

Vacancies and Hirings: Preliminary Evidence from a Survey on Italian Employers¹

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Abstract

In this paper we seek to enrich our understanding of the connection between job vacancies and hirings, using a recent experimental survey carried out on a small set of Italian employers. We study some basic facts on friction in job matching that are still unknown, in particular the fractions of hirings which occur without benefit of a prior job vacancy and of vacancies cancelled without being followed by a hiring. We develop an enlarged set of measures of friction including also the proportion of non-instantaneous hirings and the job vacancy duration. The results obtained begin uncovering the above facts and can be regarded as an initial step for other surveys, and then for further developments of job search and matching models. We also deal with some of the main issues arising in the measurement of the job vacancy variable, such as the distinction between point-in-time stocks and flows of vacancies, job openings and unfilled jobs and the possible recruiting practices difficult to be captured by the current job vacancy surveys, providing preliminary evidence also about these facts.

Keywords: job vacancies, hirings without vacancies, non-instantaneous hirings, vacancies without hirings, job-filling rate, vacancy duration, vacancy flows, job openings, unfilled jobs, recruiting practices.

1. Introduction

Information on job vacancies has been increasingly used in economics to measure the effects of friction in job matching on unemployment.³ The key concept in this literature is the hiring function, or the matching function, which has been interpreted and estimated as a (Cobb-Douglas) production function with stocks of vacancies and unemployment as input and the number of hirings per period as output (first by Pissarides, 1986, Blanchard and Diamond, 1989 and Layard et al., 1991, and then by many others, as the comprehensive survey by Petrongolo and Pissarides, 2001 shows).

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In particular, I owe to Marina Sorrentino and Leonello Tronti the original idea of an experimental survey covering the missing information on job vacancies. And I am grateful to them to have suggested this possibility to me and given always extremely valuable and kind advice throughout the design of the survey and the analysis of the results.

The views expressed in this paper are solely those of the author and do not necessarily reflect Istat official positions.

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³ See, in particular, Abraham (1983, 1987), Pissarides (1985, 1986, 2000), Blanchard and Diamond (1989), Jackman et al. (1989) and Layard et al. (1991).

Furthermore, the job vacancy rate has also traditionally been used as a possible leading indicator of cyclical employment dynamics.⁴

Due to the many possible uses of job vacancies, recently the production of statistics regarding this variable has markedly increased. In particular, in 2000, the US Bureau of Labor Statistics launched the new monthly Job Openings and Labour Turnover Survey (JOLTS, see Clark and Hyson, 2001 and Faberman, 2005). In Europe, the job vacancy rate⁵ has been included in the list of the *Principal European Economic Indicators* on the job market. Moreover a regulation regarding harmonized quarterly statistics has been produced, after a transition period when a number of member states started to produce broadly harmonized statistics on the basis of a gentlemen's agreement with Eurostat.⁶ Today almost all of the member states produce quarterly job vacancy statistics. In Italy Istat has been running a quarterly business survey on job vacancies and hours worked since the third quarter of 2003 (see Istat, 2009a, 2009b).

Despite these recent developments in the production of job vacancy statistics, some basic facts concerning friction in job matching are still unknown or only partially known.

In particular, no official current survey collects information on the proportion of hirings which occur without benefit of a prior vacancy and, then, which are outside the standard matching framework. Very little information exists also on cancelled vacancies, which are withdrawn from the market without being filled, in particular on firms' reasons for cancelling job vacancies.

Furthermore, information on job vacancy duration and unfilled jobs as a measure of the unmet labour demand is only rarely collected.

In particular, a complementary sample survey on the duration of job vacancies would give not only valuable information about the duration of job vacancies – as distinct from the average duration of recruitment – but also a possibility to estimate the proportion of instantaneous hirings which occur without a prior vacancy.

Gathering information on the job vacancy duration, the proportion of non-instantaneous hirings and of cancelled job vacancies would enlarge the set of possible measures of friction in job matching in terms of deviations from instantaneous hirings, with respect to the job vacancy rate and the average duration of recruitment. Additional information on the number of unfilled jobs – as distinct from job openings or recruitment processes – would measure the direct effect of recruitment problems on employment.

Moreover, information currently available mainly regards the point-in-time stocks of job vacancies, while both inflows of new vacancies opened and outflows of vacancies filled or cancelled during a reference period are almost never collected. But, a point-in-time vacancy stock within a reference period does not necessarily represent all the vacancies opened during that period, due to a possible unmeasured flow of new vacancies posted and filled shortly before or after that point-in-time.

We study these facts by using the data of an experimental survey on job vacancy flows and duration, purposely carried out in order to start collecting the information on vacancies

⁴ See, for example, Haggard-Guénette (1989), Zagorsky (1998), Amoah (2000), European Central Bank (2002), Australian Bureau of Statistics (2003), Valletta (2005), Ruth et al. (2006) and Mandrone et al. (2010).

⁵ The job vacancy rate is defined as the percentage ratio between vacancies and the sum between vacancies and occupied posts.

⁶ Some member states, in particular the United Kingdom and the Netherlands, were already conducting surveys aimed at producing these indicators.

and their connection to hirings. The experimental survey is carried out on a small non-random sample of Italian firms, aimed at understanding if firms are able to provide data on the above mentioned facts and, if so, at preliminarily measuring them. The sample includes 76 firms selected using ad hoc defined criteria. The very limited coverage of the sample and the restricted number of respondent firms (22) require a special caution in interpreting the presented results.

We first document some of the main issues which arise in the measurement of the job vacancy variable on which, so far, very little evidence exists. Besides the distinction between the concepts of job openings and unfilled jobs and point-in-time stocks and flows of job vacancies, two other issues have been investigated. The first concerns the possible recruiting practices and, then, job vacancies which are more difficult to be captured by the current job vacancy surveys. In particular, the current job vacancy definitions state that active recruiting steps have to be taken by the employers. But, employers could find it difficult to identify the active recruitment steps among their usual recruitment activities. For example, firms could not consider recalls of former employees to be an active step, unless instructed to do so. At the aggregate level, this could have a negative impact on the number of firms with no reported vacancies. The second regards the possible ways in which the employers record job vacancy information and the level of detail of the registered information. In particular, if the employers hold a kind of job vacancies record-keeping in which each job vacancy opened and closed in a period is recorded.

The other set of basic facts analysed pertains to the connection between vacancies and hirings. Attempts have been made to highlight the extent to which hirings do not begin with vacancies and vacancies do not end in hirings and the time needed to fill job vacancies successfully. Then, the enlarged set of measures of friction has been studied. Using the information collected by the experimental survey, in particular the opening and closing date of each job vacancy reported by the respondent firms, we also take into consideration other interesting quantities concerning the job vacancy daily process: the daily job vacancy stocks, the daily job-filling rate and the daily flow of new vacancies.

Despite a key role in theoretical models, few empirical studies consider vacancies and their connection to hirings at the firm level. Our work is related to recent studies analysing the fraction of hirings without vacancies from a theoretical point of view (Farm, 2005, 2010) and estimating them (Davis et al., 2009). These studies can be interpreted “*as efforts to partly unpack the “black box” nature of the matching function*” (Davis et al., 2009, p.4).

The paper proceeds as follows. The next section offers a recognition of the current job vacancy surveys carried out by the EU member states, the United States, Australia and Canada and a short comparison has been made of their main characteristics. Section 3 discusses the current status of the information available on job vacancies by highlighting the information still missing. Section 4 introduces the experimental survey on job vacancy flows and duration, describing its objectives and characteristics. In the two central sections, our attention has been focused on the results obtained by using the data from this survey. First, in section 5, we show some preliminary, but interesting evidence concerning the measurement of the job vacancy variable. Then, in section 6, we deal with those facts on friction in job matching which are still unknown by showing the initial evidence on the fraction of instantaneous and non-instantaneous hirings and of cancelled vacancies and on the job vacancy daily process. Section 7 concludes the paper with a summary of our main contributions and some remarks about various avenues for future gatherings of job vacancy variables.

2. Current Sources of Information on Job Vacancies in Europe, the USA, Australia and Canada

In the last ten years there has been strong pressure from and extensive work within the European Union to produce and disseminate quarterly statistics concerning job vacancies, both for the aggregate countries and for the single member states. The inclusion of the job vacancy rate in the list of the *Principal European Economic Indicators* on the job market and the fact that the production of quarterly job vacancy statistics by EU member states is now subject to a regulation⁷ are, respectively, a signal and an outcome of these efforts. Currently, almost all of the EU countries produce quarterly job vacancy statistics. Some countries have a very long tradition and solid experience in the production of quarterly, or monthly, vacancy statistics. For example, the Netherlands has been conducting such statistics since 1988. Others have only recently started coming out with findings. In Italy the quarterly business survey on job vacancies and hours worked has been carried out by Istat since the third quarter of 2003.

The majority of the member states have carried out regular firm-based surveys to produce job vacancy statistics. Administrative collection has been used only by Belgium, France, Luxembourg, the Czech Republic and Slovenia.

Surveys of help-wanted advertisements are highly uncommon in the EU,⁸ while they seem to be a popular source of vacancy data in the non-EU countries considered in this paper. The US Conference Board has monthly published, since 1950, the Help-Wanted Advertising Index (HWI). Statistics Canada came out between 1980 and 2003 as an index similar to the US one. Five such indexes are currently available in Australia.⁹

The three above mentioned non-EU countries have also had previous experience in collecting vacancy data by using firm-based surveys. The Australian Bureau of Statistics currently takes a job vacancy quarterly survey which was first conducted in 1977 and completely revised in 1983 (see Australian Bureau of Statistics, 2007). National firm-based surveys were also conducted during the '70s and then interrupted in the United States and Canada. As already mentioned, in 2000 the US Bureau of Labor Statistics launched the JOLTS.¹⁰ Similarly, Statistics Canada has been coming out with the new annual Workplace and Employee Survey (WES) since 1999 (see Statistics Canada, 2007). Furthermore, in 2000 new infra-annual firm-based job vacancy surveys have been carried out by some single American states such as, Florida, Colorado, Texas, Massachusetts, Nebraska and Minnesota.

⁷ Regulation (EC) No 453/2008 of the European Parliament and of the Council of 23 April 2008 on quarterly statistics on Community job vacancies and implementing ones.

⁸ With the exception of Italy where a help wanted advertising index is produced by the Isfol-Csa since 1980.

