database has a relatively strict definition of opening and closing establishments.

NORWAY

Overview: Longitudinal establishment data for the mining and quarrying and manufacturing sectors.

Sources: Data are from the *Industristatistikk Heft I Næringstall* (Manufacturing Statistics Volume I Industrial Figures) produced by the *Statistisk Sentralbyrå* (Central Bureau of Statistics) from the Central Register of Establishments and Enterprises. Most data in the Central Register are taken from the Value Added Tax Register of the Directorate of Taxes and from the Register of Employers in the National Insurance Institution. Annual reports are collected from all large establishments (usually defined as more than five persons), while only some annual data are collected from small establishments.

Period: 1976-1986. Collection of data on changes in establishment employment was terminated after 1986.

Coverage peculiarities: Data are limited to ISIC Rev. 2 Major Divisions 2 (Mining and quarrying) and 3 (manufacturing) sectors. Employment includes those on leave or on strike. Proprietors, owners and family workers are also included. Only proprietors and partners actively engaged in the daily work of the establishment are counted. Working shareholders in corporations and co-operatives are counted as ordinary employees. In larger enterprises, salaried managers and directors are counted as employees.

Classification: Data are available using the national industrial classification system which corresponds very closely to ISIC Rev.. 2 classification for mining and quarrying.

Definition of enterprise/establishment: An enterprise is a legal ownership unit covering one or more establishments. A functional unit which at a single physical location, is engaged mainly in activities within a specific activity group (four-digit ISIC).

Methodology: Data are longitudinal for enterprises while data on employment are obtained indirectly through the records of enterprises. In some multi-establishment enterprises, the number of employees in constituent establishments is estimated.

Openings/closures: Opening (closing) establishments are those which began (disappeared) in time t or early in time t+1 based on registration for National Insurance or the Value Added Tax. Because employment estimates are annual averages, the estimated contributions of openings and closures to job turnover is likely affected.

Comments: Establishments flows to (from) mining and manufacturing from (to) other industries were excluded from openings and closures as a continuous time series was not available. The same is true for movements to and from self-employment. As a result the sum of opening, closure, expansion and contraction does not equal the net change in employment.

SWEDEN

Overview: Longitudinal data based on several sources for establishments and individuals.

Sources: Information comes from Database Statistics on Regional Employment produced by Statistics Sweden. This data set is based upon data from several sources combined in the Register of Regional Employment (*ÅRSYS*): the Register of Income Verifications, the Taxation Register and the Business Register.

Period: 1985 to 1991.

Coverage peculiarities: Statistics on Regional Employment covers all industries, both the private and public sectors including agriculture, forestry and fishing. For this study, ISIC 1 (primary industries), ISIC 91 (public administration), ISIC 931 (education services), ISIC 933 (medical, dental, other health and veterinary services) and ISIC 934 (welfare institutions) were excluded. Data on the self-employed are available.

Classification: Industry data are available using the ISIC Rev. 2 classification.

Definition of enterprise and establishment: The enterprise is the legal balance sheet unit, i.e. the smallest unit for which most balance sheets and profit and loss data can be obtained. A local unit is where a defined activity takes place at the same physical location or area.

Methodology: Longitudinal data available for establishments. Data on individuals contains both an identification code for the individual (hence may also be longitudinal) as well as a code for both the establishment and enterprise, allowing individuals to be linked to establishments. Each November, establishment codes are compared and establishments and their dependent employment (linked to the establishment through the establishment code on the individual's file) determined. Data for period t are re-estimated using information in t+1 so that stock for the end and beginning of two periods do not exactly match.

Openings/closures: Openings and closures are recorded when an establishment changes its identification number, which takes place only if two of three conditions are met, i.e.: i) activity or staff; ii) location; and iii) owner. This relatively strict definition may lead to a lower estimate of opening and closing establishments compared with a number of other countries. In Denmark a similar rule is used though the criteria are slightly different.

Comments: For small establishments (less than 10 employees), the control of identification numbers is not always adequate. Sometimes establishments may incorrectly get new numbers when they may only have changed legal form. In some cases, individuals cannot be assigned to a particular establishment. This leads to just a slight underestimation of employment, except in the construction industry where about 25 per cent of workers cannot be assigned to any particular establishment.

UNITED KINGDOM

Overview: Series of separate periods based on private sector data on firms.

Sources: Data were taken from a series of articles: Doyle and Gallagher (1986) for 1982-1984; Gallagher, Daly and Thomason (1991) for 1985-1987; Daly, Campbell, Robson and Gallagher (1991) for 1987-1989; Brace, Robson and Gallagher (1993) for 1989-1991. All are based on the Dun and Bradstreet Corporation database, developed for marketing purposes.

Period: 1982-1991 in biannual sets: 1982-1984, 1985-1987, 1987-1989 and 1989-1991. Bi-annual estimates are divided by 2 rather than applying a compound growth rate.

Coverage peculiarities: Data are available for the entire private sector. Industry data are not available except at a very aggregated level.

Definition of enterprise: As per Dun and Bradstreet practices.

Methodology: Data are only longitudinal for firms and then generally only for each two year period. Data on individual workers are calculated from enterprise records. Each firm record has a unique numeric identifier when it is first entered on the database. To calculate enterprise and job dynamics, firm files for different years are matched. The comparison point is December of each year.

Openings/closures: Openings are based on entry of a record on the Dun and Bradstreet file. Closures are not recorded directly but are based on failure to revise a record in the database. Firm records are not always updated which causes difficulties. In 1982-1984, 1985-1987 and 1989-1991, apparent openings which had a date of birth prior to the end of 1982, 1985 and 1989 were deleted, while openings with a start-up beginning in mid-1987 were included in 1987-1989. In 1989-1991, additional validation of openings was undertaken through a sample survey of apparent births. Delays in recording openings mean that births over a two year period actually represent those for a shorter period. This would require subsequent revision of earlier results which has not been done. For closures, in 1982-1984, 1985-1987 and 1989-1991, the record had to have been revised no earlier than time t and then not be revised at t+1 to be counted as a closure. In 1987-89 apparent closures on the file which had been updated at the beginning of the previous two-year period (t-1) but not subsequently, were counted as closures. Data were subjected to further validation to deal with the problems of mergers and ownership changes. For 1982-1984, 1985-1987 and 1987-1989, employment gains which arose solely through merger and acquisition activity were not included. Furthermore, firm closures are adjusted to eliminate company takeovers. However, in 1989-1991 data for mergers were included in the estimates for the four components of change though their contribution to net job creation was provided separately for firms with 1000+ employees.

Comments: Data are not a formal time series but separate analyses carried out on pairs of years. Data were adjusted to more accurately reflect the actual population and distribution of firms and jobs. It is evident that the coverage of the Dun and Bradstreet file is incomplete in the smaller firm size categories. Information for 1985-1987 excludes firms with fewer than five employees while all other cohorts extend to the smallest size category. Adjustments were made so that the data would more accurately reflect the population of United Kingdom firms (especially in the smaller size categories) by comparing results with data from the administration of the Value-Added Tax. In general, the same scaling factors were applied in 1989-1991 as had been applied in 1987-1989. Data from the United Kingdom may suffer from some of the same difficulties in measuring establishment openings and closures as data in the United States.

UNITED STATES

Dun and Bradstreet Corporation

Overview: Longitudinal information on establishments but not on workers.

Sources: Data are from the United States Small Business Administration, Office of Advocacy. The data collected by Dun and Bradstreet Corporation for the Duns Marketing Identifier (DMI) are used to produce the United States Establishment and Employment Microdata (USEEM) file and the United States Establishment and Longitudinal Microdata (USELM) file.

Period: 1976-1990 in biannual sets: 1976-1978, 1978-1980, 1980-1982, 1982-1984, 1984-1986, 1986-1988 and 1989-91. Biannual estimates are divided by 2 rather than applying a compound growth rate.

Coverage peculiarities: The USEEM covers all domestic business establishments in the private sector that have at least one dependent employee and a Dun and Bradstreet credit rating. Agriculture is included but the coverage is incomplete.

Classification: Data are available using the U.S. Standard Industrial Classification (SIC) on a broad industry basis (one-digit) for 1984-1988 and on a more detailed basis (two-digit) for 1989-1991.

Definition of enterprise/establishment: An enterprise is an aggregation of all establishments owned by a single parent company. It can include subsidiaries and branches as well as establishments related through financial linkages. An establishment is a single location business unit. It is the smallest unit in which business activity is conducted and on which statistical information is collected [U.S. Small Business Administration (1988)].

Methodology: Data on establishments are linked to the appropriate enterprise. Employment data are obtained indirectly from records of establishments. The USELM is a longitudinally linked stratified sample drawn - with linked records - from all USEEM files. About half the establishments represented in a typical USEEM file are represented in the USELM file. A weighting scheme is used to adjust the sample data so that it is compatible with analogous data from the USEEM file. Using the USELM file, comparisons were made in December of the two years in each two-year period to calculate job turnover, though employment levels were recorded at various times during the year. Estimates for each two-year period are re-estimated so stocks at the end of the previous two-year period do not match those at the beginning of the following period. The period 1984-1988 was estimated together while other two-year periods were estimated separately. Data beginning in 1984-1986 are based on a different design of the USEEM files arising from a major expansion in the DMI file. Data prior to 1984 could not be adjusted to reflect this new design.

Establishments were classified by the size of the owning enterprise in the case of multi-establishment enterprises. This was done to minimize the distortion at detailed industry levels of having to classify a multi-establishment enterprise by a single SIC code. This likely results in significant differences in the attribution of employment changes across size categories relative to other countries.

Openings/closures: Openings are based on the entry of a record on the Dun & Bradstreet file. Closures are based on failure to revise a record in the database. There are lags between actual opening and closing and their being recorded but little is known about their effect.

Comments: Coverage of the Dun & Bradstreet database is incomplete in small service sector firms. Employment data are missing for about 12 per cent of establishments while employment totals are absent for about 13 per cent of firms. Among multi-establishment firms, comparison of a firm's recorded employment with that derived from adding up employment in the relevant establishments reveals that firm totals are both over-and under-estimated in a significant proportion of cases. Records showing radical change between periods were edited. Records with reporting dates older than four years were generally believed to represent out-of-business establishments and were deleted. A test using the 1989-1991 data set found only ten per cent of these establishments were truly out-of-business. Missing employment data was imputed. Due to particular difficulties with the 1989-1991 file, detailed analysis of the data should be treated with caution especially as regards births of new businesses.

Geographic and legal changes, or combinations, were difficult to separate from true openings and closures and likely have resulted in their overstatement in Dun and Bradstreet data [Kirchhoff (1992)]. Data from the State of Pennsylvania used in OECD (1987) tended to show similarly high opening and closing rates. The Pennsylvania data were derived from unemployment insurance records though openings and

closing could have been overstated. Baldwin, Dunne and Haltiwanger (1993) found relatively similar levels of turnover as well as job creation and job destruction for selected years in the period 1973-1986 for manufacturing in Canada and the United States. The samples and definitions used were carefully harmonized. For the United States, the opening rate in manufacturing averaged less than 2 per cent while the closure rate was less than 3 per cent for selected years between 1970 and 1986. These are substantially lower than the rates estimated through the Dun and Bradstreet data base for 1984-1988 of 7.4 and 7.7 per cent respectively. It appears that the Dun and Bradstreet data overstate openings and closures. A new data source is currently being developed by the U.S Small Business Administration.

Longitudinal Research Database (LRD)

Overview: A longitudinal database for establishments and enterprises but not for workers, based on census and survey data.

Sources: Contains data from the quinquennial Census of Manufactures (CM) and the Annual Survey of Manufactures (ASM) of the U.S. Department of Commerce, Bureau of the Census.

Period: The LRD includes CM data for six years (1963, 1967, 1972, 1977, 1982 and 1987) and ASM data for non-census years from 1972 to 1988.

Coverage peculiarities: Covers only the manufacturing sector and only establishments with at least five employees.

Classification: Data are available using the U.S. Standard Industrial Classification (SIC) for detailed industries (four-digit).

Definition of enterprise/establishment: The enterprise is the entire economic unit under common ownership or control. In the case of ownership or control of one enterprise by another, all establishments of the subsidiary are considered part of the owning enterprise. Compared to the Eurostat definition, this emphasizes ownership rather than operational control. An establishment is a single physical location where services or industrial operations are performed. Distinct activities performed at the same location are defined as separate establishments if: the individual activities are not customarily associated with one another; no industry description in the SIC includes such combined activities; employment in each activity is significant; and separate records are available [U.S. Department of Commerce, Bureau of the Census (1979)]. The last would seem to be the most important in terms of defining data availability.

Methodology: Data on job creation and loss in the LRD is based on the ASM. This is a probability sample of one-seventh to one-fifth of establishments and approximately 75 per cent of employment from the CM, followed for five years. In census years, it is possible to identify the sample of establishments that would have been in the ASM were it conducted, which provides a continuous series from the ASM. Establishments are added to the ASM annually from the Company Organization Survey (multi-unit companies) and openings (single-unit companies) identified through Employer Identification numbers of the Social Security Administration. There have been two significant changes to the ASM affecting the definition of the sampling unit and sample weights. Establishment level longitudinal data can be generated as each establishment is given a permanent plant number (PPN) which it maintains during its life. Employment levels in each establishment can then be compared across consecutive surveys. Several adjustments are made to the raw data involving: a redefinition of annual employment; imputation of missing data; and adjustment for processing errors. Data are validated using administrative records. Rotation of establishments in the ASM leads to the need to impute employment in the year preceding entry into the sample as well as to distinguish the effects of rotation from actual employment changes. Aggregate data from the LRD do not correspond exactly to the official aggregate ASM/CM published data.

Openings/closures: To identify openings and closures, establishment identification numbers (PPN) are first matched. These remain unchanged through the life of the plant even if ownership changes. Employment levels in consecutive years are compared which provides a preliminary estimate of opening and closing. Coverage Codes (CC) are compared. The CC variable provides information on why an establishment did or did not appear in a year, i.e. whether and how establishment operations have changed. Total employment in previous periods is also compared. This may have an effect somewhat similar to screening establishment changes using continuity of the workforce.

Comments: The LRD is a mixture of register, census and survey data.

Annex B

DATA SOURCES FOR FACTORS INFLUENCING JOB TURNOVER

This data annex contains a description of the data sources used in section C.

v) Factors influencing turnover

Data in this section of the report are derived from several sources. Data on excess job turnover come from national sources described in Annex A. Other data are derived from two data bases developed by the OECD. The International Sectoral Data Base (ISDB) and the STructural ANalysis data base (STAN). Sources for each variable are as follows:

- Average establishment size (employment/establishment): data derived from job gain and job loss data (see Technical annex A).

- Change in output (Absolute value of the change in the rate of change of industry value-added) (percentage points): Output defined as value added, national currencies 1985 prices (ISDB).

- Capital investment (gross investment/capital stock) (per cent): Investment and capital stock in national currencies 1985 prices (capital stock calculated with country-specific average service lives) from the ISDB.

- Openness to trade [(Exports + Imports)/(Total Demand or (Output + imports))] (per cent): Exports and imports in current prices, national currencies from the STAN database. Exports and imports obtained from OECD Compatible Trade and Production database. Production in current prices, national currencies from the STAN database.

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Table 1 **Job gains and job losses** a

Average annual rates as a per cent of total employment

	Canada b 1983-91	Denmark 1983-89	Finland 1986-91	France 1984-92	Germany 1983-90	Italy b 1984-92	New Zealand 1987-92	Sweden 1985-92	United Kingdom b,c 1985-91	United States c 1984-91
Gross job gains	**14.5**	**16.0**	**10.4**	**13.9**	**9.0**	**12.3**	**15.7**	**14.5**	**8.7**	**13.0**
Openings	3.2	6.1	3.9	7.2	2.5	3.9	7.4	6.5	2.7	8.4
Expansions	11.2	9.9	6.5	6.7	6.5	8.4	8.3	8.0	6.0	4.6
Gross job losses	**11.9**	**13.8**	**12.0**	**13.2**	**7.5**	**11.1**	**19.8**	**14.6**	**6.6**	**10.4**
Closures	3.1	5.0	3.4	7.0	1.9	3.8	8.5	5.0	3.9	7.3
Contractions	8.8	8.8	8.7	6.3	5.6	7.3	11.3	9.6	2.7	3.1
Net employment change	**2.6**	**2.2**	**-1.6**	**0.6**	**1.5**	**1.3**	**-4.1**	**-0.1**	**2.1**	**2.6**
Net entry (openings less closures)	0.2	1.1	0.5	0.2	0.5	0.2	-1.1	1.5	-1.2	1.1
Net expansion (expansions less contractions)	2.4	1.1	-2.1	0.4	0.9	1.1	-3.0	-1.6	3.4	1.5
Job turnover	**26.3**	**29.8**	**22.4**	**27.1**	**16.5**	**23.4**	**35.5**	**29.1**	**15.3**	**23.4**
Base period employment (thousands)	7 034	1 447	1 308	12 778	16 350	8 381	828	2 306	16 744	85 824

a) Sampling months/periods vary across countries as follows: Canada: annual averages; Denmark: November; Finland: annual averages; France: December; Germany: June; Italy: December; New Zealand: February; Sweden: November; the United Kingdom: December; and the United States: December (June in 1989 and 1991).
b) Data refer to firms.
c) These data should be treated with caution.

Sources and s: See Annex A.

Table 2 Comparison of job gains and job losses in two periods a

Average annual rates as a per cent of total employment

	Canada b		Finland		France		Germany		Italy b		New Zealand		Sweden		United Kingdom b c		United States c	
	1983-89	1989-91	1986-89	1989-91	1984-89	1989-92	1983-89	1989-90	1984-89	1989-92	1987-89	1989-92	1985-89	1989-92	1985-89 b	1989-91	1984-88	1989-91
Gross job gains	**14.9**	**13.4**	**11.1**	**9.3**	**13.9**	**13.7**	**8.7**	**10.2**	**12.7**	**11.8**	**16.8**	**14.0**	**16.1**	**12.6**	**9.1**	**8.0**	**13.2**	**12.6**
Openings	3.2	3.4	4.4	3.1	7.3	6.9	2.4	2.8	4.1	3.6	8.1	6.2	7.3	5.6	3.1	1.9	8.9	7.4
Expansions	11.7	10.0	6.7	6.2	6.6	6.8	6.4	7.4	8.6	8.2	8.7	7.7	8.8	7.0	6.0	6.1	4.3	5.1
Gross job losses	**10.1**	**16.5**	**10.3**	**14.5**	**12.8**	**13.9**	**7.7**	**6.6**	**10.5**	**11.9**	**20.6**	**18.5**	**13.2**	**16.1**	**6.7**	**6.4**	**10.0**	**11.1**
Closures	2.8	3.7	3.3	3.4	6.9	7.1	2.0	1.8	3.6	4.0	9.3	7.2	5.2	4.9	4.2	3.4	7.2	7.6
Contractions	7.3	12.8	7.0	11.1	5.9	6.8	5.7	4.8	7.0	7.9	11.3	11.3	8.1	11.3	2.5	3.0	2.9	3.5
Net employment change	**4.8**	**-3.1**	**0.8**	**-5.2**	**1.2**	**-0.2**	**1.1**	**3.6**	**2.2**	**-0.1**	**-3.8**	**-4.5**	**2.9**	**-3.5**	**2.4**	**1.6**	**3.2**	**1.4**
Net entry (openings less closures)	0.3	-0.3	1.0	-0.3	0.5	-0.2	0.4	1.0	0.6	-0.4	-1.2	-0.9	2.1	0.8	-1.1	-1.5	1.7	-0.1
Net expansion (expansions less contractions)	4.4	-2.8	-0.2	-4.9	0.7	-0.1	0.6	2.6	1.6	0.3	-2.6	-3.6	0.8	-4.2	3.5	3.1	1.4	1.6
Job turnover	**25.0**	**29.9**	**21.4**	**23.9**	**26.7**	**27.6**	**16.4**	**16.8**	**23.3**	**23.7**	**37.4**	**32.5**	**29.4**	**28.7**	**15.8**	**14.4**	**23.2**	**23.7**
Base period employment (thousands)	7 034	9 160	1 308	1 329	12 778	13 594	16 350	17 400	8 381	9 347	828	738	2 306	2 588	16 744	15 835	85 824	92 217

a) Sampling months/periods vary across countries: see a to Table 1.
b) Data refer to firms.
c) These data should be treated with caution.
Sources and s: See Annex A.

