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No. 4178

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LABOUR ECONOMICS



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Discussion Paper No. 4178
January 2004

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January 2004

ABSTRACT

Temporary Contracts and Employee Effort*

Temporary contracts provide employers with a tool to screen potential new employees and have been shown to provide 'stepping stones' into permanent employment for workers. For both reasons, workers on temporary contracts have an incentive to provide more effort than permanent employees. Using indicators for unpaid overtime work and absences taken from the Swiss Labor Force Survey, we present evidence that temporary workers indeed provide higher effort than permanent employees: their probability of working unpaid overtime exceeds that of permanently employed workers by 60%. We show the heterogeneity of this effect across different types of temporary contracts, investigate differences between men and women, and discuss the relevance of endogenous selection into temporary employment.

JEL Classification: C25, J24, J41 and M50

Keywords: absenteeism, career concerns, contract-based incentives, moral hazard, overtime and temporary work

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*We thank two anonymous referees, Markus Frölich, the participants of the 2003 Swiss Economics Association Meetings and of the Personnel-Economics Workshop 2003 in Zurich for helpful comments.

Submitted 30 September 2003

1. Introduction

Contract-based incentives are of key interest not only for behavioral sciences such as personnel economics, but also for active human resources management.¹ An important characteristic of employment contracts is whether they are permanent or temporary. Since temporary employment as a share of total employment recently has risen in a number of countries it has garnered increased scientific attention (cf. OECD 2002, Booth et al. 2002a). However, researchers mostly address questions relating either to the macroeconomic impact of temporary employment on unemployment and labor turnover,² or to differences of job (e.g. wage, training) and worker characteristics in permanent versus temporary contracts.³

This appears to be the first study to raise the question of whether there are measurable behavioral responses connected to holding permanent versus temporary employment contracts. The incentives behind such responses are hypothesized to derive from the character of temporary jobs as potential "stepping stones" to generally preferable permanent jobs, a role that is confirmed in empirical studies:⁴ If temporary employment can offer access to desirable permanent contracts, temporary employees have an incentive to display high levels of effort.

The issue of behavioral responses to temporary contracts is related to an empirical literature which confirms contract-based incentives in a variety of other areas. The studies look at effort responses to probation and employment protection, analyze the response of absenteeism to sick-leave regulations, and describe responses to monitoring intensity.⁵

Using data from the Swiss Labor Force Survey (SLFS) we compare the behavior of

¹ The subsequent discussion of contract-based incentives will exclude payment issues.

² See e.g. OECD 1999, Cahuc and Postel-Vinay 2002, Dolado et al. 2002, Holmlund and Storrie 2002, and Blanchard and Landier 2002.

³ See e.g. Morris and Vekker 2001, OECD 2002 and Segal and Sullivan 1997.

⁴ A summary of that literature is provided by OECD 2002, pp.160-161.

individuals in permanent and temporary contracts. The SLFS - a rotating panel dataset - contains information on workers' current contract and on effort indicators such as absenteeism and unpaid overtime work. We investigate the overall evidence for incentive effects of temporary contracts as well as their heterogeneity across effort indicators and worker groups. Particular attention is devoted to possible gender differences in the response to contractual incentives, as well as to the potential bias related to non-random selection into temporary employment.

This study adds to the literature in several regards. First, it continues the micro-level analysis of temporary contracts initiated by Booth et al. (2002b). That study examined whether temporary contracts deserve to be considered as "stepping stones." The authors confirm for the United Kingdom that a large proportion of workers on temporary contracts move on to permanent contracts with higher wages and fringe benefits. They also show that high effort among temporary workers is positively correlated with the probability of career advancement.⁶

Second, we provide empirical evidence of the extent of contract related incentive effects, an issue neglected in prior discussions. We carefully describe the behavior of individuals employed in different types of temporary contracts to clarify that there are important heterogeneities. Finally, we present evidence for the interesting case of Switzerland, a country similar to the United Kingdom and the United States in that employment protection is limited.

Our results confirm the existence of contract-based incentives for temporary contracts: Temporarily employed individuals are significantly more likely to provide unpaid overtime

⁵ See e.g. Ichino and Riphahn (2001), Barmby et al. (1991), and Nagin et al. (2002).

⁶ Hagen (2003) also confirms the stepping stone hypothesis using German data.

work. On average their overtime work propensity exceeds that of permanently employed workers by 60 percent. The findings are robust to changes in sample and specifications and yield no clear differences in the behavioral responses of males and females. We investigate the relevance of endogenous selection into temporary employment and describe the heterogeneity of our findings across different types of temporary employment.

The paper proceeds as follows: Section 2 characterizes the Swiss institutional background for temporary employment, briefly surveys the relevant literature, and then formulates the hypotheses tested in our empirical analysis. Section 3 describes the data and empirical strategy, and section 4 presents the results. A conclusion is provided in section 5.

2. Institutions, Prior Evidence, and Hypotheses

In international comparison the labor market in Switzerland is left quite unregulated. Employment protection in permanent contracts is weak, as even after 8 years of tenure layoff notice periods are only 2 months, reaching the maximum of only 3 months after 9 years of tenure.⁷ Given the limited employment protection for permanent contracts it may be less likely in Switzerland compared to other countries that temporary contracts are used as buffers against cyclical fluctuations by employers. Temporary contracts can extend over many years without limitations, and only must grant a layoff notice period of 6 months when they exceed a duration of 10 years. If temporary contracts are used to circumvent the stricter regulations of permanent contracts the temporary contracts will be looked at as permanent contracts. However, given the very limited extent of regulation for permanent contracts in Switzerland

⁷ The OECD (1999) provides a ranking of the overall strictness of employment protection for regular employment for the late 1980s and the late 1990s. Out of 27 countries Switzerland ranks fifth (after the United States, the United Kingdom, Canada, and Australia) in both periods, rendering it one of the countries with the lowest employment protection.

there is little reason to use temporary contracts to avoid the additional regulation.⁸

Since the incentive effect of temporary contracts on worker effort has not been investigated before, we review related studies and then discuss our hypotheses. The effect of contract-based incentives on employee behavior has been addressed in the empirical literature on the role of employment protection as well as in research on sick-pay related moral hazard.