⁹ Two of them based, respectively, on advertisements placed in major metropolitan newspapers and internet advertisements carried on selected employment internet sites (produced by the Australia and New Zealand Banking Group); the other three (by the Department of Employment, Workplace Relations and Small Business) based, respectively, on counts of newspaper advertisements for skilled vacancies (Skilled Vacancies Index), internet advertisements for ICT vacancies on selected employment internet sites (ICT Vacancies Index) and internet advertisements for job vacancies on the Australian Job Search employment internet site (Vacancies on AJS series).

¹⁰ For a detailed description of the JOLTS, see <http://www.bls.gov/jlt/>.

2.1 Current Job Vacancy Surveys in Europe: A Short Comparison

The European regulation states that the quarterly job vacancy statistics have to cover the population of all firms with at least one employee in all economic activities, with the exclusion of the activities of households as employers and those of extraterritorial organisations and bodies¹¹ (that is, sections A to S of Nace Rev. 2 classification).

Currently, not all member states are satisfying this requirement.¹² In particular, the Italian and French surveys cover only firms with at least 10 employees. Furthermore, the Italian survey covers businesses in industry and private services, with the exclusion of all public services and also of private educational and health services, i.e. it covers from sections B to N of the Nace Rev. 2 classification. The educational and health services, both public and private, are also excluded by the German survey which does not cover mining and quarrying, and electricity, gas and water supply, i.e. it covers section C, sections from F to O and sections from R to S. The French and Portuguese surveys exclude public administration, covering sections from B to N and from P to S. The coverage of the three non-EU surveys considered is similar to that of sections from B to S of the Nace Rev. 2 classification, although the armed forces have been excluded by the Australian survey and public administration by the Canadians.

The EU regulation does not impose one or more reference dates for vacancies within the quarter. Most of the member states, Bulgaria, Cyprus, Estonia, Finland, France, Greece, Hungary, Italy, Latvia, Lithuania, the Netherlands, Poland, Portugal, Romania, Spain and also the Australian and JOLTS surveys, collect job vacancy data only on one single date in the reference period, usually the last day of the quarter or month. Other countries such as, Belgium, the Czech Republic, Luxembourg, Slovakia, Slovenia, Sweden and the United Kingdom, have two other dates within the quarter, e.g. the middle Wednesday of each month in Sweden or the Friday in day 2-8 of each month in the United Kingdom. The German survey is carried out on a continuous basis over a period of two months from the second half of the first month to the first half of the last month of the quarter.

Also the job vacancy definitions used in each survey differ from that included in the EU regulation, in which job vacancies are defined as paid posts, existing or newly created, which are unoccupied, or about to become vacant in cases where (i) the employer is taking active steps and is prepared to take further steps to find a suitable candidate from outside the firm concerned; (ii) the employer intends to fill the vacancy either immediately or within a specific period of time.

The Swedish and Finnish surveys, for instance, collect job vacancies defined as both job openings or recruitment processes and unfilled jobs as a measure of the unmet labour demand. In the Spanish survey, and also in the Australian one, the definition includes only job vacancies to be filled immediately as proxy of the unmet labour demand. The JOLTS measures unmet labour demand, although in this survey unfilled jobs are called job openings. The Spanish and the Dutch surveys include also purely internal job vacancies and not only vacancies for which the employer is looking for a suitable candidate from outside the firm. The Italian survey excludes job vacancies for managers. Job vacancies for which a

¹¹ Covering agriculture, forestry and fishing activities (section A of the Nace Rev. 2 classification) is considered as optional.

¹² For a more detailed description of the methodology applied by each country, see http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/en/jvs_q_esms.htm.

suitable candidate has already been recruited, but has yet to start working are considered to be still vacant in the Italian survey, while they are not in the British and Slovenian surveys, and also in the Australian and the US ones.

Regarding the variables measured by the existing EU surveys, only the Spanish and the Dutch quarterly surveys collect information also on the flows of vacancies, besides that on the stocks. In particular, they collect data on job vacancies filled, cancelled and opened in the reference quarter.

Information about main job vacancy characteristics concerning the firm's economic activity, size in terms of number of employees and geographical area is generally provided by the current surveys. Information on hard-to-fill job vacancies is also frequently asked in the different surveys. Sometimes data on immediately available job vacancies are acquired like in the Italian and German questionnaire. In particular, in the German one a distinction is made between short-term job vacancies, to be filled immediately or during the next three months, and long-term vacancies, to be filled after the next three months. In the German survey, vacancies are differentiated also by occupation and qualification, i.e. university degree or not. Similarly, the Polish survey collects information on job vacancies disaggregated by occupation and level of education and on the newly created job vacancies. In the Portuguese survey job vacancies are also broken down by occupation.

Information on job vacancy duration is rarely collected by the existing EU and non-EU surveys. The information is currently provided by the Dutch and German annual surveys and by some of the American state surveys, e.g. the Minnesota¹³ job vacancy survey.

The quarterly job vacancy statistics that will be produced according to the EU regulation will be useful mainly as short term indicators. As such, they will be available only at a relatively high level of aggregation with sections of the NACE in force. But they are going to be available in as short a time as possible after the end of the reference period which is around 45 days for the entire reference population and around 70 days for the economic activity sections.

So far, the demand for more structural information on job vacancies, as expressed in particular by the EU Commission, has yet to produce a regulation on harmonized annual statistics and therefore remains largely unsatisfied. Some member states, however, are already carrying out annual surveys on a regular basis, e.g. Bulgaria, Germany, Spain, Latvia, Lithuania, the Netherlands, Poland, Romania, Slovakia and Slovenia. Some of the annual surveys have preceded the infra-annual one. For example, in the Netherlands the annual job vacancy survey started in 1976, long before the quarterly one started in 1988. Germany has regularly carried out the annual job vacancy survey since 1989 during the fourth quarter of each year, while the additional quarterly survey has come out only since 2006, in the first, second and third quarters.

Figure 1 shows the job vacancy rates in the European countries currently producing and transmitting job vacancy statistics for the latest quarter published by Eurostat.

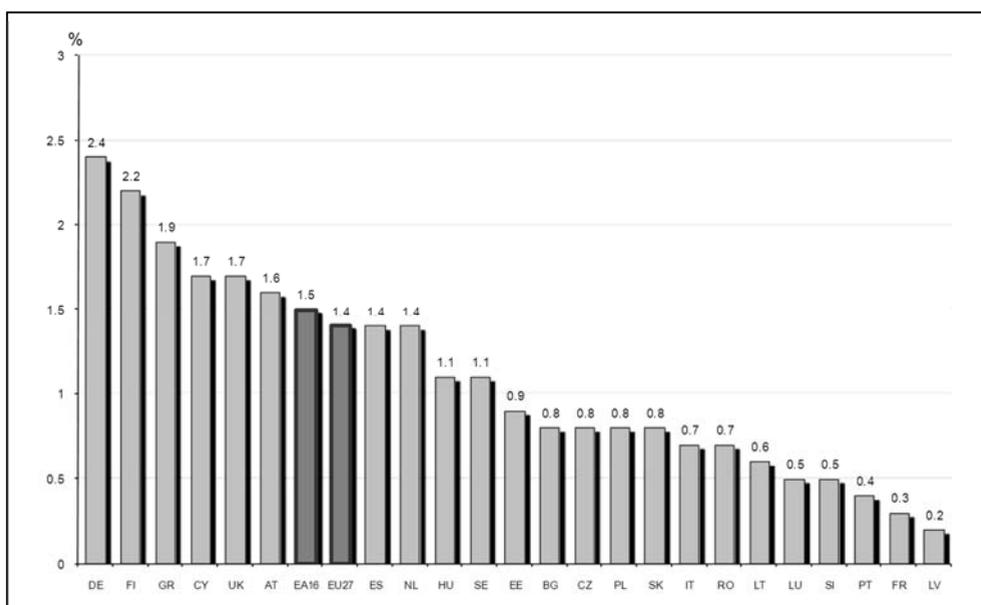
The job vacancy rates are quite different across the European countries. For example, the Italian figure is half the EU(27) and EA(16) aggregates. In particular, 0.7 job vacancies out of 100 job positions, occupied or vacant, are registered in Italy with respect to 1.4% and 1.5% in the EU(27) and EA(16) aggregates. A job vacancy rate far from the EU aggregates and less than half of the Italian one is observed in France (0.3%), which has the lowest rate

¹³ For further details on the Minnesota job vacancy survey, see http://www.positivelyminnesota.com/Data_Publications/Data/All_Data_Tools/Job_Vacancy_Survey.aspx.

together with Latvia (0.2%). Spain and the Netherlands (1.4%) are well above France and Italy with a job vacancy rate equal to the EU(27) average. Above EU average rates are observed in Germany, Finland, Greece, Cyprus, the United Kingdom and Austria. In particular, Germany (2.4%) and Finland (2.2%) have the highest job vacancy rates.

The differences can be explained by both the different structural characteristics of the labour markets in the various countries and the above described different characteristics of the EU surveys. In particular, the differences in the population coverage of the indicator and the less than complete harmonization in the measurement of job vacancies and occupied posts, i.e. different reference dates or different number of reference dates within the quarter, and the differences in the applied job vacancy definitions, also may contribute to produce the observed discrepancies.

Figure 1 - Job Vacancy Rates in Europe - First Quarter 2010 (percentage values)



Source: Eurostat

3. Information Still Missing on Job Vacancies

In spite of the recent improvements in the production of the job vacancy statistics, some important parts of the recruitment statistics are yet to be covered.

The analysis of the ongoing surveys carried out in the previous section highlights the information on job vacancies which is still missing along with the lack of more structural information on job vacancies.

First, the information collected mainly regards the job vacancy stocks, while the flows, both inflows of new vacancies opened and outflows of vacancies filled or cancelled during the reference period, are collected only in the Spanish and the Dutch quarterly surveys.

Furthermore, the stock is generally collected on one specific date within the reference period with the exceptions of Belgium, the Czech Republic, Luxembourg, Slovakia Slovenia, Sweden, the United Kingdom and Germany, which use more reference dates for the vacancy stock. But, the point-in-time stock may not represent the openings of new job positions during the whole reference period due to possible unmeasured flows of new vacancies which are posted and filled within this period. Furthermore, the information on the stock alone is not sufficient to represent the job vacancy dynamics over the reference period. The stock could change only slightly or remain equal in size between the two reference dates when the inflow and outflow of vacancies fluctuate simultaneously in the same direction. Moreover, the choice of the date strongly influences the representativeness of the stock. For example, data could be highly influenced by the firm's hiring behaviour when using a specific reference date for job vacancy collection. Hence, the actual number of job vacancies could be over or under estimated.