Table 3. Influence of trend and cycle in employment growth (a)

Canada

(marginal significance level in italics)

All industries	**Trend 1**	**Trend 2**	**Trend 3**	**Trend 4**	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**
Opening establishments	0.725	0.725	0.643	0.44	0.379	0.374	0.104	0.121
	0.012	*0.012*	*0.026*	*0.128*	*0.189*	*0.196*	*0.718*	*0.675*
Closing est.	0.549	0.522	0.357	0	-0.038	-0.077	-0.242	-0.214
	0.057	*0.071*	*0.216*	*1*	*0.894*	*0.79*	*0.402*	*0.458*
Net entry	0.187	0.269	0.44	0.681	0.527	0.538	0.456	0.423
	0.518	*0.351*	*0.128*	*0.018*	*0.068*	*0.062*	*0.114*	*0.143*
Expanding est.	0.599	0.637	0.758	0.797	0.907	0.863	0.681	0.698
	0.038	*0.027*	*0.009*	*0.006*	*0.002*	*0.003*	*0.018*	*0.016*
Contracting est.	0.176	0.093	-0.165	-0.445	-0.786	-0.802	-0.907	-0.912
	0.543	*0.746*	*0.568*	*0.123*	*0.007*	*0.006*	*0.002*	*0.002*
Net expansion	0.39	0.456	0.626	0.797	0.973	0.923	0.819	0.824
	0.177	*0.114*	*0.03*	*0.006*	*0.001*	*0.001*	*0.005*	*0.004*
All industries Firms size 1 to 99 indiv.	**Trend 1**	**Trend 2**	**Trend 3**	**Trend 4**	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**
Opening establishments	0.423	0.423	0.423	0.522	0.462	0.418	0.346	0.352
	0.143	*0.143*	*0.143*	*0.071*	*0.11*	*0.148*	*0.231*	*0.223*
Closing est.	0.016	0.11	0.016	-0.071	-0.319	-0.313	-0.357	-0.385
	0.955	*0.703*	*0.955*	*0.805*	*0.27*	*0.278*	*0.216*	*0.183*
Net entry	0.302	0.231	0.302	0.401	0.681	0.692	0.637	0.665
	0.295	*0.424*	*0.295*	*0.165*	*0.018*	*0.017*	*0.027*	*0.021*
Expanding est.	0.742	0.692	0.742	0.802	0.885	0.758	0.527	0.473
	0.01	*0.017*	*0.01*	*0.006*	*0.002*	*0.009*	*0.068*	*0.102*
Contracting est.	-0.346	-0.258	-0.346	-0.434	-0.769	-0.802	-0.676	-0.626
	0.231	*0.371*	*0.231*	*0.133*	*0.008*	*0.006*	*0.019*	*0.03*
Net expansion	0.571	0.5	0.571	0.637	0.846	0.769	0.577	0.527
	0.048	*0.083*	*0.048*	*0.027*	*0.003*	*0.008*	*0.046*	*0.068*
All industries Firms size 100 or more indiv.	**Trend 1**	**Trend 2**	**Trend 3**	**Trend 4**	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**
Opening establishments	0.478	0.549	0.533	0.407	0.275	0.176	0.176	0.198
	0.098	*0.057*	*0.065*	*0.159*	*0.341*	*0.543*	*0.543*	*0.493*
Closing est.	0.775	0.808	0.632	0.478	0.088	-0.022	-0.027	0.038
	0.007	*0.005*	*0.029*	*0.098*	*0.761*	*0.939*	*0.924*	*0.894*
Net entry	-0.286	-0.286	-0.121	-0.132	0.165	0.198	0.192	0.104
	0.322	*0.322*	*0.675*	*0.648*	*0.568*	*0.493*	*0.505*	*0.718*
Expanding est.	0.214	0.253	0.44	0.473	0.83	0.797	0.775	0.742
	0.458	*0.381*	*0.128*	*0.102*	*0.004*	*0.006*	*0.007*	*0.01*
Contracting est.	0.044	-0.049	-0.346	-0.451	-0.786	-0.863	-0.868	-0.89
	0.879	*0.864*	*0.231*	*0.119*	*0.007*	*0.003*	*0.003*	*0.002*
Net expansion	-0.022	0.055	0.374	0.473	0.912	0.956	0.956	0.934
	0.939	*0.849*	*0.196*	*0.102*	*0.002*	*0.001*	*0.001*	*0.001*

a. Trend and Cycle represent trend in employment growth and cyclical component of employment growth.
The four estimates of Trend and Cycle are based on : (1) B=100, (2) B =40, (3) B=10 and (4) B=4.

Table 3. Influence of trend and cycle in employment growth (a)
Canada

(marginal significance level in italics)

Manufacturing	**Trend 1**	**Trend 2**	**Trend 3**	**Trend 4**	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**
Opening establishments	0.148	0.22	-0.06	-0.077	0.137	0.115	0.038	-0.038
	0.607	*0.447*	*0.834*	*0.79*	*0.634*	*0.689*	*0.894*	*0.894*
Closing est.	0.242	0.28	-0.022	-0.088	0.104	0.066	0.005	0.005
	0.402	*0.332*	*0.939*	*0.761*	*0.718*	*0.819*	*0.985*	*0.985*
Net entry	0.033	0.082	0.198	0.28	0.253	0.269	0.231	0.121
	0.909	*0.775*	*0.493*	*0.332*	*0.381*	*0.351*	*0.424*	*0.675*
Expanding est.	0.522	0.571	0.742	0.78	0.912	0.885	0.824	0.736
	0.071	*0.048*	*0.01*	*0.007*	*0.002*	*0.002*	*0.004*	*0.011*
Contracting est.	-0.198	-0.275	-0.654	-0.709	-0.929	-0.901	-0.874	-0.874
	0.493	*0.341*	*0.024*	*0.014*	*0.001*	*0.002*	*0.003*	*0.003*
Net expansion	0.385	0.473	0.764	0.824	0.989	0.967	0.918	0.852
	0.183	*0.102*	*0.008*	*0.004*	*0.001*	*0.001*	*0.002*	*0.003*

Services	**Trend 1**	**Trend 2**	**Trend 3**	**Trend 4**	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**
Opening establishments	0.72	0.703	0.764	0.648	0.401	0.335	0.225	0.22
	0.013	*0.015*	*0.008*	*0.025*	*0.165*	*0.246*	*0.435*	*0.447*
Closing est.	0.626	0.643	0.516	0.198	-0.132	-0.236	-0.33	-0.286
	0.03	*0.026*	*0.074*	*0.493*	*0.648*	*0.413*	*0.253*	*0.322*
Net entry	0.06	0.011	0.209	0.368	0.385	0.434	0.44	0.429
	0.834	*0.97*	*0.47*	*0.202*	*0.183*	*0.133*	*0.128*	*0.138*
Expanding est.	0.78	0.769	0.852	0.758	0.626	0.538	0.44	0.451
	0.007	*0.008*	*0.003*	*0.009*	*0.03*	*0.062*	*0.128*	*0.119*
Contracting est.	0.104	0.132	-0.077	-0.335	-0.824	-0.885	-0.934	-0.89
	0.718	*0.648*	*0.79*	*0.246*	*0.004*	*0.002*	*0.001*	*0.002*
Net expansion	0.44	0.429	0.582	0.736	0.984	0.951	0.896	0.863
	0.128	*0.138*	*0.044*	*0.011*	*0.001*	*0.001*	*0.002*	*0.003*

a. Trend and Cycle represent trend in employment growth and cyclical component of employment growth.
The four estimates of Trend and Cycle are based on : (1) B=100, (2) B =40, (3) B=10 and (4) B=4.

Table 3. Influence of trend and cycle in employment growth (a)
Germany
(marginal significance level in italics)

All industries	**Trend 1**	**Trend 2**	**Trend 3**	**Trend 4**	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**
Opening establishments	0.841	0.868	0.808	0.747	0.33	0.302	0.275	0.335
	0.004	*0.003*	*0.005*	*0.01*	*0.253*	*0.295*	*0.341*	*0.246*
Closing est.	0.39	0.264	0.088	-0.011	-0.258	-0.302	-0.313	-0.209
	0.177	*0.361*	*0.761*	*0.97*	*0.371*	*0.295*	*0.278*	*0.47*
Net entry	0.187	0.335	0.484	0.549	0.511	0.544	0.544	0.484
	0.518	*0.246*	*0.094*	*0.057*	*0.077*	*0.06*	*0.06*	*0.094*
Expanding est.	0.407	0.533	0.582	0.555	0.934	0.956	0.951	0.945
	0.159	*0.065*	*0.044*	*0.055*	*0.001*	*0.001*	*0.001*	*0.001*
Contracting est.	-0.61	-0.72	-0.813	-0.819	-0.83	-0.786	-0.753	-0.747
	0.035	*0.013*	*0.005*	*0.005*	*0.004*	*0.006*	*0.009*	*0.01*
Net expansion	0.571	0.676	0.742	0.692	0.94	0.901	0.879	0.874
	0.048	*0.019*	*0.01*	*0.016*	*0.001*	*0.002*	*0.002*	*0.002*

Manufacturing	**Trend 1**	**Trend 2**	**Trend 3**	**Trend 4**	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**
Opening establishments	0.774	0.713	0.707	0.685	0.156	0.039	-0.006	-0.022
	0.007	*0.014*	*0.014*	*0.018*	*0.589*	*0.893*	*0.985*	*0.938*
Closing est.	0.516	0.324	0.071	0.033	-0.352	-0.401	-0.44	-0.489
	0.074	*0.261*	*0.805*	*0.909*	*0.223*	*0.165*	*0.128*	*0.09*
Net entry	0.05	0.182	0.419	0.446	0.468	0.43	0.452	0.49
	0.864	*0.529*	*0.147*	*0.122*	*0.105*	*0.136*	*0.117*	*0.089*
Expanding est.	0.423	0.544	0.681	0.703	0.962	0.934	0.901	0.863
	0.143	*0.06*	*0.018*	*0.015*	*0.001*	*0.001*	*0.002*	*0.003*
Contracting est.	-0.451	-0.577	-0.725	-0.769	-0.835	-0.808	-0.791	-0.78
	0.119	*0.046*	*0.012*	*0.008*	*0.004*	*0.005*	*0.006*	*0.007*
Net expansion	0.429	0.549	0.687	0.72	0.967	0.94	0.912	0.89
	0.138	*0.057*	*0.017*	*0.013*	*0.001*	*0.001*	*0.002*	*0.002*

Services	**Trend 1**	**Trend 2**	**Trend 3**	**Trend 4**	**Cycle 1**	**Cycle 2**	**Cycle 3**	**Cycle 4**
Opening establishments	0.511	0.566	0.566	0.571	0.637	0.582	0.549	0.549
	0.077	*0.05*	*0.05*	*0.048*	*0.027*	*0.044*	*0.057*	*0.057*
Closing est.	0.167	0.072	-0.123	-0.156	-0.34	-0.446	-0.418	-0.39
	0.562	*0.802*	*0.671*	*0.589*	*0.239*	*0.122*	*0.148*	*0.177*
Net entry	0.346	0.484	0.643	0.665	0.846	0.885	0.813	0.775
	0.23	*0.094*	*0.026*	*0.021*	*0.003*	*0.002*	*0.005*	*0.007*
Expanding est.	0.495	0.604	0.736	0.742	0.945	0.929	0.824	0.698
	0.087	*0.036*	*0.011*	*0.01*	*0.001*	*0.001*	*0.004*	*0.016*
Contracting est.	-0.866	-0.866	-0.85	-0.817	-0.74	-0.707	-0.597	-0.581
	0.003	*0.003*	*0.003*	*0.005*	*0.01*	*0.014*	*0.039*	*0.044*
Net expansion	0.747	0.808	0.901	0.879	0.945	0.901	0.78	0.714
	0.01	*0.005*	*0.002*	*0.002*	*0.001*	*0.002*	*0.007*	*0.013*

a. Trend and Cycle represent trend in employment growth and cyclical component of employment growth.
The four estimates of Trend and Cycle are based on : (1) B=100, (2) B =40, (3) B=10 and (4) B=4.

Table 3. Influence of trend and cycle in employment growth (a)
Norway
(marginal significance level in italics)

	Trend 1	Trend 2	Trend 3	Trend 4	Cycle 1	Cycle 2	Cycle 3	Cycle 4
Manufacturing and mining								
Opening establishme	0.139	0.285	0.491	0.515	0.261	0.261	0.212	0.115
	0.676	*0.393*	*0.141*	*0.122*	*0.434*	*0.434*	*0.525*	*0.73*
Closing est.	-0.394	-0.309	-0.127	-0.091	-0.091	-0.091	-0.176	-0.236
	0.237	*0.354*	*0.703*	*0.785*	*0.785*	*0.785*	*0.598*	*0.478*
Net entry	0.709	0.685	0.515	0.467	0.176	0.176	0.248	0.2
	0.033	*0.04*	*0.122*	*0.162*	*0.598*	*0.598*	*0.456*	*0.549*
Expanding est.	0.176	0.418	0.721	0.842	0.818	0.818	0.806	0.745
	0.598	*0.21*	*0.03*	*0.011*	*0.014*	*0.014*	*0.016*	*0.025*
Contracting est.	-0.03	-0.176	-0.394	-0.6	-0.903	-0.903	-0.915	-0.952
	0.928	*0.598*	*0.237*	*0.072*	*0.007*	*0.007*	*0.006*	*0.004*
Net expansion	0.236	0.43	0.697	0.842	0.952	0.952	0.939	0.903
	0.478	*0.197*	*0.037*	*0.011*	*0.004*	*0.004*	*0.005*	*0.007*

All industries	Trend 1	Trend 2	Trend 3	Trend 4	Cycle 1	Cycle 2	Cycle 3	Cycle 4
Firms size 1 to 99 indiv.								
Opening establishme	0.612	0.612	0.539	0.491	0.139	0.115	0.115	0.042
	0.066	*0.066*	*0.106*	*0.141*	*0.676*	*0.73*	*0.73*	*0.899*
Closing est.	0.152	0.152	0.103	0.018	-0.127	-0.212	-0.212	-0.176
	0.649	*0.649*	*0.757*	*0.957*	*0.703*	*0.525*	*0.525*	*0.598*
Net entry	0.612	0.612	0.648	0.673	0.612	0.673	0.673	0.6
	0.066	*0.066*	*0.052*	*0.044*	*0.066*	*0.044*	*0.044*	*0.072*
Expanding est.	0.83	0.83	0.855	0.879	0.842	0.818	0.818	0.709
	0.013	*0.013*	*0.01*	*0.008*	*0.011*	*0.014*	*0.014*	*0.033*
Contracting est.	-0.285	-0.285	-0.321	-0.333	-0.527	-0.576	-0.576	-0.515
	0.393	*0.393*	*0.335*	*0.317*	*0.114*	*0.084*	*0.084*	*0.122*
Net expansion	0.648	0.648	0.685	0.721	0.782	0.794	0.794	0.697
	0.052	*0.052*	*0.04*	*0.03*	*0.019*	*0.017*	*0.017*	*0.037*

All industries	Trend 1	Trend 2	Trend 3	Trend 4	Cycle 1	Cycle 2	Cycle 3	Cycle 4
Firms size 100 or more indiv.								
Opening establishme	0.321	0.467	0.503	0.43	0.018	-0.03	-0.139	-0.248
	0.335	*0.162*	*0.131*	*0.197*	*0.957*	*0.928*	*0.676*	*0.456*
Closing est.	-0.6	-0.358	-0.152	-0.03	-0.152	0.042	0.03	-0.127
	0.072	*0.283*	*0.649*	*0.928*	*0.649*	*0.899*	*0.928*	*0.703*
Net entry	0.733	0.588	0.455	0.236	-0.103	-0.2	-0.188	-0.188
	0.028	*0.078*	*0.173*	*0.478*	*0.757*	*0.549*	*0.573*	*0.573*
Expanding est.	-0.418	-0.006	0.236	0.418	0.564	0.709	0.648	0.491
	0.21	*0.985*	*0.478*	*0.21*	*0.091*	*0.033*	*0.052*	*0.141*
Contracting est.	0.358	0.091	-0.091	-0.321	-0.915	-0.964	-0.927	-0.939
	0.283	*0.785*	*0.785*	*0.335*	*0.006*	*0.004*	*0.005*	*0.005*
Net expansion	-0.321	0.042	0.248	0.455	0.927	0.976	0.964	0.915
	0.335	*0.899*	*0.456*	*0.173*	*0.005*	*0.003*	*0.004*	*0.006*

Manufacturing	Trend 1	Trend 2	Trend 3	Trend 4	Cycle 1	Cycle 2	Cycle 3	Cycle 4
Opening establishme	-0.079	0.273	0.479	0.552	0.297	0.297	0.261	0.115
	0.813	*0.413*	*0.151*	*0.098*	*0.373*	*0.373*	*0.434*	*0.73*
Closing est.	-0.588	-0.273	-0.164	-0.042	-0.103	-0.103	-0.091	-0.236
	0.078	*0.413*	*0.623*	*0.899*	*0.757*	*0.757*	*0.785*	*0.478*
Net entry	0.685	0.588	0.491	0.382	0.176	0.176	0.139	0.164
	0.04	*0.078*	*0.141*	*0.252*	*0.598*	*0.598*	*0.676*	*0.623*
Expanding est.	0.139	0.503	0.806	0.915	0.83	0.83	0.806	0.721
	0.676	*0.131*	*0.016*	*0.006*	*0.013*	*0.013*	*0.016*	*0.03*
Contracting est.	-0.03	-0.248	-0.491	-0.661	-0.867	-0.867	-0.879	-0.879
	0.928	*0.456*	*0.141*	*0.047*	*0.009*	*0.009*	*0.008*	*0.008*
Net expansion	0.212	0.527	0.758	0.891	0.927	0.927	0.915	0.855
	0.525	*0.114*	*0.023*	*0.008*	*0.005*	*0.005*	*0.006*	*0.01*

a. Trend and Cycle represent trend in employment growth and cyclical component of employment growth.
The four estimates of Trend and Cycle are based on : (1) B=100, (2) B =40, (3) B=10 and (4) B=4.