The studies evaluating the incentive effects of employment protection utilize institutional regulations to identify the relevant effects. Ichino and Riphahn (2001) find strong increases in absenteeism among Italian bank employees when probation periods end and employment protection sets in. Riphahn and Thalmaier (2001) confirm similar absenteeism responses to the end of probationary contracts among German employees. Jimeno and Toharia (1996) investigate the effect of low employment protection in Spanish temporary employment on absenteeism: Those without employment protection provide significantly higher levels of effort compared to workers in secure permanent contracts.

The hypothesis that sick-pay provides incentives for opportunistic behavior has been confirmed in a broader literature. Barmby et al. (1991) show that sick-pay regulations yield clear employee responses. Johansson and Palme (1996, 2002) describe the decline in absenteeism among Swedish men after a reduction of sick-pay, and Barmby (2002) finds that workers reduce absences more when sick-pay is low relative to earnings.

Similar to probationary periods, employment protection legislation, and sick-pay provisions, the duration of workers' employment contracts may generate effort responses.

⁸ In his textbook on Swiss labor laws Rehbinder (2002) even points out that the liberal dismissal rules do not meet the more restrictive requirements of the European Union and similarly contradict Agreement 158 of the International Labor Organization, which requires stricter employee protection.

These can be evaluated by comparing the behavior of workers on temporary and permanent contracts. As long as temporary employment contracts are less attractive than permanent ones temporary workers have an incentive to provide high levels of effort.⁹ A first reason is that firms tend to use temporary employment to screen potential permanent employees prior to committing to a binding contract. So if temporary workers want to obtain a permanent employment contract with typically higher wages they need to pass this employer screening.

Second, there is considerable direct evidence that temporary contracts serve as stepping stones into more attractive employment contracts - also with other than the current employer. Booth et al. (2002b) confirm for their U.K. sample that over a period of 7 years about 38 percent of all workers observed on fixed-term contracts move on to permanent employment after the fixed-term contract expires.¹⁰ Interestingly, the authors confirm a positive correlation between a worker's effort as measured by the number of unpaid hours of overtime work, and the probability of moving on to a permanent contract.

However, these incentive mechanisms may not characterize all types of temporary contracts in the same way, Booth et al. (2002b) distinguish jobs which are temporary by nature ("seasonal and casual employment") from those which could just as well be filled by permanent employees ("fixed term contracts"). Employees in these contract categories differ significantly in their transition rates to permanent employment, in the long run wage effects of past temporary employment, as well as in wages and job satisfaction.

Another interesting issue concerns the difference between male and female temporary workers. Booth et al. (2002b) argue – similar to Lazear and Rosen (1990) - that women may

⁹ OECD (2002) estimates show significant wage penalties for temporary employment in regressions that control for individual and job characteristics, separately for 13 European countries. This finding is representative of the literature. We investigated the wage difference between permanent and temporary workers in Switzerland and confirmed the disadvantage of temporary workers independent of the chosen empirical specification.

¹⁰ In our data 26 percent of those temporarily employed in one year move on to permanent employment in the next period.

seek temporary employment because this better matches their high propensity to move on to non-market employment. Therefore women may more frequently self-select in non-screening types of temporary employment than men. This would suggest that women in temporary employment *ceteris paribus* may provide less effort than men, as men are more likely to seek career advancement ("housewife effect").

Additional aspects may affect behavioral differences between the sexes: Discrimination might influence the selection of individuals into fixed term versus permanent jobs. If for given ability men are more likely to find permanent employment, then - on average - women in temporary employment should be of higher ability. If high ability is correlated with a career orientation then these high ability women may respond to incentives and provide additional effort.¹¹ In this case women in temporary employment *ceteris paribus* may provide more effort than men ("resilience effect"). However, the conclusion that the experience of discrimination results in the subsequent provision of high effort may not be convincing: If high ability has not been rewarded in the past high effort now may be in vein as well ("frustration effect"). These are three gender-specific mechanisms where the first and the last should cause lower and the second higher effort among women compared to men. Below we investigate the empirical evidence on this question.

Overall our empirical analysis seeks to test the following hypotheses:

- H1: Workers in temporary employment provide more effort compared to workers in permanent contracts.
- H2: The effort response of temporary workers to the incentives inherent in temporary employment contracts varies because of the heterogeneity in the incentive itself: Seasonal and casual workers may not be subject to the same level of ability screening as substitute workers on jobs that might become permanent. We expect heterogeneity in effort response by type of temporary contract.
- H3: We hypothesize that males and females differ in their response to temporary employment incentives.

¹¹ Booth et al. (2002c) also discuss active discrimination on the part of the employer as an explanation for differences between the sexes.

3. Data and Empirical Strategy

3.1 Dataset and Sample

The data for our analysis are taken from six annual waves (1996 - 2001) of the Swiss Labor Force Survey (SLFS). The SLFS is a telephone survey among randomly chosen individuals aged 15 and above. It does not cover foreign workers without a permanent residence permit. The typical annual survey samples 16-18,000 households. The SLFS is a rotating panel where every individual is interviewed up to five times. The questionnaires cover sociodemographic indicators, employees' type of contract, and measures of effort.

Pooling the observations from six annual surveys yields 103,005 observations. We restrict our sample to non-self-employed individuals in full-time employment, who are not in an apprenticeship or in military service. We drop individuals of retirement age (men above age 65, women above 63) and a few observations with missing values on key variables. Our sample covers 33,945 person-year observations, representing 10,497 different male and 5,411 different female workers, with on average 2.1 annual observations per person.

3.2 Key Dependent and Explanatory Variables

We consider two effort indicators as dependent variables, which are established in this literature: The first measures whether the worker provides unpaid overtime hours,¹² the second describes whether a person missed work for the entire week prior to the survey due to illness, accident, personal or family matters, or "other" reasons.¹³ Both measures are binary variables.