Second, the information on unfilled job vacancies is still quite uncommon as compared to the job openings. In particular, job vacancies can be defined in terms of both unfilled positions and recruitment processes. In other words: “(...) *firms create vacancies in one sense (recruitment processes) in order to avoid vacancies in another sense (unfilled jobs)*” (Farm, 2010, p. 12). In order to highlight this distinction, vacancies as recruitment processes are usually called job openings, while vacancies as unmet labour demand are labelled as unfilled jobs. The definitions adopted by the recently launched job vacancy surveys mainly regard the concept of job openings and not that of unfilled jobs,¹⁴ which are collected only by the Swedish, Finnish and Spanish surveys and by the Australian and JOLTS ones.

Third, job vacancy duration is almost never collected except by the annual Dutch and German surveys and by some of the American state surveys.

Fourth, some basic facts concerning the connection between vacancies and hirings are still almost unknown. They pertain to the hirings without vacancies and vacancies without hirings.

There are several ways in which a hiring can occur without any preceding recruitment activity. For example, an employer might create a new position to hire an attractive candidate who suddenly becomes available or known. The hiring outcome is analogous to a discouraged worker who is not actively seeking work, but who accepts a job if a suitable one becomes available (see Gatto and Tronti, 2010). Then, there is no job vacancy which precedes hiring. Moreover, employers can hire someone they have previously engaged as an independent contractor, consultant, or temporary worker, while forgoing any active recruiting. It can be observed that even if a recruitment process precedes a hiring, it can sometimes be so short that the distinction between the recruitment process and the hiring is negligible. For example, some hirings are made more or less directly by recalling former employees. Hirings with negligible or non-existent recruitment processes before hiring are usually called instantaneous hirings (see Farm, 2005, 2010 and Davis et al., 2009). Even though the proportion of instantaneous hirings is not measured in the current job vacancy surveys, what information there is does suggest that not every hiring begins with a job vacancy, as shown, for example, by the Employment Opportunity Pilot Project surveys carried out in the United States in 1980 and 1982. In these surveys employers were asked questions about the hiring process for the most recently hired people. In the first survey, 28% responded that they did not recruit for the position (as reported in Farm, 2010).

¹⁴ Also the surveys carried out in the past, such as those discussed in NBER (1966), Muysken (1994) and Verhage et al. (1997), generally considered job openings.

The other issue which has received little attention is the fact that personnel searches do not always end successfully, resulting in job vacancies which are closed without being filled. There are several reasons, usually connected with the business cycle, for which vacancies may be closed. Employers with job vacancies may stop searching, apart from a possible “discouraged employer effect”, because part of the work has been contracted out or the financial economic situation of the firm has worsened. Firms can have difficulties in forecasting their labour demand and they realize that they have overestimated their needs. Some job vacancies may also be cancelled because firms realize that no recruitment is possible at the moment and that they have to solve their staffing problems by other means, e.g. reorganization and training followed by posting job vacancies which are easier to fill (see Verhage et al., 1997 and Farm, 2005, 2010). Unfortunately, there is very little information on cancelled job vacancies, particularly on firms’ reasons for cancelling job vacancies. Some sample surveys by the Public Employment Service in Sweden in the beginning of the 1990s suggest that the proportion of job vacancies which end in hiring is very high, and at least equal to 90% (as reported by Farm, 2010). Similarly, results by van Ours and Ridder (1992, p. 145) suggest that the job vacancies cancelled are a small percentages, somewhere around 4%.

Covering the vacancy information which is still missing would be an important step towards a better and fuller understanding of some basic facts on friction in job matching: *“If all hirings were instantaneous there would be no vacancies as measured in vacancy surveys. We can consequently interpret the number of vacancies as a summary measure of friction in terms of deviations from instantaneous hirings (...). A theory of vacancies only applies to deviations from instantaneous hirings, so it matters whether the proportion of non-instantaneous hirings is 100 per cent or 10 per cent”* (Farm, 2010, p. 2 and p. 20).

Beside the job vacancy rate, a summary measure of deviations from instantaneous hirings is the average recruitment time, T , as measured by V/H , where V denotes the stock of job vacancies, defined as ongoing recruitment processes, and H is the flow of hirings per period. Hence:¹⁵

$$V=HT \quad (1)$$

It can be observed that the average recruitment time is the inverse of the job-filling rate, H/V , also called vacancy yield which is *“a measure of success in generating hires”* (see, Davis et al., 2009, p. 34).

Furthermore, in the equation above the assumption that every hiring begins with a job vacancy is implicitly made. But, in general, it may be difficult to define and measure job vacancies for the instantaneous hirings, since they are characterized by a non-existent or negligible recruitment processes before. Hence, a more accurate estimation should take into account only the proportion of hirings preceded by job vacancy (b), as suggested by Farm (2010, p. 4):

$$V=bHT \quad (2)$$

Thus, a complementary sample survey regarding the duration of job vacancies would give not only valuable information about the duration of job vacancies as distinct from the average duration of recruitment, but also a possibility to estimate the proportion of instantaneous hirings from equation (2).

¹⁵ For instance, in Abraham (1983) and Jackman et al. (1989) attempts are made to estimate the total number of job vacancies from the total number of hirings per period and the average duration of job vacancies for some part of the economy according to equation (1).

However, equation (2) is not yet complete since it presupposes that all vacancies end with hirings, so that bH measures the total inflow of job vacancies. Once again, a more accurate estimation should take into account only the proportion of non-cancelled vacancies (c),

$$cV=bHT \quad (3)$$

To summarize, collecting information on job vacancy duration, the proportion of non-instantaneous hirings and job vacancies cancelled would increase the set of possible measures of friction in job matching in terms of deviations from instantaneous hirings with respect to the job vacancy rate and the non-adjusted average duration of recruitment.

But how do deviations from instantaneous hirings affect employment? The additional information concerning the number of unfilled jobs is a measure of the direct effect of recruitment problems on employment. More precisely *“the time it takes to recruit workers may reduce employment by making the number of filled jobs (employees) less than the number of jobs. And the difference is the number of unfilled jobs.”* (Farm, 2010, p. 9).

Four main definitions of unfilled jobs, aimed at adequately measuring the unmet labour demand can be found in literature (see, Farm, 2003a for a detailed description and comparison of the following definitions). A traditional definition, “unoccupied job openings which are available immediately”, a definition which corresponds to the ILO-definition of unemployment, the classical definition, “unsatisfied labour demand”, and a definition suggested by Eurostat, “job openings which are available immediately”.

4. The Experimental Survey on Job Vacancy Flows and Duration

In this section the experimental survey on job vacancy flows and duration will be presented. This survey has been purposely designed and launched in order to measure those basic facts on friction in job matching which are still rarely or never covered by the current official surveys on job vacancies, as the investigation in the previous section has shown. Due to its experimental nature and to its characteristics, the survey is based on a very small sample of firms. It is aimed both at understanding if firms are able to provide data on these basic facts and, if so, at providing initial quantitative evidence on them.¹⁶

In particular, the experimental survey covers two main areas in which the recruitment statistics are still particularly lacking, not only in Italy where the recent Istat quarterly survey on job vacancies and hours worked provides new valuable short-term indicators for labour market analysis (see Istat, 2009a, 2009b). Unfortunately, the current Istat survey collects information only on the stock of vacancies, including details on hard-to-fill and immediately available vacancies, while it does not provide information on the flow of vacancies.

This is mainly due to the increase in the response burden for the firms that it should imply, given its periodicity and the collection of other variables in addition to job vacancies, considering hours worked, employees, hirings and separations. The experimental survey, similar to an *ad hoc* survey, focuses only on the recruitment and the hiring processes, for both of which an in-depth analysis has been carried out by collecting very

¹⁶ I have carried out the experimental survey for my PHD thesis in agreement with the Istat department in charge of the quarterly survey on job vacancies and hours worked, where I was employed as a research fellow. The aims of the experimental survey and the results to be obtained from it were also of interest for the Istat department since they were meant to provide insights for the Istat job vacancy survey.

detailed information. To this end, in the survey, firms with particular characteristics which would have enabled the exploration of the research objectives have been chosen by using a purposive sampling method.

The first area of interest of the experimental survey pertains to the connection between vacancies and hirings. Attempts have been made to highlight the extent to which hirings do not begin with job vacancies and job vacancies do not end in hirings and the time to fill a job vacancy successfully by measuring:

- hirings without vacancies;
- vacancies without hirings;
- job vacancy duration.

Besides these facts, the experimental survey focuses on some of the main issues which arise in measuring the job vacancy variable, on which, so far, very little information exists. Thus, the other area of interest considers the distinction between the concepts of job openings and unfilled jobs and between point-in-time stocks and flows of job vacancies. In addition to this, another two issues have been investigated: the possible recruiting practices, and then job vacancies, more difficult to gather; and the possible ways in which employers record information on job vacancies, if there exists a kind of job vacancy record-keeping which records each vacancy opened and closed in a period and the level of detail of the job vacancy characteristics which has been recorded.

The first two issues have already been dealt with in the previous section, while regarding the last two, it can be observed that the job vacancy variable is more difficult to be accurately measured compared to other variables generally collected in business surveys. Three main contributing factors can be taken into consideration.

First, the concept of job vacancy and the conditions required in the currently used job vacancy definitions could not be fully understood by firms. This could cause an underreporting of vacancies by the respondents to the job vacancy surveys.

In particular, firms could find it difficult to identify the active recruitment actions among their usual recruitment activities. The current job vacancy definitions, for example the EU regulation and the JOLTS definitions, require that active steps be taken by firms. For example, firms could not consider recalls of former employees to be an active step, unless instructed to do so. Similarly, they could not identify the examination of the curricula, which they generally receive and record in their database, aimed at filling specific job positions as active recruiting. Therefore, they could not report job vacancies, i.e. to have started recruitment processes, since they do not consider the two actions above as active recruitment steps. It is worthwhile to note that over the period from the first quarter 2004 to the second quarter 2008 the fraction of Italian firms with at least 10 employees in industry and private services with no reported vacancies at the end of each quarter averages 89% (see Istat, 2009a).

