On the Wages of Temporary Help Service Workers in Germany

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Abstract

This paper produces first econometric estimates for Germany of the contemporanous wage gap associated with Temporary Help Service (THS) employment, as well as the long-term effects of THS work on the future earnings of workers. In addition, we present evidence showing that average male real earnings in the THS industry have declined by about 9% in the period 1975-1995. Our estimates of the overall and group-specific wage gaps attached to THS work are large, albeit significantly smaller than those cited in the existing descriptive literature. Moreover, we find no evidence for any discernable negative average long-term earnings effects of THS work. If anything, THS work seems to have aided workers in putting to a halt declines in their relative earnings observable before joining the THS market.

Keywords: temporary help services, wage differential, long-term earnings
JEL Classification: J30, J31, J40

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1 Introduction

Growing at an average annual rate of more than 13% since 1973, temporary help service (THS) employment has been one of the fastest growing employment forms in Germany over the last three decades. Despite widespread economic stagnation and general labor market slackness, its pace of expansion even accelerated in the 1990s. Far from having tapped its full potential, forecasts (CIETT, 2000) predict undiminished growth of the THS industry in the first decade of the new millenium. Although the THS sector is still minute, accounting for just above 1% of dependent employment, it is far from being a negligible source of labor turnover and net employment growth in the economy. Roughly three quarters of a million of workers are engaged in the THS sector within a given year, more than twice its employment stock on a given day. In addition, more than one hundred and seventy thousand jobs have been created in the industry in 1995-2000 alone, a period in which employment that is subject to social insurance contribution fell by almost twice this figure in the economy at large. In the year 2000, almost 6% of all newly formed employment relationships of the latter type were THS jobs.[1] On a number of measures, therefore, THS work constitutes one of the most dynamic segments of the German labor market. This trend growth is discernable in most OECD countries. Since 1992, THS employment at least doubled in all member states of the European Union. At the same time, the industry has been deregulated lifting restrictive measures circumscribing its operation. In some European countries, in fact, this submarket has been legalized for the first time (Sweden in 1991, Spain in 1994, Italy in 1998, Norway in 1999).[2] In Germany, the Hartz Commission set-up by the government to develop policy strategies to battle unemployment has put the creation of public THS firms attached to regional employment offices centerpiece in its recently publicized catalogue of recommendations.

However, concern has been raised about the quality of jobs generated in the industry, predominantly about wages paid, but also about the long-term effects of THS work experience on workers´ future employment and earnings prospects (ISA, 2001; German Parliament, 2000). Empirical evidence on relative remuneration levels in the THS sector in Germany hardly exists. Moreover, that which does exist is rather descriptive in nature than based on econometric analysis. Our knowledge of the long-term effects of THS work on the future earnings of workers is even more limited. For Germany, evidence on this issue is non-existent. This analysis will aim to rectify these deficiencies by providing empirical evidence on the earnings of THS workers, how they evolved over time, how they compare to wages paid outside this industry, and how subsequent long-term earnings of workers are affected by a previous spell in THS employment.

[1] According to Houseman, Kalleberg, and Erickcek (2001), the growth in THS employment accounted for 10% of net employment growth in the US in the 1990s.

[2] For an overview on the European THS industry, as well as the national regulatory frameworks governing its operation, see, for example, Storrie (2002), CIETT (2000), or Bronstein (1991).

We proceed as follows. Section 2 introduces the THS market in greater detail and surveys arguments from economic theory that can be brought to bear on the issue of remuneration. Section 3 reviews the existing literature, and Section 4 describes the data. Section 5 and Section 6 contain the core of the empirical analysis. The former documents how THS wages have evolved as employment in the industry increased rapidly over the last decades. The latter contains an econometric analysis of average and group-specific wage gaps, as well as of the long-run effects of THS work on the earnings of individuals. Section 7 discusses the main findings and concludes.

