How Are Fixed-term Contracts Used by Firms? [*]
An Analysis Using Gross Job and Worker Flows

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Abstract

Using Spanish establishment level data on temporary and permanent job and worker flows, we examine firms' relative usage of fixed-term contracts in response to changes in their prior net employment expectations for the short-run and the long-run –viewed as proxies of how a wide variety of future shocks are ultimately perceived by establishments. The employment response of establishments to changing net employment expectations for the short-run is, primarily, suggestive of their reliance on fixed-term contracts as a buffer to cushion short-run changes in demand as well as to shield permanent workers from downward workforce adjustments. In contrast, their response to changes in net employment expectations for the long-run mostly hints on the use of fixed-term contracts as a screening device. Therefore, policies providing financial incentives to convert fixed-term into permanent contracts –thus targeting firms' using fixed-term contracts as a screening device, are likely to only have limited effectiveness.

I.   Introduction

During the 1980s, several countries implemented labor market reforms with the intent of lowering unemployment levels by deregulating employment and promoting the use of fixed-term contracts.[1] As opposed to open-ended or permanent work contracts, fixed-term or temporary work contracts provided employers with substantially lower dismissal costs.[2] These reduced discharge costs consisted of limited severance payments and non-existent judicial procedures available to workers wanting to sue employers for unfair dismissals. From a legal point of view, fixed-term contracts were conceived to be used as a buffer or cushion to address temporary changes in employment needs due to changes in product demand characteristic of seasonal industries, such as tourism or construction, or to fill vacancies on a temporary basis. However, in part fueled by the cost advantages described above, fixed-term contracts became widely used by firms for other purposes, e.g. as a buffer for workers with open-ended contracts during economic downturns or to screen workers for permanent positions at a relatively low cost. In some instances, as was the case with Spain from 1984 to 1994, the employment regulation was changed to allow for the use of fixed-term contracts to hire workers fulfilling permanent jobs. Owing to the characteristics of the data we work with, we focus on two of the most discussed usages of fixed-term contracts in the labor literature, i.e. on their use as a buffer and on their use as a screening device.

Spain is the most prominent case of an extensive use of fixed-term contracts and constitutes an unparallel example given its unprecedented growth in temporary employment, which grew from less than 10 percent of the wage and salary workforce in the early 1980s to approximately 30 percent by the second half of the 1980s (Dolado *et al.* 2002). In fact, the

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[1] See Bertola and Ichino (1995) for a comparative analysis of legal reforms in Europe in the last two decades.

proportion of temporary workers has barely changed since then despite the legalization of temporary help agencies and the passage of various labor market reforms aimed at reducing establishments' reliance on temporary contracts (Toharia and Malo 2000). Hence, there is growing interest in gaining a better understanding of establishments' employment practices by type of work contract.

We use Spanish data from the *Encuesta de Coyuntura Laboral* (ECL) to examine establishments' employment practices by type of work contract. The ECL is a quarterly longitudinal survey that contains detailed information on stocks and gross flows of workers at the establishment level. Additionally, it provides information on establishments' net employment expectations for the next quarter and year. These expectations furnish detailed plant level information on how establishments perceive that a wide variety of short-run and long-run shocks may be affecting their future employment needs. For the purpose of this study, we use data on establishments having 500 or more workers during the period 1/1993-1/2002[3] to first examine the extent to which establishments accurately forecast their short-run and long run employment needs by comparing their *expected* net employment changes for any given quarter to their *realized* gross job and worker flows. Subsequently, we examine the dynamics of gross job and worker flows by type of work contract and contract conversion flows from fixed-term to permanent at the establishment level in response to changes in net employment expectations for the short-run and the long-run. We find that establishments' response to changing net employment expectations for the short-run are, primarily, suggestive of their reliance on fixed-term contracts as a buffer to cushion short-run changes in demand as well as to shield permanent

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[2] Throughout the paper, we will use the terms fixed-term and temporary, as well as the terms open-ended and permanent, interchangeably.
[3] This is the only stratum of establishments for which detailed longitudinal information on gross flows is made available.

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workers from downward workforce adjustments, whereas their response to changes in net employment expectations for the long-run mostly hint on the use of fixed-term contracts as a screening device.

II.   Literature Review and Hypotheses to be Tested

An extensive literature has examined the dynamics of labor demand in terms of the employment and worker-hours response to changes in adjustment costs.[4] However, despite the theoretical evidence on higher dismissal costs reducing *total* job reallocation and worker turnover rates (e.g. Blanchard and Portugal 2001), the literature does not provide a clear prediction of the dynamics of gross job and worker flows by type of work contract (Bentolila and Saint-Paul 1992). Focusing on Spain, García-Serrano (1998) provides some descriptive evidence on worker turnover and job reallocation being higher for fixed-term contracts, which account for the majority of job creation, job destruction, and for the difference between worker turnover rates and job reallocation rates (also called 'churning'). However, García-Serrano's analysis displays a descriptive nature and is based on just two years of data (i.e. 1993 and 1994). More importantly, this study does not examine establishments' temporary and permanent job and worker flows' dynamics in response to their changing employment expectations for the short-run and long run. The link between establishments' prior net employment expectations and their job and worker flows by type of contract reveals important information on how a variety of economic and non-economic shocks are perceived to affect employment at the plant level and, in turn, on how these expectations impact their temporary and permanent employment practices.

However, some researchers have addressed this gap with an analysis of the impact that the availability of fixed-term contracts may have on the dynamics of gross job and worker flows. For

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[4] See, for example, Hamermesh (1993) for a synthesis of this theoretical and empirical literature.

instance, Goux *et al.* (2001) discuss how the availability of fixed-term contracts affects average (temporary and permanent) employment levels in France. They argue that fixed-term contracts provide the firm with greater staffing flexibility. According to the authors, low dismissal costs associated to fixed-term contracts allow firms to respond to short-term increases in demand through the hiring of temporary workers despite prospects of a future economic downturn. Yet, Goux *et al.* (2001) do not empirically test this hypothesis regarding the use of temporary workers as a buffer. Other studies have done that for the U.S. and a few European countries. For instance, Houseman and Abraham (1993) examine whether Japanese women are used as a buffer, and Booth *et al.* (2002) carry a similar analysis for women and ethnic minorities in the U.K. However, possibly due to the difficulty of finding representative firm level data sets, these studies have relied on household or individual level data surveys. As such, they cannot directly inform on the dynamics of establishments' gross job and worker flows by contract type. In fact, even when the analyses involve firm level data, they are restricted to specific industry analyses. For instance, Houseman *et al.* (2001) examine whether temporary workers are used as a buffer by U.S. hospitals and firms in the auto supply industries. Lastly, Varejao and Portugal (2003) address a similar question to the one we examine using Portuguese data of workers flows at the firm level. They find that screening workers for permanent positions is by far the most important reason behind Portuguese firms' usage of fixed-term contracts.