Second, differently from employment or hours worked variables, mainly recorded by the firm for administrative purposes, job vacancy information is generally not recorded in the firm information system: “*The principal difficulty is that employers do not keep records of vacancies comparable in accuracy or detail with their payroll record*” (Meyers and Creamer, 1967, p.2). First evidence seems to suggest that most of employers do not keep information on exactly when the recruitment process has started and ended, as shown by the preliminary tests of the questionnaires of the current Istat quarterly job vacancy survey and of its previous pilot survey (see Fivizzani et al., 2003).

Third, the less the job vacancy information is formally recorded by employers, the less the accuracy of the information collected when the time lag between the reference date for the job vacancy variable and the date in which it is actually collected increases. *“In fact, the nature of job vacancies characterized by volatility and the possibly informal way in which they leave track in the enterprise information system would suggest preferring a data collection closer to the reference date”* (Baldi et al., 2007, p.14).

Hence, the second area of interest of the experimental survey focuses on the measurement of the:

- number of job openings and unfilled jobs;
- point-in-time stock of vacancies, inflow of new vacancies and outflow of vacancies both for filling and cancelling.

Furthermore, qualitative information is also acquired which regards the:

- possible recruitment actions taken by the firm;
- possible ways in which firms record job vacancy information.

4.1 Sample and Questionnaire Design

The observation unit of the experimental survey is the firm. Due to the experimental nature of the survey, a small sample composed of 76 firms has been used. As already mentioned, a purposive sampling technique has been applied to select firms potentially able to provide the information required. As a frame, the list of respondents to the current Istat survey on job vacancies and hours worked in the fourth quarter 2007 has been considered.

In particular, a set of firms with the following characteristics has been selected:

- with at least one job vacancy at the end of the fourth quarter 2007 or one hiring during this quarter;
- belonging to the size class 50 to 499 employees;
- frequently respondent to the current Istat survey;
- whose economic activity is classified in “Manufacturing” and “Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods” (Ateco 2002 sections D and G);
- operating in the provinces of Milan, Venice, Padova, Treviso, Rome, Latina and Naples.

The first condition ensures the feasibility of the survey. The measurement of the variables of interest would be otherwise unfeasible in firms with no job vacancies and no hirings.

On the basis of the second condition small and very large firms have been excluded. Three factors have suggested pursuing this avenue. First, some very large firms with more than 500 employees can be reluctant to provide information on their job vacancies due to misplaced confidentiality concerns, both with respect to third parties and to workers of the concerned firm. Such difficulties have been actually encountered in some waves of the Istat job vacancy survey. Thus, in order to minimize the risk of non-response, these firms have been excluded. Second, a significant number of job vacancies could be more easily collected in medium-large firms, since the average number of job vacancies increases with the firms’ size (as shown in Baldi et al., 2007). Third, small firms generally use informal search channels more often. But, the more the channel used to recruit new employees is informal, the more the employers find difficulties in both recognizing the active recruitment actions among their usual activities and identifying the exact starting and ending dates.

Then, information on the life-cycle of job vacancies, i.e. their opening and closing dates, useful for measuring both job vacancy flows and duration, could more likely be acquired if medium-large firms were selected.

Following the third selection condition, firms responding in at least three out of five consecutive waves of the Istat job vacancy survey have been selected in order to minimize the non-response risk.

On the basis of the fourth condition, firms in only two economic activity sections have been selected, mainly due to the experimental nature of the survey and to the very limited resources for it to be carried out. Hence, sections D and G have been considered due to the following reasons. They are sections in which a sufficient number of firms could have been selected once the above mentioned selection conditions were applied. Moreover, they are sections in which information regarding job vacancy duration, as much as possible referred to different occupation, could have been more likely acquired.

Finally, considering firms which geographically differ, firms in the above mentioned provinces have been selected.

The target sample, defined as a set of firms with the above mentioned characteristics, is well distributed between the two economic activity sections considered (Table 1). However, taking into account the four classes and the three divisions identified, respectively, in section D and G according to a Pavitt-like classification and the Ateco 2002 classification, scale intensive (D2 Pavitt class), traditional firms (D4) and wholesale trade firms (division 51) account, on the whole, for 70% of the target sample. Respondent firms have been 22 of the 76 selected firms. An above average response rate is observed in section G. Hence, the composition of the respondent firms differs from that of the target sample in favour of this last section, which covers around 60% of the respondents.

Firms with 50-100 employees cover more than half of the target sample, while those with 100-300 account for less than 30%. The set of respondent firms is quite similarly distributed among the three size classes, even though firms with 100-300 employees increase their percentage shares because of an above average response rate. Firms in the province of Milan account for the largest percentage of both the target sample and the set of respondent firms (55% and 50%).

Information has been acquired by means of a thorough questionnaire suitable for occasional and *ad hoc* surveys. It is composed of 5 sections including, on the whole, 13 questions, mainly close-ended. Given the experimental nature of the survey and the very little information that exists on some of the facts studied, such as instantaneous hirings and cancelled job vacancies, the option to specify other possible circumstances which could have caused them, besides those suggested in the questionnaire, has been added to the corresponding questions. The reference period for the variables collected is the fourth quarter 2007.

Table 1 - Sample and Respondent Firms by the Economic Activity Sections, Size Classes and Provinces Selected

	Sample		Respondent Firms		Response Rate
	Number	% of Total Sample	Number	% of Total Respondents	
Economic Activity Section					
D- Manufacturing (a)	39	51.3	9	40.9	23.1
D1-Science Based	2	2.6	1	4.5	50.0
D2-Scale intensive	15	19.7	3	13.6	20.0
D3- Specialised Suppliers	6	7.9	2	9.1	33.3
D4- Traditional Firms	16	21.1	3	13.6	18.8
G- Wholesale and Retail Trade; Repair of Motor Vehicles, Motorcycles and Personal and Household Goods (b)	37	48.7	13	59.1	35.1
50-Sale, Maintenance and Repair of Motor Vehicles and Motorcycles; Retail Sale of Automotive Fuel	4	5.3	3	13.6	75.0
51-Wholesale Trade and Commission Trade, except of Motor Vehicles and Motorcycles	22	28.9	7	31.8	31.8
52- Retail Trade, except of Motor Vehicles and Motorcycles; Repair of Personal and Household Goods	11	14.5	3	13.6	27.3
Total	76	100	22	100	28.9
Size Class					
50- 100	42	55.3	11	50.0	26.2
100- 300	21	27.6	8	36.4	38.1
300- 499	13	17.1	3	13.6	23.1
Total	76	100	22	100	28.9
Province					
Milan	42	55.3	11	50.0	26.2
Venice	8	10.5	3	13.6	37.5
Padova	7	9.2	2	9.1	28.6
Treviso	11	14.5	2	9.1	18.2
Rome	4	5.3	3	13.6	75.0
Latina	1	1.3	0	0.0	0.0
Naples	3	3.9	1	4.5	33.3
Total	76	100	22	100	28.9

Source: Experimental survey on job vacancy flows and duration

(a) Broken down by the four classes of the Pavitt-like classification.

(b) Broken down by the three divisions included in this section according to the Ateco 2002 classification.

The first section of the questionnaire contains the data identifying the firm.

The second section aims at collecting information on the characteristics of the recruitment process. Information is required regarding the different recruiting channels used and actions taken by the employers and on the priority they attribute to each. Besides the usual formal and informal recruiting methods like advertising in newspapers, word of mouth, etc., practices which firms could find difficult to identify as active steps, unless explicitly instructed to do so, have also been added, e.g. recalls of former employees and screening of the curricula. This section brings up two further questions. The first, if the firm keeps a job vacancy register and, then, the possible ways in which job vacancy information is registered, whether by using a specific database, paper documents or informally without any kind of registration. The second, if the information recorded allows for reconstructing the job vacancy opening and closing dates and the main characteristics and requirements of the corresponding job positions such as wage level, whether permanent or fixed-term, whether it concerns replacement demand or employment growth, skill level, level and type of education required, etc.

Job vacancies are the subject of the third section of the questionnaire.¹⁷ In particular, for each job vacancy still open at the end of the fourth quarter 2007, the following data are required: its opening date, i.e. when the firm has taken the first active steps to fill the corresponding job position, and its actual or supposed closing date; the firm's reasons for opening the job vacancy, e.g. expansion of the firm production or substitution of workers which have already left or still occupied the position; and if the job vacancy is immediately available, i.e. when a suitable candidate can start to work immediately or later than in the next three months. These last two questions are aimed at measuring the unmet labour demand on the basis of the unfilled jobs traditional definition (see section 3). In this section a further question requires information on job vacancies closed without being filled during the period from the end of the reference quarter to the date of interview. The question mainly focuses on the firm's reasons for cancelling job vacancies. It avoids asking all the above mentioned information also for each cancelled vacancy in order to contain the response burden for the firms. In particular, a first question asks if the firm has interrupted the search of new workers without finding a suitable candidate during that period. If the answer is yes, a further question asks how many cancelled job vacancies broken down by possible reasons. The following reasons have been suggested: the firm met difficulties in finding suitable candidates; the firm exaggerated its need for new workers; the general economic situation changed; the economic situation of the firm worsened and there was a reduction of the annual budget for hiring new workers; and job vacancies were filled by means of reorganization using internal employees. As already mentioned, firms were also asked to specify other possible reasons for withdrawing job vacancies from the labour market.

Hirings during the fourth quarter 2007 are the subject of the fourth section of the questionnaire. They correspond to the job vacancies filled during the reference quarter with the exception of hirings which have taken place without any recruiting efforts before. Therefore, the same data required in the previous section for each job vacancy still open at the end of the reference quarter are also asked for each job vacancy filled during the quarter. Moreover, as in the previous section, a further question asks how many cancelled

¹⁷ They have been defined as in the Istat current job vacancy survey questionnaire in which, according to the EU regulation definition, job vacancies are posts for which the employer had already taken active steps to find and hire suitable candidates from outside the firm and was ready to take further such steps, if needed. It can be noted that the same reference date, the last day of the reference quarter, has been used.

job vacancies broken down by firm's reasons for their cancellation. The last question of this section aims at measuring hirings without a prior vacancy. A first question asks whether during the reference quarter the firm hired new workers without doing any active recruitment efforts. If the answer is yes, a further question asks how many hirings took place without vacancies broken down by possible situations determining them. The following situations have been set up: attractive candidates suddenly contact the firm which then decides to hire them, even though the firm is not looking for new workers to hire; external institutions or organizations suggest new workers to hire; and internal offices, different from the personnel department, recommend new workers to hire. Firms were also required to specify other possible situations, beside those listed above, which could have implied instantaneous hirings.