¹² Respondents are asked whether it happens frequently or at least sometimes that they have to work longer hours than spelled out in their contract. If they agree a subsequent question asks whether this is typically remunerated financially, in leisure, or not at all. Those indicating that overtime work is typically not remunerated provide unpaid overtime work.

¹³ Similar indicators were used by Booth et al. (2002b) in the case of overtime and Jimeno and Toharia (1996) for absences.

The key explanatory variable indicates whether the individual works on a temporary contract. 4.4 percent of all employees in our sample are temporarily employed. This figure differs from the about ten percent share presented by OECD (2002) for Switzerland; the difference is most likely due to the different selection of the samples.¹⁴ Based on the sampling rules applied by OECD (2002) Switzerland's temporary employment share is at the OECD average. While some countries experienced severe fluctuations in the share of their temporary employment over time, the Swiss figure remained stable during the six years of our data between a maximum of 4.9 percent in 1996 and the lowest value of 3.7 percent in 2000.

Based on the SLFS information on the type of temporary contract we distinguish four contract types and coded a fifth describing observations with missing contract type information. The four contract types describe (i) seasonal and casual employment, (ii) public sector sponsored employment programs, (iii) internships, and (iv) "advanced temporary contracts" combining temporary substitute workers, fixed term project work, probationary employment, temporary employment agency workers, and "other" temporary contracts.¹⁵ Public sector sponsored programs are designed to reintegrate previously unemployed workers in the labor market. Internships are temporary contracts with typically low or no pay, where the intern intends to learn about the workings of a company or agency. We expect that the incentive to provide effort is highest among those with the highest probability of company screening, i.e. categories (iv) and (iii), and lowest among groups (ii) and (i) where workers are either unlikely to reapply for employment or where promotions are not possible.

Table 1 presents the characteristics of individuals employed in permanent and temporary contracts. It yields differences in a variety of dimensions: Temporary work is more

¹⁴ The OECD (2002, Chart 3.1) measures include part-time workers, apprentices and self-employed workers, and do not seem to impose age restrictions.

frequent among the young, among females, non-married, and foreign workers. The educational patterns are nonlinear in that temporary workers are more likely to be in the lowest and the highest educational categories compared to those employed permanently. Despite of conditioning on full-time employment we find a higher number of weekly hours worked (contractual and overtime) for temporary workers. The distribution of workers across firm size categories does not seem to differ by contract type, but permanent workers have much longer tenure.¹⁶

Given the availability of panel data for some of our observations it is interesting to measure the probability of remaining in temporary employment over time. The period-to-period probability of leaving temporary employment for a permanent job amounts to 26 percent in our sample. The reverse probability of leaving permanent employment for a temporary job is low at 0.9 percent.¹⁷

Given that permanent and temporary contracts differ in a number of dimensions it is interesting to describe effort levels by contract type. The first row in Panel A of Table 2 indicates that 20.6 percent of all those employed on permanent contracts and 27.7 of those on temporary contracts have worked unpaid overtime. The first row in Panel B shows that the absence rate among those in permanent contracts exceeds that among temporary workers by about 44 percent. Thus the aggregate measures agree with our expectation of higher effort among temporary employees. These differences are similar when we evaluate the evidence by sex, where generally men appear to provide higher levels of effort than women.

The last five columns of Table 2 describe mean effort by type of temporary employment contract. For both indicators, we find the highest effort levels among those in

¹⁵ Varying formulations of the contract categories across the six annual questionnaires did not allow us to describe these contract types more finely in a consistent manner over time.

¹⁶ The large share of temporary workers with tenure beyond 5 years is surprising. However, there are no clear patterns in the data suggesting that this is a special group.

contract categories (iii) and (iv).¹⁸ Also when disaggregating by sex effort seems to be lowest among those in public programs.

3.3 Empirical Strategy

The purpose of our analysis is to test the hypotheses derived in section 2. Hypothesis 1 (H1) claims that workers in temporary contracts provide more effort than those permanently employed. This is tested by regressing our effort outcomes on an indicator of temporary employment in random effects probit models. To ensure that the measured outcomes are not due to composition effects, the model considers control variables describing the individual worker (age, sex, marital status, nationality, health, level of education), the job (tenure, firm size, industry, occupation), and survey year effects. Table 3 provides descriptive statistics of the explanatory variables. We provide the results of random effects probit estimates when the control for individual-specific unobserved heterogeneity improved the model, and discuss standard probit results with robust standard errors otherwise.

In step 2 of the analysis we test H2, which proposes that effort responses of temporary workers should vary by type of contract. We expect higher effort among interns and those on advanced temporary contracts. This is formally tested by substituting a set of type of contract indicators for the overall indicator of temporary employment in our models.

The last step of the analysis investigates differences in responses to incentives by gender. We first add interactions between the temporary contract and female sex indicators and then discuss more refined estimation approaches.

¹⁷ Both figures represent lower bounds of the true shares because we do not observe the transitions of those individuals who drop out of the survey due to panel rotation.

¹⁸ The high effort levels of workers in the last column of Table 2 with missing contract type information are surprising, but may be correlated with the high educational level in this group (figures not presented).

4. Results

The results of the "baseline" regressions for the overtime and absence indicators are presented in Table 4. The random effects control significantly improved the model fit in the overtime model, only. Overall the regression results are robust to the choice of the estimator.

The temporary contract indicator yields the expected coefficient in the model for overtime work: Individuals on temporary jobs are significantly more likely to work unpaid overtime hours than individuals on permanent contracts. In fact, controlling for the other variables the difference in the predicted probabilities even exceeds that presented in Table 2: The regression suggests that holding everything else constant the probability of overtime work under a temporary contract exceeds that under a permanent contract by 60.49 percent (see bottom row and notes of Table 4), which compares to a 33.85 percent difference in the unadjusted data in Table 2.¹⁹

The other results indicate that the propensity to work unpaid overtime increases significantly with age and education, it is higher for males, Swiss nationals, for married individuals, and for those free of grave health shocks.²⁰ Also, overtime work is correlated with tenure, firm size, occupation, and industry. Joint coefficient tests yielded significant overall effects for the sets of age, tenure, firm size, occupation, and industry indicators.