Focusing on Spain, Jimeno and Toharia (1993a) and Bentolila and Dolado (1994) examine the hypothesis of temporary workers being used as a buffer, although from a collective bargaining point of view. In their models, wage gaps between permanent workers –also called 'insiders'– and temporary workers –or 'outsiders'– are accentuated via collective bargaining. In particular, the authors argue that permanent workers feel protected (with a very limited exposure to

unemployment) in their higher salary requests by the existence of temporary workers who can be easily dismissed in the event of any labor adjustment needs. As a result, according to these authors, salaries become relatively independent of the unemployment rate dynamics. Hernanz (2003) has questioned the aforementioned models on the basis that they are only valid when workers with temporary and permanent workers are considered substitutes. In contrast, if temporary workers and their counterparts with open-ended contracts are considered complements, both will be hired simultaneously, although in different proportions given the lower cost associated to fixed-term contracts. Yet, a valid test of whether temporary and permanent workers are complements or substitutes requires information on the firm's production function. Finally, in a recent study, Polavieja (2006) argues that fixed-term contracts are mainly used as a screening device. However, he recognizes that the use of fixed-term contracts as a screening device does not rule out firms' reliance on fixed-term contracts as a buffer or cushion to address short-term increases in demand or downward labor adjustments owing to fixed-term contracts' lower dismissal costs.

Therefore, in light of the aforementioned explanations regarding the usage of temporary work contracts by firms, we hypothesize that:

a)   If temporary contracts are used as a screening device, temporary hires and job creation should increase (diminish) in establishments adjusting to growing (declining) employment expectations for the long-run. Additionally, any contract conversion flows would signal the use of fixed-term contracts as a screening device. Nonetheless, given the permanent nature of the new contract, changes in net employment expectations for the long-run should induce greater contract conversions than temporary changes in net employment expectations for the short-run.

b)   When temporary job and worker flows are used as a buffer, any labor adjustments to address diminishing employment expectations are primarily carried out via changes in temporary

job and worker flows. Specifically, as formulated by Goux *et al.* (2001), only if temporary employment is used as a buffer for permanent employment will we observe that establishments foreseeing a decline in net employment in the long run opt to increase their temporary job or worker flows to accommodate their current demands while still keeping future dismissal costs low. Additionally, establishments' greater reliance on fixed-term contract to address growing net employment expectations for the short-run also reflects their usage of temporary employment as a cushion or buffer against such changes.

A priori, we do not subscribe to one particular use of temporary job and worker flows by firms. After all, in large establishments, it is reasonable to expect temporary and permanent workers to take on a variety of responsibilities and tasks. Furthermore, as noted by Polavieja (2006), the use of fixed-term contracts as a screening device by the establishment is not disputed with the use of temporary employment in some instances as a buffer or cushion to address changes in employment needs. Since establishments' net employment expectations can be considered proxies of how a wide variety of future shocks are ultimately perceived by establishments, we use changes in establishments' net employment expectations for the short and long run to gauge the extent to which establishments use fixed-term contracts to meet their changing employment needs, drawing conclusions on establishments' use of fixed-term contracts as a screening device and/or as a buffer.

III.   Institutional Background

Before proceeding any further, it is important to briefly review some of the institutional aspects of the Spanish labor market most relevant to our analysis. Before the passage of the Workers' Statute in 1980, fixed-term or temporary contracts were only allowed in sectors

characterized by their seasonal employment needs under the so-called "causality principle".[5] In addition, interim contracts of a temporary nature were permitted in exceptional occasions. The 1984 reform of the Workers' Statute liberalized fixed-term employment introducing a new contract (the so-called *fixed-term contract for employment promotion*) that did not require the "causality principle". As such, firms could use fixed-term contracts to hire workers for all types of positions –temporary as well as permanent. [6] The intent was that the introduction of this new contractual figure would help lower the very high unemployment rate characterizing that time period. This reform increased employment flexibility at the margin by exclusively altering the dismissal costs of temporary contracts, while leaving the regulation of indefinite-term or permanent work contracts unchanged. In part fuelled by the cost advantages of fixed-term contracts, temporary employment expanded very rapidly. On the demand side, firms used fixed-term contracts as a means to cut down employment costs. On the supply side, youngsters relied on these contractual arrangements as a means to enter the labor market. As reference of the fast growth of temporary employment, it is worth noting that, before the 1984 reform, approximately 10 percent of wage and salary workers held temporary work contracts (Fina *et al.*, 1989). By 1992, this proportion had grown to account for 33 per cent of wage and salary workers according to data from the Spanish labor force survey or *Encuesta de Población Activa* (Toharia and Malo, 2000; Dolado *et al.*, 2002). The extended use of fixed-term contracts was only weakly linked to industry changes and became a common feature of all Spanish industries (Toharia 2005).

Furthermore, temporary employment rates remained stable since the early 1990s despite the legalization of temporary work agencies in 1994, the passage of two labor reforms in 1994

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[5] This legal principle stated that fixed-term contracts should be exclusively used for temporary needs of the firm and open-ended contracts for permanent needs.

and 1997 intended to reduce temporary employment rates, or the business cycle. With regards to business cycles, Figure 1 depicts the evolution of temporary employment and GDP growth rates. Temporary employment increased between 1988 and 1992 at a time when GDP growth rates were slowing down. This relationship switched sign between 1993 and 1995 and, from 1996 onwards, temporary employment rates have remained fairly stable regardless of fluctuations in the growth rate of GDP. Therefore, temporary employment rates seem to exhibit limited sensitivity to the business cycle.

What about the potential impact of the two labor reforms of 1994 and 1997? The 1994 reform introduced two types of changes. First, it legalized temporary work agencies –whose intermediation was only restricted in sectors with high injury rates, in Health Services and in the Public Administration.[7] Second, the 1994 legal reform tried to limit the use of fixed-term contracts through the restoration of the causality principle for temporary employment and the elimination of the *fixed-term contract for employment promotion* introduced in 1984. However, as Toharia and Malo (2000) show, the proportion of temporary contracts remained fairly unchanged following the reform, even if the composition of temporary employment by type of contract differed. In particular, the *fixed-term contracts for employment promotion* were replaced by the so-called *per-task contracts*. Additionally, the new legislation allowed for 'small' collective dismissals[8] to be treated as individual workers' dismissals as long as they were based on economic grounds[9] to reduce firms' dismissal costs.[10]

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[6] These fixed-term contracts could not last less than 6 months or more than 3 years with the same worker. However, firms were able to hire new employees using the same type of fixed-term contract to continue to cover the permanent position.
[7] The most extended evaluation of the impact of the temporary work agencies on the high use of temporary contracts in Spain concludes that, while they are not responsible for the high rate of temporary employment in Spain, they have shortened the duration of fixed-term contracts (Toharia, 2005).
[8] Dismissals should not involve more than 10 percent of the workforce.
[9] Economic grounds refer to relevant technological changes in the firm and, in general, to economic downturns.