2 Theoretical Considerations

The THS market is "a triangular arrangement in which a temporary work agency (TWA) hires a worker for the purpose of placing him or her at the disposal of a third party, the user enterprise, for a temporary assignment" (Bronstein, 1991). These "transaction facilitators" (Smith, 1971) therefore act as labor market intermediaries between final labor supply and demand. In most countries, the THS firm is the legal (de jure) employer of the THS worker[3], and placements occur on the basis of a commercial contract between THS and client firm that can be terminated both swiftly and at no cost to the client. This triangularity and the frequent change of work sites constitute the core features characterizing THS employment and set it apart from other forms of flexible labor such as employee leasing, fixed-term contract, casual, or on-call workers.

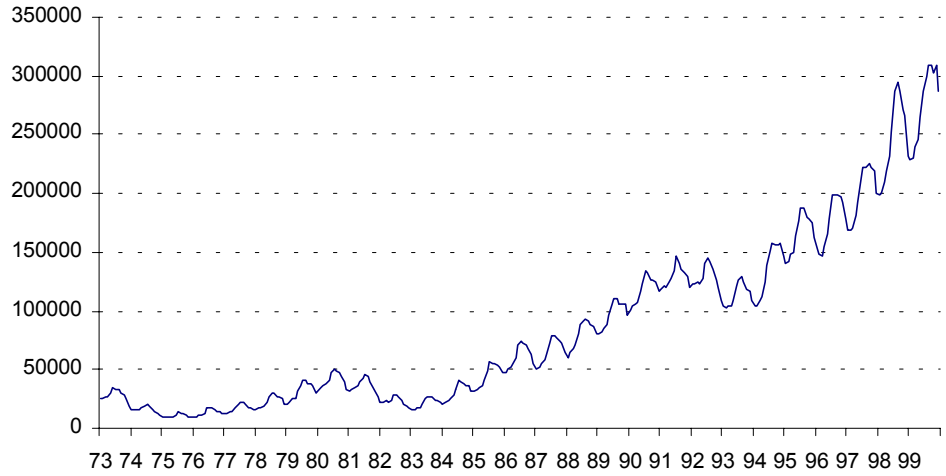
Proponents of this industry point to the benefits it bestowes on the final suppliers and demanders of labor, workers and client firms. For the client, this submarket reinstitutionalises spot-market type (Ono, 2000), market-mediated fast access to labor services freed from otherwise applicable institutional constraints, such as collective bargaining, firing costs, and the like. Client firms therefore benefit from increased numerical flexibility in their staffing policies. THS workers, in turn, are frequently recruited among the un- or nonemployed and are thus given access to paid work (entry-level jobs), otherwise often denied to them on the general labor market (CIETT, 2000). Moreover, THS work can be a step-stone to regular employment (Houseman, Kalleberg, and Erickcek, 2001) by providing both work experience and multiple contacts with potential employers through successive placements. While workers can thus signal their ability to potential future employers, clients can likewise screen THS workers during assignments for direct employment. The magnitudes of these ´access-to-work´ and ´step-stone´ functions of THS employment, however, are still insufficiently explored.[4]

[3] So, for example, in Germany, Spain, the Netherlands, France and to a lesser extent the UK, which together account for over 90% of THS workers assigned in the EU on a given day (CIETT, 2000). In the US, the legal situation is somewhat ambiguous on this count, but as Segal and Sullivan (1997) note, in the majority of cases the agency is in fact the legal employer.

[4] For Germany, Almus et al (2000) study the step-stone function of non-profit temping in Rhineland Paletine, and first results for commercial THS firms are presented in Schröder (1996). A paper investigating these two functions,

Opponents of this industry, on the other hand, stress the instability of employment relationships and the lack of career advancement opportunities in the THS industry. In fact, most employment relationships in the THS sector last less than a year. As can be seen in Figure 1, THS placements are markedly procyclical and display high seasonal fluctuations, with the latter in fact being only second in magnitude to those observed in agriculture (Storrie, 2002). Thus not only are current earnings of THS workers claimed to fall short of those obtained outside the industry, but future earnings of THS workers are seen to be adversely affected too.

Figure 1: Monthly stock of THS Placements, 1973-1999



Source: German Parliament, various years. Pre-1992, West Germany only.