In contrast to the estimation of overtime work, the model for absences does not yield a statistically significant difference by contract status. While the negative coefficient indicates a lower absence probability for those on temporary contracts, the coefficient is insignificant.

¹⁹ The SLFS offers information on the average number of unpaid overtime hours worked during the last calendar year. To test the robustness of our results we ran linear regressions on this outcome for the subsample of workers with at least one year of tenure, i.e. those who were employed under the same contract during the observation period: The results confirm that the temporarily employed provide significantly more unpaid hours of overtime work than those on permanent contracts.

²⁰ The measure for a health shock is available only for the 1998 - 2001 surveys and describes whether a worker has ever experienced a health based work absence of more than half a year.

This finding is robust across specifications and estimators, and remains unchanged when more detailed indicators and interactions of the temporary work indicator are considered.²¹

This same result of no significant difference in absence rates of temporary and permanent workers was found for the case of Spain by Jimeno and Toharia (1996). However, they could show that composition effects determined this outcome: Since temporarily employed workers were employed in industries and occupations with higher accident rates, these accident related absences affected the overall comparison between permanent and temporary workers. When the authors controlled for occupation and / or industry specific accident rates, the overall absence rates showed significant differences between permanent and temporary employees. In order to test whether such compositional effects possibly explain the lack of a significant difference in the absence rates of permanent and temporary workers in our case as well, we obtained industry-specific accident rates for Switzerland.²² The regression of absence probabilities in Table 4 was then reestimated considering controls for industry-specific accident rates. This additional set of controls – even though significant predictors of absence probabilities – did not affect the coefficient estimate for temporary contracts. Independent of whether we considered the industry and occupational controls with the accident rates, there was no significant difference in the propensity of temporary and permanent workers in our data.²³

²¹ Given the very small share of absence events in the data the imprecise estimate may be due to the small number of observations in the temporary contract group (only 12 temporary workers experienced a work absence). Since logit and probit models generate different results when there is an extreme split in the dependent variable, we estimated the models with logit estimators as well. The outcome of an insignificant difference for the absence outcome between temporary and permanent contract workers remains robust.

²² The “Swiss collecting agency for the statistics of the accident insurance” provides information on accident rates (number of accidents per 1,000 insured workers) by industries covered by private and public accident insurances. We obtained the data for the year 1999 – about the middle of the period we are investigating – and grouped them in 16 industries which could then be matched to our data.

²³ Guadalupe (2003) shows that differences in the accidents between temporary and permanent workers may not only be due to composition effects across industries and occupations, but that there may be structural

We conclude that in our data temporary workers differ from permanently employed colleagues with respect to unpaid overtime work but not regarding absences. This can be interpreted to mean that either temporary workers do not make a special effort to avoid absences or permanent workers miss work already at very low levels. By international comparison Swiss absenteeism rates are indeed very low: Barnby et al. (2002) compare absence rates for 9 European countries: Swiss workers are the least likely to miss work. The Swiss absence rate of 1.8 is far below the international average of 3.2. This suggests that in Switzerland absenteeism is not a dimension in which temporary workers can signal their motivation. We therefore focus our further analysis on the overtime work indicator, for which hypothesis 1 cannot be rejected.

Robustness Tests

In this section we discuss tests of the robustness of our results to changes in sample and specification. One could for example imagine that there are selection effects taking place over the course of the temporary contract. If the temporary contract serves as a screening tool for the employer then it seems plausible that workers who represent bad matches are dismissed earlier than those who are good matches. In that case one might expect different effort levels of temporary workers depending on their tenure in the temporary contract: Those with longer tenure might be a positive selection. To investigate whether the effort effect varies with tenure we estimated the temporary contract coefficient when using only subsets of employees. The results are summarized in Table 5 (rows 2 and 3) and suggest positive and significant effects for temporary employees with short tenure under one or under three years.

reasons why temporarily employed workers suffer more accidents than permanent employees in the same industry and occupation. Since we do not have contract type specific accident rates available for Switzerland we cannot control for such effects. This might be the reason why we find no difference in the absence rates by contract type.

However, based on the simulations in the last column of Table 5 the contract related effect seems indeed to be larger for those temporary workers with longer tenure. This may be due to match selection as mentioned above but could also be related to the term structure of alternative types of temporary contracts (cf. next section below).

In row 4 of Table 5 we provide the results of an estimation where only individuals with at least one year of tenure are considered. The rationale is that we may observe workers in our sample of permanently hired workers who were recently hired and are still in the probationary period of their contract. During probation they can be fired easily with only one week's notice and such they are subject to similar behavioral incentive mechanisms as workers on temporary contracts.²⁴ If workers on probation are among the permanent employees this may cause a downward bias for the effect of temporary contracts. By dropping observations with less than one year of tenure we circumvent this problem and indeed obtain a clear and sizeable effect of temporary contract incentives exceeding the baseline result.

A plausible objection to our specification in Table 4 could be that the selection into occupations and industries which are controlled for in Table 4 are endogenous. Therefore we reestimated the model in Table 4 this time omitting occupation and industry effects. Row 5 in Table 5 yields that the coefficient of the temporary contract indicator remains highly significant and positive when the specification of the model is changed. Overall our results are highly robust to changes in sample and specification.

Heterogeneity of Effort Responses

Next, we investigate the heterogeneity of effort responses across different types of temporary employment. The estimation results are presented in Table 6. The categorical

²⁴ For more detailed analyses of the incentive effects of probation periods see Ichino and Riphahn

indicators of the type of contract are jointly significant at the 1 percent level. The coefficients confirm our expectations in that interns and workers on advanced temporary contracts are more likely to provide extra work effort, with a highly significant effect for the latter. The predicted effects indicate an increase in the probability of overtime work by 2.3 and 4.6 percentage points for interns and "advanced" temporary workers, respectively. These are sizeable effects given a baseline probability of overtime work of 6.5 percent.²⁵ Even when controlling for covariates, workers on public programs are less likely to work overtime.²⁶ Thus hypothesis 2 cannot be rejected, there is significant heterogeneity in the effort response of temporary workers.