As the rate of temporary employment remained fairly high after the passage of the 1994 reform, a new legal reform was implemented in 1997. This new reform also targeted firms' prominent reliance on fixed-term contracts with two new measures: (1) a new open-ended contract characterized by lower dismissal costs and (2) the promotion of *temp-to-perm* contract conversions through monetary incentives from the Public Administration.[11] Yet, despite all these institutional labor market changes, temporary employment has remained at about one third of the wage and salary workforce up to the present decade.[12] Since other flexible work contracts (e.g. part-time contracts) have been scarcely used in Spain, fixed-term contracts constitute the predominant work arrangement used by Spanish employers in order to increase their employment flexibility (Toharia, 2005).

IV.   Data and Descriptive Analysis

A)   Data

The data for this research come from the *Encuesta de Coyuntura Laboral* (ECL). The ECL is a longitudinal survey carried out on a quarterly basis since the second quarter of 1990 by the Spanish Ministry of Labor and Social Affairs. It surveys establishments with more than five workers in non-agriculture industries, with the exception of Public Administration, Defense and Social Security, diplomatic delegations, and international and religious organizations in the service sector. In 1997, the ECL underwent important methodological changes involving the inclusion of establishments with less than 5 workers in the survey sample along with a new sample stratification methodology.

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[10] However, the Tribunals' interpretation of *economic grounds for individual dismissals* was controversial because of the lack of an objective definition of what constitutes an economic reason for dismissal.

[11] See Toharia and Malo (2000) for further details on these reforms.

[12] Some authors, as Dolado *et al.* (2002), document a smooth decline in the private sector after 1997. In 2006, new political measures have been implemented following the 1997 labor market reform to curb down the high rate of temporary employment.

We use data on establishments having more than 500 employees during the period 1/1993-1/2002. This is the only stratum of micro data and the only time period for which detailed information on establishment level gross employment flows (employment stock at the moment and at the end of the previous quarter, as well as the number of arrivals and separations by type of work contract during the quarter) has been made publicly available. Furthermore, this is the only stratum of establishments unaffected by the 1997 changes to the survey methodology. Finally, this stratum of establishments with 500 employees constitutes the Spanish universe of large firms and, therefore, observations do not need to be weighted. The number of such large establishments is around 1,000 in a given quarter.[13] In particular, due to new establishment creation, we work with an unbalanced panel consisting of 1,811 establishments and 27,381 observations during the 1/1993-1/2002 period.

On average, this stratum represents approximately 15 percent of non-agriculture employment. About 20 percent of their workforce holds fixed-term contracts depending on the time period under examination (García-Serrano 1998). Since approximately 30 percent of wage and salary workers hold temporary work contracts in Spain, our gross and net temporary flows may, in any event, be considered under-estimates of the gross and net temporary flows in the entire universe of Spanish establishments. There are a couple of reasons as for why this is the case. First, our sample consists of large establishments for which the percentage of workers with fixed-term contracts is smaller than for small and medium size establishments not included in the sample. Second, for any given worker, the ECL does not record hires and separations taking place within the same establishment during the same month. For instance, if a worker is hired in the first month of the quarter, separated in the second month, and re-hired in the third month during any

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[13] When a firm is occasionally below the threshold of 500 employees, it is maintained in our stratum and it is only eliminated when the firm does not recover the level of 500 employees during two additional quarters.

given quarter, the ECL records two hires and one separation within that establishment during that quarter. However, if a worker is hired, separated and re-hired during the same month, the ECL only records one hiring. Hence, the ECL provides under-estimates of gross and net temporary flows of short duration. Despite these shortcomings, the high frequency and longitudinal information on establishment level gross employment flows (by type of work contract) and the information on the establishments' net employment expectations for the short-run and for the long run make the ECL a unique and well-suited survey for the analysis proposed in this study.

B) Gross Job and Worker Flows by Contract Type

Our methodology follows the empirical approach outlined in Davis and Haltiwanger (1990, 1992) to construct job and worker flows. Worker turnover (or worker reallocation) can be divided into two components: worker mobility due to gross job reallocation (i.e. job creation and job destruction processes) and worker mobility in excess of job reallocation (i.e. worker rotation or worker shuffling). Because our data set contains information on hires and separations at the establishment level, it is possible for us to construct measures of worker reallocation and distinguish among its components.

First of all, let us consider total gross worker turnover. Given the size of establishment i at times t ($E_{i,t}$) and $t-1$ ($E_{i,t-1}$), the average size of establishment i between $t-1$ and t is defined as follows: $N_{i,t} = (E_{i,t} + E_{i,t-1}) / 2$. By aggregating, it is possible to obtain the size of the whole economy: $N_t = \Sigma_i N_{i,t}$. The hiring (separation) rate is defined as the proportion of the number of workers arriving in (leaving) establishments between $t-1$ and t with respect to the employment stock:

$$h_{i,t} = H_{i,t} / N_{i,t} \ (s_{i,t} = S_{i,t} / N_{i,t}).$$

Then, by aggregating, we may calculate the aggregate hiring rate:

$$WPOS_t = \Sigma_i \, (N_{i,t} / N_t) \cdot h_{i,t}$$

and the aggregate separation rate:

$$WNEG_t = \Sigma_i \, (N_{i,t} / N_t) \cdot s_{i,t}$$

The sum of both rates is the worker turnover or worker reallocation rate (WR_t):

$$WR_t = WPOS_t + WNEG_t$$

Now let us consider job reallocation. The employment growth rate in each establishment is defined as follows: $g_{i,t} = (E_{i,t} - E_{i,t-1}) / N_{i,t} = (H_{i,t} - S_{i,t}) / N_{i,t}$. In other words, the employment growth rate can be calculated as the difference between current and past employment stocks, or as the difference between hires and separations in the corresponding period of time.[14] Then, for the whole economy, we can define the job creation rate as:

$$JPOS_t = \Sigma_i \, (N_{i,t} / N_t) \cdot g_{i,t} \,, \qquad \text{for } g_{i,t} > 0$$

and the job destruction rate as:

$$JNEG_t = \Sigma_i \, (N_{i,t} / N_t) \cdot \big/ g_{i,t} \big/ \,, \qquad \text{for } g_{i,t} < 0$$