Theoretically, however, it is far from clear that THS workers should in fact experience a contemporaneous or future wage discount at all. According to the theory of compensating differentials (see, for example, Rosen 1986), part of remuneration also comprises compensation for undesirable job characteristics. If THS work entails a disproportionate accumulation of such negative attributes, workers should be compensated for them in the form of a relative wage markup. Employment spells in the THS industry are in general of short duration, as pointed out above, and thus bear a greater risk of unemployment for the worker. This job instability, in turn, implies less intra-firm career advancement opportunities and training. All of these features would demand a compensating wage differential.

Lack of union coverage, high labor turnover, and the prevalence of general skills in the THS industry, however, may prevent the formation of ´insiders´ that, endowed with sufficient bargaininig

as well as, hitherto neglected, potential long-term effects of THS work on employment paths of individuals is work in progress by one of the authors.

power, would ensure payment of these compensating differentials. Moreover, if THS work fulfills an ´access-to-work´ or ´step-stone´ function, then workers can be expected to implicitly ´pay´for these positive attributes in the form of a contemporaneous wage discount. As the fruits of this investment, i.e. improved future employment and wage prospects, accrue largely to the worker only, she and not the agency, according to human capital theory (Becker, 1964), is expected to bear the associated costs[5].

The preceding discussion also entails implications for long-term earnings based on human capital theory. If THS employment indeed shares features of an investment for the worker, then long-term earnings of former THS workers should benefit. If, on the other hand, insufficient on-the-job training or stigma effects dominate, future earnings should be adversely affected. In sum, a priori no clear-cut economic case can be made either about the likely sign of the wage differential attached to THS work, nor about the implications of THS work experience for long-term wage growth. Many conflicting arguments can be brought to bear on the issue, leaving undecided their likely net effect. Empirical analyis has to provide the answer.

3 Previous Research

The existing literature on relative wages in the THS sector is still sparse and inconclusive. Whereas the former deficiency largely derives from the lack of adequate data for statistical analysis (IWG, 1995; Storrie, 2002), reasons for the latter are more multi-faceted, as the following literature review will show. Evidence on the effect of THS work experience on the subsequent earnings of workers is even more limited. For Germany, it is lacking entirely. We will briefly review the main studies, their results and potential short-comings.

Rudolph and Schröder´s (1997) survey article on the German THS market, although only marginally touching the issue of relative compensation levels, constitutes the most valuable source of information for Germany on the subject to date. Using the employment statistics of the federal employment office (Bundesanstalt für Arbeit), the authors compare average earnings of THS and non-THS workers for the restricted sample of full-employed, male, West German workers, aged 25-35 for the years 1980, 1990 and 1995 and different occupations (high- and low qualified blue- and white-collar workers). They find that the overall wage gap associated with THS work has risen from -22.6% in 1980 to -36.6% in 1995. Moreover, the occupation-specific wage gap is larger for low-skilled than high-skilled workers. In a recent study (ISA, 2001) by the German Federal Union Association (DGB), new evidence by Rudolph is cited showing that this trend increase in the average wage gap has persisted throughout 1998. These figures are also cited in the latest

[5] Although ´takeover-fees´ are sometimes charged by agencies to clients who want to permanently hire a THS worker, their payment is hardly enforceable.

quadrennial report of the German government on the industry (German Parliament, 2000). The magnitudes of these unconditional wage gaps are roughly in line with those reported in Storrie (2002) and those found in a survey conducted by the Institute of Economics and Society (IWG, 1995). Using the IABES 1975-1990, a one percent random sample of all workers registered by the social security system in Germany, Rudolph and Schröder (1997) also compare immediate pre- and post-THS earnings to those achieved while employed in the THS industry for all industry movers in 1980-1990. For 44.2% (73.6%) of workers, earnings improved when joining (leaving) the THS industry. Although these figures are uninformative with respect to the long-term earnings effects of having held a job in the THS industry, their magnitudes indicate that THS work experience might not necessarily lead to a deterioration of post-THS earnings at the individual level.