In the final section of the questionnaire, firms have been asked to indicate whether they find it difficult to fill in the questionnaire and to specify the possible difficulties they may meet.

Firms were contacted by telephone to identify a possible reference person and to verify her/his willingness to respond to the survey questionnaire. To contain the response burden and facilitate the collaboration, firms could transmit the data by telephone, via e-mail or fax or through face-to-face interviews. After the data transmission, firms were contacted again by telephone to acquire the missing information. The need of further recalls was expected due to the kind of information required and its level of detail.

Firms were contacted during the months of February and March 2008, on the one hand, to facilitate the recall of the opening dates of vacancies both still open at the end of the reference quarter and filled during this quarter; on the other hand, to wait for a sufficient time to fill vacancies still open at the end of the reference quarter, so as to compute, as much as possible, completed job vacancy durations.

5. Measuring Job Vacancies: Some Preliminary Evidence

In the following sections, the results obtained in the two areas of interest of the experimental survey are discussed. The results are limited to the set of respondent firms and influenced by the characteristics of the selected firms, due to the non-random sampling method used to extract the sample. Even so, they provide initial measurements of some basic facts on friction in job matching which are still unknown and represent a first step for further surveys and analysis. Due to the preliminary nature of the results, special caution should be paid in interpreting and comparing them with those from other studies.

5.1 Do the Firms Record Highly Detailed Job Vacancy Information?

Most of the respondent firms (15 out of 22) formally record job vacancy information in their databases or on paper (Table 2). The result was somewhat foreseen, having excluded from the sample small firms with less than 50 employees. Furthermore, the fraction of firms which formally record job vacancy information increases in moving from the smallest to the largest size class. Among the firms which formally record job vacancy information, the majority (around 70%) use specific databases, approximately 2 out of 3 are large firms with an average of 200 employees. Paper documentation is mainly used by the smallest firms among those selected, with an average of 60 employees.

Table 2 - Firms by Size Class and Kind of Job Vacancy Information Recording

SIZE CLASS	Formal Recording			Informal Recording	Total
	Database	Paper	Total		
50 - 100	2	4	6	5	11
100- 300	6	0	6	2	8
300- 499	2	1	3	0	3
Total	10	5	15	7	22

Source: Experimental survey on job vacancy flows and duration

Regarding the job vacancy information which is recorded (Table 3), a large percentage of the respondent firms holds information on: the characteristics of the job position corresponding to the job vacancy, whether open-ended or fixed-term, part-time or full-time, wage level, etc.; the requirements that are posted on job applications in terms of skills, education level, previous experience, etc.; the firms' reasons for searching for new employees for that position; and when a suitable candidate could start to work, immediately or only later. This kind of data seems to be available not only in firms which formally record job vacancy information (e.g. around 50% of firms record the recruiting channels and 80% the kind of contract), but also in firms which keep track of job vacancy information only in informal ways (with a percentage ranging from a low of around 14% to a high of 40% depending on the kind of information).

Job vacancy opening date, when the firm takes the first active step to fill the position, and closing date, when the position has been filled or the vacancy cancelled, are available only in the respondent firms which formally record job vacancy information. In particular, around 1 out of 2 of these firms records opening and filling dates, while the cancellation date is recorded only by one of them. As expected, employers who keep track of job vacancy information only in an informal way were not able to provide these dates, mainly due to the difficulties they found trying to remember them since the dates were not recorded in their database or on paper.

Table 3 - Firms by Kind of Job Vacancy Information Recorded

KIND OF JOB VACANCY INFORMATION RECORDED	Formal Recording	Informal Recording	Total
Opening Date	7	0	7
Filling Date	8	0	8
Cancelling Date	1	0	1
Recruiting Channels	8	1	9
Contract (Open-Ended, Fixed Term, etc.)	12	3	15
Working Time (Full-Time or Part-Time)	9	3	12
Wage Level	8	3	11
Skill Level	12	3	15
Education Level	11	3	14
Previous Experience	11	2	13
Firm's Reasons for Recruiting New Employees	9	2	11
Availability of the Job Position	8	3	11
Total	15	7	22

Source: Experimental survey on job vacancy flows and duration

Note: The sum of firms by kind of information recorded exceeds the total number of firms which, respectively, formally and informally record job vacancy information, since each firm can register more information.

The results shown in the previous tables derive from the answers to the second section of the questionnaire of the experimental survey purposely designed to acquire this kind of information (see section 4.1 for the questionnaire description). However, positive evidence on job vacancy characteristics registered by the respondent firms also comes out as answers to the third and fourth sections of the questionnaire. In these sections firms are required to provide some of the characteristics considered in table 3, respectively for each job vacancy still open at the end of the fourth quarter 2007 and hiring during this quarter.

Almost all of the 22 respondent firms have been able to provide complete, by day, month and year, filling dates directly in the questionnaire.¹⁸ Furthermore, the majority of firms providing the supposed filling dates in a second step, during further recalls, were able to specify the actual dates, either because the recruitment processes had already ended in the meantime or the period left to the end was shorter than before and the filling dates were more easily foreseeable.

Half of the 22 respondent firms have also been able to provide complete opening dates directly in the questionnaire, while the remaining ones needed further recalls. Among these last firms, for example, five have been recalled because, in the questionnaire, they provided the month and year of the opening dates without specifying the days. Then, these firms were able to provide some further information, even if regarding only the sub-period within the month during which the first active step had been taken, which was during the first ten days of the month, at the beginning of the month, etc. Three firms did not provide the opening dates at all. During the following contacts, one of them answered that, in general, opening dates could be dated the week before the closing dates, while the other two were not able to specify the opening dates, since the employers hired someone they had previously engaged as an intern or temporary worker. These last hirings have been considered as hirings without vacancies as better explained in section 6.1.

The difference in the number of firms providing, respectively, complete opening and closing dates was somewhat expected. Complete filling dates should be more easily provided, also by firms which keep track of the job vacancy information only in informal ways, since the hiring dates can be used to date approximately the filling of the job vacancies.¹⁹ Complete opening dates can be provided by the employers purposely and formally recording such information, which is otherwise difficult to be remembered or reconstructed.

Data on firms' reasons for taking new active recruitment steps and on the availability of the job positions for which these steps have been taken, also required in the third and the fourth sections of the questionnaire, have been provided by all the respondent firms.

To summarize the difficulties found by the respondents in providing complete opening and closing dates, Table 4 shows the total number of job vacancies collected and those for which it was, to some extent, difficult to obtain these dates, broken down by job vacancies still open at the end of the fourth quarter 2007 and job vacancies filled during the same quarter. At least for the firms respondent to the experimental survey, it seems feasible to collect job vacancy opening and closing dates. Job vacancies for which opening dates were

¹⁸ It can be observed that most of the firms reporting to not record job vacancy closing dates answered the questions requiring these dates in the third and fourth sections of the questionnaire.

¹⁹ The vacancy closing and hiring dates do not necessarily correspond. A job vacancy could be closed because a suitable candidate has been found, but she/he could sign the hiring contract only later. Furthermore, the hiring date could not be the same as the date in which the new worker actually starts to work.

not directly reported in the questionnaire account for 24% of all the 116 job vacancies collected, excluding job vacancies cancelled.²⁰ However, during the further recalls the employers were able to provide information useful for deducing complete opening dates also for this fraction of vacancies. Vacancies with supposed closing dates for which firms were not able to provide the actual closing dates account for around 9% of the job vacancies collected.

Table 4 - Job Vacancies Collected and Job Vacancies with Deduced Opening Dates and with Missing Closing Dates

	Job Vacancies with Deduced Opening Dates	Job Vacancies with Supposed Closing Dates	Total Job Vacancies Collected
Stock of Job Vacancies Still Open at the End of the 4 th Quarter 2007	19	10	52
Flow of Job Vacancies Filled in the 4 th Quarter 2007	9	0	64
Flow of Job Vacancies Cancelled in the 4 th Quarter 2007	-	-	8
Total	28	10	124

Source: Experimental survey on job vacancy flows and duration

As further positive evidence regarding the possibility to collect detailed information on job vacancy characteristics, it can also be observed that more than 70% of the respondent firms believe it to be feasible, and also easy, to provide the data required in the questionnaire of the experimental survey as the answers to the last section of the questionnaire have shown.

5.2 Recruitment Practices and Job Vacancies Difficult to be Captured

This section focuses on the possible difficulties that some employers might find in considering some of their usual recruiting methods as active recruiting steps and, then, in reporting to have opened job vacancies. In the job vacancy definitions further instructions define the active recruiting steps. They usually include: advertising the vacancy in the media, for example, internet, newspapers, etc.; contacting private employment agencies/head hunters; notifying the job vacancy to the public employment services networking; or word of mouth; accepting job applications; interviewing or selecting possible candidates.

Vacancies for which non-active recruiting steps have been taken by the employers are difficult to be captured by the current measurements of job vacancies. At the aggregate level, this could have a negative impact on the number of firms with no reported vacancies.

The results obtained by the experimental survey show that (Table 5) half of the respondent firms often use the examination of the curricula available in their database to cover specific job positions, which is not included among the active steps of the job vacancy definitions. It can be observed that the analysis of the curricula should not actually represent a recruiting step, if they have been collected by means of another active step, such

²⁰ For the cancelled job vacancies the opening and closing dates are not required in the questionnaire (see section 4.1).

as by advertising in newspaper, taken by the firm to cover the same job positions for which the curricula have been analysed. But, this is not the case for the firms which answered using the screening of the curricula as recruiting practice in the experimental survey.

Recalls of former employees, also not explicitly included in the job vacancy definitions, seem to be rarely used by the respondent firms. This was somewhat expected, since the selected sample does not include seasonal firms.

The other two informal search channels considered, contacting people whom the firm already knows and using ‘word of mouth’, are used with medium to high priority by more than 30% of the respondent firms. This result is quite high considering that the selected sample excludes small firms.