The job reallocation rate (JR_t) is the sum of both rates. It provides us with an estimate of worker mobility due to job creation and job destruction:

$$JR_t = JPOS_t + JNEG_t$$

Worker turnover (RR_t) can then be defined as the extent of worker reallocation taking place in excess of job flows:

$$RR_t = WR_t - JR_t = 2 \cdot min \, (H_t, \, S_t)$$

Finally, aggregate net employment growth rates are given by the difference between both job creation and job destruction rates. They may also be computed as the difference between total hires and total separations. Hence:

$$NET_t = JPOS_t - JNEG_t = WPOS_t - WNEG_t$$

Using data on the employment stock by contract type, we compute the indicators of job creation and job destruction for temporary, permanent, and total plant level employment. Similarly, we exploit the information on hires and separations by contract type at the establishment level to construct indicators of gross worker flows, gross temporary worker flows, and gross permanent worker flows. Finally, we derive net flows for temporary, permanent, and total employment. All indicators are computed in thousands. Additionally, we compute the average employment stock between t and $t+1$ to then gauge the fraction of the adjustment made through changes in temporary versus permanent employment. We thus have measures of all gross temporary and permanent employment flows, with total gross flows being the sum of both.

The data base also includes information on the number of new permanent contracts signed with workers previously hired by the establishment on a fixed-term basis each quarter. Therefore, we are also able to compute conversion rates. Such a rate is defined as $WPOS_t$, with the only difference that $h_{i,t}$ now refers to these new permanent contracts instead of all new permanent contracts. Finally, it is worth noting that new permanent contracts resulting from contract conversions are included in the calculation of permanent hires in the same way that the fixed-term contracts converted to a permanent basis are considered temporary employment separations. Otherwise, these permanent and temporary worker flows would be miscalculated.

C)   Net Employment Expectations and Gross Job and Worker Flows by Contract Type

The main purpose of this study is to learn about how establishments adjust their temporary and permanent job and worker flows to fluctuations in their future employment needs as captured by changes in their prior net employment expectations. Therefore, we create two sets of

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[14] In both instances, this growth rate provides us with insights on the establishment's net job creation or destruction rate.

dichotomous variables to capture establishments' net employment expectations for the following quarter and for the following year. These dummies are created using the responses of establishments' human resource and personnel departments when asked whether they expect their employment stock to increase, remain unchanged, or decrease in the short-run (next quarter) and in the long run (next year). In particular, establishments' human resource and personnel departments are asked to "Indicate the foreseen employment changes for the following two time periods: (a) for the upcoming trimester, that is, between the first and last days of the upcoming trimester, and (b) for the upcoming year, that is, between the first and last days of the upcoming twelve months". Survey respondents then choose among three options regarding their expected future net employment: increasing (*se aumentará*), unchanged (*permanecerá estable*) and diminishing (*disminuirá*). Because the survey universe consists of large establishments with 500 plus workers, human resource and personnel departments are typically well informed and, in any case, assisted by the statistical survey team in interpreting and answering the questions posed by the professional interviewers. Furthermore, to the extent that the information on establishments' net employment expectations is used on a quarterly basis by the Ministry of Labor to publicize industries' employment outlooks, establishments' responses to this question are carefully checked across quarters to ensure data reliability.

Past research has used industry or regional information regarding changes in sales, shipments, output prices or other observable shocks to gauge changes in labor demand (e.g. Hamermesh 1993). In this study, we make use of information on establishments' net employment expectations for the upcoming quarter and year. As the term indicates, these expectations do not exclusively reflect a frictionless target but, rather, *expected* changes in the employment needs of the establishment given its adjustment costs and overall human resource

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See, for example, Davis *et al.* (1996), chapter 2.

strategy. Because of the lack of information on establishments' adjustment costs or human resource strategies, most studies using measures of observable shocks run into an omitted variable problem that biases their estimate of the establishment's reaction to the shock. In this regard, the usage of individualized information on establishments' net employment expectations for the upcoming quarter and year constitutes an ideal measure to address a related, yet slightly different, question we pose ourselves in this study. The latter refers to establishments' employment practices vary by type of work contract and, in particular: to which extent do establishments use temporary employment as a screening device and/or as a buffer when adjusting to their changing net employment expectations? Additionally, the usage of establishments' net employment expectations for the upcoming quarter and year provides some advantages over more conventional measures of observable shocks. First, instead of proxying for changes in labor demand via changes in sales, shipments, or output prices, establishments' net employment expectations directly capture how a variety of shocks are ultimately perceived by plants as reflected by their expectations regarding future employment needs. Second, survey data provide us with information regarding changes in establishments' net employment expectations for the *short-run* and the *long-run*. In this manner, we are able to distinguish how establishments rely on specific contract types depending on the temporal proximity of the expected change in their employment needs. Third, establishments' net employment expectations are measured at the *establishment level* instead of at the industry or regional level. As such, they constitute a more valuable measure considering that establishments may respond differently to future shocks depending on the accuracy of their information and their economic standing.

Table 1 displays average gross job and worker flows according to the sign of establishments' net employment expectations for the next quarter and year.[15] For the most part, employment expectations are met with temporary and permanent employment adjustments of the same sign. This is particularly true in the short-run. For instance, establishments seem to respond to increasing net employment expectations from a previous quarter by expanding their temporary and permanent workforces by 37 and 8 workers per one thousand, respectively. Likewise, diminishing net employment expectations from a previous quarter are met with reductions in both temporary and permanent employment of 6 and 11 workers per one thousand, correspondingly. As such, fixed-term contracts seem to be used as a shock absorber or buffer in the short-run, particularly to respond to growing net employment expectations. Additional evidence of the usage of temporary employment as a buffer is provided by the fact that net temporary employment is positive for establishments with unchanged or with diminishing net employment expectations for the long-run. This statistic supports the predictions from the dynamic labor demand model presented by Goux *et al.* (2001), who argue that establishments will continue to hire temporary workers in the presence of a long-run economic downturn in order to satisfy current demand as they will be able to use them as a buffer for permanent employees at a future date.

Is there any evidence of the usage of temporary employment as a screening device? Yes. The simultaneous use of fixed-term and permanent contracts to address both growing as well as diminishing net employment expectations for the short-run is suggestive of the usage of fixed-term contracts as a screening device. Additional evidence regarding the use of fixed-term contracts to screen workers is provided by establishments' conversion flows. The ratio of permanent hires to conversions remains at about 2.5 regardless of the change in net employment

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[15] Gross job and worker flows indicators are computed at the establishment level.

expectations. The sole exception occurs when establishments adjust to diminishing employment expectations for the next year, in which case this rate rises to approximately 3.6 as fewer *temp-to-perm* contract conversions take place. The relatively stable proportionality between permanent hires and conversion flows is suggestive of the usage of fixed-term contracts as a screening device, possibly as part of the establishments' long-run employment strategies.