However, the German evidence cited above is merely descriptive in nature, referring to unconditional mean differences in earnings for all workers or broadly defined groups of workers. THS employment, in fact, differs systematically in its compositional structure from non-THS employment. In Germany, THS workers frequently exhibit an accumulation of attributes commonly associated with lower earnings per se (see Table 2). Failure to control for the employment histories, educational qualifications, or occupations of workers, as well as potential ability differences between THS and non-THS workers in a multivariate wage regression framework might therefore severely bias the estimates obtained.

That a more disaggregated analysis can lead to results quite different from those obtained through mere gross comparisons of average wage rates is evinced in a study by Cohen and Haberfeld (1993) who find occupation-specific wage differentials of differing sign and magnitude for the Israelian THS market. The authors run separate OLS wage regressions for four clerical occupations (typists, book-keepers, clerks and key-punch operators) in the early 1980s using two samples - one for THS workers drawn from a large THS firm in Israel, the other for full-time, non-THS workers drawn from a 20% sample of the 1983 Israeli Census. Whereas the hourly wage rates of typists and book-keepers on average exceeded those of non-THS workers in the same occupations by 15% and 9% respectively, those of clerks and key-punch operators in THS employment were 31% and 16% lower than the earnings of their non-THS counterparts. The average wage gap across all ocupations, however, amounted to 8%. Taken alone, the latter aggregate figure clearly does not carry much information on pay structures in the THS industry covering up important differences discernable at a more disaggregated level.

The importance to control for earnings-related attributes is also borne out in a study by Segal and Sullivan (1997) who use data on outgoing rotations of the Current Population Survey (CPS) from 1983-1993 to estimate the contemporaneous wage gap between THS and non-THS workers

in the US. In their preferred regression specification, the authors run a panel wage regression with individual fixed effects controlling for a host of earnings-related attributes like age, race, sex, education, union status, and one-digit occupation. The unconditional average wage gap for all collars can thus be reduced from -21.8% in a pooled OLS regression to a mere -3.1% in the fixed-effect panel regression. Occupation-specific differentials previously in the two-digits all fall below -6%. The estimated wage gap for white collar workers, though negative, is insignificant at the 10% level. However, the data used suffers from severe drawbacks that call into question the reliability of their findings, as the authors themselves acknowledge in later work on the subject.[6]

In light of these data problems, the authors in a new study (Segal and Sullivan, 1998) take recourse to a different data set, a 10% sample of the quarterly wage records from the adminstrative files of the unemployment insurance system of the State of Washington covering the years 1984 to 1994. Compared to the survey-based CPS data used previously, this data set neither suffers from misreported industry affiliation of THS workers, nor severe contamination of SIC 7363 with workers employed in PEOs (only about 3% in 1992). Lacking any demographic and occupational data, the authors use a regression framework frequently applied in the displacement literature (see, for example, Jacobson et al, 1993), controlling for both individual fixed effects and time trends, as well as allowing for THS effects in periods before and after the actual THS employment spell. The latter is accomplished by the inclusion of a series of dummy variables representing the number of quarters the current observation is apart from the THS employment spell.[7] Unlike all other studies hitherto considered, this analysis therefore also examines the effect of THS work on the subsequent (post-THS employment) earnings of workers. The authors find a THS wage gap of 10%, comparing THS wages to wages immediately before and after THS work or to the wages of non-THS jobs begun during the same period as workers were in the THS industry. Moreover, immediate pre- and post-THS relative earnings are of the same magnitude (ca. -5%) and the estimated wage gap becomes statistically insignificant after 5 quarters (base category: continuing non-THS job). Thus THS workers, on average, experienced a temporary dip in their earnings prior to joining the THS industry, but did not seem to be adversely affected by their work experience in this sector. While the former finding underscores the importance to control for the previous labor market histories of THS workers, the latter result indicates that neither inadequate training, possible stigma effects

[6] THS workers frequently misreport their industry, leading to measurement error in the THS indicator. In addition, 25% of records could not be matched at all across years and were thus excluded from the analysis. Identification of THS work status is based on reported industry code SIC 7363 ("Help Supply Services"). But since 1987, SIC 7363 contains both THS and employee leasing firms, also known as professional employer organization (PEOs). These workers are typically long-term employees of the firms they are leased to and thus differ fundamentally from the group of THS workers. According to the 1992 Census of Services Industries about 23% of workers coded as working in SIC 7363 were in fact working in PEOs (Segal and Sullivan, 1998).