Among the formal search channels, advertising in the media and contacting private employment agencies are used with a quite high priority by half of the respondent firms. The result on the high use of these formal recruiting channels by the respondents was expected due to the selection of medium-large firms. Formal channels are generally more expensive than the informal ones and, then, often beyond the reach of small firms. Finally, notifying to the public employment services is used with minimum priority by the majority of the respondent firms.

Table 5 - Firms by Order of Priority with which They Use the Different Recruiting Methods

Priority	Formal Recruiting Channels			Informal Recruiting Channels			Recruiting Actions		
	Advertising in the Media	Contacting Private Employment Agencies	Notifying to the Public Employment Services	Word of Mouth	Contacting Known People	Recalls of Former Employees	Accepting Job Applications	Interviewing Candidates	Analysis of the Curricula
Maximum	1	0	0	0	1	0	0	11	0
High	5	4	0	2	1	0	9	6	11
Medium	5	7	2	6	6	1	6	0	6
Low	4	6	5	8	5	8	2	0	2
Minimum	7	5	15	6	9	13	5	5	3
Total	22	22	22	22	22	22	22	22	22

Source: Experimental survey on job vacancy flows and duration

5.3 Job Openings and Unfilled jobs

Evidence regarding the distinction between the two vacancy concepts, recruitment processes, job openings, and unmet labour demand, unfilled jobs, also comes out from the experimental survey. In particular, in the experimental survey, job openings are measured using the current Istat job vacancy definition, while unfilled jobs are measured according to the traditional definition “unoccupied job openings which are available immediately” (see section 3). According to the Swedish vacancy survey, which measures not only job openings, but also unfilled jobs by using the traditional definition as specified above, evidence arises out of unfilled jobs which account for a significant percentage. They average 40% of all vacancies in the private sector over the period 2000-2009.

Job vacancies which represent unmet labour demand account for a large percentage of all the vacancies reported by the firms respondent to the experimental survey (about 54%). In particular, of the 52 vacancies existing at the end of the fourth quarter 2007 (see Table 4), 28 comply with the requirements of the above traditional definition. These vacancies are mostly

new job positions created in order to expand the firm production. Only 4 of the total unfilled jobs are already existing job positions for which the separations of workers occupying them have not been anticipated and then, the replacements have not been made before the corresponding positions became unfilled.

5.4 Stock-Flow Distinction in the Job Vacancy Variable

The nature of job vacancies characterized by volatility and the possibly informal way in which they leave traces in the firm information system suggest taking into account two other problems which arise when measuring this variable: the distinction between point-in-time stocks and monthly or quarterly flows and the time between the reference and the collection dates.

A data collection near the reference date should be preferred in order to facilitate firms in reconstructing the number of job vacancies on the reference date (as suggested in Baldi et al., 2007), above all for firms recording job vacancy information only in informal ways.

In the following, the results obtained by the experimental survey useful for assessing the representativeness of the point-in-time stock will be presented. Table 6 shows the components of job vacancy total inflows and outflows observed in the set of respondent firms in the fourth quarter 2007. They have been computed by using the opening and closing dates of both job vacancies still open at the end of the reference quarter and vacancies filled during this quarter.

Being the opening and closing dates of the job vacancies cancelled not required in the questionnaire, which instead focuses on the reasons for cancelling job vacancies, the number of new vacancies opened in the reference quarter and cancelled in the same quarter has been estimated by applying the overall ratio between cancelled and filled vacancies, irrespectively of vacancy opening dates, to the new vacancies opened and filled in the reference quarter. The number of vacancies opened before the reference quarter and cancelled in this quarter has been obtained as the difference.

Besides the stock of job vacancies at the end of the fourth quarter 2007, table 6 also shows the stock at the end of the third quarter 2007, derived from the following quarterly equation of motion for the vacancy stock:

$$V_t = V_{t-1} + I_{t-1,t} - (F_{t-1,t} + C_{t-1,t}) \quad (4)$$

where V_t denotes the stock of job vacancies at the end of the fourth quarter 2007; $I_{t-1,t}$ the inflow of new vacancies opened in the fourth quarter 2007 and unfilled until the end of the quarter; $F_{t-1,t}$ and $C_{t-1,t}$ the outflow of vacancies opened before the fourth quarter and, respectively, filled and cancelled in the fourth quarter.

Each quarter, the stock of vacancies evolves in three ways. First, an inflow of new vacancies increases the stock. Second, hires deplete the stock. Third, some vacancies close without being filled, also depleting the stock.

In the above equation the inflow of new vacancies does not include new vacancies posted and filled or cancelled within the reference quarter (also listed in Table 6), since they do not contribute to producing the observed vacancy stock at the end of this quarter, being closed before then. Analogously, the depletion of vacancies during the reference quarter only regards vacancies which already existed at the end of the previous quarter, while vacancies posted and filled or cancelled within the reference quarter are excluded since they did not exist yet at the end of the previous quarter.

The results obtained show that for the restricted set of respondent firms the inflow of new vacancies in the fourth quarter 2007 is 1.94% and the outflow is 1.99% of employment, quite larger than the vacancy stock at the end of the quarter equal to 1.44%. The selection applied to extract the sample could have contributed to producing inflows and outflows of vacancies which significantly exceed the stock. For example, they could depend on the selection of firms with at least one job vacancy or hiring in the reference period and, then, with a minimum level of job and worker turnover.

Evidence of flows exceeding the stock comes out from the Netherlands quarterly survey which collects this kind of information. Inflows and outflows exceed the stock by about 30% on the average over the period 2000-2008.

Table 6 - Stocks, Inflows and Outflows of Job Vacancies

	Level	Percent of Employment
Stock of Job Vacancies at the End of 3 th Quarter 2007	54*	1.49
Stock of Job Vacancies at the End of 4 th Quarter 2007	52	1.44
Inflow of Job Vacancies: Job Vacancies Opened in the 4 th Quarter 2007	70	1.94
<i>Vacancies Opened in the quarter and Unfilled until the end of the quarter</i>	43	1.19
<i>Vacancies Opened and Filled in the quarter</i>	24	0.66
<i>Vacancies Opened and Cancelled in the quarter</i>	3*	0.08
Outflow of Job Vacancies: Job Vacancies Closed in the 4 th Quarter 2007	72	1.99
Job Vacancies Filled	64	1.77
<i>Vacancies Opened and Filled in the quarter</i>	24	0.66
<i>Vacancies Opened before the quarter and Filled in the quarter</i>	40	1.11
Job Vacancies Cancelled	8	0.22
<i>Vacancies Opened and Cancelled in the quarter</i>	3*	0.08
<i>Vacancies Opened before the quarter and Cancelled in the quarter</i>	5*	0.14

Source: Experimental survey on job vacancies flows and duration

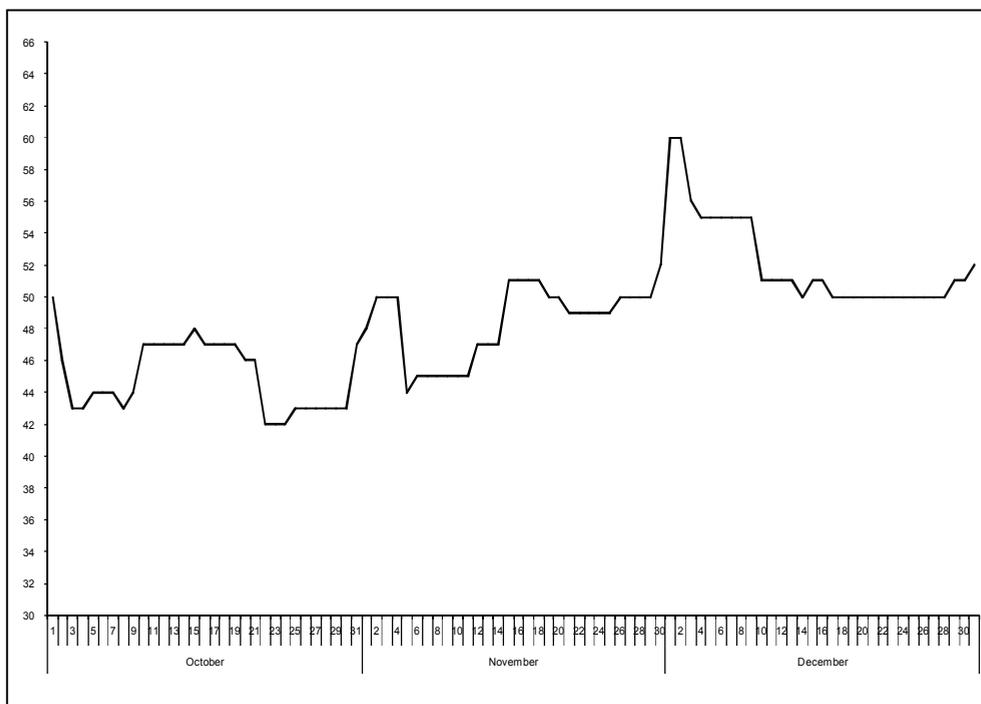
(*) Estimated as described in the text.

It can be observed that the higher the level of the vacancy inflows and outflows within the quarter, the lower the representativeness of the vacancies stock at a specific point-in-time of the quarter. Beside the level of the flows, their composition also provides some useful information for assessing the representativeness of the point-in-time vacancy stock. Taking into account the point-in-time stock at the end of the reference quarter, it necessarily implies that an unmeasured flow of new vacancies exists. In particular, as already mentioned, the flow of new vacancies posted and closed, for filling or cancelling, within the quarter is unmeasured by the stock at the end of the quarter. This component accounts for a significant percentage of the total flows of new vacancies which is slightly below 40%, while the flow of new vacancies remaining unfilled at the end of the quarter accounts for 60% (Table 6).