In sum, establishments seem to primarily rely on temporary employment flows to meet increases in their net employment expectations as would be expected if firms use fixed-term contracts as a shock absorber or buffer. Likewise, establishments increase their temporary employment when they are either uncertain or expect a decline in their future net employment –both signs of establishments' possible reliance on temporary employment as a buffer for permanent employment. However, establishments also raise their net permanent employment to meet growing net employment expectations, suggesting that fixed-term and open-ended contracts are used in a complementary manner by some firms as would be the case when fixed-term contracts are used as a screening device.

V. Empirical Methodology

Our main purpose is to learn about establishments' employment practices by type of work contract and, specifically, assess the extent to which establishments use temporary employment as a screening device and/or as a buffer when adjusting to their changing net employment expectations. In modeling establishments' temporary and permanent net employment, gross job and worker flows, and *temp-to-perm* contract conversions, we account for a variety of variables possibly influencing establishments' employment practices ranging from general establishment characteristics to institutional and macroeconomic controls.

In the first category of general establishment descriptors, we include information regarding the establishment size, industry and sector. Smaller establishments may be more likely to rely on temporary workers as a means to respond to changes in their product demand or financial constraints.[16] Likewise, establishments in certain industries, such as services, and sectors, as is the case with the private sector, experience a higher volume of job and worker rotation. In addition to the aforementioned establishment level characteristics, we account for various institutional aspects, such as the presence and scope of a collective bargaining agreement due to its potential impact on the establishment's employment practices.[17] Finally, we incorporate regional dichotomous variables as well as quarterly and yearly dummies. The regional dummies allow us to take into account changes in the economic and institutional environment in which establishments operate, as in the case of regional economic booms/crises or variations in payroll taxes/subsidies. Additionally, we incorporate year and quarter dummies to purge our estimated coefficients from the impact of nationwide labor market reforms and seasonal fluctuations in establishments' job and worker flows, respectively. A description of the variables used in our regression analysis, along with their means and standard deviations, is provided in Table A in the appendix.

Given the longitudinal nature of our dataset, the aforementioned discussion suggests the following panel data model:

(1) $y_{it} = X_{it}\beta + Z_i\delta + \mu_i + \varepsilon_{it}$

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[16] Establishments' size is lagged one period in order to guarantee its predetermined character.

[17] Due to the institutional framework of Spanish collective bargaining, collective agreements extend to any establishment of the sector. Therefore, the relevant distinction is not whether or not there is a collective agreement applicable to the establishment's employees but, rather, the scope of the collective agreement in place. See, for example, Jimeno and Toharia (1993b) or García-Serrano and Malo (2002) for greater details on collective bargaining in Spain.

where y_{it} represents the ratio of temporary to permanent gross job and worker flows being examined; X_{it} is a vector of time-varying characteristics –including the establishment's net employment change expectations, lagged size, internal collective bargaining, industry, and other establishments' size and workforce composition– and sets of dummies for each quarter in our sample; Z_i is a vector including information on time-invariant characteristics of the establishments in our sample, such as their location and whether they belong to the public sector; μ_i is the unobserved establishment specific and time invariant effect, assumed to have zero mean, finite variance σ_υ^2, and to be identically distributed (i.i.d.) over the panel; and ε_{it} is the idiosyncratic error, also assumed to have zero mean, finite variance σ_e^2, and to be i.i.d. over all the observations in our panel.

To determine whether unobserved plant level fixed characteristics should be modeled as fixed-effects or random-effects, we examine whether μ_i is uncorrelated with other explanatory variables in our model. If the unobserved establishment-specific effect is potentially correlated with some explanatory variables, the fixed-effects method is needed since the use of random-effects would yield inconsistent estimates. Both the Breusch and Pagan Lagrangian multiplier and the Hausman specification tests suggest the specification of the individual effects to be fixed.[18] Hence, we estimate equation (1) via OLS as a fixed-effect model and, in this manner, we obtain consistent and efficient estimates of β and δ.

VI.   Results

A)   <u>Net Employment Expectations and Temporary to Permanent Job and Worker Flows</u>

Table 2 displays the estimates from the fixed-effects regression analysis of the ratios of temporary to permanent gross job and worker flows. In particular, columns 1 and 2 present the

estimates for the ratios of temporary to permanent job creation and job destruction rates, columns 3 and 4 show the estimates for the ratios of temporary to permanent hires and separation rates, and the last column (column 5) presents the estimates corresponding to the ratio of temporary to permanent net employment change at the establishment level.

The results displayed in Table 2 are supportive of the hypothesis that establishments use fixed-term contracts with screening purposes as well as a buffer. Specifically, the positive sign on establishments' prior employment growth expectations for the long-run when examining ratios of temporary to permanent job creation flows signals that establishments create nearly 37 percent more temporary than permanent positions when envisioning a long-run growth period. This behavior is suggestive of establishments using temporary work contracts as a screening device to meet long-run employment needs.

However, the figures in Table 2 also provide some evidence of the usage of temporary work contracts as a shock absorber or buffer to meet other changes in establishments' employment expectations. For instance, the positive signs on establishments' prior employment growth expectations for the short-run when examining the ratios of temporary to permanent job creation flows are indicative of their greater reliance on temporary employment to meet short-run changes in their product demand and other immediate employment needs. Similarly, the fact that establishments respond to diminishing employment expectations for the long-run by creating temporary positions at more than twice the rate of permanent positions suggests, once more, their partial usage of temporary contracts as a buffer that allows them to avoid the future costly dismissal of permanent employees, according to Goux *et al.*'s prediction (Goux *et al.*, 2001).

Also signaling the usage of temporary contracts as a shock absorber or buffer is the change in the ratio of temporary to permanent job destruction among establishments facing

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[18] Results are available from the authors upon request.

employment growth and employment decline expectations in the short-run. Establishments are significantly less likely to destroy temporary (relative to permanent) positions when faced with employment growth expectations for the short-run. However, establishments destroy temporary positions at two and a half the rate that they destroy permanent positions when addressing diminishing employment expectations for the short-run.

Yet another sign of the usage of fixed-term contracts as a shock absorber or buffer is the fact that establishments are six times more likely (and four times less likely) to hire workers on a temporary (as compared to a permanent) basis when faced with employment growth (decline) expectations, which hints that temporary hiring is primarily used by firms to meet short-run increases in demand.