Table 3 Components of turnover and the trend and cycle in employment growth a

United States: Manufacturing b
(1972-1988)

	Trend 1	Trend 2	Trend 3	Trend 4	Cycle 1	Cycle 2	Cycle 3	Cycle 4
Opening establishments	-0.086	-0.086	-0.214	-0.243	-0.421	-0.439	-0.446	-0.471
Closing establishments	-0.196	-0.196	-0.436	-0.489	-0.504	-0.496	-0.507	-0.504
Expanding establishments	0.211	0.211	0.446	0.500	0.600*	0.586*	0.575*	0.543*
Contracting establishments	-0.068	-0.068	-0.386	-0.479	-0.657**	-0.650**	-0.621*	-0.579*

* indicates significant at 5 per cent level using the t test;

** indicates significant at 1 per cent level using the t test;

a. Trend and Cycle represent trend in employment growth and cyclical component of employment growth.
The four estimates of Trend and Cycle are based on : (1) B=100, (2) B =40, (3) B=10 and (4) B=4.

b. Data for the United States in Table 3 only are from the LRD used in Davis et al (1994).

Table 4 Job gain rate and job loss rate by industry
(per cent of industry employment)

Canada 1984-89 a

Industry group (SIC)	Job gains	Openings	Expansions	Job losses	Closures	Contractions	Net employment change	Turnover
Division 4: Mines quarries and oil wells	**11.7**	1.3	10.4	**-11.2**	-2.3	-8.9	**0.6**	22.9
Division 5: Manufacturing industries	**10.8**	1.4	9.3	**7.9**	2.0	5.9	**2.9**	18.6
Division 6: Construction industries	**24.8**	4.9	19.9	**-16.8**	-3.8	-13.1	**7.9**	41.6
Division 7: Transportation, communications and other utilities	**8.7**	1.5	7.2	**-6.4**	-1.7	-4.7	**2.3**	15.1
Division 8: Major Group 1: Wholesale trade	**16.5**	2.4	14.1	**-10.8**	-2.6	-8.2	**5.7**	27.3
Division 8: Major group 2: Retail trade	**13.9**	2.9	11.0	**-9.1**	-2.6	-6.5	**4.8**	23.0
Division 9: Finance, insurance and real estate	**12.6**	2.4	10.1	**-7.9**	-2.0	-5.9	**4.6**	20.5
Division 10: Community , business and personal services	**19.5**	5.2	14.3	**-13.1**	-4.0	-9.0	**6.4**	32.5
All industries	**14.9**	3.2	11.7	**-10.1**	-2.8	-7.3	**4.8**	25.0

Denmark. 1984-89

Industry group (Div.)	Job gains	Openings	Expansions	Job losses	Closures	Contractions	Net employment change	Turnover
Major division 2: Mining and quarrying	**17.3**	6.5	10.8	**-17.0**	-7.3	-9.7	**0.3**	34.3
Major division 3: Manufacturing	**13.4**	4.3	9.0	**-11.9**	-3.5	-8.4	**1.4**	25.3
Major division 4: Electricity, gas and water	**8.3**	3.1	5.2	**-7.1**	-3.0	-4.1	**1.1**	15.4
Major division 5: Construction	**19.7**	5.9	13.9	**-17.2**	-5.1	-12.1	**2.6**	36.9
Major division 6: Wholesale and retail trade and restaurants and hotels	**16.9**	7.2	9.7	**-15.1**	-6.3	-8.8	**1.8**	32.0
Major division 7: Transport, storage and communication	**16.8**	5.9	10.8	**-13.4**	-4.7	-8.7	**3.4**	30.1
Major division 8: Financing, insurance and real estate	**16.1**	6.3	9.8	**-12.2**	-4.9	-7.3	**3.8**	28.3
Major division 9: Community, social and personal services	**16.3**	6.9	9.4	**-15.0**	-5.7	-9.3	**1.3**	31.3
All industries	**16.0**	6.1	9.9	**-13.8**	-5.0	-8.8	**2.2**	29.8

Finland 1986-89

Industry group (Div.)	Job gains	Openings	Expansions	Job losses	Closures	Contractions	Net employment change	Turnover
Major division 2: Mining and quarrying	**6.3**	2.1	4.2	**-15.4**	-4.6	-10.8	**-9.1**	21.7
Div. 21 Coal mining and 22 Crude petroleum and natural gas production	*****	*	*	*****	*	*	*****	*
Div. 23 Metal ore mining	**1.7**	0.9	0.8	**-21.9**	-10.5	-11.4	**-20.2**	23.6
Div. 29 Other mining	**7.8**	2.5	5.4	**-13.2**	-2.6	-10.6	**-5.4**	21.0
Major division 3: Manufacturing	**8.1**	2.7	5.5	**-9.6**	-2.9	-6.7	**-1.5**	17.8
Div. 31 Manufacture of food, beverages and tobacco	**6.8**	1.6	5.2	**-7.8**	-1.8	-6.0	**-1.0**	14.5
Div. 32 Textile, wearing apparel and leather industries	**5.0**	2.3	2.7	**-13.9**	-5.7	-8.3	**-8.9**	18.9
Div. 33 Manufacture of wood and wood products including furniture	**9.2**	2.3	6.9	**-9.0**	-2.9	-6.1	**0.2**	18.1
Div. 34 Manufacture of paper and paper products, printing and publishing	**9.6**	3.0	6.6	**-9.6**	-2.6	-7.0	**-0.1**	19.2
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	**6.8**	2.0	4.8	**-7.9**	-1.2	-6.6	**-1.1**	14.6
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	**7.6**	1.4	6.2	**-6.2**	-0.9	-5.3	**1.4**	13.7
Div. 37 Basic metal industries	**4.3**	0.7	3.6	**-6.4**	-1.9	-4.4	**-2.0**	10.7
Div. 38 Manufacture of fabricated metal products, machinery and equipment	**9.4**	3.7	5.7	**-10.2**	-3.2	-7.0	**-0.8**	19.6
Div. 39 Other manufacturing industries	**5.8**	1.6	4.2	**-10.9**	-2.6	-8.3	**-5.0**	16.7
Major division 4: Electricity, gas and water	**8.1**	4.5	3.6	**-13.6**	-1.0	-12.6	**-5.5**	21.7
Div. 41 Electricity, gas and steam	**8.2**	4.6	3.6	**-13.8**	-0.9	-12.8	**-5.6**	22.0
Div. 42 Water works and supply	**4.5**	1.6	3.0	**-8.3**	-3.9	-4.4	**-3.6**	12.9
Major division 5: Construction	**16.5**	6.5	10.0	**-13.4**	-5.3	-8.2	**3.1**	30.0
Div. 50 Construction	**16.5**	6.5	10.0	**-13.4**	-5.3	-8.2	**3.1**	30.0
Major division 6: Wholesale and retail trade and restaurants and hotels	**11.9**	4.6	7.3	**-10.8**	-3.4	-7.4	**1.1**	22.7
Div. 61 Wholesale trade	**13.0**	4.9	8.1	**-11.7**	-4.9	-6.8	**1.3**	24.6
Div. 62 Retail trade	**11.1**	4.4	6.7	**-10.1**	-2.6	-7.5	**1.0**	21.2
Div. 63 Restaurants and hotels	**13.2**	5.9	7.3	**-9.7**	-2.2	-7.5	**3.5**	22.9
Major division 7: Transport, storage and communication	**12.7**	6.8	5.9	**-13.4**	-5.7	-7.6	**-0.7**	26.0
Div. 71 Transport and storage	**13.5**	6.6	6.8	**-13.3**	-3.7	-9.5	**0.2**	26.7
Div. 72 Communication	**11.3**	7.1	4.2	**-13.5**	-9.1	-4.4	**-2.2**	24.9
Major division 8: Financing, insurance and real estate	**14.1**	6.2	7.9	**-8.1**	-2.6	-5.5	**6.0**	22.1
Div. 81 Financial institutions	**8.5**	3.1	5.4	**-4.6**	-1.0	-3.6	**3.9**	13.1
Div. 82 Insurance	**8.0**	1.8	6.2	**-6.8**	-2.6	-4.3	**1.1**	14.8
Div. 83 Real estate and business services	**19.2**	9.2	10.0	**-10.8**	-3.7	-7.1	**8.4**	30.0
Major division 9: Community, social and personal services	**11.3**	4.1	7.2	**-7.1**	-1.7	-5.3	**4.3**	18.4
Div. 92 Sanitary and similar services	*****	*	*	*****	*	*	*****	*
Div. 93 Social and related community services	**9.6**	3.4	6.1	**-6.0**	-1.1	-4.9	**3.5**	15.6
Div. 94 Recreational and cultural services	**14.3**	5.6	8.6	**-9.0**	-2.6	-6.4	**5.3**	23.2
Div. 95 Personal and household services	**13.7**	4.9	8.8	**-8.3**	-2.6	-5.7	**5.4**	22.0
All industries	**11.1**	4.4	6.7	**-10.3**	-3.3	-7.0	**0.8**	21.4

* Estimates not available

a) Data refer to firms

Sources: See Annex A.

Table 4 Job gain rate and job loss rate by industry
(per cent of industry employment)

France 1985-88

Industry group (NAP)	**Job gains**	Openings	Expansions	**Job losses**	Closures	Contractions	**Net employment change**	Turnover
U02 Food and agriculture	**11.8**	6.3	5.5	**-12.9**	-6.7	-6.2	**-1.1**	24.7
U03 Energy production and distribution	**7.0**	4.0	2.9	**-9.9**	-4.6	-5.3	**-2.9**	16.8
U04 Intermediate goods producing industries	**9.8**	5.7	4.0	**-11.6**	-6.0	-5.6	**-1.8**	21.3
U05A Industrial appliance manufacture	**11.2**	6.6	4.6	**-13.5**	-7.2	-6.3	**-2.3**	24.7
U05B Domestic appliance manufacture	**9.7**	6.6	3.1	**-13.6**	-5.9	-7.7	**-3.9**	23.3
U05C Motor vehicle and land transportation equipment manufacture	**4.5**	2.5	2.0	**-9.2**	-3.1	-6.1	**-4.7**	13.7
U06 Consumer goods manufacture	**12.1**	6.6	5.5	**-14.5**	-7.9	-6.6	**-2.6**	26.6
U07 Building and construction industry	**16.2**	8.1	8.1	**-15.7**	-8.8	-6.8	**0.5**	31.8
U08 Trade	**15.6**	8.9	6.7	**-14.6**	-8.4	-6.2	**1.0**	30.2
U09 Transportation and communications	**13.7**	6.8	6.9	**-11.5**	-6.2	-5.3	**2.2**	25.3
U10 Commercial services	**17.7**	9.0	8.7	**-13.4**	-7.2	-6.2	**4.2**	31.1
U11 Property rental and credit	**11.0**	5.6	5.3	**-11.1**	-5.3	-5.8	**-0.1**	22.0
U12 Insurance	**11.3**	7.7	3.6	**-11.4**	-7.3	-4.1	**-0.2**	22.7
U13 Financial institutions	**7.3**	3.4	4.0	**-7.7**	-3.3	-4.4	**-0.3**	15.0
U14 Non-commercial services	**10.6**	5.2	5.4	**-8.7**	-4.0	-4.7	**1.9**	19.2
All industries	**13.6**	7.4	6.3	**-13.0**	-7.0	-6.0	**0.6**	26.7

Germany 1984-89

Industry group (Div.)	**Job gains**	Openings	Expansions	**Job losses**	Closures	Contractions	**Net employment change**	Turnover
Major division 2: Mining and quarrying	**2.0**	0.2	1.8	**-5.3**	-0.2	-5.1	**-3.4**	7.3
Div. 21 Coal mining	**1.5**	0.1	1.3	**-4.9**	-0.1	-4.9	**-3.5**	6.4
Div. 22 Crude petroleum and natural gas production	**5.6**	0.5	5.0	**-9.4**	-0.2	-9.2	**-3.8**	14.9
Div. 23 Metal ore mining	**1.5**	0.0	1.5	**-10.7**	-0.1	-10.6	**-9.2**	12.3
Div. 29 Other mining	**4.2**	0.6	3.5	**-6.1**	-1.1	-5.0	**-2.0**	10.3
Major division 3: Manufacturing	**6.7**	1.2	5.5	**-5.9**	-1.0	-4.9	**0.8**	12.6
Div. 31 Manufacture of food, beverages and tobacco	**7.8**	1.6	6.2	**-8.1**	-1.7	-6.3	**-0.3**	15.9
Div. 32 Textile, wearing apparel and leather industries	**6.3**	1.7	4.6	**-8.7**	-1.9	-6.8	**-2.4**	15.0
Div. 33 Manufacture of wood and wood products including furniture	**8.5**	2.2	6.4	**-9.0**	-2.3	-6.8	**-0.5**	17.6
Div. 34 Manufacture of paper and paper products, printing and publishing	**6.5**	1.4	5.1	**-5.1**	-1.1	-4.1	**1.4**	11.6
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	**5.2**	0.8	4.4	**-3.4**	-0.4	-2.9	**1.8**	8.6
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	**5.9**	1.3	4.6	**-7.1**	-1.3	-5.8	**-1.3**	13.0
Div. 37 Basic metal industries	**4.8**	0.9	3.9	**-5.3**	-0.5	-4.9	**-0.6**	10.1
Div. 38 Manufacture of fabricated metal products, machinery and equipment	**7.1**	1.1	5.9	**-5.4**	-0.8	-4.7	**1.7**	12.5
Div. 39 Other manufacturing industries	**7.3**	1.5	5.7	**-7.3**	-1.4	-5.9	**-0.1**	14.6
Major division 4: Electricity, gas and water	**4.0**	0.2	3.8	**-3.0**	-0.2	-2.8	**1.0**	7.1
Div. 41 Electricity, gas and steam and 42 Water works and supply	**4.0**	0.2	3.8	**-3.0**	-0.2	-2.8	**1.0**	7.1
	*****	*	*	*****	*	*	*****	*
Major division 5: Construction	**10.0**	2.9	7.0	**-11.8**	-3.2	-8.6	**-1.8**	21.8
Div. 50 Construction	**10.0**	2.9	7.0	**-11.8**	-3.2	-8.6	**-1.8**	21.8
Major division 6: Wholesale and retail trade and restaurants and hotels	**11.9**	4.4	7.5	**-10.6**	-3.6	-7.0	**1.3**	22.4
Div. 61 Wholesale trade and 62 Retail trade	**10.9**	3.6	7.2	**-9.7**	-3.0	-6.7	**1.2**	20.6
	*****	*	*	*****	*	*	*****	*
Div. 63 Restaurants and hotels	**18.1**	9.3	8.8	**-16.0**	-7.6	-8.4	**2.1**	34.1
Major division 7: Transport, storage and communication	**10.6**	2.9	7.7	**-7.7**	-2.3	-5.4	**2.9**	18.3
Div. 71 and 72 Transport and storage and communication	**10.6**	2.9	7.7	**-7.7**	-2.3	-5.4	**2.9**	18.3
	*****	*	*	*****	*	*	*****	*
Major division 8: Financing, insurance and real estate	**10.8**	3.2	7.6	**-7.3**	-2.1	-5.2	**3.5**	18.1
Div. 81 Financial institutions and 82 Insurance	**5.2**	0.8	4.4	**-3.6**	-0.7	-2.9	**1.7**	8.8
	*****	*	*	*****	*	*	*****	*
Div. 83 Real estate and business services	**16.4**	5.7	10.7	**-11.0**	-3.5	-7.5	**5.3**	27.4
Major division 9: Community, social and personal services	**10.6**	3.2	7.4	**-8.6**	-2.6	-5.9	**2.6**	19.2
Div. 92 Sanitary and similar services	**6.4**	1.2	5.3	**-4.3**	-0.7	-3.6	**2.1**	10.8
Div. 93 Social and related community services	**10.3**	3.3	7.0	**-7.9**	-3.0	-4.9	**3.8**	18.2
Div. 94 Recreational and cultural services	**10.2**	3.7	6.5	**-6.8**	-1.9	-4.9	**3.4**	17.1
Div. 95 Personal and household services	**11.5**	3.4	8.1	**-9.9**	-2.7	-7.2	**1.6**	21.3
All industries	**8.7**	2.4	6.4	**-7.7**	-2.0	-5.7	**1.1**	16.4

* Estimates not available

a) Data refer to firms

Sources: See Annex A.

Table 4 Job gain rate and job loss rate by industry
(per cent of industry (per cent of industry employment)

Italy 1987-89 a

Industry group (Div.)	Job gains	Openings	Expansions	Job losses	Closures	Contractions	Net employment change	Turnover
Major division 2: Mining and quarrying	**8.3**	1.8	6.5	**-10.3**	-2.3	-7.9	**-2.0**	18.6
Div. 21 Coal mining	**7.9**	2.0	5.9	**-13.6**	-7.1	-6.5	**-5.7**	21.6
Div. 22 Crude petroleum and natural gas production	**1.7**	0.4	1.2	**-10.2**	-0.3	-9.9	**-8.5**	11.8
Div. 23 Metal ore mining	**9.7**	0.6	9.1	**-10.4**	-4.2	-6.3	**-0.8**	20.1
Div. 29 Other mining	**10.3**	2.4	7.8	**-10.3**	-2.7	-7.6	**-0.0**	20.6
Major division 3: Manufacturing	**11.3**	3.4	7.9	**-9.8**	-3.6	-6.3	**1.4**	21.1
Div. 31 Manufacture of food, beverages and tobacco	**11.6**	3.1	8.6	**-10.8**	-3.6	-7.2	**0.8**	22.4
Div. 32 Textile, wearing apparel and leather industries	**12.6**	4.7	7.9	**-12.8**	-5.5	-7.3	**-0.1**	25.4
Div. 33 Manufacture of wood and wood products including furniture	**12.5**	3.6	8.9	**-10.6**	-3.9	-6.7	**1.9**	23.2
Div. 34 Manufacture of paper and paper products, printing and publishing	**10.1**	3.2	6.9	**-7.3**	-2.6	-4.7	**2.8**	17.4
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	**8.3**	2.1	6.2	**-7.5**	-2.7	-4.7	**0.9**	15.8
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	**9.2**	2.4	6.8	**-8.5**	-2.8	-5.7	**0.7**	17.7
Div. 37 Basic metal industries	**7.8**	2.3	5.5	**-11.3**	-3.0	-8.3	**-3.5**	19.1
Div. 38 Manufacture of fabricated metal products, machinery and equipment	**11.1**	3.1	8.0	**-8.3**	-2.8	-5.5	**2.8**	19.4
Div. 39 Other manufacturing industries	**20.6**	6.5	14.1	**-18.3**	-5.2	-13.1	**2.3**	38.9
Major division 4: Electricity, gas and water	**1.1**	0.1	1.1	**-1.5**	-0.2	-1.2	**-0.3**	2.6
Div. 41 Electricity, gas and steam	**0.9**	0.1	0.8	**-1.4**	-0.2	-1.2	**-0.6**	2.3
Div. 42 Water works and supply	**4.8**	0.2	4.6	**-2.0**	-0.3	-1.6	**2.8**	6.8
Major division 5: Construction	**22.7**	6.5	16.2	**-19.6**	-5.5	-14.2	**3.0**	42.3
Div. 50 Construction	**22.7**	6.5	16.2	**-19.6**	-5.5	-14.2	**3.0**	42.3
Major division 6: Wholesale and retail trade and restaurants and hotels	**17.2**	5.9	11.3	**-12.4**	-4.7	-7.7	**4.8**	29.6
Div. 61 Wholesale trade	**15.2**	4.6	10.6	**-10.3**	-3.8	-6.5	**4.9**	25.5
Div. 62 Retail trade	**15.6**	5.7	9.9	**-11.1**	-4.6	-6.5	**4.4**	26.7
Div. 63 Restaurants and hotels	**21.0**	7.2	13.8	**-15.7**	-5.4	-10.4	**5.3**	36.7
Major division 7: Transport, storage and communication	**8.6**	2.0	6.5	**-6.0**	-1.5	-4.5	**2.6**	14.6
Div. 71 Transport and storage	**9.6**	2.4	7.2	**-7.2**	-1.8	-5.4	**2.5**	16.8
Div. 72 Communication	**3.1**	0.0	3.0	**-0.1**	0.0	-0.1	**3.0**	3.1
Major division 8: Financing, insurance and real estate	**10.1**	3.4	6.7	**-5.9**	-2.2	-3.7	**4.2**	16.0
Div. 81 Financial institutions	**3.0**	0.3	2.7	**-1.8**	-0.7	-1.1	**1.2**	4.8
Div. 82 Insurance	**9.6**	3.6	6.0	**-6.5**	-2.9	-3.6	**3.1**	16.2
Div. 83 Real estate and business services	**18.9**	7.2	11.7	**-10.8**	-3.9	-6.9	**8.1**	29.7
Major division 9: Community, social and personal services	**14.9**	4.1	10.8	**-10.2**	-3.3	-6.9	**4.7**	25.1
Div. 92 Sanitary and similar services	**18.4**	3.7	14.7	**-10.2**	-3.1	-7.1	**8.2**	28.6
Div. 93 Social and related community services	**11.5**	3.4	8.0	**-6.7**	-2.0	-4.7	**4.8**	18.1
Div. 94 Recreational and cultural services	**15.8**	4.8	11.0	**-12.8**	-4.0	-8.8	**3.0**	28.6
Div. 95 Personal and household services	**16.6**	5.2	11.4	**-13.8**	-5.0	-8.9	**2.7**	30.4
All industries	**13.2**	4.0	9.2	**-10.5**	-3.6	-6.9	**2.7**	23.7