[7] These parameters, however, suffer from an identification problem due to the undifferentiated use of all available observations on workers over time in the regression analysis. For more details, and a solution to this problem, see Section 6.4.

attached to THS work, nor lack of firm tenure, do seem adverse effects of sufficient quantitative importance to affect the long-term earnings of workers. However, lack of typical human capital controls in the wage regressions make it impossible to ascertain, how the differential varies across different groups (age, sex, education, etc.). The same missing data problem also cast a severe doubt on whether the problem of self-selection of workers into different (THS, non-THS) job types has been adequately dealt with. We will return to this issue of endogeneity in Section 6.1, where we discuss the identification strategy employed for our empirical model.

Taken as a whole, a number of tentative conclusions can be derived from this literature survey that will form a starting point for our empiricial analysis. First, the gross of the available evidence indicates that average earnings in the THS sector are inferior to average earnings outside this sector. Second, differences in the compositional structure of THS and non-THS employment seem to explain a large part of this wage gap. For Germany, however, regression estimates controlling for these differences are lacking, so that current estimates of the wage gap based on descriptive analyses alone are likely to be severely biased. Third, evidence on the long-term effects of THS work on the earnings of workers hardly exists. For Germany, in fact, it is simply non-existent. The available singular source (Segal and Sullivan, 1998) on this issue is based on US data whose results, however, might afterall shed little light on the functioning of the German THS market. As the legal framework governing the THS sector is far more restrictive in Germany than in the US, the usual qualifier beseting cross-country comparisons and transferability of results carries additional weight in the present context. We will adress both earnings dimensions in Section 6, where we provide empirical estimates of the contemporaneous wage gap attached to THS work, as well as the long-term effects of THS work on the earnings of workers formerly employed in this sector. Finally, surprisingly little attention has been devoted to how wages in the THS sector have evolved over time, as the industry expanded rapidly over the last three decades. This issue clearly deserves greater attention. We therefore start the empirical part of this paper in Section 5 with an analysis of relative and absolute wage trends in the THS industry.

4 The Data

The analysis is based on the IAB Employment Subsample (IABES) 1975-1995, a 1% random sample of all employees registered by the social security system in Germany over this period (see Bender et al. (2000) for a detailed description of the dataset). Employment information is based on statutory notifications by employers on their workforce to the institutions of the social security system. A notification is required for the start and termination of an employment relationship, and hence any inter-establishment change. In addition, annual stock-taking notifications at the end of the year

update information on continuing employment. These statutory notifications are supplemented with additional information on the establishments issuing these notifications and unemployment periods that involve benefit payments. Exact daily flow information on the employment and unemployment history of more than half a million persons result in a total of nearly 8 million observations for the 21 years covered in the IABES. Large sample sizes are a desirable feature given the small share of the THS workforce in total employment. Moreover, typical problems beseting longitudinal surveys data, such as panel mortality due to non-responses, or memory gaps in restrospective questions are not encountered (Bender et al. 2000). The longitudial dataset contains a host of worker, job, and firm attributes that make it well suited for the current analysis. To exploit the longitudinal structure of the dataset for our statistical analysis, we construct an annual panel (sampling date: 30th of June) from this raw data to ensure that each and every sampling point in time corresponds to a unique notification.[8]

THS Indicator: The IABES does not of itself allow identification of an employment spell in the THS industry. For reasons of data confidentiality, only two-digit industry identifiers are included in the public use file. A separate application for an identifying variable of THS employment spells (based on a restricted access to three-digit industry level information) was made and granted by the Federal Ministry of Labour and Social Affairs and supplied by the Institute for Employment Research (IAB) of the Federal Employment Service. However, THS workers cannot be differentiated from the permanent workforce of the THS firm, as both are reported as working in WZW865 ´Temporary Help Services´. But this short-coming is not too problematic, since permanent staff only constitutes a small fraction of total employment in THS firms (Rudolph and Schröder, 1997).[9] Furthermore, only those firms are listed as THS firms in the IABES that do exclusively engage in this business.[10]