Finally, the last column of Table 2 displays the response of the ratio of temporary to permanent net employment flows to prior changes in net employment expectations for the short-run. Because net employment flows are the sum of all job/worker flows –whether positive or negative– this ratio signals establishments' relative adjustments in temporary (as compared to permanent) employment when faced with changing net employment expectations. In this regard, it is interesting to note that adjustments in temporary employment are about three times greater than adjustments in permanent employment when establishments address diminishing employment expectations. This behavior is suggestive of the use of fixed-term contracts as a buffer for workers with permanent contracts. However, temporary employment adjustments are about three times smaller than adjustments in permanent employment when establishments face employment growth expectations. If temporary contracts were being used as a buffer, we would expect the opposite, i.e. greater temporary employment adjustments when establishments respond to short-run growing employment expectations (perhaps resulting from the hiring of new

temporary workers to address the short-run increases in demand). Instead, it seems as if establishments use their temporary work contracts with screening purposes and do not bother to make substantial changes to their temporary workforce in the face of what they envision as only short-run changes in their employment expectations. Consequently, the response of temporary to permanent net employment flows provides mixed evidence of the potential uses of fixed-term contracts by establishments.

In sum, establishments do not seem to use fixed-term contracts with just one purpose. Instead, the response of establishments to changing net employment expectations for the short-run is mainly suggestive of their reliance on fixed-term contracts as a shock absorber or buffer, whereas their response to changes in net employment expectations for the long-run mostly alludes to their usage of fixed-term contracts as a screening device.

Finally, it is also worth noticing that, the ratio of temporary to permanent job creation is smaller among larger sized establishments suggesting that the creation of temporary employment is relatively more frequent among smaller sized establishments. However, the ratios of temporary to permanent job destruction, job separations and, as such, the sum of temporary to permanent flows, are all greater among larger establishments. It is also interesting to note that the presence of collective bargaining at the firm level significantly raises the ratio of temporary to permanent job creation, job destruction, hires, and, overall, net employment flows. This effect confirms the reduced fluctuations in permanent employment often observed in the presence of unions and employment protection measures. Finally, establishments' ratios of temporary to permanent job and worker flows do not seem to vary much by industry. The only exception are the relatively smaller ratios of temporary to permanent net employment flows in the construction industry compared to more seasonal industries in the tourism and alike services.

B)   Net Employment Expectations and Temporary to Permanent Contract Conversions

Another means to gain a better understanding of how establishments make use of temporary work contracts is to examine their temporary to permanent contract conversions. This analysis not only informs on the usage of fixed-term contracts as a screening device but, also, on how *temp-to-perm* contract conversions are affected by changes in establishments' net employment expectations for the upcoming quarter and year.

According to the figures in Table 3, establishments decrease (increase) their temporary to permanent contract conversions when faced with growing (diminishing) employment expectations for the short-run. Why? It is possible that, if establishments do not use fixed-term contracts as a shock absorber or buffer, they may not increase their temporary job creation and hires to address employment growth expectations that they envision as temporary. Instead, it is possible that establishments view fixed-term contracts as a screening device. Therefore, any *temp*-to-*perm* contract conversions constitute employment practices with long-term effects. Under such scenario, establishments may not alter their contract conversions in the face of what are viewed as short-run or temporary diminishing employment expectations. Additional evidence of the use of fixed-term contracts as a screening device stems from the fact that establishments increase (decrease) their temporary to permanent contract conversions by approximately one contract per quarter to adjust to employment growth (decline) expectations for the long-run. In sum, these findings suggest that some establishments use fixed-term contracts as a screening device.

Finally, it is worth discussing the lower temporary to permanent contract conversion rates among establishments with collective bargaining at the firm level. Permanent workers, also called the "insiders" in the collective bargaining literature (e.g. Jimeno and Toharia 1993a,

Bentolila and Dolado 1994), typically have more clout in any agreements reached at the firm level than temporary workers. Therefore, any collective bargaining agreement at the firm level is more likely to ensure, first, better working conditions for permanent workers. The latter may, in some instances, come at the cost of allowing for the use of temporary work contracts as a shock absorber or buffer (resulting in fewer contract conversions) to cut labor costs when faced with a downturn (as, for example, Bentolila and Dolado, 1994, alleged in their theoretical model). Finally, industry-wise, the results indicate that establishments in the finance and insurance industries are less likely to use temporary work contracts as a screening device than other establishments in the service industry.

VII.   Conclusions

Previous theoretical (Goux *et al.*, 2001) as well as empirical work (García-Serrano, 1998) has stressed the importance of distinguishing between fixed-term and open-ended work contracts when examining firms' employment practices. The literature also recognizes a variety of ways in which firms use temporary employment. In this paper, we focus on two of the most salient and discussed uses in the literature on fixed-term employment: (a) the use of fixed-term contracts as a buffer to cushion short-run changes in demand as well as to shield permanent workers from downward workforce adjustments, and (b) the usage of fixed-term contracts as a screening device. Using gross job and worker flows data on Spanish establishments, we examine establishments' employment practices by type of work contract and discuss the extent to which establishments use temporary employment as a screening device or as a buffer when adjusting to changes in prior employment expectations. Establishments' prior employment expectations provide us with detailed plant level information on how a wide variety of short-run and long-run

shocks are ultimately perceived by establishments as reflected by changes in their expectations regarding future employment needs.

Using data from Spain, the country with the highest rate of temporary employment in the European Union, we find that establishments appear to use fixed-term contracts for a variety of purposes. On one hand, establishments seem to rely on fixed-term contracts as a buffer to meet expected short-run changes in employment needs. Some examples of this behavior are establishments' greater temporary to permanent job creation and hiring ratios when responding to employment growth expectations for the short-run; yet, the also greater rate at which they destroy temporary positions when faced with diminishing employment expectations for the short-run. On the other hand, establishments also appear to create temporary jobs at a higher rate than permanent jobs to address long-run employment growth expectations, which hints on the usage of fixed-term contracts as a screening device to satisfy long-term employment needs.

We also look closely at establishments' temporary to permanent contract conversions to better understand their determinants. We find that, not surprisingly, conversions are more (less) likely to occur following employment growth (decline) expectations for the long-run, whereas the opposite occurs in the presence of changes in establishments' prior employment expectations for the short-run. That is, establishments continue to convert fixed-term contracts to permanent when adjusting to diminishing employment expectations for the short-run –perhaps owing to their temporary nature. In contrast, they are not likely to go forward with temporary to permanent contract conversions when facing employment growth expectations for just the short-run.

In sum, establishments appear to use fixed-term contracts both as a screening device and as a buffer. However, the use of fixed-term contracts as a buffer seems to be the most prominent

when responding to changing net employment expectations for the short-run. In contrast, the response of establishments to changes in net employment expectations for the long-run is mainly suggestive of their usage of fixed-term contracts as a screening device.