New Zealand 1987-1989

Industry group (Div.)	Job gains	Openings	Expansions	Job losses	Closures	Contractions	Net employment change	Turnover
Major division 2: Mining and quarrying	**11.3**	4.4	6.8	**-23.9**	-10.4	-13.6	**-12.7**	35.2
Div. 21 Coal mining	**7.8**	2.0	5.8	**-37.9**	-13.0	-24.9	**-30.1**	45.6
Div. 22 Crude petroleum and natural gas production	**7.0**	1.0	6.0	**-8.7**	-0.9	-7.8	**-1.7**	15.7
Div. 23 Metal ore mining	**26.5**	15.7	10.9	**-30.4**	-21.1	-9.4	**-3.9**	57.0
Div. 29 Other mining	**11.1**	4.3	6.8	**-18.1**	-9.1	-9.0	**-7.0**	29.3
Major division 3: Manufacturing	**11.9**	4.5	7.4	**-17.9**	-8.1	-9.9	**-6.0**	29.9
Div. 31 Manufacture of food, beverages and tobacco	**10.9**	3.7	7.2	**-16.4**	-5.9	-10.5	**-5.5**	27.3
Div. 32 Textile, wearing apparel and leather industries	**12.7**	5.6	7.1	**-21.6**	-11.4	-10.2	**-8.8**	34.3
Div. 33 Manufacture of wood and wood products including furniture	**13.0**	5.1	7.9	**-19.7**	-11.2	-8.5	**-6.7**	32.6
Div. 34 Manufacture of paper and paper products, printing and publishing	**9.6**	4.6	5.0	**-14.2**	-7.0	-7.3	**-4.6**	23.9
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	**11.4**	3.2	8.2	**-16.0**	-6.2	-9.8	**-4.6**	27.4
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	**10.9**	3.0	7.8	**-20.0**	-8.7	-11.2	**-9.1**	30.8
Div. 37 Basic metal industries	**14.2**	3.5	10.7	**-10.9**	-3.2	-7.7	**3.3**	25.1
Div. 38 Manufacture of fabricated metal products, machinery and equipment	**12.9**	4.9	7.9	**-19.4**	-8.7	-10.7	**-6.5**	32.2
Div. 39 Other manufacturing industries	**16.5**	8.9	7.6	**-21.8**	-13.2	-8.6	**-5.2**	38.3
Major division 4: Electricity, gas and water	**10.8**	5.1	5.8	**-16.5**	-2.8	-13.8	**-5.7**	27.3
Div. 41 Electricity, gas and steam	**10.5**	4.9	5.7	**-16.4**	-2.6	-13.8	**-5.8**	26.9
Div. 42 Water works and supply	**13.9**	7.0	6.8	**-18.4**	-5.2	-13.2	**-4.6**	32.3
Major division 5: Construction	**18.6**	8.4	10.2	**-25.1**	-11.5	-13.6	**-6.5**	43.7
Div. 50 Construction	**18.6**	8.4	10.2	**-25.1**	-11.5	-13.6	**-6.5**	43.7
Major division 6: Wholesale and retail trade and restaurants and hotels	**16.8**	8.2	8.6	**-19.2**	-9.9	-9.3	**-2.4**	36.0
Div. 61 Wholesale trade	**18.0**	7.9	10.0	**-21.3**	-11.1	-10.3	**-3.4**	39.3
Div. 62 Retail trade	**15.8**	7.7	8.1	**-17.8**	-9.5	-8.4	**-2.0**	33.7
Div. 63 Restaurants and hotels	**17.2**	9.7	7.5	**-19.1**	-9.2	-9.8	**-1.9**	36.3
Major division 7: Transport, storage and communication	**23.4**	15.7	7.8	**-31.8**	-11.6	-20.2	**-8.3**	55.2
Div. 71 Transport and storage	**17.6**	8.2	9.4	**-23.0**	-9.5	-13.5	**-5.4**	40.6
Div. 72 Communication	**32.2**	26.9	5.3	**-44.9**	-14.7	-30.2	**-12.8**	77.1
Major division 8: Financing, insurance and real estate	**21.8**	10.2	11.6	**-19.2**	-8.8	-10.4	**2.6**	41.0
Div. 81 Financial institutions	**14.4**	5.9	8.4	**-16.1**	-5.2	-10.9	**-1.7**	30.4
Div. 82 Insurance	**20.5**	6.0	14.5	**-17.7**	-7.3	-10.4	**2.9**	38.2
Div. 83 Real estate and business services	**27.1**	14.0	13.2	**-21.6**	-11.6	-10.0	**5.5**	48.7
Major division 9: Community, social and personal services	**19.3**	9.1	10.3	**-18.9**	-9.2	-9.7	**0.5**	38.2
Div. 92 Sanitary and similar services	**23.4**	14.0	9.5	**-20.8**	-13.0	-7.9	**2.6**	44.2
Div. 93 Social and related community services	**11.0**	2.1	8.8	**-13.8**	-1.8	-12.0	**-2.8**	24.8
Div. 94 Recreational and cultural services	**23.3**	8.0	15.3	**-21.8**	-8.5	-13.3	**1.5**	45.1
Div. 95 Personal and household services	**18.0**	8.9	9.2	**-18.3**	-10.5	-7.8	**-0.3**	36.3
All industries	**16.8**	8.1	8.7	**-20.6**	-9.3	-11.3	**-3.8**	37.4

* Estimates not available

a) Data refer to firms

Sources: See Annex A.

Table 4 Job gain rate and job loss rate by industry
(per cent of industr (per cent of industry employment)

Norway 1984-86

Industry group (Div.)	Job gains	Openings	Expansions	Job losses	Closures	Contractions	Net employment change	Turnover
Major division 2: Mining and quarrying	**13.4**	1.6	11.8	**-5.8**	-1.1	-4.7	**7.6**	19.2
Major division 3: Manufacturing	**7.9**	1.3	6.6	**-7.5**	-1.9	-5.6	**0.3**	15.4
Div. 31 Manufacture of food, beverages and tobacco	**7.7**	1.3	6.3	**-7.1**	-1.7	-5.4	**0.6**	14.8
Div. 32 Textile, wearing apparel and leather industries	**7.7**	1.1	6.6	**-9.7**	-2.5	-7.1	**-2.4**	17.4
Div. 33 Manufacture of wood and wood products including furniture	**7.3**	1.1	6.2	**-8.4**	-2.1	-6.3	**-1.6**	15.7
Div. 34 Manufacture of paper and paper products, printing and publishing	**6.3**	0.8	5.4	**-5.5**	-0.9	-4.6	**0.5**	11.7
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	**6.1**	0.6	5.5	**-5.9**	-0.8	-5.0	**-0.3**	12.0
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	**7.6**	1.5	6.1	**-6.7**	-1.3	-5.4	**1.0**	14.3
Div. 37 Basic metal industries	**3.3**	0.1	3.2	**-4.0**	-1.0	-3.0	**-0.2**	7.3
Div. 38 Manufacture of fabricated metal products, machinery and equipment	**9.9**	1.6	8.3	**-9.0**	-2.6	-6.3	**1.0**	18.8
Div. 39 Other manufacturing industries	**10.1**	2.6	7.5	**-6.2**	-1.5	-4.7	**1.6**	16.3
Minining and quarrying (2) and manufacturing (3)	**8.2**	1.3	6.9	**-7.4**	-1.9	-5.5	**0.7**	15.6

Sweden 1986-89

Industry group (Div.)	Job gains	Openings	Expansions	Job losses	Closures	Contractions	Net employment change	Turnover
Major division 2: Mining and quarrying	**13.5**	7.7	5.7	**-16.6**	-7.9	-8.7	**-3.1**	30.0
Div. 21 Coal mining	**7.8**	0.9	7.0	**-13.9**	-3.5	-10.4	**-6.1**	21.7
Div. 22 Crude petroleum and natural gas production	**49.2**	33.1	16.1	**-39.8**	-29.7	-10.2	**9.3**	89.0
Div. 23 Metal ore mining	**11.1**	7.8	3.3	**-16.6**	-8.5	-8.2	**-5.6**	27.7
Div. 29 Other mining	**19.5**	7.6	11.9	**-16.1**	-6.1	-10.0	**3.3**	35.6
Major division 3: Manufacturing	**11.9**	5.3	6.6	**-10.9**	-4.0	-6.9	**1.0**	22.8
Div. 31 Manufacture of food, beverages and tobacco	**13.3**	5.3	8.0	**-11.3**	-4.0	-7.3	**2.0**	24.6
Div. 32 Textile, wearing apparel and leather industries	**9.1**	3.9	5.2	**-12.6**	-4.1	-8.4	**-3.5**	21.6
Div. 33 Manufacture of wood and wood products including furniture	**13.5**	5.0	8.5	**-11.1**	-3.5	-7.6	**2.4**	24.6
Div. 34 Manufacture of paper and paper products, printing and publishing	**10.7**	4.8	5.9	**-10.0**	-3.5	-6.6	**0.7**	20.7
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	**10.7**	4.4	6.4	**-9.5**	-3.7	-5.8	**1.3**	20.2
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	**16.1**	7.7	8.4	**-10.0**	-3.7	-6.3	**6.1**	26.1
Div. 37 Basic metal industries	**15.5**	10.3	5.1	**-17.1**	-10.4	-6.7	**-1.7**	32.6
Div. 38 Manufacture of fabricated metal products, machinery and equipment	**11.7**	5.1	6.6	**-10.6**	-3.6	-7.0	**1.1**	22.3
Div. 39 Other manufacturing industries	**10.7**	4.8	5.9	**-8.3**	-2.6	-5.8	**2.3**	19.0
Major division 4: Electricity, gas and water	**9.0**	2.9	6.1	**-8.9**	-2.9	-6.0	**0.1**	17.9
Div. 41 Electricity, gas and steam	**9.1**	3.0	6.1	**-8.8**	-3.0	-5.8	**0.2**	17.9
Div. 42 Water works and supply	**7.8**	2.0	5.8	**-9.8**	-1.6	-8.2	**-2.0**	17.6
Major division 5: Construction	**21.5**	10.4	11.1	**-15.2**	-5.8	-9.4	**6.3**	36.6
Div. 50 Construction	**21.5**	10.4	11.1	**-15.2**	-5.8	-9.4	**6.3**	36.6
Major division 6: Wholesale and retail trade and restaurants and hotels	**18.5**	8.8	9.7	**-14.9**	-6.2	-8.7	**3.6**	33.4
Div. 61 Wholesale trade	**17.2**	7.7	9.5	**-13.5**	-5.5	-8.0	**3.7**	30.7
Div. 62 Retail trade	**16.2**	7.6	8.6	**-13.5**	-5.6	-7.9	**2.7**	29.6
Div. 63 Restaurants and hotels	**29.4**	15.7	13.7	**-22.9**	-9.9	-12.9	**6.5**	52.3
Major division 7: Transport, storage and communication	**16.4**	6.3	10.1	**-14.4**	-6.0	-8.4	**2.0**	30.8
Div. 71 Transport and storage	**18.3**	7.7	10.6	**-15.6**	-7.0	-8.6	**2.7**	33.9
Div. 72 Communication	**13.0**	3.8	9.2	**-12.2**	-4.2	-8.1	**0.8**	25.2
Major division 8: Financing, insurance and real estate	**18.9**	8.5	10.4	**-14.3**	-5.5	-8.8	**4.6**	33.2
Div. 81 Financial institutions	**19.1**	8.5	10.6	**-13.9**	-4.8	-9.1	**5.2**	33.1
Div. 82 Insurance	**7.7**	2.0	5.8	**-6.2**	-1.3	-4.9	**1.5**	14.0
Div. 83 Real estate and business services	**21.0**	9.8	11.3	**-16.1**	-6.6	-9.5	**5.0**	37.1
Major division 9: Community, social and personal services	**16.7**	6.1	10.6	**-14.1**	-4.9	-9.3	**2.6**	30.9
Div. 92 Sanitary and similar services	**21.3**	7.2	14.1	**-16.2**	-4.3	-11.8	**5.1**	37.5
Div. 93 Social and related community services	**14.6**	4.7	9.9	**-12.4**	-4.0	-8.4	**2.2**	26.9
Div. 94 Recreational and cultural services	**15.6**	5.2	10.4	**-14.5**	-4.7	-9.9	**1.1**	30.2
Div. 95 Personal and household services	**18.8**	9.0	9.8	**-14.9**	-6.8	-8.2	**3.9**	33.8
All industries	**16.1**	7.3	8.8	**-13.2**	-5.2	-8.1	**2.9**	29.4

U.S. 1984-88

Industry group (SIC)	Job gains	Openings	Expansions	Job losses	Closures	Contractions	Net employment change	Turnover
B. Mining	**9.5**	6.6	2.9	**-16.6**	-10.6	-6.0	**-7.1**	26.1
C. Construction	**14.7**	8.1	6.6	**-13.4**	-8.9	-4.5	**1.3**	28.1
D. Manufacturing	**11.2**	7.5	3.8	**-11.0**	-7.7	-3.2	**0.2**	22.2
E. Tansportation and public utilities	**13.2**	9.0	4.2	**-9.7**	-7.1	-2.6	**3.5**	22.9
F. Wholesale trade	**13.3**	9.1	4.2	**-10.7**	-7.6	-3.1	**2.6**	24.0
G. Retail trade	**12.7**	7.8	4.9	**-10.7**	-7.9	-2.8	**1.9**	23.4
H. Finance, insurance and real estate	**13.5**	10.1	3.4	**-10.2**	-7.9	-2.2	**3.3**	23.7
I. Services	**13.3**	8.1	5.2	**-9.5**	-6.3	-3.2	**3.8**	22.8
All industries	**12.7**	8.5	4.2	**-10.3**	-7.4	-2.9	**2.4**	23.1

* Estimates not available
a) Data refer to firms
Sources: See Annex A.

Table 5 Replacement rates by industry
(Proportion of job loss rate)

Canada 1984-89 a

Industry group (SIC)	Replacement Rates		
	Total	Existing establishments	Opening establishments
	(Job gain rate/job loss rate)		
Division 4: Mines quarries and oil wells	1.05	0.93	0.11
Division 5: Manufacturing industries	1.37	1.19	0.18
Division 6: Construction industries	1.47	1.18	0.29
Division 7: Transportation, communications and other utilities	1.37	1.13	0.23
Division 8: Major Group 1: Wholesale trade	1.53	1.31	0.22
Division 8: Major group 2: Retail trade	1.53	1.21	0.32
Division 9: Finance, insurance and real estate	1.58	1.28	0.31
Division 10: Community , business and personal services	1.49	1.09	0.40
All industries	**1.47**	**1.15**	**0.32**

Denmark. 1984-89

Industry group (Div.)	Replacement Rates		
	Total	Existing establishments	Opening establishments
	(Job gain rate/job loss rate)		
Major division 2: Mining and quarrying	1.02	0.63	0.38
Major division 3: Manufacturing	1.12	0.76	0.36
Major division 4: Electricity, gas and water	1.16	0.73	0.43
Major division 5: Construction	1.15	0.81	0.34
Major division 6: Wholesale and retail trade and restaurants and hotels	1.12	0.64	0.48
Major division 7: Transport, storage and communication	1.25	0.81	0.44
Major division 8: Financing, insurance and real estate	1.31	0.80	0.52
Major division 9: Community, social and personal services	1.09	0.63	0.46
All industries	**1.16**	**0.72**	**0.44**

Finland 1986-89

Industry group (Div.)	Replacement Rates		
	Total	Existing establishments	Opening establishments
	(Job gain rate/job loss rate)		
Major division 2: Mining and quarrying	0.41	0.27	0.14
Div. 21 Coal mining and 22 Crude petroleum and natural gas production	*	*	*
Div. 23 Metal ore mining	0.08	0.03	0.04
Div. 29 Other mining	0.59	0.41	0.19
Major division 3: Manufacturing	0.85	0.57	0.28
Div. 31 Manufacture of food, beverages and tobacco	0.87	0.67	0.20
Div. 32 Textile, wearing apparel and leather industries	0.36	0.20	0.17
Div. 33 Manufacture of wood and wood products including furniture	1.03	0.77	0.25
Div. 34 Manufacture of paper and paper products, printing and publishing	0.99	0.68	0.31
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	0.86	0.61	0.25
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	1.22	1.00	0.22
Div. 37 Basic metal industries	0.68	0.57	0.11
Div. 38 Manufacture of fabricated metal products, machinery and equipment	0.93	0.56	0.36
Div. 39 Other manufacturing industries	0.54	0.39	0.15
Major division 4: Electricity, gas and water	0.60	0.26	0.33
Div. 41 Electricity, gas and steam	0.60	0.26	0.34
Div. 42 Water works and supply	0.54	0.36	0.19
Major division 5: Construction	1.23	0.75	0.49
Div. 50 Construction	1.23	0.75	0.49
Major division 6: Wholesale and retail trade and restaurants and hotels	1.10	0.68	0.42
Div. 61 Wholesale trade	1.11	0.69	0.42
Div. 62 Retail trade	1.10	0.66	0.44
Div. 63 Restaurants and hotels	1.36	0.75	0.61
Major division 7: Transport, storage and communication	0.95	0.44	0.51
Div. 71 Transport and storage	1.01	0.52	0.50
Div. 72 Communication	0.84	0.31	0.53
Major division 8: Financing, insurance and real estate	1.74	0.98	0.77
Div. 81 Financial institutions	1.86	1.18	0.68
Div. 82 Insurance	1.16	0.90	0.26
Div. 83 Real estate and business services	1.78	0.92	0.85
Major division 9: Community, social and personal services	1.60	1.02	0.59
Div. 92 Sanitary and similar services	*	*	*
Div. 93 Social and related community services	1.59	1.02	0.57
Div. 94 Recreational and cultural services	1.59	0.96	0.63
Div. 95 Personal and household services	1.65	1.06	0.58
All industries	**1.08**	**0.65**	**0.43**

* Estimates not available
a) Data refer to firms
Sources: See Annex A.