Differences by Gender

Finally, we investigate potential differences between the sexes as suggested by hypothesis 3. The baseline model for unpaid overtime work in Table 4 yields a sizeable significant negative coefficient for the indicator of female sex: Among all workers females are less likely to provide unpaid overtime work than men. We are interested in the differences for temporary contracts and reestimated the model after adding an interaction for temporary contract and female sex. The result (see Table 7, column 1) yields an imprecisely estimated coefficient of small magnitude. Thus we find no significant difference between the sexes.

In section 3 we discussed alternative hypotheses regarding the differences in male-female effort responses to working on temporary contracts. If both, the factors causing higher and lower effort are effective, the net effect might be that females do not differ from males.

(2001) or Riphahn and Thalmeier (2001).

²⁵ The results of higher effort among those on "advanced" temporary jobs was confirmed also in robustness tests where we investigated the average number of unpaid overtime hours worked as an outcome measure for those workers with at least one year of tenure. See footnote 19 above.

²⁶ Individuals on Public Program Contracts are somewhat less likely to provide extra effort even though

To investigate this possibility we estimate refined models with additional interaction terms.

In column (2) of Table 7 we present the effect of interactions of the type of temporary contract and female sex. These coefficients are jointly significant at the ten percent level and show that the direction of the effort effect for women runs counter to the effect estimated for men and thereby counter to H2: Female interns are significantly less likely to provide unpaid overtime work compared to male interns. Female seasonal and casual workers are significantly more likely to work overtime compared to their male colleagues. This weakly suggests that women respond less to career incentives than men.

A possible explanation may be that female workers accumulate less overtime in general because due to family obligations their time constraints are particularly binding (cf. Table 2). We investigated whether this affects the effort responses to temporary work by controlling for interactions with marital status and even an indicator of whether there are children to care for in the household.²⁷ These estimations did not yield statistically significant results and we cannot reject the hypothesis that in our sample the family background of women has no effect on their response to incentives.²⁸

Endogenous Selection into Temporary Contracts

A potentially important issue not addressed so far concerns the exogeneity of the temporary contract indicator itself. This problem was explicitly or implicitly ignored in prior studies of temporary workers (Jimeno and Toharia 1996, Booth et al. 2002b). It is possible

Gerfin and Lechner (2002) find that these programs are the "success story" among Swiss employment programs.

²⁷ The data does not allow us to guarantee that the women in our sample are the mother of the children but it is likely to be true in most cases.

²⁸ We also investigated whether women are on average more likely to end up in temporary employment than men with the same characteristics. If the selection mechanism works different for the two sexes this may affect our results. However, the sex indicator has no significant impact on the probability of being temporarily employed, neither overall nor for the different types of contracts when looked at separately.

that those who end up in temporary employment are not a random draw from the population and that this selection affects the estimates. Given the detailed controls for human capital and job characteristics in our model it is unlikely that a selection based on *observable* characteristics causes a bias in our estimation.

However, the results may be biased if *unobservable* factors determine the selection into temporary contracts and if these are correlated with our dependent variable. On the one hand temporary employees might be a "negative" selection of workers with lower ability or motivation, accepting the wage penalty connected to this type of employment. In that case we would expect a weaker effort response to contract-based incentives compared to an average worker, and our estimates would provide an underestimate of the true effort response.

Alternatively one might argue that temporarily employed workers are a "positive" selection of workers with below average risk-aversion, who accept temporary wage penalties and the challenge of active screening (e.g. as trainees) to qualify for better positions and in expectation of later rewards. In this case our estimates would exaggerate the true effect.

If unobserved characteristics cause selection into temporary employment, the panel nature of our data helps to investigate their impacts: If temporary workers as a group differ systematically from permanent employees there should be a noticeable difference in behavior of those temporary workers who just became permanent compared to those who were permanently employed throughout. We investigate this hypothesis by adding an indicator to the baseline model of Table 4 which describes whether a person who is currently permanently employed was a temporary employee in the preceding period.

The results are presented in Table 8 (column 1). The overall temporary contract coefficient is hardly affected by the additional control and the lagged indicator of prior temporary employment status has an insignificant positive coefficient. Thus once previously temporarily employed workers are on a permanent contract their effort does not differ

significantly from that provided by other permanently employed workers. This provides evidence against endogenous selection into temporary employment.

One could alternatively argue that high effort among temporary workers is driven by a group of "positively selected" high performers. The results in Table 8(1) yield that those who later work on permanent jobs still provide (insignificantly) more effort than other permanent employees. To investigate the relevance of potential "positive selection" for our results we additionally compare the effort of temporary workers who do and do not reach permanent jobs in the next period. We expect that the latter would be a less "positively selected" group, for whom – if selection is important – the effort response to temporary contracts should be lower. The results in column 2 of Table 8 show highly significant positive coefficients even for those temporary workers who are not moving up to permanent jobs in the next period. Given that the estimated effect is even larger for those who are not moving up than for the "high achievers" who are subsequently employed permanently, this provides further evidence against the suggestion of endogenous selection into temporary employment.

We performed two additional tests for the endogeneity of temporary employment. First, to investigate the potential biasing impact of considering an endogenous "temporary work" indicator on the other coefficients in our model, we reestimated model 1 in Table 4 excluding the temporary contract variable. The marginal effects of the other variables remained largely unchanged, which is unlikely to occur if temporary work were endogenous. Second, the problem could in principle be addressed by using a fixed effects regression. However, the fixed effects logit estimator involves the loss of a sizeable number of observations, in our case 27,141 of 33,945 observations. With the fixed effects estimator we again obtain a positive coefficient on the "temporary work" indicator. This positive effect – even though imprecisely estimated – again supports the conclusion that the positive correlation between "temporary work" and worker effort is not due to endogeneity.

5. Summary

This study analyzes the behavioral correlates of temporary versus fixed term contracts based on six waves of data from the Swiss Labor Force Survey. The results suggest that temporary workers provide significantly more effort: They have a 60 percent higher probability of working unpaid overtime than employees with permanent contracts. Among the temporarily employed effort differs depending on the type of contract: Those in positions with potential for "upward mobility" are significantly more likely to supply high levels of effort.