What policy implications stem from these findings? Most notably, policies consisting of financial incentives to convert fixed-term into permanent contracts are likely to have a limited effectiveness when firms also use fixed-term contracts as a buffer. At any rate, the possibility still exists that establishments' response to changing employment expectations in small and medium size establishments not included in our sample differs from that observed in large establishments. While the literature (e.g. Davis *et al.* Chapter 4, 1996) has shown that gross flows are mainly driven by the behavior of large firms, the availability of detailed employment stock and flow data for small and medium size establishments should prove useful in furthering our understanding of establishments' employment practices by type of work contract.

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Table 1
Gross Flows by Contract Type and by Establishments' Net Employment Expectations
(All figures in per thousands)

Expectations for Next Quarter (Temps)	Temporary Job Creation	Temporary Job Destruction	Temporary Hires	Temporary Separations	Net Temporary Employment	-
Increasing	50.41	12.96	247.93	210.48	37.45	-
Unchanged	22.30	15.33	139.54	132.56	6.98	-
Diminishing	13.64	19.78	65.03	71.17	-6.14	-
Expectations for Next Quarter (Perms)	**Permanent Job Creation**	**Permanent Job Destruction**	**Permanent Hires**	**Permanent Separations**	**Net Permanent Employment**	**Conversions(*)**
Increasing	12.81	4.80	23.36	15.35	8.01	9.04
Unchanged	6.06	6.88	14.16	14.98	-0.82	5.36
Diminishing	6.23	16.88	11.89	22.55	-10.66	4.24
Expectations for Next Year (Temps)	**Temporary Job Creation**	**Temporary Job Destruction**	**Temporary Hires**	**Temporary Separations**	**Net Temporary Employment**	**-**
Increasing	90.83	18.07	932.13	859.37	72.76	-
Unchanged	52.11	20.37	551.48	519.75	31.73	-
Diminishing	24.29	12.64	184.06	172.41	11.65	-
Expectations for Next Year (Perms)	**Permanent Job Creation**	**Permanent Job Destruction**	**Permanent Hires**	**Permanent Separations**	**Net Permanent Employment**	**Conversions(*)**
Increasing	32.86	14.03	84.62	65.79	18.84	37.16
Unchanged	18.35	20.69	56.81	59.15	-2.34	21.97
Diminishing	8.27	49.87	31.68	73.28	-41.60	8.68

Source: Authors' tabulations using the ECL.
Note: Gross flows are measured following Davis-Haltiwanger methodology as explained in the main text. (*) 'Conversions' refers to permanent hires proceeding from immediately previous temporary contracts with the same workers. By definition, the amount of conversions is as much as permanent hires.

Table 2
Fixed Effects Estimates of Ratios of Quarterly Temporary to Permanent Gross Job and Worker Flows
(S.E. in Parentheses)

Independent Variables	Job Creation	Job Destruction	Hires	Separations	Net Employment
Expectations for Next Quarter					
Increasing	1.951***	-2.451***	6.157***	-4.620	-2.680***
	(0.756)	(0.393)	(1.870)	(2.896)	(0.537)
Diminishing	0.500	2.651***	-3.713*	1.883	3.279***
	(1.180)	(0.367)	(2.191)	(3.198)	(0.595)
Expectations for Next Year					
Increasing	1.372*	-0.664	2.810	-1.690	0.421
	(0.798)	(0.409)	(1.968)	(3.058)	(0.567)
Diminishing	2.304*	-0.663	-0.199	-0.526	-0.335
	(1.270)	(0.497)	(2.386)	(3.494)	(0.646)
Establishment Characteristics					
Establishment Size at (t-1)	-0.175**	0.402***	0.213	0.628**	0.123**
	(0.072)	(0.035)	(0.170)	(0.270)	(0.050)
Collective Bargaining at firm level	2.313**	1.072**	4.443*	5.715	1.136*
	(1.013)	(0.459)	(2.293)	(3.555)	(0.664)
Energy	-5.743	1.531	-16.072**	-2.527	-1.588
	(4.743)	(1.271)	(7.789)	(11.231)	(2.112)
Chemicals, Rubber, Plastics	-0.596	1.597	-14.511	-1.037	0.052
	(5.632)	(1.444)	(9.134)	(12.783)	(2.429)
Machinery	4.025	2.029	-10.108	-1.055	1.632
	(4.187)	(1.253)	(7.647)	(10.847)	(2.035)
Other Manufacturing	-0.214	1.123	-9.869	-0.353	-0.672
	(3.908)	(1.034)	(6.373)	(9.139)	(1.727)
Construction	-4.231	2.161	-4.559	-2.512	-5.218*
	(5.349)	(1.708)	(10.030)	(14.999)	(2.776)
Trade	0.998	1.334	-4.230	-4.199	-0.614
	(2.891)	(0.974)	(5.644)	(8.275)	(1.540)
Transportation & Communications	-0.979	-0.597	-3.222	2.521	-1.566
	(2.423)	(0.704)	(4.410)	(6.241)	(1.156)
Finance & Insurance	-0.001	0.304	-3.531	-0.837	0.982
	(1.856)	(0.661)	(3.653)	(5.570)	(1.034)
Regression Fit Statistics					
No. Of Observations	8466	16212	21414	24759	24678
Number of Groups	1509	1664	1744	1772	1781
F statistic	4.67	13.09	5.16	2.08	4.14
Prob > F	0.0000	0.0000	0.0012	0.0000	0.0000

Notes: ***indicates statistical significance at the 1 percent level, **indicates significance at the 5 percent level, and *indicates significance at the 10 percent level. The regressions include a constant term as well as dummies for each quarter in our sample. Unchanged employment expectations and 'other services' are used as reference categories. Gross flows used to construct the ratios are measured following Davis-Haltiwanger methodology as explained in the main text.

Table 3
Fixed Effects Estimates of Quarterly Gross "Temp-to-Perm" Contract Conversion Flows (S.E. in Parentheses)

Independent Variables	Temp-to-Perm Conversions
Expectations for Next Quarter	
Increasing	-0.564*
	(0.336)
Diminishing	1.634***
	(0.382)
Expectations for Next Year	
Increasing	0.879**
	(0.352)
Diminishing	-0.951**
	(0.419)
Establishment Characteristics	
Establishment Size at (t-1)	0.023
	(0.032)
Collective Bargaining at firm level	-0.840**
	(0.421)
Energy	-0.923
	(1.389)
Chemicals, Rubber, Plastics	-0.406
	(1.554)
Machinery	-0.069
	(1.283)
Other Manufacturing	0.347
	(1.125)
Construction	0.954
	(1.813)
Trade	-0.075
	(0.991)
Transportation & Communications	-0.002
	(0.751)
Finance & Insurance	-1.496**
	(0.675)
Regression Fit Statistics	
No. Of Observations	29345
Number of Groups	1858
F statistic	6.24
Prob > F	0.0000