Also the choice of the reference date accounts for the representativeness of the point-in-time vacancy stock. The information collected in the experimental survey on the opening and closing dates has made it possible to compute the stocks of job vacancies on each day of the fourth quarter 2007 (see Figure 2). There is a considerable variation of the stocks across the different days of the reference quarter. In particular, the stocks range from a low

of 42 (at 22-24 October 2007) to a high of 60 job vacancies (at 1-2 December 2007). Moreover, the daily vacancy stock series shows an increasing trend in moving from October to December with monthly averages growing from 45, to 48 and to 52. Furthermore, looking at the daily dynamics of the stock, it seems that, within each month, the stock reaches the maximum at the beginning of the month, then it markedly declines and increases during the middle of the month. Next, it decreases and then increases again at the end of the month, although in the month of December the increase in the middle of the month does not appear. Therefore, due to the above mentioned facts on both the observed trend within the quarter and the dynamics within the month, the stock at the end of the reference quarter is 7% higher than the average daily stock in the quarter. In terms of the job vacancy rate measured as the number of vacancies reported at the end of the fourth quarter 2007 divided by the sum of vacancies and the simple average of employment between the third and fourth quarter 2007, the above difference inflates the vacancy rate at the end of quarter (1.42, see Table 7) with respect to the average daily job vacancy rate in the quarter (1.32%). The discrepancy of 0.1 percentage points between the two rates is not at all insignificant given the low level of the job vacancy rate.

Figure 2 - Daily Job Vacancy Stocks in the Fourth Quarter 2007



Source: Experimental survey on job vacancy flows and duration

6. Job Vacancies and Their Connection to Hirings: Some Preliminary Evidence

6.1 Hirings without Vacancies and Vacancies without Hirings

On the basis of the experimental survey we get the result that a substantial fraction of all hirings observed in the respondent firms seems to be outside the standard matching framework (17%). In particular, out of the 77 hirings reported by the respondents, 13 have been occurred without a prior vacancy. They account for 0.4% of the employment in the respondent firms.

The selection applied to extract the sample could have influenced the observed fraction of hirings without vacancies. Davis et al. (2009) using the JOLTS data find evidence that, not only a sizeable fraction of hires occur outside a standard framework of worker recruitment. Their analysis indicates that more than 1 in 6 hires occur without benefit of a vacancy, but also that the fraction of hires without a vacancy decreases systematically with employer size. In particular, they estimate that 14% of hirings take place without vacancies at firms with 50-250 employees, compared, for example, to 30% at firms with 0-9 employees and to about 5% at firms with 1,000 or more employees. Hence, our evidence also reflects the fact that among the selected firms, even if small firms are excluded, firms which do not exceed 100 employees account for 50% (as shown in Table 1).

The answers given by respondent firms to the questions on instantaneous hirings have also widened the set of the possible reasons for them with respect to those suggested in the questionnaire.

In particular, one out of the five firms which reported hirings without vacancies replied that the hirings had occurred because new employees were proposed by internal offices different from the personnel department. This was one of the possible items included in the questionnaire. During the further recalls better explanations of the reasons for this kind of instantaneous hirings have been obtained. The employer explained that these hirings generally take place since new job positions are created to hire attractive candidates recommended by the employees already working in the firm.

Another firm replied that instantaneous hirings occurred because the employer hired someone who had already been working for the firm although she/he was engaged by an external supplying firm.

Hirings that occur without vacancies were also reported by two other firms where the employers hired someone they had previously engaged, respectively, as a temporary worker and an intern.

The last firm reporting instantaneous hirings explained that its hiring process generally occurs without a prior vacancy mainly due to the kind of activities carried out, i.e. demolitions, decontaminations and reutilizations. In particular, for this firm the need for workers to be employed in the different scrap yards can suddenly arise. Therefore, new employees are generally recruited from an already established pool of former workers which the firm usually turns to without any additional and time-consuming recruitment effort, so that new employees are hired also in the same day in which such needs appear.

The information provided by the respondent firms highlights that, beside hirings not preceded by any active recruiting activities at all, hirings which are preceded by a recruitment process which is so short that the distinction between the recruitment and the

hiring process is negligible, also exist, in particular as explained by the last firm reporting instantaneous hirings. Since such vacancies, i.e. vacancies with negligible duration, are more difficult to be captured, it is likely that they are not measured in current job vacancy surveys.

Finally, one employer reported that even though instantaneous hirings did not occur in the fourth quarter 2007, they would have probably taken place in the following quarters. Due to the expansion of its production, this firm was always looking for new workers to hire. Hence, new job positions would be created to hire attractive candidates who suddenly became available or known.

Vacancies without hirings which are withdrawn from the market without being filled also appear in the experimental survey. They account for a significant percentage (11%) of all the vacancies closed by filling or cancelling by the respondent firms during the reference quarter. In particular, of all the 72 vacancies closed by the respondent firms, 8 are cancelled vacancies (see Table 6). Furthermore, job vacancies opened before the fourth quarter 2007 and cancelled in this quarter account for 9% of total vacancy stock at the end of the third quarter 2007. Regarding the firms' reasons for cancelling job vacancies, three firms responded that they had met difficulties in finding suitable candidates for the opened job positions while two others, respectively, answered that the need for new workers had been overestimated and then, consequently reduced, and that job vacancies had been filled by means of a reorganization using internal employees.

Recent evidence suggests that cancelled vacancies are quite common. UK vacancy data from the Office of National Statistics show that the proportion of all vacancies notified to the public employment service that are subsequently cancelled varied between 20% and 30% over the period 1985-2001 (see Andrews et al., 2008). Machin (2003) noted that a substantial proportion of these cancelled vacancies are regarded by employers as no longer existing. Also Andrews et al. (2008) provide some evidence that many cancelled vacancies are actually withdrawn from the market and do they not merely represent employers filling their vacancies by using other search strategies.

6.2 The Enlarged Set of Measures of Friction Including Vacancy Duration and Proportion of Non-Instantaneous Hirings

This section illustrates the enlarged set of friction measurements in terms of deviations from instantaneous hirings (discussed in section 3) with data from the experimental survey.

The considered measures of friction include not only the job vacancy rate and the estimated average duration of recruitment, obtained by inverting the vacancy yield, but also the proportion of non-instantaneous hirings and the job vacancy duration, i.e. the mean number of days required to fill an open job position. These last two quantities are not yet directly observed in the current job vacancy surveys with only very few exceptions regarding duration. Furthermore, besides the vacancy duration, the information collected also uncovers several other interesting quantities which pertain to the job vacancy daily process: the daily job vacancy rate, the daily job-filling rate and the daily flow of new vacancies.

As already mentioned, the job vacancy rate in the set of respondent firms was around 1.4% in the fourth quarter 2007, i.e. the respondent firms opened in this quarter 1.4 job vacancies per 100 job positions both occupied and vacant. As expected, this rate is quite above that for the total national economy coming from the current Istat quarterly survey (1.1%, see Istat, 2009b) due to both the selection of firms with 50-499 employees and with

at least one job vacancy or hiring. First, the Istat job vacancy rate includes also firms with no reported vacancies at the end of the reference quarters. This contributes to lower the rate because by adding these firms the denominator increases while the numerator remains unchanged. Second, the job vacancy rate within the firms with job vacancies decreases with firm size and above average job vacancy rates have been observed from firms with 5-10 to those with 50-100 employees (as shown in Istat, 2007). As already mentioned, the respondent firms in this last size class account for 50% of the total respondents.

Table 7 also reports the vacancy yield obtained by dividing the flow of hirings during the reference quarter (H_t) by the stock of vacancies at the end of the previous quarter (V_{t-1}). The respondent firms have a vacancy yield in the order of around 1.4 hirings per vacancy in the reference quarter.

The implied average recruitment time, according to equation (1), is around 64 days.

The selection applied to extract the sample contributes also to produce the observed vacancy yield and the implied average recruitment time, given that there are considerable variations across the employer size classes of the vacancy yield, as shown in the study of Davis et al. (2009). In particular, in this study, evidence has been found that the vacancy yield falls with firm size. For example, it falls by half in moving from firms with 50-250 employees to those with more than 1,000.

But the vacancy yield, and the implied average recruitment time, partly reflect the flow of hirings without vacancies. This flow contributes to inflate the vacancy yield and to reduce the average recruitment time, being these hirings not preceded by vacancies. On the contrary, the vacancy yield is depleted by the flow of cancelled job vacancies, being these vacancies not followed by hirings.

The adjusted vacancy yield obtained excluding the two above mentioned components, i.e. taking into account only non-instantaneous hirings and non-cancelled vacancies, bH and cV in equation (3), on the whole, decreases. The adjustment on the vacancy yield eliminates the inflating effect of the instantaneous hirings, in this case more significant with respect to the depleting effect of the cancelled vacancies.

The estimated average recruitment time implied by the adjusted vacancy yield is 70 days, 6 days higher than that estimated without excluding the two components.

Table 7 also shows the observed proportion of non-instantaneous hirings. In the set of respondent firms the fraction of hirings that are inside the standard matching framework is relatively large. They account for 83% of all hirings reported by the respondents.

Moreover, the job vacancy duration is presented in table 7. It averages around 76 days and has been computed as the average number of days required to fill the 116 job vacancies reported, on the whole, by the respondent firms during the reference quarter (see also Table 4). In addition to this, the average duration of 118 vacancies including also two vacancies corresponding to hirings with negligible recruitment processes before hiring is shown. The duration including “vacancies with negligible duration” averages around 1 day less the duration observed if such vacancies are unknown like they are in the current job vacancy surveys which usually do not capture them.

These average durations do not include the observed cancelled vacancies,²¹ for which it is likely that durations would be even longer than the average, since they are mainly hard-to-fill vacancies as shown in section 6.1. The duration of job vacancies for which firms

²¹ Cancelled vacancies are excluded from both durations, since their opening and closing dates have not been collected.

meet difficulties in recruiting a suitable candidate is particularly long and more than a quarter (around 4 months) as shown by the results of the Excelsior survey (see Unioncamere Ministero del Lavoro, 2007).

Coherently with the evidence in table 7 of vacancies lasting for less than a quarter, the analysis of flows in table 6 shows that most of the job vacancies observed at the end of the reference quarter were posted within the same quarter. In particular, job vacancies posted during the reference quarter which remain unfilled until its end account for around 80% of the total stock of job vacancies on this date.

The observed average durations are even longer than the estimated average recruitment time. It can be observed that, as expected according to equation (3), the adjusted estimated average recruitment time is more similar to the observed duration than the non-adjusted one.

But, the results of relatively long durations go against what seems to be a stylized fact, namely that *“the average completed duration of a vacancy is in most cases under a month”* (Farm, 2010, p. 8 and Petrongolo and Pissarides, 2001, p. 421).