Measure of Earnings: The measure of earnings used in the IABES is average gross daily earnings per employment notification. As the earnings information is based on notifications to the social security system, it is highly accurate. We express gross daily wages in prices of 1995 using an annual consumer price index. Although we only consider workers employed on the 30th of

[8] As information on continuing employment relationships is only updated with the annual stock-taking notification at the end of the calendar year, changes in time-varying attributes like wages, occupation, and the like are only recorded for these employment relationships once a year. We have chosen the annual sampling date of 30.6. to make our findings time-consistent with official statistics (ANÜSTAT) on the THS sector in Germany, sampled on the 30.6. and 31.12.

[9] According to a recent survey of the THS industry in Germany (Lünendonk, 2002), the share of adminstrative personnel in the total workforce of the ten largest THS firms in Germany amounted to less than 8% in 2001.

[10] In Germany firms must obtain a licence in order run temporary help services. Firms can be of two types. Firms solely providing these services (´Hauptzweck Arbeitnehmerüberlassung´), or mixed enterpises that do also engage in normal production (´Mischbetriebe´). Only the former type are listed under WZW865. These employ about 85% of the stock of THS workers (IW, 2000).

June in a given year, the wage information available are average daily gross earnings for the entire respective notification period. As the latter may last up to a year, the use of an annual, instead of a quarterly price index is the more appropriate choice.[11] Unfortunately, earnings information is both top-coded (censored), as well as truncated from below by design at the legal threshold for social security contributions. However, as less than 5% of observations per annum exhibit earnings that are top-coded, the former data defect is unlikely to be of major practical importance.[12] We also ignore the latter restriction by confining our analysis to the population of immediate interest, i.e. workers in actual full-time employment.

Due to the sampling design, civil servants and the self-employed are not included in the IABES. Omission of these two categories of workers, however, is not a severe shortcoming, as these are unlikely to constitute major alternative employment forms available to THS workers and thus a valid control group in our wage analysis. As the data set is based on obligatory notifications of employers about their workforce to the institutions of the social security system and the THS firm is the legal employer of the THS worker, the dataset contains no information on client firms.[13] As a consequence, there is no information on the industry a THS worker is assigned to in a given placement. As industry affiliation is regularly found to be an important determinant of wages, missing industry information for placements might lead to a bias in our analysis of the wage differential. Although the issue cannot be definitely resolved, there are reasons to believe that such an omission is not too crucial for the validity of our estimates. THS wages are set independently of individual placements[14], where the fee charged to the client firm in a given placement generally takes the form of a mark-up over these wages (Storrie, 2002). Most of the variation due to different industry assignments is therefore likely to show up in fees charged rather than in wages received by the THS worker. Moreover, from a conceptual point of view, it is much harder to argue for a direct link between industry assignment and THS wages, as industry affiliation of THS workers is two-dimensional (employment contract vs. work-site), one being time-constant, the other time-variant.

[11] We use the annual cost of living index for all private households in West Germany of the German Council of Economic Experts in their Annual Report 2001/2002.

[12] As a first robustness check, we ran our regressions both with and without those observations that are top-coded. The results, in fact, hardly differ.

[13] Note that all existing studies reviewed in Section 3 suffer from this drawback.

[14] Until recently, the durations of the employment contract of the worker with the THS firm, which sets out compensation levels, and the first assignment of the THS worker to a client were not allowed to coincide by law, the so-called synchronization ban, aimed to achieve employment stability for workers in the THS industry.

Sample Selection: We have further restricted the sample to individuals that (1) are currently neither engaged in an apprenticeship, internship, nor do voluntary service, part-time or telework,[15] (2) do not have any missings recorded in any of the variables used in the regression analysis, and (3) are working at establishments in West Germany, as the number of observations on THS workers in East Germany is too small for statistical analysis. In total, we can identify about five thousand THS workers. In addition, and to ease the computational burden, we have drawn a 1% random sample of non-THS workers. A list of the variables used in the regression analysis can be found in Appendix 1.