Interestingly, there was no measurable effect of temporary employment on absenteeism, an indicator typically applied in this literature. We interpret this result in combination with international evidence as indicative of a low overall level of opportunistic absences in Switzerland, which may well be related to the low level of employment protection in this country. In consequence, temporary employees may not be able to signal their characteristics to the employer by low absence rates.

A comparison between males and females yields no significant differences in their overall responses to contract-based incentives in Switzerland. There are only weak indicators for a stronger response of males to such incentives. This similarity of the incentive response of the two sexes would be interesting to examine with different data and for other countries, as it deviates from the findings for the United Kingdom (Booth et al. 2002b).

Our results support the predictions of an incentive-based model of employee signaling behavior in situations of asymmetric information. This can be interpreted either as a behavioral response of those on permanent contracts to the benefits provided by their position, or as its mirror image, the response of temporary workers to the lack of such benefits and their incentive to obtain them.

The former interpretation stresses moral hazard in the behavior of permanent employees who may have reduced their effort levels. However, given the nature of our effort

indicator, i.e. unpaid overtime work, which describes not just the absence of shirking but the presence of effort above and beyond contractual requirements, the moral hazard interpretation is not convincing. Instead we prefer to emphasize the extra effort of temporary workers who invest in signaling activities. Such behavior - when observed among managers – is considered as an indicator of ‘career concerns’ which are "concerns about the effects of current performance on future compensation" (Gibbons and Murphy 1992, p.468). The career concerns concept appears appropriate for the situation of temporary employees whose future depends – just as in the case of managers – on being able to establish a reputation with current or potential future employers. In sum, our evidence supports the hypothesis that asymmetric information on employee characteristics provides effective incentives for temporary employees to invest in signaling behaviors.

References

- Barmby, Tim, Chris Orme and John Treble, 1991, Worker Absenteeism: An Analysis Using Microdata, *Economic Journal* 101(405), 214-229.
- Barmby, Tim A., Marco G. Ercolani, and John G. Treble, 2002, Sickness Absence: An International Comparison, *Economic Journal* 112(480), F315-F331.
- Barmby, Tim, 2002, Worker Absenteeism: A Discrete Hazard Model with Bivariate Heterogeneity, *Labour Economics* 9(4), 469-476.
- Blanchard, Olivier and Augustin Landier, 2002, The Perverse Effects of Partial Labour Market Reform: Fixed-Term Contracts in France, *Economic Journal* 112(480), F214-F244.
- Booth, Alison L., Juan J. Dolado, and Jeff Frank, 2002a, Introduction: Symposium on Temporary Work, *Economic Journal* 112(480), F181-F189.
- Booth, Alison L., Marco Francesconi and Jeff Frank, 2002b, Temporary Jobs: Stepping Stones or Dead Ends?, *Economic Journal* 112(480), F189-F213.
- Booth, Alison L., Marco Francesconi and Jeff Frank, 2002c, Labour as a Buffer: Do Temporary Workers Suffer? *IZA Discussion Paper* No. 673, IZA Bonn / Germany.
- Cahuc, Pierre and Fabien Postel-Vinay, 2002, Temporary Jobs, Employment Protection and Labor Market Performance, *Labour Economics* 9(1), 63-91.
- Dolado, Juan J., Carlos Garcia-Serrano, and Juan F. Jimeno, 2002, Drawing Lessons from the Boom of Temporary Jobs in Spain, *Economic Journal* 112(480), F270-F295.
- Gerfin, Michael and Michael Lechner, 2002, A Microeconomic Evaluation of the Active Labour Market Policy in Switzerland, *Economic Journal* 112(482), 854-893.
- Gibbons, Robert and Kevin J. Murphy, 1992, Optimal Incentive Contracts in the Presence of Career Concerns: Theory and Evidence, *Journal of Political Economy* 100(3), 468-505.
- Guadalupe, Maria, 2003, The Hidden Costs of Fixed Term Contracts: The Impact on Work Accidents, *Labour Economics* 10(3), 339-357.
- Hagen, Tobias, 2003, Do Fixed Term Contracts Increase the Long-Term Employment Opportunities of the Unemployed? *ZEW Discussion Paper* 03-49, ZEW Mannheim / Germany.
- Holmlund, Bertil and Donald Storrie, 2002, Temporary Work in Turbulent Times: The Swedish Experience, *Economic Journal* 112(480), F245-F269.

- Ichino, Andrea and Regina T. Riphahn, 2001, The Effect of Employment Protection on Worker Effort: A Comparison of Absenteeism During and After Probation, *IZA Discussion Paper* No. 385, IZA Bonn / Germany.
- Jimeno, Juan Francisco and Luis Toharia Cortés, 1996, Effort, Absenteeism, and Fixed Term Employment Contracts, *Revista Espanola de Economia* 13(1), 105-119.
- Johannson, Per and Mårten Palme, 1996, Do Economic Incentives Affect Work Absence? Empirical Evidence Using Swedish Micro Data, *Journal of Public Economics* 59(2), 195-218.
- Johannson, Per and Mårten Palme, 2002, Assessing the Effect of Public Policy on Worker Absenteeism, *Journal of Human Resources* 37(2), 381-409.
- Lazear, Edward P. and Sherwin Rosen, 1990, Male-Female Wage Differentials in Job Ladders, *Journal of Labor Economics* 8(1, pt.2), S106-S123.
- Morris, Michael and Alexander Vekker, 2001, An Alternative Look at Temporary Workers, Their Choices, and the Growth in Temporary Employment, *Journal of Labor Research* 22(2), 373-390.
- Nagin, Daniel S., James B. Rebitzer, Seth Sanders, and Lowell J. Taylor, 2002, Monitoring, Motivation, and Management: The Determinants of Opportunistic Behavior in a Field Experiment, *American Economic Review* 92(4), 850-873.
- OECD (Organisation for Economic Co-operation and Development), 1999, *Employment Outlook*, Paris.
- OECD (Organisation for Economic Co-operation and Development), 2002, *Employment Outlook*, Paris.
- Rehbinder, Manfred, 2002, *Schweizerisches Arbeitsrecht*, 15. ed., Stämpfli Verlag AG Bern.
- Riphahn, Regina T. and Anja Thalmaier, 2001, Behavioral Effects of Probation Periods: An Analysis of Worker Absenteeism, *Jahrbücher für Nationalökonomie und Statistik* 221(2), 179-201.
- Segal Lewis M. and Daniel G. Sullivan, 1997, The Growth of Temporary Services Work, *Journal of Economic Perspectives* 11(2), 117-136.