Table 5 Replacement rates by industry
(Proportion of job loss rate)

France 1985-88

Industry group (NAP)	Replacement Rates		
	Total	Existing establishments	Opening establishments
	(Job gain rate/job loss rate)		
U02 Food and agriculture	0.91	0.42	0.49
U03 Energy production and distribution	0.70	0.30	0.41
U04 Intermediate goods producing industries	0.84	0.35	0.50
U05A Industrial appliance manufacture	0.83	0.34	0.49
U05B Domestic appliance manufacture	0.71	0.23	0.48
U05C Motor vehicle and land transportation equipment manufacture	0.49	0.21	0.27
U06 Consumer goods manufacture	0.83	0.38	0.45
U07 Building and construction industry	1.03	0.52	0.52
U08 Trade	1.07	0.46	0.61
U09 Transportation and communications	1.19	0.60	0.59
U10 Commercial services	1.32	0.64	0.67
U11 Property rental and credit	0.99	0.48	0.51
U12 Insurance	0.98	0.31	0.67
U13 Financial institutions	0.96	0.52	0.44
U14 Non-commercial services	1.22	0.62	0.60
All industries	**1.05**	**0.48**	**0.57**

Germany 1984-89

Industry group (Div.)	Replacement Rates		
	Total	Existing establishments	Opening establishments
	(Job gain rate/job loss rate)		
Major division 2: Mining and quarrying	0.37	0.33	0.04
Div. 21 Coal mining	0.30	0.27	0.03
Div. 22 Crude petroleum and natural gas production	0.59	0.54	0.06
Div. 23 Metal ore mining	0.14	0.14	0.00
Div. 29 Other mining	0.68	0.57	0.10
Major division 3: Manufacturing	1.14	0.93	0.21
Div. 31 Manufacture of food, beverages and tobacco	0.97	0.77	0.20
Div. 32 Textile, wearing apparel and leather industries	0.72	0.53	0.19
Div. 33 Manufacture of wood and wood products including furniture	0.94	0.70	0.24
Div. 34 Manufacture of paper and paper products, printing and publishing	1.27	1.00	0.27
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	1.54	1.31	0.23
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	0.82	0.65	0.18
Div. 37 Basic metal industries	0.90	0.73	0.16
Div. 38 Manufacture of fabricated metal products, machinery and equipment	1.31	1.10	0.21
Div. 39 Other manufacturing industries	0.99	0.78	0.21
Major division 4: Electricity, gas and water	1.32	1.25	0.08
Div. 41 Electricity, gas and steam and 42 Water works and supply	1.32	1.25	0.08
	*	*	*
Major division 5: Construction	0.84	0.60	0.25
Div. 50 Construction	0.84	0.60	0.25
Major division 6: Wholesale and retail trade and restaurants and hotels	1.12	0.71	0.42
Div. 61 Wholesale trade and 62 Retail trade	1.12	0.75	0.37
	*	*	*
Div. 63 Restaurants and hotels	1.13	0.55	0.58
Major division 7: Transport, storage and communication	1.38	1.00	0.38
Div. 71 and 72 Transport and storage and communication	1.38	1.00	0.38
	*	*	*
Major division 8: Financing, insurance and real estate	1.48	1.04	0.44
Div. 81 Financial institutions and 82 Insurance	1.47	1.25	0.22
	*	*	*
Div. 83 Real estate and business services	1.48	0.97	0.51
Major division 9: Community, social and personal services	1.24	0.86	0.38
Div. 92 Sanitary and similar services	1.48	1.21	0.26
Div. 93 Social and related community services	1.31	0.89	0.42
Div. 94 Recreational and cultural services	1.50	0.95	0.54
Div. 95 Personal and household services	1.17	0.82	0.35
All industries	**1.14**	**0.83**	**0.31**

* Estimates not available

a) Data refer to firms

Sources: See Annex A.

Table 5 Replacement rates by industry
(Proportion of job loss rate)

Italy 1987-89 a

Industry group (Div.)	Replacement Rates		
	Total	Existing establishments	Opening establishments
	(Job gain rate/job loss rate)		
Major division 2: Mining and quarrying	0.81	0.63	0.18
Div. 21 Coal mining	0.58	0.43	0.15
Div. 22 Crude petroleum and natural gas production	0.16	0.12	0.04
Div. 23 Metal ore mining	0.93	0.87	0.05
Div. 29 Other mining	1.00	0.76	0.24
Major division 3: Manufacturing	1.15	0.80	0.35
Div. 31 Manufacture of food, beverages and tobacco	1.07	0.79	0.28
Div. 32 Textile, wearing apparel and leather industries	0.99	0.62	0.37
Div. 33 Manufacture of wood and wood products including furniture	1.18	0.84	0.34
Div. 34 Manufacture of paper and paper products, printing and publishing	1.38	0.95	0.43
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	1.11	0.83	0.28
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	1.09	0.81	0.28
Div. 37 Basic metal industries	0.69	0.49	0.20
Div. 38 Manufacture of fabricated metal products, machinery and equipment	1.34	0.97	0.38
Div. 39 Other manufacturing industries	1.13	0.77	0.36
Major division 4: Electricity, gas and water	0.78	0.73	0.06
Div. 41 Electricity, gas and steam	0.60	0.55	0.05
Div. 42 Water works and supply	2.41	2.33	0.09
Major division 5: Construction	1.15	0.82	0.33
Div. 50 Construction	1.15	0.82	0.33
Major division 6: Wholesale and retail trade and restaurants and hotels	1.39	0.91	0.48
Div. 61 Wholesale trade	1.48	1.03	0.45
Div. 62 Retail trade	1.40	0.89	0.51
Div. 63 Restaurants and hotels	1.34	0.88	0.46
Major division 7: Transport, storage and communication	1.43	1.09	0.34
Div. 71 Transport and storage	1.35	1.01	0.34
Div. 72 Communication b	*	*	0.27
Major division 8: Financing, insurance and real estate	1.70	1.13	0.57
Div. 81 Financial institutions	1.67	1.51	0.16
Div. 82 Insurance	1.48	0.93	0.55
Div. 83 Real estate and business services	1.74	1.08	0.66
Major division 9: Community, social and personal services	1.46	1.06	0.41
Div. 92 Sanitary and similar services	1.81	1.45	0.36
Div. 93 Social and related community services	1.72	1.21	0.51
Div. 94 Recreational and cultural services	1.23	0.86	0.37
Div. 95 Personal and household services	1.20	0.82	0.37
All industries 1987-1989	**1.25**	**0.88**	**0.38**
All industries 1985-1989	**1.21**	**0.81**	**0.39**

New Zealand 1987-1989

Industry group (Div.)	Replacement Rates		
	Total	Existing establishments	Opening establishments
	(Job gain rate/job loss rate)		
Major division 2: Mining and quarrying	0.47	0.29	0.19
Div. 21 Coal mining	0.20	0.15	0.05
Div. 22 Crude petroleum and natural gas production	0.80	0.69	0.12
Div. 23 Metal ore mining	0.87	0.36	0.52
Div. 29 Other mining	0.61	0.38	0.24
Major division 3: Manufacturing	0.66	0.41	0.25
Div. 31 Manufacture of food, beverages and tobacco	0.67	0.44	0.23
Div. 32 Textile, wearing apparel and leather industries	0.59	0.33	0.26
Div. 33 Manufacture of wood and wood products including furniture	0.66	0.40	0.26
Div. 34 Manufacture of paper and paper products, printing and publishing	0.67	0.35	0.32
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	0.71	0.51	0.20
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	0.54	0.39	0.15
Div. 37 Basic metal industries	1.30	0.98	0.32
Div. 38 Manufacture of fabricated metal products, machinery and equipment	0.66	0.41	0.25
Div. 39 Other manufacturing industries	0.76	0.35	0.41
Major division 4: Electricity, gas and water	0.65	0.35	0.31
Div. 41 Electricity, gas and steam	0.64	0.35	0.30
Div. 42 Water works and supply	0.75	0.37	0.38
Major division 5: Construction	0.74	0.41	0.33
Div. 50 Construction	0.74	0.41	0.33
Major division 6: Wholesale and retail trade and restaurants and hotels	0.87	0.45	0.43
Div. 61 Wholesale trade	0.84	0.47	0.37
Div. 62 Retail trade	0.89	0.45	0.43
Div. 63 Restaurants and hotels	0.90	0.40	0.51
Major division 7: Transport, storage and communication	0.74	0.24	0.49
Div. 71 Transport and storage	0.77	0.41	0.36
Div. 72 Communication	0.72	0.12	0.60
Major division 8: Financing, insurance and real estate	1.14	0.61	0.53
Div. 81 Financial institutions	0.89	0.53	0.37
Div. 82 Insurance	1.16	0.82	0.34
Div. 83 Real estate and business services	1.26	0.61	0.65
Major division 9: Community, social and personal services	1.02	0.54	0.48
Div. 92 Sanitary and similar services	1.12	0.45	0.67
Div. 93 Social and related community services	0.79	0.64	0.16
Div. 94 Recreational and cultural services	1.07	0.70	0.37
Div. 95 Personal and household services	0.99	0.50	0.49
All industries	**0.81**	**0.42**	**0.39**

* Estimates not available

a) Data refer to firms

b) Replacement rate for Div. 72 not calculated as losses in existing firms minimal relative to expansion.

Sources: See Annex A.

Table 5 Replacement rates by industry
(Proportion of job loss rate)

Norway 1984-86

Industry group (Div.)	Replacement Rates Total (Job gain rate/job loss rate)	Existing establishments	Opening establishments
Major division 2: Mining and quarrying	2.31	2.04	0.28
Major division 3: Manufacturing	1.06	0.88	0.17
Div. 31 Manufacture of food, beverages and tobacco	1.07	0.89	0.19
Div. 32 Textile, wearing apparel and leather industries	0.80	0.68	0.11
Div. 33 Manufacture of wood and wood products including furniture	0.87	0.73	0.13
Div. 34 Manufacture of paper and paper products, printing and publishing	1.15	1.00	0.15
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	1.04	0.94	0.10
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	1.14	0.92	0.23
Div. 37 Basic metal industries	0.82	0.79	0.03
Div. 38 Manufacture of fabricated metal products, machinery and equipment	1.10	0.93	0.17
Div. 39 Other manufacturing industries	1.63	1.22	0.42
Minining and quarrying (2) and manufacturing (3)	**1.11**	**0.93**	**0.18**

Sweden 1986-89

Industry group (Div.)	Replacement Rates Total (Job gain rate/job loss rate)	Existing establishments	Opening establishments
Major division 2: Mining and quarrying	0.81	0.34	0.47
Div. 21 Coal mining	0.56	0.50	0.06
Div. 22 Crude petroleum and natural gas production	1.23	0.40	0.83
Div. 23 Metal ore mining	0.67	0.20	0.47
Div. 29 Other mining	1.21	0.74	0.47
Major division 3: Manufacturing	1.10	0.61	0.49
Div. 31 Manufacture of food, beverages and tobacco	1.17	0.71	0.47
Div. 32 Textile, wearing apparel and leather industries	0.72	0.41	0.31
Div. 33 Manufacture of wood and wood products including furniture	1.22	0.77	0.45
Div. 34 Manufacture of paper and paper products, printing and publishing	1.07	0.59	0.47
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	1.13	0.67	0.46
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	1.61	0.84	0.77
Div. 37 Basic metal industries	0.90	0.30	0.60
Div. 38 Manufacture of fabricated metal products, machinery and equipment	1.10	0.62	0.48
Div. 39 Other manufacturing industries	1.28	0.71	0.57
Major division 4: Electricity, gas and water	1.01	0.68	0.33
Div. 41 Electricity, gas and steam	1.03	0.69	0.34
Div. 42 Water works and supply	0.80	0.60	0.20
Major division 5: Construction	1.42	0.73	0.69
Div. 50 Construction	1.42	0.73	0.69
Major division 6: Wholesale and retail trade and restaurants and hotels	1.24	0.65	0.59
Div. 61 Wholesale trade	1.27	0.71	0.57
Div. 62 Retail trade	1.20	0.64	0.56
Div. 63 Restaurants and hotels	1.29	0.60	0.69
Major division 7: Transport, storage and communication	1.14	0.70	0.44
Div. 71 Transport and storage	1.18	0.68	0.49
Div. 72 Communication	1.06	0.75	0.31
Major division 8: Financing, insurance and real estate	1.32	0.73	0.59
Div. 81 Financial institutions	1.38	0.76	0.61
Div. 82 Insurance	1.24	0.93	0.32
Div. 83 Real estate and business services	1.31	0.70	0.61
Major division 9: Community, social and personal services	1.18	0.75	0.43
Div. 92 Sanitary and similar services	1.32	0.87	0.44
Div. 93 Social and related community services	1.18	0.80	0.38
Div. 94 Recreational and cultural services	1.07	0.71	0.36
Div. 95 Personal and household services	1.26	0.66	0.60
All industries	**1.22**	**0.67**	**0.55**

* Estimates not available

U.K. 1985-89 a

	Replacement Rates Total	Existing establishments	Opening establishments
All industries	**1.36**	**0.89**	**0.46**

U.S. 1984-88

Industry group (SIC)	Replacement Rates Total (Job gain rate/job loss rate)	Existing establishments	Opening establishments
B. Mining	0.62	0.18	0.43
C. Construction	1.18	0.53	0.65
D. Manufacturing	1.07	0.36	0.71
E. Tansportation and public utilities	1.39	0.44	0.95
F. Wholesale trade	1.33	0.41	0.92
G. Retail trade	1.26	0.48	0.78
H. Finance, insurance and real estate	1.41	0.35	1.06
I. Services	1.49	0.58	0.91
All industries	**1.23**	**0.41**	**0.82**

* Estimates not available
a) Data refer to firms
Sources: See Annex A.

Table 6: A measure of non-cyclical turnover by industry
(per cent of employment)

Canada 1979-91 a

Industry group (SIC)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
Division 4: Mines quarries and oil wells	6.0	-4.6	10.6	23.1	**46.1**
Division 5: Manufacturing industries	4.7	-7.1	11.8	19.1	**61.4**
Division 6: Construction industries	13.6	-14.5	28.1	40.7	**69.1**
Division 7: Transportation, communications and other utilities	3.7	-4.9	8.7	15.8	**54.8**
Division 8: Major Group 1: Wholesale trade	9.4	-8.9	18.3	26.7	**68.6**
Division 8: Major group 2: Retail trade	9.1	-7.7	16.8	23.6	**71.1**
Division 9: Finance, insurance and real estate	8.1	-6.3	14.4	19.7	**73.3**
Division 10: Community , business and personal services	13.5	-10.9	24.4	31.1	**78.4**
All industries	**8.7**	**-9.0**	**17.7**	25.0	**70.8**

Denmark. 1981-89

Industry group (Div.)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
Major division 2: Mining and quarrying	11.3	-11.0	22.3	35.4	**63.1**
Major division 3: Manufacturing	11.2	-8.6	19.7	24.7	**79.9**
Major division 4: Electricity, gas and water	5.9	-5.3	11.2	15.9	**70.1**
Major division 5: Construction	13.4	-14.0	27.4	37.7	**72.7**
Major division 6: Wholesale and retail trade and restaurants and hotels	14.2	-12.9	27.0	31.6	**85.4**
Major division 7: Transport, storage and communication	13.1	-10.9	24.0	29.5	**81.5**
Major division 8: Financing, insurance and real estate	12.3	-10.0	22.3	28.3	**78.9**
Major division 9: Community, social and personal services	12.4	-13.3	25.8	30.6	**84.1**
All industries	**13.6**	**-11.4**	**25.4**	**30.0**	**84.8**

Finland 1986-91

Industry group (Div.)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
Major division 2: Mining and quarrying	5.1	-13.1	18.2	22.9	**81.5**
Div. 21 Coal mining and 22 Crude petroleum and natural gas production	*	*	*	*	*
Div. 23 Metal ore mining	1.0	-3.2	4.2	18.7	**21.8**
Div. 29 Other mining	6.5	-11.4	17.9	24.1	**76.6**
Major division 3: Manufacturing	5.0	-8.9	13.9	18.3	**76.2**
Div. 31 Manufacture of food, beverages and tobacco	5.7	-6.9	12.6	15.3	**82.6**
Div. 32 Textile, wearing apparel and leather industries	3.2	-13.2	16.4	22.4	**76.2**
Div. 33 Manufacture of wood and wood products including furniture	4.0	-8.5	12.5	18.5	**68.1**
Div. 34 Manufacture of paper and paper products, printing and publishing	5.5	-8.8	14.3	18.5	**77.1**
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	5.6	-7.4	13.0	15.0	**87.0**
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	5.1	-5.5	10.6	15.4	**69.0**
Div. 37 Basic metal industries	2.6	-4.5	7.1	10.2	**69.3**
Div. 38 Manufacture of fabricated metal products, machinery and equipment	5.3	-8.8	14.1	20.2	**70.1**
Div. 39 Other manufacturing industries	4.2	-9.6	13.8	17.0	**81.8**
Major division 4: Electricity, gas and water	6.0	-6.6	12.6	19.1	**66.3**
Div. 41 Electricity, gas and steam	6.0	-6.4	12.4	19.2	**64.8**
Div. 42 Water works and supply	3.7	-4.5	8.2	14.2	**58.7**
Major division 5: Construction	7.8	-13.4	21.2	30.2	**69.8**
Div. 50 Construction	7.8	-13.4	21.2	30.2	**69.8**
Major division 6: Wholesale and retail trade and restaurants and hotels	9.6	-9.2	18.8	24.2	**77.5**
Div. 61 Wholesale trade	10.1	-11.2	21.3	25.7	**82.7**
Div. 62 Retail trade	9.1	-8.1	17.3	23.1	**74.5**
Div. 63 Restaurants and hotels	8.7	-7.6	16.2	24.9	**64.5**
Major division 7: Transport, storage and communication	7.3	-10.4	17.7	27.0	**65.3**
Div. 71 Transport and storage	8.4	-7.8	16.2	24.6	**65.6**
Div. 72 Communication	3.6	-12.4	16.0	31.0	**51.7**
Major division 8: Financing, insurance and real estate	10.0	-7.1	17.2	23.5	**72.1**
Div. 81 Financial institutions	4.9	-4.3	9.3	14.2	**64.7**
Div. 82 Insurance	6.6	-4.8	11.4	21.7	**53.7**
Div. 83 Real estate and business services	13.8	-8.9	22.7	30.3	**73.7**
Major division 9: Community, social and personal services	9.6	-7.1	16.7	20.3	**81.6**
Div. 92 Sanitary and similar services	*	*	*	*	*
Div. 93 Social and related community services	6.7	-5.5	12.2	14.4	**82.7**
Div. 94 Recreational and cultural services	7.5	-8.7	16.2	23.6	**68.3**
Div. 95 Personal and household services	12.5	-7.3	19.8	24.4	**80.0**
All industries	**7.9**	**-9.4**	**17.2**	**22.5**	**76.6**

* Estimates not available

a) Data refer to firms

Sources: See Annex A.