For example, among the surveys collecting information on vacancy duration, the Minnesota job vacancy survey has shown that for the fourth quarter 2009 job vacancies open less than 30 days account for 58%.

Longer durations arise from the annual Dutch job vacancy survey. In particular, over the 2000-2006 period the percentage of job vacancies lasting less than one month varied between 20-30%; the percentage with a duration between one and three months between 30-40%; while the share of job vacancies open for a quarter or more fell between 40-50%.

The differences between the durations from the two surveys can be both explained by the different structural characteristics of the two labour markets and by the different characteristics of the surveys (as described in section 2.1).

In Italy the only information on job vacancy duration is the above mentioned regarding the job positions for which firms meet difficulties in recruiting a suitable candidate (see Unioncamere Ministero del Lavoro, 2007).

Regarding the results of the experimental survey, the characteristic of the selected firms in terms of the number of employees could have affected the duration observed, to the extent that large firms are more bureaucratic in their hiring process than the smaller ones (as Abraham, 1983, suggests). Furthermore, as shown in section 5.2 the respondent firms very often use formal search channels, in particular advertising and contacting private employment agencies. This could have also influenced the duration observed, given that using informal search channels seems to reduce job vacancy duration, while using public or private employment agencies or putting advertisements in newspaper seems to increase it (as, for instance, Gorter et al., 1996, Gorter and van Ommerem, 1999 and Devaro, 2001, 2005 show).

Moving from the quarterly to the daily framework, table 7 and figure 3 show, at a daily level, some of the quantities analysed so far only at a quarterly level.

Similar to the vacancy yield, the daily job-filling rate is defined as the hirings reported on day s in quarter t divided by the vacancy stock reported on the previous day ($h_{s,t}/v_{s-1,t}$).

An average job-filling rate in the quarter equal to 1.7% per day is observed in the respondent firms (Table 7). The above considerations on the effects of the selection hold, since the job-filling rate exhibits the same strong patterns as the vacancy yield (as shown in Davis et al., 2009). Hence, it declines with employer size, falling by more than half in moving from the smallest to the largest firms. Figure 3 shows the daily job-

filling rate and the daily flow of new vacancies in comparison with the daily job vacancy stock. The daily flow of new vacancies averages in the quarter 0.02% of employment,²² considerably lower than the average daily vacancy stock (around 1.3%). Both the daily flow of new vacancies and the job-filling rate strongly differ depending on the day of the quarter, ranging from 0 to, respectively, 0.36% and 24%. Peaks of both the two daily series are generally observed at the beginning of each month, during the middle of the month and between its end and the beginning of the next one. They correspond, respectively, to peaks and troughs of the job vacancy daily stock series (see also Figure 2). Although the job vacancy stock also considerably varies within the quarter, it does not show the same strong variations as the daily flow of new vacancies and the job-filling rate, due to the general low levels of these last two daily series. In fact, neither does the former significantly raise the stock of vacancies nor does the latter markedly lower it until fully depleting it.

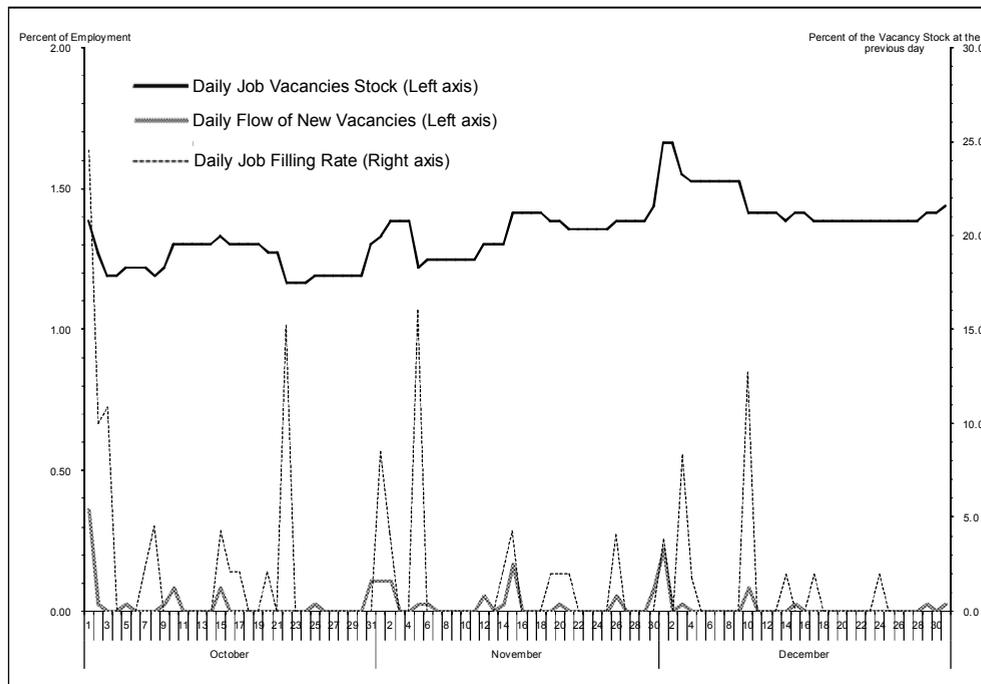
Table 7 - Enlarged Set of Measures of Friction (a)

Quarterly Framework (4th Quarter 2007)	
Job Vacancy Rate	1.42
Vacancy Yield	1.43
Estimated Average Duration of Recruitment (<i>days</i>)	64.17
Proportion of Non-Instantaneous Hirings (<i>% of total hirings</i>)	83.12
Adjusted Vacancy Yield	1.31
Adjusted Estimated Average Duration of Recruitment (<i>days</i>)	70.05
Daily Framework (average daily values in the quarter)	
Vacancy Stock (<i>% of employment</i>)	1.34
Job-Filling Rate (<i>% of the vacancy stock at the previous day</i>)	1.70
Flow of New Vacancies (<i>% of employment</i>)	0.02
Duration (<i>days</i>)	76.47
Duration including also "Vacancy with Negligible Duration" (<i>days</i>)	75.18

Source: Experimental survey on job vacancy flows and duration.

(a) Job vacancy rate, vacancy yield and duration of recruitment are as defined in the text.

²² Multiplying the average daily flow rate by the number of days of the quarter the resulting quarterly flow of new vacancies rate is lower than that shown in Table 6 (1.85% with respect to 1.94%), since the first does not include the inflow of new vacancies cancelled during the quarter. These vacancies have been estimated at a quarterly level (as described in section 5.4) but not at a daily level, with their opening and closing dates not being available.

Figure 3 - Daily Job-Filling Rate, Flow of New Vacancies and Vacancy Stock

Source: Experimental survey on job vacancy flows and duration.

7. Concluding Remarks

This paper examines some basic facts on job vacancies and their connection to hirings, not yet directly observed in the current job vacancy surveys. Also some important issues in the measurement of job vacancy variable are analysed. The data of a recent experimental survey on job vacancy flows and duration have been used, a small purposive non-random sample of Italian employers. This survey is aimed at both assessing whether any employers are able to provide data on the above facts and at preliminarily measuring them.

We find initial evidence that around 1 in 6 hirings occurs without benefit of a prior vacancy. The evidence collected in the experimental survey also shows several ways in which hirings can occur without a reported vacancy as when employers create new job positions to hire attractive candidates recommended by the employees already working in the firm, or when employers hire someone they have previously engaged as a temporary worker or intern, or when employers hire someone previously engaged by an external supplying firm. Besides hirings not preceded by any active recruiting activity like those specified above, hirings preceded by a recruitment process which is so short that the distinction between recruiting and hiring is negligible also appear. For example, when new employees are recruited from an already established pool of former workers which employers usually turn to without any additional recruitment efforts.

We also start to show that vacancies withdrawn from the market without being filled account for more than 10% of all the vacancies closed, whether filled or cancelled. Our findings also suggest that employers cancel job vacancies not only when vacancies are hard-to-fill, but also when they overestimate the need for new workers or when job vacancies are filled by means of a reorganization using internal employees.

We develop an enlarged set of measures of friction in terms of deviations from instantaneous hirings, including not only the job vacancy rate and the estimated average recruitment time, but also the proportion of non-instantaneous hirings – as complementing the hirings without vacancies – and the job vacancy duration. We find preliminary evidence of vacancies which take quite a long time to be filled with an average duration of two and a half months.

Even if a non-representative sample is used in the experimental survey, the results obtained begin uncovering some parts of the still unknown recruitment statistics. They can be regarded as a first step for future, more extended, surveys which could provide useful input for further developments of search and matching models. We find initial evidence – in particular the fraction of hirings that are outside the standard matching framework and of cancelled vacancies – indicating that more information is needed to throw light upon these important aspects of friction in job matching. Furthermore, the fact that we are able to receive from some employers data on the connection between vacancies and hirings as those required in the experimental survey encourages us to continue collecting this information in more extended surveys. It will also allow more detailed analysis, including, for instance, the territorial and sectorial ones.

The empirical analysis we carry out provides us with some useful initial input for improving the measurement of the job vacancy variable. We find that total inflows and outflows of vacancies during the reference quarter significantly exceed the stock at its end by more than 30%. In addition to this, we show that around 2 out of 5 of all the new vacancies opened in the reference quarter are unmeasured by the stock at the end of the quarter, with these new vacancies closed before this date. We also find that the vacancy stocks at each day of the reference quarter significantly differ and that the stock observed at the end of the quarter is 7% higher than the average daily stock in the quarter. These findings suggest complementing the information on the point-in-time vacancy stocks – the measure of vacancies mainly used in the current job vacancy surveys – with that on vacancy flows in order to get more representative information.

The initial evidence obtained from the experimental survey also warrants completing the information on job openings, or recruitment processes, with that on unfilled jobs, which are a more accurate measure of the unmet labour demand. Our results show that more than 1 out of 2 of all the job vacancies collected are unoccupied job openings which are immediately available.

Furthermore, the evidence collected suggests that at least some employers could rely heavily also on recruiting practices that are difficult to be captured by current measurements of job vacancies, but which should be included by them to contain the possible underreporting of vacancies by the employers responding to the job vacancy surveys.

Finally, we also find evidence that at least some employers formally record a lot of useful and highly detailed information on job vacancy characteristics, including the job vacancy opening and closing dates. In the long run, this valuable information could be exploited by the already existing or possible future job vacancy surveys.

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