Notes: ***indicates statistical significance at the 1 percent level, **indicates significance at the 5 percent level, and *indicates significance at the 10 percent level. The regressions include a constant term as well as dummies for each quarter in our sample. Unchanged employment expectations and 'other services' are used as reference categories. Gross flows are measured following Davis-Haltiwanger methodology as explained in the main text.
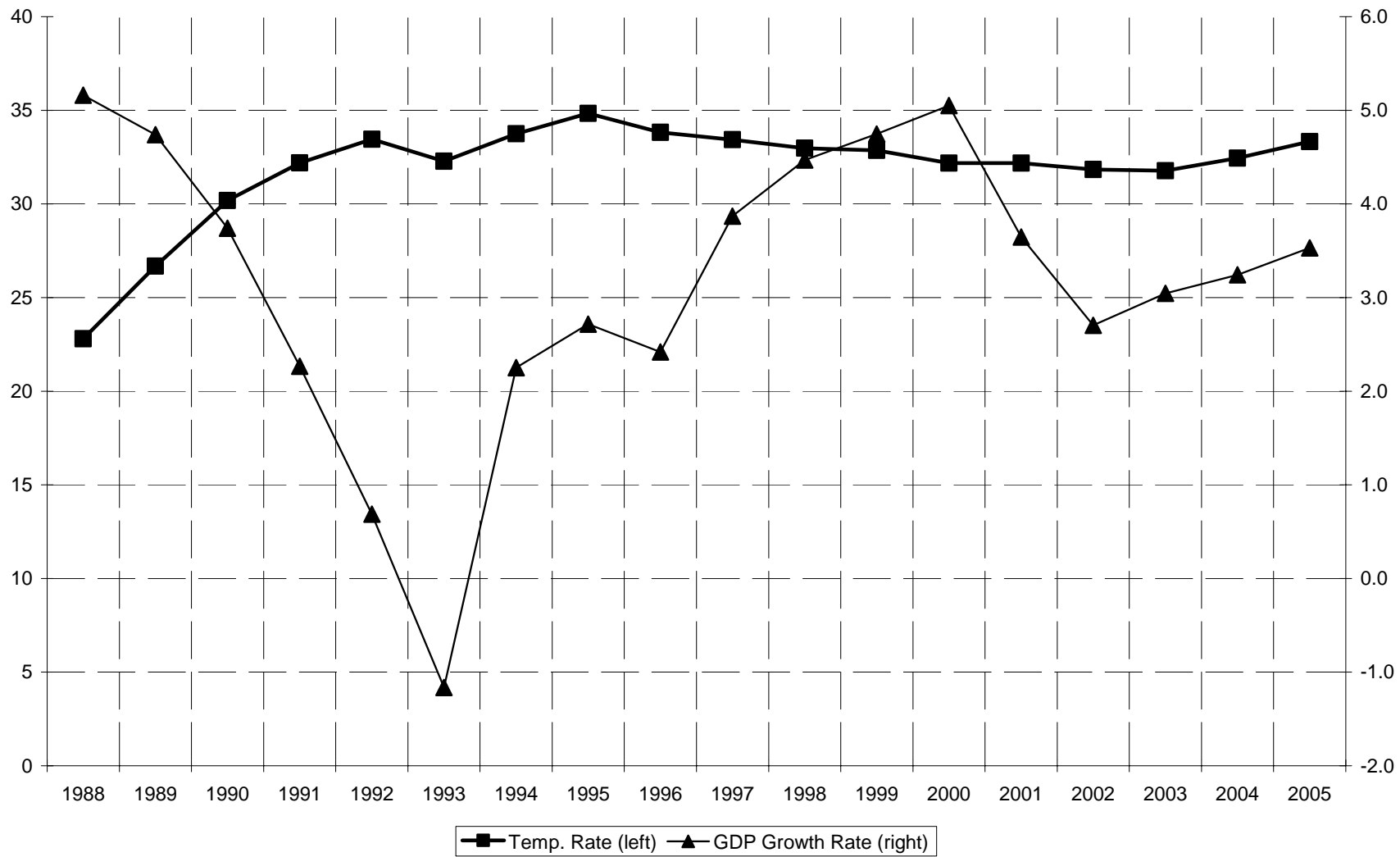
Figure 1
Temporary Employment and GDP Growth Rates

Source: Labor Force Survey and National Accounts.

Table A
Description, Means, and Standard Deviations

Variables	Description	Mean	S.D.
Ratios of Quarterly Flows by Contract Type			
JPOSRATIO	Establishment's ratio of quarterly *temp* to *perm* job creation flows	5.9067	23.6145
JNEGRATIO	Establishment's ratio of quarterly *temp* to *perm* job destruction flows	2.5828	13.4375
WPOSRATIO	Establishment's ratio of quarterly *temp* to *perm* hires	24.0556	112.7021
WNEGRATIO	Establishment's ratio of quarterly *temp* to *perm* separations	17.7020	150.2000
WNETRATIO	Establishment's ratio of quarterly *temp* to *perm* net employment flows	0.3078	26.3056
Establishment's quarterly temp to perm contract conversion flows		1.4889	9.4991
Expectations for Next Quarter			
Increasing	Dummy variable indicative of increasing net employment expectations for the next quarter	0.1497	0.3568
Unchanged	Dummy variable indicative of unchanged net employment expectations for the next quarter	0.6983	0.4590
Diminishing	Dummy variable indicative of diminishing net employment expectations for the next quarter	0.1489	0.3560
Expectations for Next Year			
Increasing	Dummy variable indicative of increasing net employment expectations for the next year	0.1461	0.3532
Unchanged	Dummy variable indicative of unchanged net employment expectations for the next year	0.7179	0.4500
Diminishing	Dummy variable indicative of diminishing net employment expectations for the next year	0.1360	0.3428
Other Establishment Characteristics			
Establishment Size at (t-1)	Establishment's size last quarter in hundreds of workers	12.5883	15.0206
Collective Bargaining	Establishment-level collective bargaining dummy	0.3882	0.4874
Energy	Industry dummy	0.0342	0.1818
Chemicals, Rubber, Plastics	Industry dummy	0.0412	0.1988
Machinery	Industry dummy	0.1170	0.3214
Other Manufacturing	Industry dummy	0.0494	0.2166
Construction	Industry dummy	0.0162	0.1262
Trade	Industry dummy	0.0909	0.2874
Transportation & Comm.	Industry dummy	0.0833	0.2764
Finance & Insurance	Industry dummy	0.0749	0.2632
Other Services	Industry dummy	0.4640	0.4987

Source: Authors' tabulations using the ECL.