Table 6: A measure of non-cyclical turnover by industry
(per cent of employment)

France 1985-88

Industry group (NAP)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
U02 Food and agriculture	10.7	-11.6	22.3	24.7	**90.4**
U03 Energy production and distribution	4.5	-7.0	11.5	16.7	**68.3**
U04 Intermediate goods producing industries	9.4	-9.6	19.0	21.3	**88.9**
U05A Industrial appliance manufacture	10.1	-12.2	22.3	24.7	**90.2**
U05B Domestic appliance manufacture	6.7	-10.5	17.2	23.3	**73.8**
U05C Motor vehicle and land transportation equipment manufacture	3.5	-7.5	10.9	13.7	**79.8**
U06 Consumer goods manufacture	11.4	-13.3	24.7	26.8	**93.0**
U07 Building and construction industry	14.9	-15.1	30.0	31.8	**94.2**
U08 Trade	14.6	-13.8	28.4	30.2	**94.2**
U09 Transportation and communications	12.2	-10.9	23.1	25.2	**91.5**
U10 Commercial services	15.5	-13.0	28.5	31.0	**91.6**
U11 Property rental and credit	8.9	-10.3	19.2	22.0	**87.2**
U12 Insurance	7.2	-7.6	14.8	22.7	**65.4**
U13 Financial institutions	6.8	-7.1	13.9	15.0	**92.7**
U14 Non-commercial services	9.6	-7.7	17.3	19.2	**90.0**
All industries (1985-1988)	**12.6**	**-12.7**	**25.3**	**26.7**	**94.8**
All industries (1978-1991)	**9.8**	**-11.1**	**20.9**	**25.4**	**82.4**

Germany 1978-90

Industry group (Div.)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
Major division 2: Mining and quarrying	1.32	-2.14	3.5	9.3	**37.3**
Div. 21 Coal mining	0.98	-1.81	2.8	8.9	**31.3**
Div. 22 Crude petroleum and natural gas production	2.14	-1.25	3.4	13.4	**25.4**
Div. 23 Metal ore mining	0.09	-1.09	1.2	10.0	**11.8**
Div. 29 Other mining	1.71	-3.58	5.3	10.4	**51.0**
Major division 3: Manufacturing	4.42	-4.92	9.3	12.6	**74.4**
Div. 31 Manufacture of food, beverages and tobacco	6.86	-7.01	13.9	15.6	**88.6**
Div. 32 Textile, wearing apparel and leather industries	4.90	-7.63	12.5	15.1	**82.9**
Div. 33 Manufacture of wood and wood products including furniture	6.72	-6.21	12.9	17.3	**74.6**
Div. 34 Manufacture of paper and paper products, printing and publishing	4.33	-3.95	8.3	11.8	**69.9**
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	2.87	-3.05	5.9	8.6	**69.0**
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	4.37	-4.16	8.5	12.8	**66.6**
Div. 37 Basic metal industries	2.49	-3.60	6.1	10.1	**60.4**
Div. 38 Manufacture of fabricated metal products, machinery and equipment	3.82	-4.11	7.9	11.7	**67.9**
Div. 39 Other manufacturing industries	4.89	-6.11	11.0	14.6	**75.2**
Major division 4: Electricity, gas and water	2.48	-2.12	4.6	6.6	**70.1**
Div. 41 Electricity, gas and steam and 42 Water works and supply	2.48 *	-2.12 *	4.6 *	6.6 *	**70.1**
Major division 5: Construction	8.82	-8.00	16.8	21.7	**77.5**
Div. 50 Construction	8.82	-8.00	16.8	21.7	**77.5**
Major division 6: Wholesale and retail trade and restaurants and hotels	9.89	-9.35	19.2	22.4	**85.8**
Div. 61 Wholesale trade and 62 Retail trade	8.63 *	-8.47 *	17.1 *	20.4 *	**83.8**
Div. 63 Restaurants and hotels	17.39	-14.80	32.2	35.7	**90.3**
Major division 7: Transport, storage and communication	7.34	-6.96	14.3	18.5	**77.3**
Div. 71 and 72 Transport and storage and communication	7.34 *	-6.96 *	14.3 *	18.5 *	**77.3**
Major division 8: Financing, insurance and real estate	8.62	-6.38	15.0	18.1	**82.7**
Div. 81 Financial institutions and 82 Insurance	4.54 *	-3.22 *	7.8 *	9.5 *	**81.9**
Div. 83 Real estate and business services	12.65	-9.06	21.7	27.0	**80.3**
Major division 9: Community, social and personal services	9.21	-8.40	17.3	19.9	**87.2**
Div. 92 Sanitary and similar services	4.87	-2.99	7.9	11.3	**69.6**
Div. 93 Social and related community services	9.35	-6.84	16.2	19.4	**83.4**
Div. 94 Recreational and cultural services	6.27	-4.17	10.4	15.4	**67.7**
Div. 95 Personal and household services	9.15	-8.52	17.7	21.7	**81.3**
All industries	**6.83**	**-6.59**	**13.4**	16.3	**82.5**

* Estimates not available

a) Data refer to firms

Sources: See Annex A.

Table 6: A measure of non-cyclical turnover by industry
(per cent of employment)

Italy 1987-91 a

Industry group (Div.)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
Major division 2: Mining and quarrying	6.9	-8.1	14.9	18.1	**82.7**
Div. 21 Coal mining	2.2	-6.1	8.4	20.8	**40.2**
Div. 22 Crude petroleum and natural gas production	1.2	-3.1	4.2	14.3	**29.6**
Div. 23 Metal ore mining	2.3	-4.1	6.4	15.2	**42.1**
Div. 29 Other mining	8.1	-8.4	16.5	19.5	**84.4**
Major division 3: Manufacturing	9.2	-9.6	18.8	21.3	**88.1**
Div. 31 Manufacture of food, beverages and tobacco	11.0	-10.1	21.1	24.5	**85.8**
Div. 32 Textile, wearing apparel and leather industries	9.5	-12.5	22.0	24.7	**89.1**
Div. 33 Manufacture of wood and wood products including furniture	10.4	-9.8	20.2	22.4	**90.2**
Div. 34 Manufacture of paper and paper products, printing and publishing	8.1	-6.8	14.9	17.4	**85.2**
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	6.2	-7.1	13.4	17.4	**76.7**
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	8.1	-8.2	16.4	18.2	**90.0**
Div. 37 Basic metal industries	5.7	-9.1	14.7	19.1	**77.2**
Div. 38 Manufacture of fabricated metal products, machinery and equipment	8.7	-7.7	16.4	19.8	**82.7**
Div. 39 Other manufacturing industries	16.4	-15.6	32.0	37.1	**86.4**
Major division 4: Electricity, gas and water	0.9	-0.8	1.7	2.7	**64.5**
Div. 41 Electricity, gas and steam	0.6	-0.2	0.8	2.3	**33.5**
Div. 42 Water works and supply	4.0	-1.6	5.6	8.1	**69.0**
Major division 5: Construction	20.5	-17.9	38.4	41.2	**93.2**
Div. 50 Construction	20.5	-17.9	38.4	41.2	**93.2**
Major division 6: Wholesale and retail trade and restaurants and hotels	14.3	-12.0	26.3	29.2	**90.1**
Div. 61 Wholesale trade	12.4	-10.2	22.7	24.9	**91.1**
Div. 62 Retail trade	13.2	-10.7	23.9	26.5	**90.3**
Div. 63 Restaurants and hotels	17.1	-15.3	32.4	36.3	**89.4**
Major division 7: Transport, storage and communication	6.9	-5.6	12.5	14.7	**85.1**
Div. 71 Transport and storage	7.7	-6.7	14.4	16.9	**84.9**
Div. 72 Communication	1.4	-0.0	1.4	3.3	**41.5**
Major division 8: Financing, insurance and real estate	9.8	-5.3	15.2	17.1	**88.6**
Div. 81 Financial institutions	2.8	-1.3	4.1	6.1	**67.9**
Div. 82 Insurance	8.4	-5.7	14.1	16.7	**84.8**
Div. 83 Real estate and business services	17.0	-10.1	27.0	30.0	**90.1**
Major division 9: Community, social and personal services	11.9	-9.9	21.8	24.3	**89.7**
Div. 92 Sanitary and similar services	12.9	-10.0	22.9	27.2	**84.3**
Div. 93 Social and related community services	9.7	-6.2	15.8	17.8	**88.9**
Div. 94 Recreational and cultural services	14.0	-11.3	25.4	27.7	**91.6**
Div. 95 Personal and household services	13.4	-13.4	26.9	29.5	**91.2**
All industries	**11.3**	**-10.3**	**21.6**	23.7	**91.2**

New Zealand 1987-1992

Industry group (Div.)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
Major division 2: Mining and quarrying	10.3	-9.1	19.4	32.8	**56.9**
Div. 21 Coal mining	4.7	-5.6	10.3	38.2	**27.0**
Div. 22 Crude petroleum and natural gas production	1.6	-1.8	3.3	20.7	**16.1**
Div. 23 Metal ore mining	13.8	-19.6	33.4	56.0	**59.5**
Div. 29 Other mining	6.4	-14.3	20.7	33.0	**69.7**
Major division 3: Manufacturing	9.6	-14.5	24.1	28.2	**85.3**
Div. 31 Manufacture of food, beverages and tobacco	8.8	-11.0	19.7	25.6	**77.2**
Div. 32 Textile, wearing apparel and leather industries	10.4	-17.1	27.6	33.3	**82.8**
Div. 33 Manufacture of wood and wood products including furniture	9.0	-13.4	22.4	31.7	**70.6**
Div. 34 Manufacture of paper and paper products, printing and publishing	5.6	-7.2	12.9	23.0	**56.0**
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	8.1	-11.4	19.5	25.1	**77.8**
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	8.3	-10.2	18.4	29.6	**62.2**
Div. 37 Basic metal industries	3.8	-8.3	12.1	21.4	**56.5**
Div. 38 Manufacture of fabricated metal products, machinery and equipment	9.5	-15.7	25.1	30.7	**81.8**
Div. 39 Other manufacturing industries	10.4	-14.3	24.8	36.6	**67.5**
Major division 4: Electricity, gas and water	6.5	-11.3	17.8	28.0	**63.6**
Div. 41 Electricity, gas and steam	6.1	-11.2	17.3	26.4	**65.4**
Div. 42 Water works and supply	11.3	-10.9	22.2	44.3	**50.1**
Major division 5: Construction	13.4	-18.0	31.4	44.0	**71.2**
Div. 50 Construction	13.4	-18.0	31.4	44.0	**71.2**
Major division 6: Wholesale and retail trade and restaurants and hotels	11.9	-16.9	28.8	35.1	**81.9**
Div. 61 Wholesale trade	12.9	-16.2	29.1	36.9	**78.8**
Div. 62 Retail trade	11.1	-15.7	26.8	33.4	**80.2**
Div. 63 Restaurants and hotels	12.1	-17.5	29.5	36.4	**81.1**
Major division 7: Transport, storage and communication	14.4	-16.8	31.2	47.7	**65.4**
Div. 71 Transport and storage	12.2	-15.7	27.8	37.5	**74.2**
Div. 72 Communication	10.9	-18.1	29.1	63.9	**45.5**
Major division 8: Financing, insurance and real estate	14.3	-13.7	28.0	38.6	**72.5**
Div. 81 Financial institutions	10.4	-9.3	19.7	29.8	**66.2**
Div. 82 Insurance	10.7	-9.3	20.1	34.1	**58.4**
Div. 83 Real estate and business services	16.7	-17.8	34.5	45.1	**76.6**
Major division 9: Community, social and personal services	12.9	-16.6	29.5	38.3	**77.4**
Div. 92 Sanitary and similar services	16.6	-12.4	29.1	42.2	**68.9**
Div. 93 Social and related community services	8.5	-6.3	14.8	29.2	**50.9**
Div. 94 Recreational and cultural services	11.1	-17.3	28.5	45.2	**63.0**
Div. 95 Personal and household services	12.9	-16.4	29.3	34.7	**84.4**
All industries	13.1	-18.4	31.5	35.5	**88.6**

* Estimates not available

a) Data refer to firms

Sources: See Annex A.

Table 6: A measure of non-cyclical turnover by industry
(per cent of employment)

Norway 1976-86

Industry group (Div.)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
Major division 2: Mining and quarrying	8.9	-4.0	12.9	18.5	**70.3**
Major division 3: Manufacturing	4.7	-6.4	11.1	14.7	**76.2**
Div. 31 Manufacture of food, beverages and tobacco	5.4	-6.1	11.5	14.6	**79.0**
Div. 32 Textile, wearing apparel and leather industries	2.5	-8.4	10.9	16.8	**65.7**
Div. 33 Manufacture of wood and wood products including furniture	4.3	-6.6	10.9	14.6	**74.6**
Div. 34 Manufacture of paper and paper products, printing and publishing	2.6	-4.5	7.1	12.2	**58.4**
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	3.3	-3.9	7.1	11.7	**60.9**
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	4.1	-5.5	9.6	12.9	**74.9**
Div. 37 Basic metal industries	0.9	-1.9	2.8	8.2	**34.4**
Div. 38 Manufacture of fabricated metal products, machinery and equipment	6.4	-6.8	13.2	17.4	**76.4**
Div. 39 Other manufacturing industries	3.5	-5.2	8.8	16.2	**54.3**
Minining and quarrying (2) and manufacturing (3)	**4.9**	**-6.4**	**11.2**	**14.9**	**75.8**

Sweden 1986-91

Industry group (Div.)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
Major division 2: Mining and quarrying	5.6	-9.2	14.8	27.8	**53.4**
Div. 21 Coal mining	*	*	*	*	*
Div. 22 Crude petroleum and natural gas production	9.8	-10.5	20.3	68.5	**29.6**
Div. 23 Metal ore mining	1.1	-7.7	8.8	25.6	**34.5**
Div. 29 Other mining	12.5	-13.5	26.0	33.0	**78.9**
Major division 3: Manufacturing	7.5	-9.7	17.1	22.3	**76.8**
Div. 31 Manufacture of food, beverages and tobacco	8.2	-7.1	15.3	23.6	**64.6**
Div. 32 Textile, wearing apparel and leather industries	6.1	-10.1	16.2	22.8	**71.0**
Div. 33 Manufacture of wood and wood products including furniture	5.8	-10.3	16.2	22.7	**71.1**
Div. 34 Manufacture of paper and paper products, printing and publishing	9.2	-8.9	18.1	21.0	**86.0**
Div. 35 Manufacture of chemicals and chemical, petroleum, coal, rubber and plastic products	8.0	-7.7	15.7	21.2	**74.2**
Div. 36 Manufacture of non-metallic mineral products, except products of petroleum and coal	5.2	-8.6	13.8	23.9	**57.8**
Div. 37 Basic metal industries	5.4	-9.7	15.1	32.0	**47.2**
Div. 38 Manufacture of fabricated metal products, machinery and equipment	6.4	-9.8	16.2	21.5	**75.2**
Div. 39 Other manufacturing industries	8.0	-7.0	15.1	19.3	**78.0**
Major division 4: Electricity, gas and water	7.8	-7.3	15.1	20.1	**75.0**
Div. 41 Electricity, gas and steam	7.9	-7.2	15.1	20.1	**75.0**
Div. 42 Water works and supply	5.5	-7.0	12.5	20.3	**61.6**
Major division 5: Construction	15.5	-13.8	29.3	35.3	**83.1**
Div. 50 Construction	15.5	-13.8	29.3	35.3	**83.1**
Major division 6: Wholesale and retail trade and restaurants and hotels	13.5	-13.8	27.3	33.1	**82.5**
Div. 61 Wholesale trade	14.1	-12.7	26.9	31.1	**86.4**
Div. 62 Retail trade	11.8	-12.8	24.6	29.2	**84.1**
Div. 63 Restaurants and hotels	17.3	-19.3	36.6	50.2	**72.9**
Major division 7: Transport, storage and communication	13.2	-12.2	25.4	30.3	**83.9**
Div. 71 Transport and storage	14.0	-11.8	25.9	34.1	**75.9**
Div. 72 Communication	8.3	-7.4	15.7	23.5	**66.8**
Major division 8: Financing, insurance and real estate	17.1	-13.7	30.9	33.6	**91.9**
Div. 81 Financial institutions	9.1	-10.9	20.0	31.1	**64.4**
Div. 82 Insurance	5.3	-4.9	10.2	20.0	**51.2**
Div. 83 Real estate and business services	18.0	-14.5	32.5	36.9	**87.9**
Major division 9: Community, social and personal services	15.1	-13.7	28.8	30.9	**93.1**
Div. 92 Sanitary and similar services	17.4	-14.0	31.4	37.8	**83.1**
Div. 93 Social and related community services	11.5	-10.8	22.3	27.2	**82.0**
Div. 94 Recreational and cultural services	14.8	-12.6	27.5	30.1	**91.3**
Div. 95 Personal and household services	14.5	-13.4	27.9	33.3	**83.9**
All industries	**12.7**	**-12.8**	**25.5**	29.1	**87.4**

* Estimates not available

U.S. 1984-91

Industry group (SIC)	(1) Smallest job gain rate	(2) Smallest job loss rate	(3) Minimal turnover	(4) Average turnover	(3)/(4) Ratio (per cent)
B. Mining	9.2	-14.5	23.7	25.5	**92.9**
C. Construction	10.8	-11.4	22.2	26.1	**85.3**
D. Manufacturing	9.6	-10.9	20.5	22.1	**92.7**
E. Tansportation and public utilities	12.6	-9.8	22.4	23.0	**97.5**
F. Wholesale trade	10.4	-10.6	21.0	22.7	**92.4**
G. Retail trade	11.8	-10.1	21.9	24.0	**91.1**
H. Finance, insurance and real estate	12.5	-9.4	21.9	23.1	**94.9**
I. Services	12.7	-8.8	21.5	22.6	**95.2**
All industries 1984-91	**12.2**	**-10.3**	**22.5**	23.3	**96.4**
All industries 1976-91	**8.9**	**-6.5**	**15.3**	21.1	**72.6**

* Estimates not available
a) Data refer to firms
Sources: See Annex A.