Table 1: Worker Characteristics by Type of Contract (in percent of column total)

	Permanent	Temporary
Sociodemographic Characteristics		
Agegroup 16-25	9.63	27.66
Agegroup 26-40	47.54	46.48
Agegroup 41-65	42.83	25.85
Female	30.48	42.33
Married	49.70	31.75
Foreigner	16.15	22.37
Health Problems	1.35	1.21
Education None or basic	12.17	15.00
Education Medium	55.79	37.31
Education Advanced School	5.75	13.26
Education Adv. Vocational Training	17.13	7.57
Education Academic	9.15	26.86
Employment Characteristics		
Regular weekly working hours	41.81	42.39
Average weekly paid overtime hours (last calendar year)	2.42	1.84
Average weekly unpaid overtime hours (last calendar year)	5.85	6.76
Firmsize 1-11 employees	28.57	29.81
Firmsize 20-99 employees	29.41	24.45
Firmsize > 99 employees	40.30	39.99
Firmsize - Missing information	1.71	5.76
Tenure < 5 years	40.12	78.83
Tenure 5-15 years	36.40	12.32
Tenure > 15 years	23.49	8.84
Number of observations	32,452	1,493

Table 2: Unpaid Overtime Work and Absenteeism by Type of Contract and Sex (in percent)

	Contract		Type of Temporary Contract				
	Perma- nent	Tem- porary	Seasonal & Casual	Public Program	Internship	Advanced	Missing Information
A. Probability of Providing Unpaid Overtime Work (in percent)							
All	20.62	27.66	17.62	8.99	22.33	32.71	32.43
Males	21.94	30.43	14.52	7.02	32.22	35.90	34.09
Females	17.62	23.89	22.09	12.50	15.20	27.86	30.00
B. Probability of Absence in the Week Prior to the Survey (in percent)							
All	1.15	0.80	0.95	2.25	0.47	0.55	2.70
Males	1.06	0.58	0.81	1.75	0.00	0.55	0.00
Females	1.35	1.11	1.16	3.13	0.80	0.56	6.67
Number of observations	32,452	1,493	210	89	215	905	74

Table 3: Descriptive Statistics of Explanatory Variables

Variable	Male		Female	
	Mean	Std.Dev.	Mean	St.Dev.
Key Explanatory Variables				
Temporary Contract (0/1)	0.037	0.188	0.060	0.238
Temp. Contract Seasonal & Casual (0/1)	0.005	0.073	0.008	0.090
Temp. Contract Public Program (0/1)	0.002	0.049	0.003	0.055
Temp. Contract Internship (0/1)	0.004	0.062	0.012	0.108
Temp. Contract Advanced (0/1)	0.023	0.151	0.034	0.181
Temp. Contract - Missing information (0/1)	0.002	0.043	0.003	0.053
Sociodemographic Characteristics				
Age in years	40.211	10.862	36.930	11.471
Agegroup 16-25 (0/1)	0.073	0.260	0.174	0.379
Agegroup 26-40 (0/1)	0.479	0.450	0.467	0.499
Agegroup 41-65 (0/1)	0.448	0.497	0.359	0.480
Married (0/1)	0.597	0.491	0.250	0.433
Foreigner (0/1)	0.163	0.369	0.167	0.373
Health Problems ¹⁾ (0/1)	0.014	0.117	0.012	0.111
Education None or basic (0/1)	0.103	0.304	0.167	0.373
Education Medium (0/1)	0.536	0.499	0.580	0.494
Education Advanced School (0/1)	0.043	0.203	0.100	0.301
Education Adv. Vocational Training (0/1)	0.207	0.405	0.077	0.267
Education Academic (0/1)	0.110	0.314	0.074	0.262
Employment Characteristics				
Firmsize 1-11 (0/1)	0.272	0.445	0.318	0.466
Firmsize 20-99 (0/1)	0.304	0.460	0.265	0.442
Firmsize >99(0/1)	0.411	0.492	0.384	0.486
Firmsize - Missing information (0/1)	0.013	0.113	0.032	0.177
Tenure (in years)	10.495	9.715	7.552	7.849
Tenure < 5 years (0/1)	0.379	0.485	0.507	0.500
Tenure 5-15 years (0/1)	0.361	0.480	0.337	0.473
Tenure >15 years (0/1)	0.261	0.439	0.157	0.363
Number of observations	23,423		10,522	

Note: ¹⁾ Descriptive statistics are calculated based on non-missing indicators only. The missing values for the first three surveys, when the question was not asked, were set to zero.