Table 7. Factors influencing excess job turnover a
t-statistics in parentheses

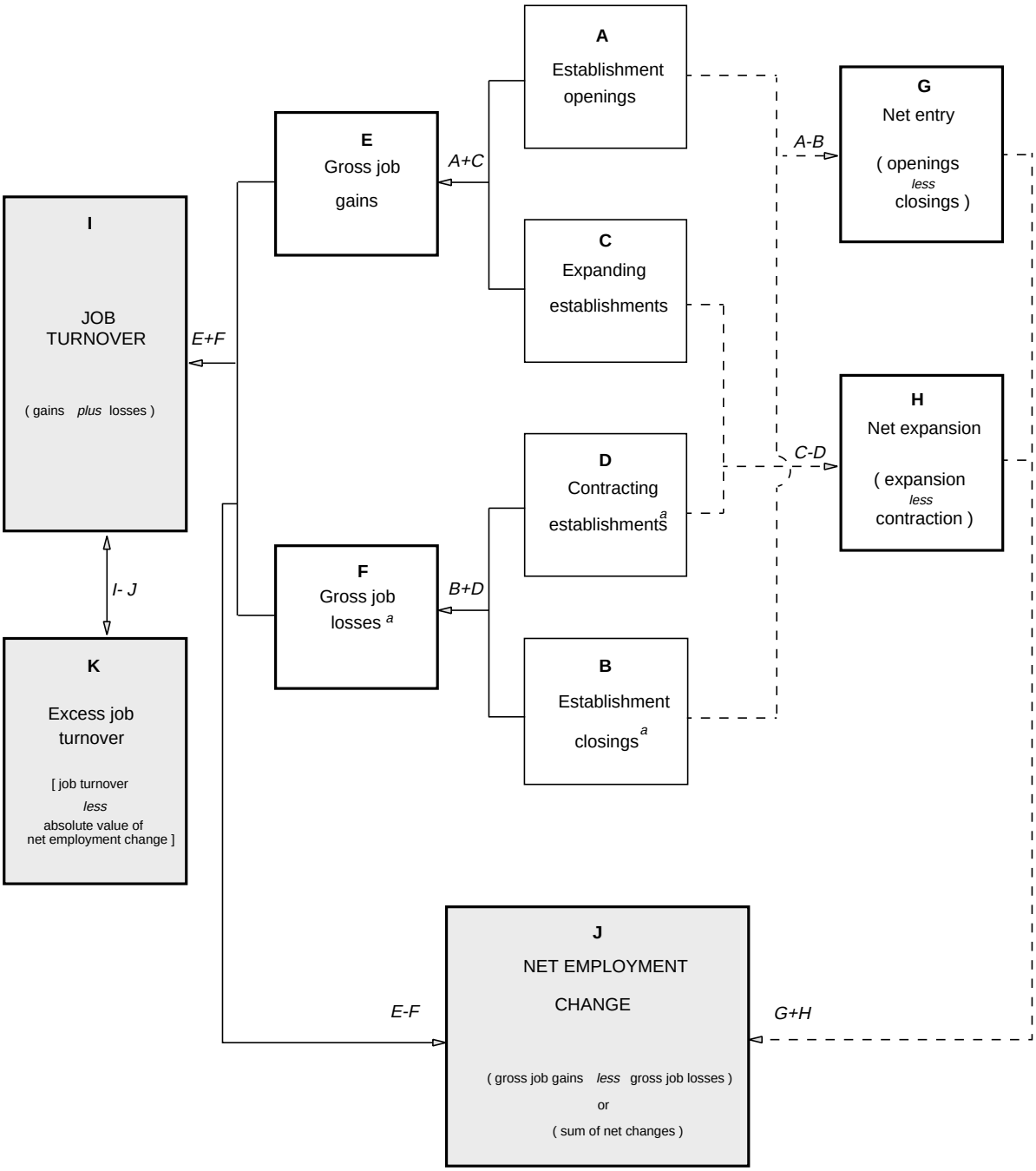
Explanatory variables	Finland b	Germany c	Germany c	Italy b	Italy b	Norway	Sweden
Constant	13.001 **	12.842 **	23.099 **	14.253 **	11.607 **	7.615 **	15.242 **
	(5.6)	(10.6)	(15.0)	(10.2)	(5.9)	(5.5)	(4.4)
Average establishment size	-0.048 *			-0.284 **	-0.317 **	-0.042 **	0.098 *
	(-2.6)			(-5.6)	(-5.6)	(-6.8)	(2.7)
Fluctuation in rate of output change (absolute value)	0.334			0.588 *	0.664 *		
	(1.2)			(2.0)	(2.1)		
Lagged fluctuation in rate of output change (absolute value)		0.115	-0.046			-0.082 *	0.335
		(1.7)	(-0.3)			(-2.2)	(1.4)
Lagged rate of gross investment		-0.230	-0.294			0.588 **	-0.022
		(-1.4)	(-1.8)			(3.5)	(-0.0)
Trade openness	0.034	-0.028		0.263 **		0.039	-0.015
	(1.0)	(-1.7)		(5.6)		(1.9)	(-0.6)
Import penetration			-0.041 *		0.451 **		
			(-2.8)		(4.9)		
Export market share			-0.661 **		0.331 *		
			(-9.2)		(3.6)		
Adjusted R**2	0.07	0.03	0.44	0.64	0.63	0.42	0.36
Root mean square error	3.570	2.994	2.288	3.999	4.071	2.874	3.747
Number of observations	18	108	99	31	31	81	38

** : significance at 1% level; * : significance at 5% level.

a) The equation is estimated using pooled time-series industry cross-sectional data with separate equations estimated for each of five countries: Canada (1978-1991, Finland (1986-91), Germany (1978-1990, 1980-1990), Italy (1987-1991), Norway (1977-1986) and Sweden (1985-1990). Data for each country were classified according to the International Standard Industrial Classification (ISIC) and there are observations for each of the nine divisions of manufacturing. Ordinary Least Squares regression was used to estimate the equations for each . t statistics based on adjusted White's heteroskedasticity consistent -covariance matrix.
b) Investment data available only for insufficient period.
c) Establishment size not available.
Source: OECD estimates.

Chart 1

Components of job turnover

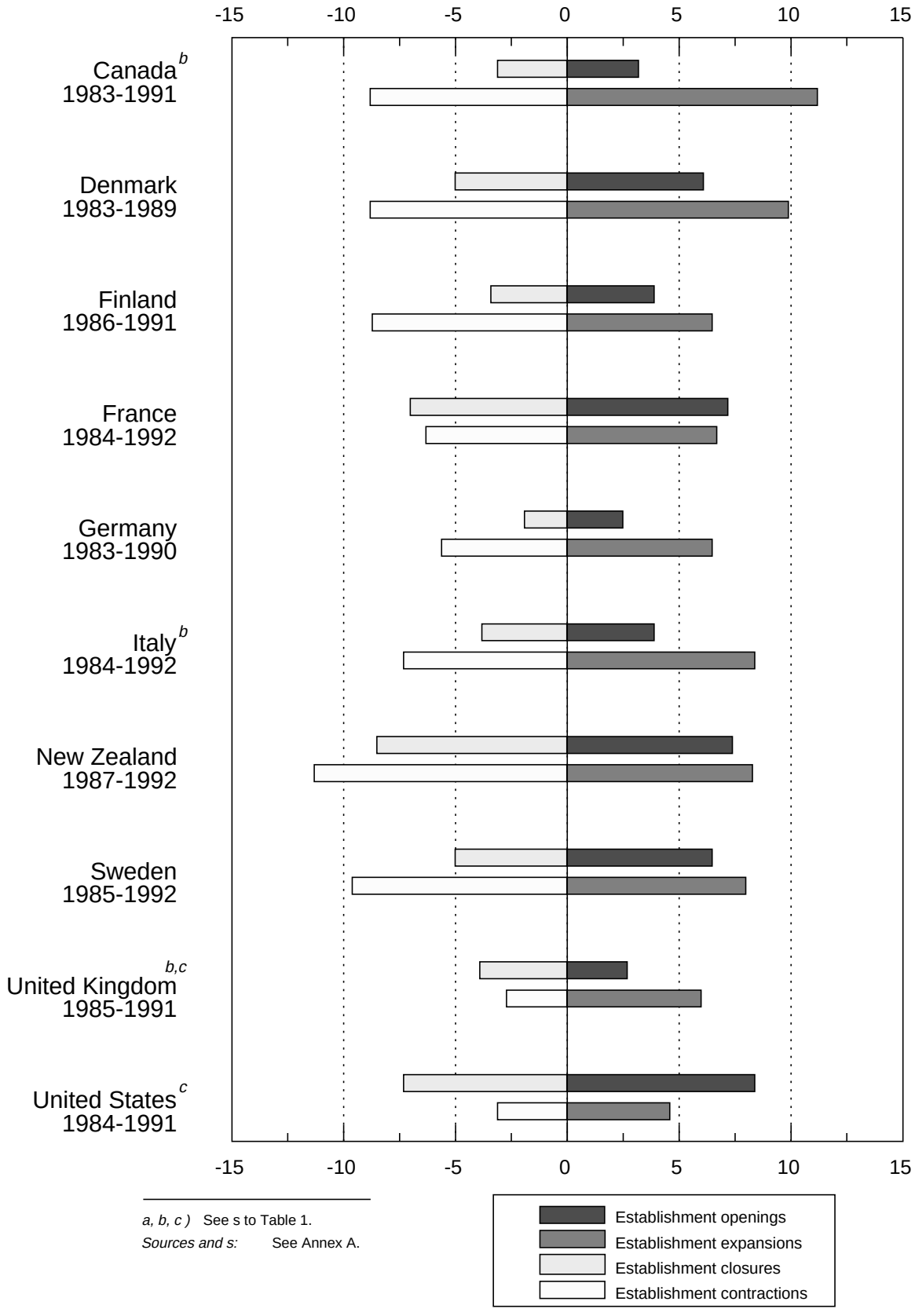


a) Absolute values.
Source: *OECD Employment Outlook,* September 1987.

Chart 2

Job gains and job losses[a]

Average annual rates as a per cent of total employment

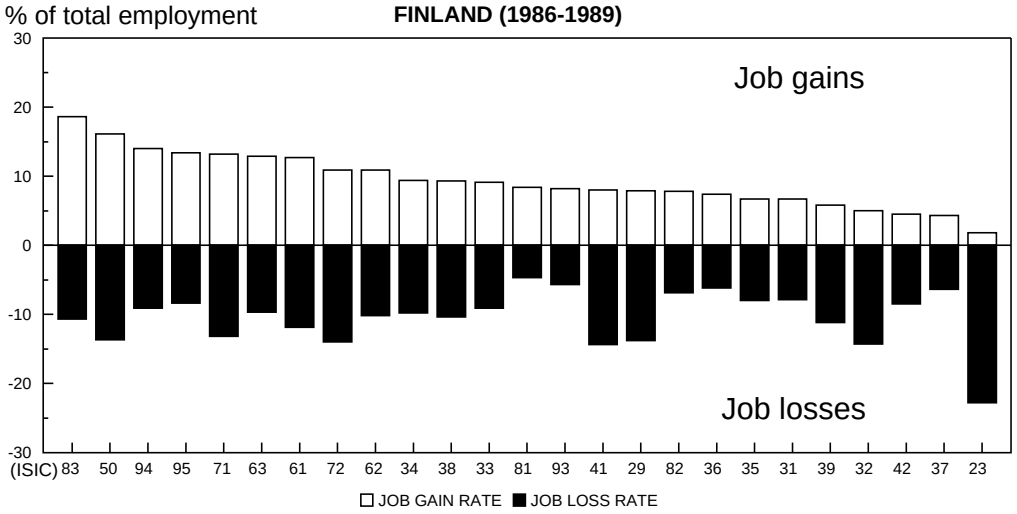


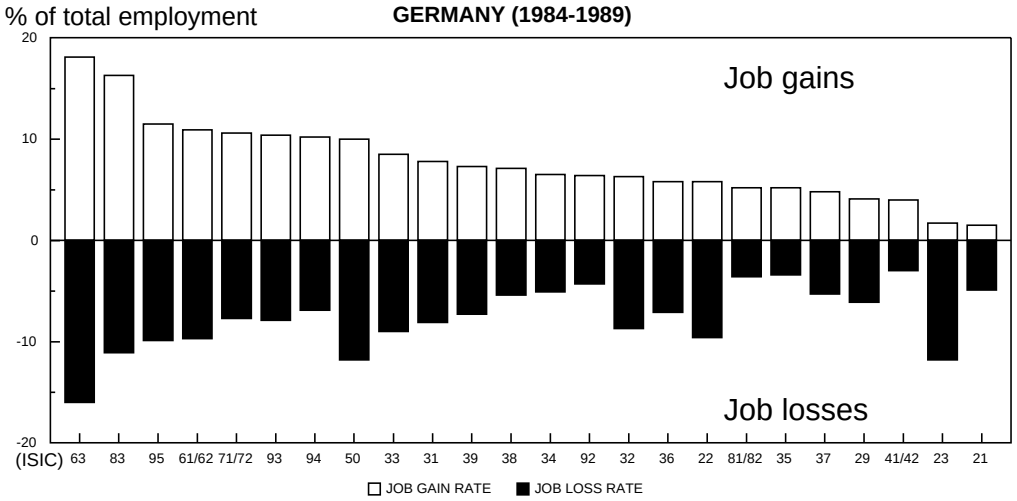
a, b, c) See s to Table 1.

Sources and s: See Annex A.

Chart 3

Job gain rate and job loss rate by industry arranged by job gain rate





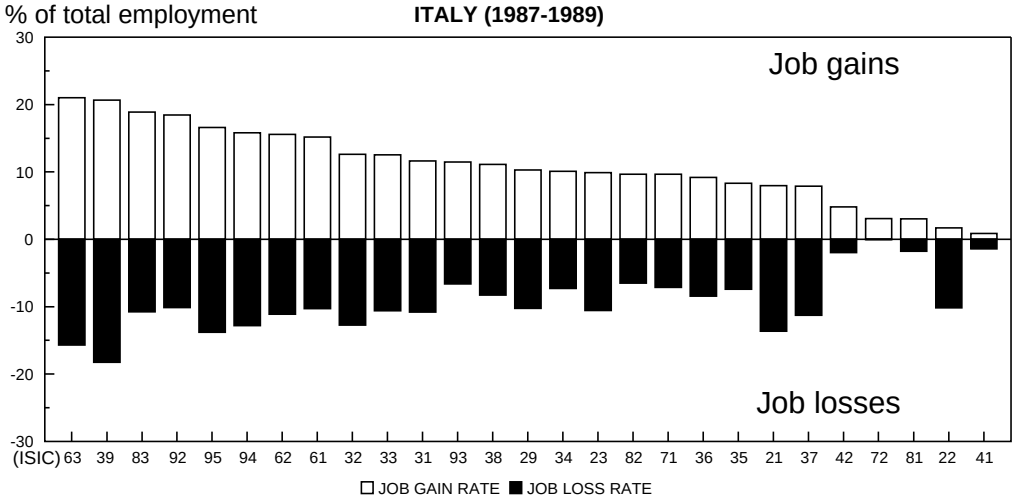
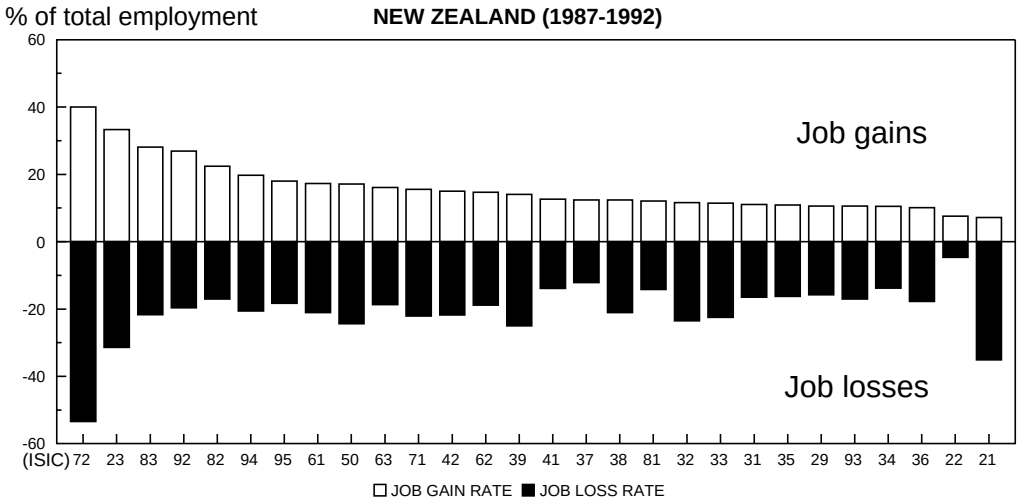
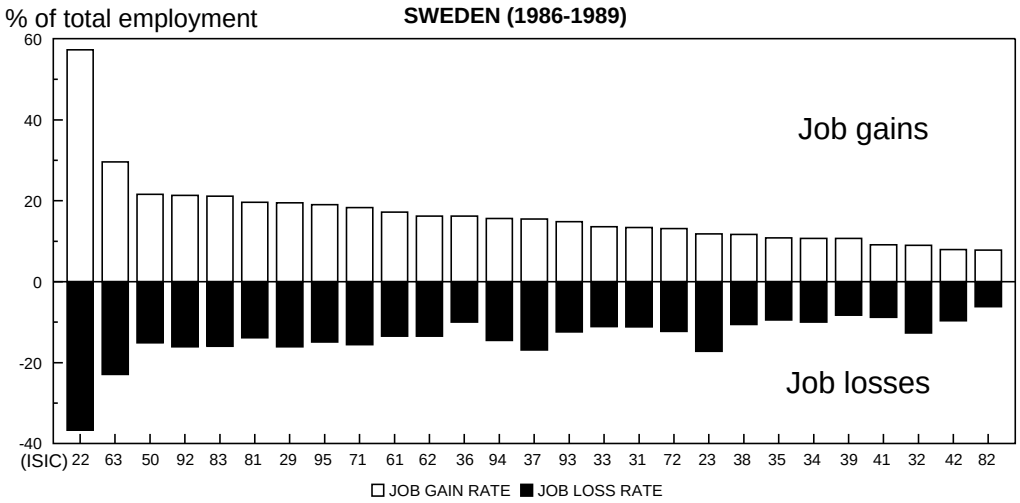


Chart 3 (cont.)

Job gain rate and job loss rate by industry arranged by job gain rate





INDUSTRIES (ISIC)

21 : Coal mining
22 : Crude petroleum and natural gas production
23 : Metal ore mining
29 : Other mining

31 : Manufacture of food, beverage and tobacco
32 : Textile, wearing apparel and leather industries
33 : Manufacture of wood and wood products
34 : Manufacture of paper and paper products, printing and publishing
35 : Manufacture of chemicals and chemical products
36 : Manufacture of non-metallic mineral products
37 : Basic metal industries
38 : Manufacture of fabricated metal products, machinery and equipement
39 : Other manufacturing industries

41 : Electricity, gas and steam
42 : Water works and supply

50 : Construction

61 : Wholesale trade
62 : Retail trade
63 : Restaurants and hotels

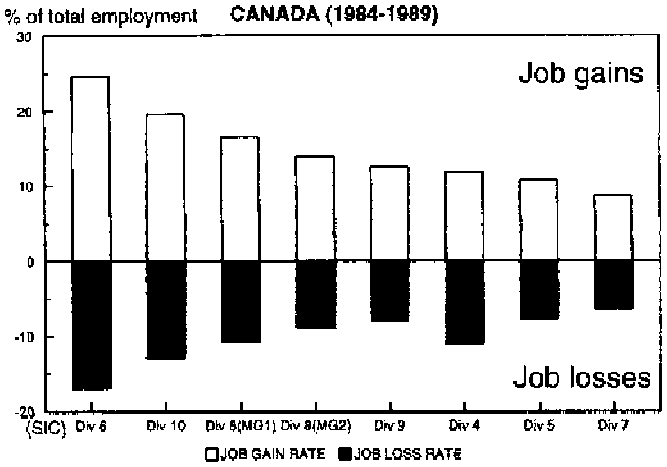
71 : Transport and storage
72 : Communication

81 : Financial institutions
82 : Insurance
83 : Real estate and business services

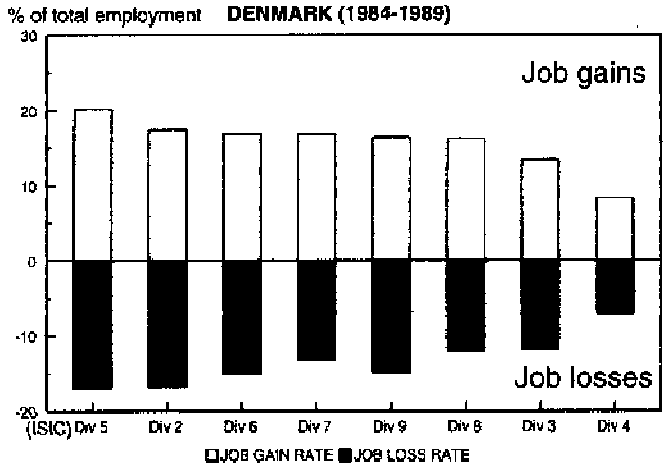
92 : Sanitary and similar services
93 : Social and related community services
94 : Recreational and cultural services
95 : Personal and houshold services

Chart 3 (cont.)

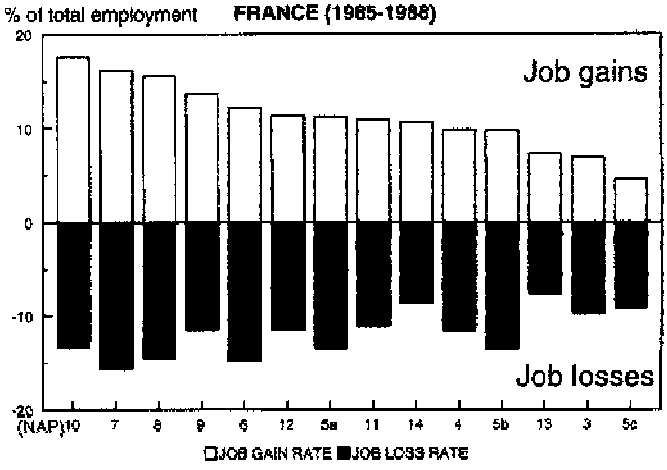
Job gain rate and job loss rate by industry arranged by job gain rate



INDUSTRIES (SIC)
Div 4: Mines quarries and oil wells
Div 5: Manufacturing industries
Div 6: Construction industries
Div 7: Transportation and communications
Div 8 (Major Group 1): Wholesale trade
Div 8 (Major Group 2): Retail trade
Div 9: Finance, insurance and real estate
Div 10: Community, business and personal services



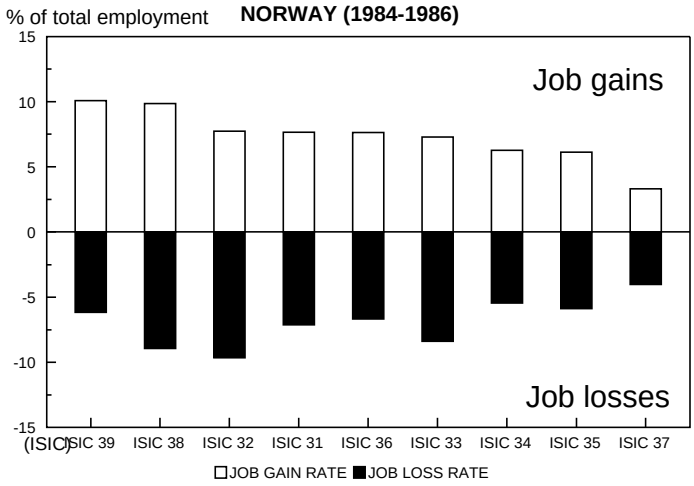
INDUSTRIES (ISIC)
Div 2: Mining and quarrying
Div 3: Manufacturing
Div 4: Electricity, gas and water
Div 5: Construction
Div 6: Wholesale and retail trade and restaurants and hotels
Div 7: Transport, storage and communication
Div 8: Financing, insurance and real estate
Div 9: Community, social and personal services



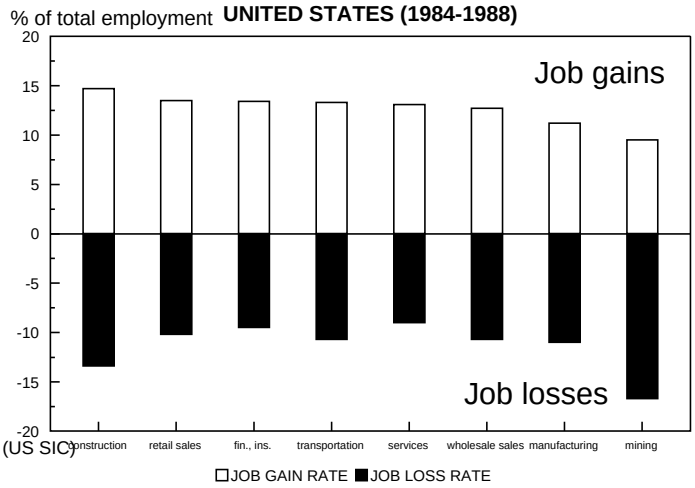
INDUSTRIES (NAP)
03 : Energy production and distribution
04 : Intermediate goods producing industries
05A : Industrial appliance manufacture
05B : Domestic appliance manufacture
05C : Motor vehicle and land transportation equipment manufacture
06 : Consumer goods manufacture
07 : Building and construction industry
08 : Trade
09 : Transportation and communications
10 : Commercial services
11 : Property rental and credit
12 : Insurance
13 : Financial institutions
14 : Non-commercial services

Chart 3 (cont.)

Job gain rate and job loss rate by industry arranged by job gain rate



INDUSTRIES (ISIC)
31 : Manufacture of food, beverage and tobacco
32 : Textile, wearing apparel and leather industries
33 : Manufacture of wood and wood products
34 : Manufacture of paper and paper products, printing and publishing
35 : Manufacture of chemicals and chemical products
36 : Manufacture of non-metallic mineral products
37 : Basic metal industries
38 : Manufacture of fabricated metal products, machinery and equipement
39 : Other manufacturing industries



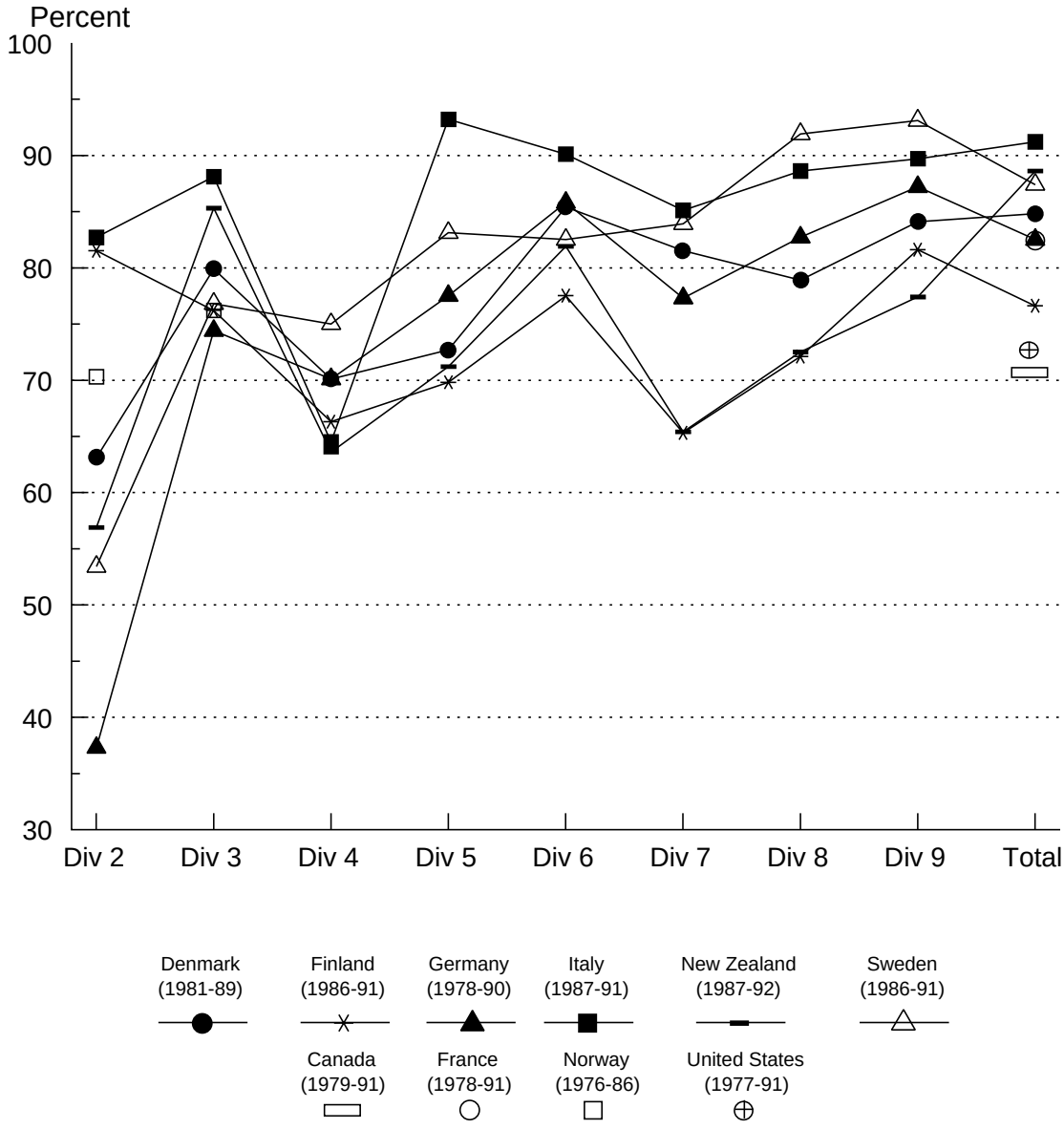
INDUSTRIES (SIC)
Div 2: Mining
Div 3: Construction
Div 4: Manufacturing
Div 5: Transportation and public utilities
Div 6: Wholesale trade
Div 7: Retail trade
Div 8: Finance, insurance and real estate
Div 9: Services

Sources: See Annex A

Chart 4

A measure of non cyclical turnover

(percentage of total turnover)



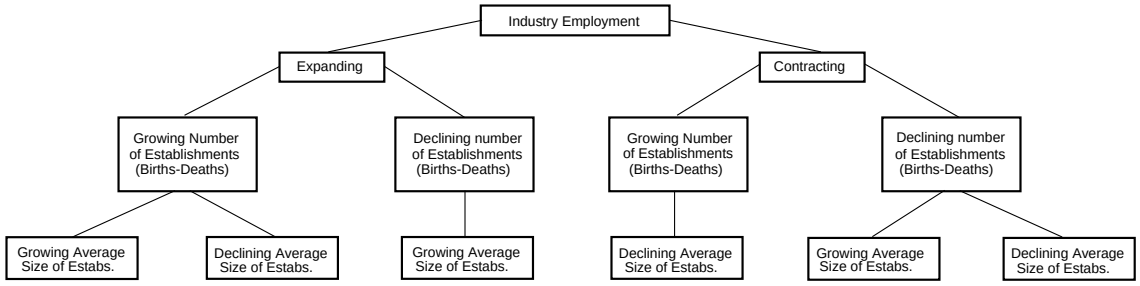
Note :
DIV 2 : Mining and quarrying
DIV 3 : Manufacturing
DIV 4 : Electricity, gas and water
DIV 5 : Construction
DIV 6 : Wholesale and retail trade and restaurants and hotels
DIV 7 : Transport, storage and communication
DIV 8 : Financing, insurance and real estate
DIV 9 : Community, social and personal services

Sources: See Annex A

Chart 5a

CLASSIFICATION OF INDUSTRIES

ISIC major divisions or equivalent



	A	B	C	D	E	F
DENMARK 1983-1989	**All industries** 4: Electricity, gas and water 6: Wholesale and retail trade and restaurants and hotels 7: Transport, storage and communication 8: Financing, insurance and real estate	9: Community, social and personal services	2: Mining and quarrying 3: Manufacturing 5: Construction			
FINLAND 1986-1989	8: Financing, insurance and real estate	**All industries** 5: Construction 6: Wholesale and retail trade and restaurants and hotels 7: Transport, storage and communication 9: Community, social and personal services		2: Mining and quarrying 3: Manufacturing 4: Electricity, gas and water		

Chart 5a *(Cont.)*

CLASSIFICATION OF INDUSTRIES

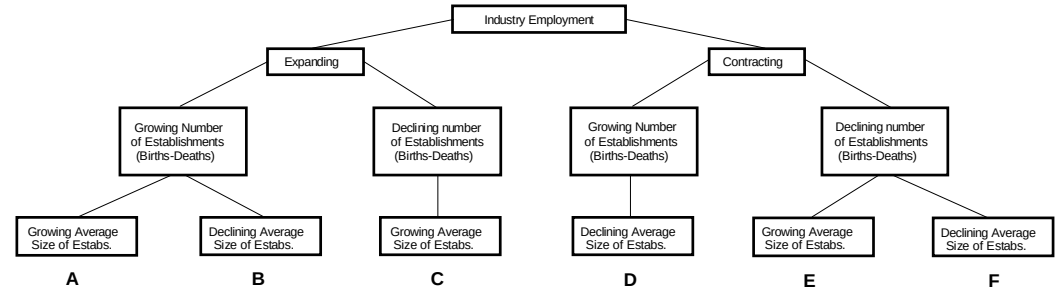
	Growing Average Size of Estabs.	Declining Average Size of Estabs.	Growing Average Size of Estabs.	Declining Average Size of Estabs.	Growing Average Size of Estabs.	Declining Average Size of Estabs.
	A	**B**	**C**	**D**	**E**	**F**
FRANCE 1985-1988 (NAP)	U07 Building and construction industry U08 Trade U10 Commercial services	**All industries** U09 Transportation and communications U11 Property rental and credit U12 Insurance U14 Non-commercial services		U04 Intermediate goods producing industries U05A Industrial appliance manufacture U05C Motor vehicule and land transportation equipment manufacture U06 Consumer goods manufacture U13 Financial institutions	U02 Food and agriculture	U03 Energy production and distribution U05B Domestic appliance manufacture
ITALY 1987-1989	5: Construction 6: Wholesale and retail trade and restaurants and hotels 9: Community, social and personal services	**All industries** 3: Manufacturing 7: Transport, storage and commnunication 8: Financing, insurance and real estate		4: Electricity, gas and water		2: Mining and quarrying
NORWAY 1983-1986	2: Mining and quarrying	3: Manufacturing				
SWEDEN 1985-1989		**All industries** 3: Manufacturing 5: Construction 6: Wholesale and retail trade and restaurants and hotels 7: Transport, storage and communication 8: Financing, insurance and real estate 9: Community, social and personal services	4: Electricity, gas and water	2: Mining and quarrying		
U.S. 1984-1989 (SIC)	F. Wholesale trade	**All industries** C. Construction G. Retail trade H. Finance, insurance and real estate I. Services		D. Manufacturing		B. Mining

Sources: See Annex A.

Chart 5b

CLASSIFICATION OF INDUSTRIES

ISIC industry divisions



	A	B	C	D	E	F
FINLAND 1986-1989	71 Transport and storage 81 Financial institutions 83 Real estate and business services 93 Social and related community services 95 Personal and household services	33 Man. of wood and wood products 34 Man. of paper and paper products, printing and publishing 36 Man. of non-metallic mineral products 50 Construction 61 Wholesale trade 62 Retail trade 63 Restaurants and hotels 82 Insurance 92 Sanitary and similar services 94 Recreational and cultural services	37 Basic metal industries	29 Other mining 31 Man. of food, beverages and tobacco 32 Textile, wearing apparel and leather industries 35 Man. of chemicals and chemical products 38 Man. of fabricated metal products, machinery and equipment 39 Other manufacturing industries 41 Electricity, gas and steam 42 Water works and supply 72 Communication	23 Metal ore mining	23 Metal ore mining
ITALY 1987-1989	36 Man. of non-metallic mineral products 50 Construction 61 Wholesale trade 62 Retail trade 63 Restaurants and hotels ...	31 Man. of food, beverages and tobacco 34 Man. of paper and paper products, printing and publishing 35 Man. of chemicals and chemical products ...	33 Man. of wood and wood products including furniture 42 Water works and supply	21 Coal mining 22 Crude petroleum and natural gas production 32 Textile, wearing apparel and leather industries 37 Basic metal industries 41 Electricity, gas and steam		

Chart 5b *(Cont.)*

CLASSIFICATION OF INDUSTRIES

	Growing Average Size of Estabs. **A**	Declining Average Size of Estabs. **B**	Growing Average Size of Estabs. **C**	Declining Average Size of Estabs. **D**	Growing Average Size of Estabs. **E**	Declining Average Size of Estabs. **F**
ITALY 1987-1989 (continued)	83 Real estate and business services 93 Social and related community services 94 Recreational and cultural services 95 Personal and household services	38 Man. of fabricated metal products, machinery and equipment 39 Other manufacturing industries 71 Transport and storage 72 Communication 81 Financial institutions 82 Insurance 92 Sanitary and similar services				
NORWAY 1983-1986	39 Other manufacturing industries	34 Man. of paper and paper products, printing and publishing 36 Man. of non-metallic mineral products 38 Man. of fabricated metal products, machinery and equipment	31 Man. of food, beverages and tobacco	35 Man. of chemicals and chemical products	32 Textile, wearing apparel and leather industries 33 Man. of wood and wood products including furniture	32 Textile, wearing apparel and leather industries 33 Man. of wood and wood products including furniture
SWEDEN 1985-1989	81 Financial institutions 93 Social and related community services	22 Crude petroleum and natural gas production 29 Other mining 31 Man. of food, beverages and tobacco 33 Man. of wood and wood products including furniture 34 Man. of paper and paper products, printing and publishing 35 Man. of chemicals and chemical products 36 Man. of non-metallic mineral products 38 Man. of fabricated metal products, machinery and equipment 39 Other manufacturing industries 50 Construction 61 Wholesale trade	41 Electricity, gas and steam 72 Communication	23 Metal ore mining 32 Textile, wearing apparel and leather industries 37 Basic metal industries	21 Coal mining 42 Water works and supply	21 Coal mining 42 Water works and supply

Chart 5b *(Cont.)*

CLASSIFICATION OF INDUSTRIES

	Growing Average Size of Estabs.	Declining Average Size of Estabs.	Growing Average Size of Estabs.	Declining Average Size of Estabs.	Growing Average Size of Estabs.	Declining Average Size of Estabs.
	A	**B**	**C**	**D**	**E**	**F**
SWEDEN 1985-1989 (continued)		62 Retail trade 63 Restaurants and hotels 71 Transport and storage 82 Insurance 83 Real estate and business services 92 Sanitary and similar services 94 Recreational and cultural services 95 Personal and household services				

Sources: See Annex A.

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