Table 4: Probit Estimates of the Determinants of Effort Choice

	Unpaid Overtime Work		Absence	
	Coeff.	St.Err.	Coeff.	St.Err.
Temporary Contract	0.241	0.065 ***	-0.132	0.114
Sociodemographic Characteristics				
Agegroup 26-40	0.008	0.056	0.051	0.079
Agegroup 41-65	0.320	0.063 ***	0.246	0.083 ***
Female	-0.285	0.042 ***	0.167	0.053 ***
Married	0.186	0.036 ***	0.044	0.047
Education Medium	0.291	0.063 ***	-0.182	0.054 ***
Education Advanced School	1.049	0.086 ***	-0.284	0.112 **
Education Adv. Vocational Training	0.984	0.072 ***	-0.361	0.081 ***
Education Academic	1.538	0.080 ***	-0.595	0.130 ***
Health Problems	-0.231	0.131 *	1.058	0.082 ***
Foreigner	-0.298	0.050 ***	0.164	0.051 ***
Employment Characteristics				
Tenure (in years/10)	-0.016	0.044	-0.068	0.060
Tenure ² (in years ² /100)	2.326	1.249 *	1.301	1.647
Firmsize 20-99 employees	-0.144	0.038 ***	0.035	0.053
Firmsize >99 employees	-0.328	0.039 ***	-0.007	0.055
Firmsize Missing information	-0.150	0.105	0.109	0.128
Fixed Effect Controls				
Occupation dummies	Yes	- ***	Yes	- ***
Industry dummies	Yes	- ***	Yes	- **
Yearly dummies	Yes	-	Yes	-
Rho	0.628	0.011 ***	-	-
Estimator	Random Effects Probit		Probit, robust St.Errors	
Log Likelihood	-13,427.2		-1,926.7	
Predicted Effect of Temp. Contract	60.49		-30.94	
Number of observations	33,945		33,945	

- Note: 1. ***, ** and * represent statistical significance at the 1, 5 and 10 percent level, respectively.
2. The predicted effect of holding a temporary employment contract reflects the ratio of the outcome probability when the temporary contract indicator is set to 1 relative to when it is set to 0, minus 1:

$$\left[\frac{\Pr(\text{Effort high} \mid x, \text{Temp} = 1)}{\Pr(\text{Effort high} \mid x, \text{Temp} = 0)} \right] - 1$$

3. The asterisks for the fixed effects controls indicate the joint significance of these measures.

Table 5: Robustness Tests of the Role of Contract Type for Unpaid Overtime Work: Coefficient Estimates in Random Effects Probit Estimates for Different Subsamples and Specifications

	Coeff.	St.Err.	Predicted Effect of Temporary Contract
1 Baseline results from Table 4			
Temporary Contract (N = 33,945)	0.241	0.065 ***	60.49
2 Subsample with tenure less than 1 year			
Temporary Contract (N = 4,683)	0.162	0.085 *	32.41
3 Subsample with tenure less than 3 years			
Temporary Contract (N = 10,42)	0.236	0.078 ***	54.03
4 Subsample with tenure more than 1 year			
Temporary Contract (N = 29,262)	0.306	0.090 ***	84.73
5 Sample as in Table 4, Model without occupation and industry controls			
Temporary Contract (N = 33,945)	0.197	0.067 ***	47.10

Note: 1. ***, ** and * represent statistical significance at the 1, 5 and 10 percent level, respectively.
2. All models control for the same set of covariates as in Table 4.

Table 6: Random Effects Probit Estimates of the Determinants of Unpaid Overtime Work: Heterogeneous Effects of Temporary Contracts

	Coeff.	St.Err.
Permanent Contract (Reference)	-	-
Temporary Contract Seasonal & Casual	0.212	0.176
Temporary Contract Public Program	-0.473	0.291
Temporary Contract Internship	0.160	0.162
Temporary Contract Advanced	0.296	0.078 ***
Temporary Contract - Missing information	0.487	0.241 **
Rho	0.627	0.011 ***
Estimator	Random Effects Probit	
Log Likelihood	-13,423.0	
P-Value for Test of Joint Sign. of Presented Coeff.	0.001	
Number of observations	33,945	

Note: 1. ***, ** and * represent statistical significance at the 1, 5 and 10 percent level, respectively.
2. The model controls for the same set of covariates as in Table 4.

Table 7: Random Effects Probit Estimates of the Determinants of Unpaid Overtime Work: Differences Across the Sexes

	(1)		(2)	
	Coeff.	St.Err.	Coeff.	St.Err.
Temporary Contract	0.278	0.083 ***	-	-
Female	-0.279	0.043 ***	-0.280	0.043 ***
Temporary Contract * Female	-0.092	0.128	-	-
Temporary Contract Seasonal & Casual	-	-	-0.076	0.250
Temporary Contract Public Program	-	-	-0.750	0.374 **
Temporary Contract Internship	-	-	0.492	0.228 **
Temporary Contract Advanced	-	-	0.360	0.098 ***
Temporary Contract - Missing information	-	-	0.483	0.312
Temporary Contract Seasonal & Casual * Female	-	-	0.607	0.354 *
Temporary Contract Public Program * Female	-	-	0.784	0.599
Temporary Contract Internship * Female	-	-	-0.664	0.323 **
Temporary Contract Advanced * Female	-	-	-0.167	0.158
Temporary Contract - Missing information * Female	-	-	0.007	0.491
Rho	0.628	0.011 ***	0.627	0.011 ***
Estimator	Random Effects Probit		Random Effects Probit	
Log Likelihood	-13,426.9		-13,417.9	
P-Value for Test of Joint Sign. of Interaction Effects	-		0.072	
Number of observations	33,945		33,945	

Note: 1. ***, ** and * represent statistical significance at the 1, 5 and 10 percent level, respectively.

2. The models control for the same set of regressors as in the specifications in Table 4.

Table 8: Random Effects Probit Estimates of the Determinants of Unpaid Overtime Work in Period t: Dynamic Effects of Temporary Contracts

	(1)		(2)	
	Coeff.	St.Err.	Coeff.	St.Err.
Reference: Permanent Contract in t-1 and in t	-	-	-	-
Temporary Contract in t	0.215	0.112 *	-	-
Permanent Contract in t and Temporary Contract in t-1	0.127	0.123	-	-
Reference: Permanent Contract in t	-	-	-	-
Temporary Contract in t and Temporary Contract in t+1	-	-	0.646	0.159 ***
Temporary Contract in t and Permanent Contract in t+1	-	-	0.255	0.199 *
Rho	0.667	0.014 ***	0.665	0.015 ***
Estimator	Random Effects		Random Effects	
Log Likelihood	-7,074.4		-7,085.2	
Number of Observations	18,037		18,037	

Note: 1. ***, ** and * represent statistical significance at the 1, 5 and 10 percent level, respectively.

2. The models control for the same set of regressors as in the specifications in Table 4.

3. Due to controls for lagged and lead variables the number of observations declined compared to prior estimations.