5 Wage Trends in the THS Sector

In a first step, we document how average earnings in the THS sector have evolved over time relative to average earnings in the labor market at large. For this purpose, we run the following simple regression

$$y_{it} = \beta_0 + \sum_{s=1}^{20} \beta_t^s + \sum_{s=1}^{21} \gamma_t^s D_{it}^s + \varepsilon_{it} \quad , t = 1975, ..., 1995. \tag{1}$$

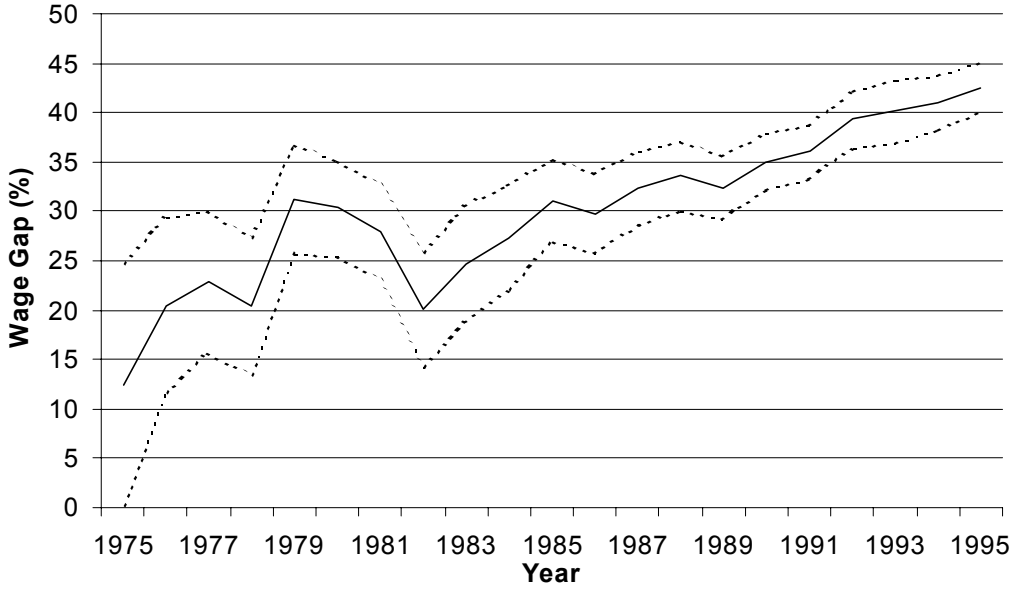
The y_{it} denote the log of real daily gross earnings of worker i in year t. The β_t^s are a set of year dummies that control for trend growth in wages, as well as cyclical patterns in aggregate wage dynamics. The D_{it}^s are annual differential intercept dummies for THS work, so that their coefficients, γ_t^s, capture the potentially time-variant impact of THS work on wages in year t. The ε_{it} are error terms with the usual ideal properties. Except for the year dummies, this model is equivalent to a cross-sectional difference in mean wages between THS workers and non-THS workers. The estimated annual percentage wage gap for full-time male THS workers in West-Germany for the years 1975-1995 is plotted in Figure 2.[16]

Covering two full business cycles, Figure 2 provides first, if yet preliminary information on the trend and cyclical properties of relative remuneration levels. First, for every year sampled, average male wages in the THS industry are inferior to average wages outside this sector. Moreover, the average male wage gap exhibits a marked upward trend over the 21 year time span, rising from just above 10% in 1975 to nearly 40% in 1995.

[15] In 1975-1995, workers in these positions account for only about 2% of THS employment, compared to 15% of employment outside the THS sector (see also Table A2 in Appendix 1).

[16] As the number of observations for female THS workers in the 1970s is quite small, we only report the result for male workers. The female wage gap, although throughout smaller than the male wage gap, displays the same trend and cyclical properties. However, its decline in the early 1980s seems to somewhat lead the cycle. As can be seen in Table 2, men constitute roughly four-fifths of all THS workers.

Figure 2: Average Wage Gap (%) for Male THS Workers, 1975-1995



Source: IABES 1975-1995. - - - denote 95% confidence interval.

Second, a marked anticyclical pattern is discernable in the first, but not in in the second half of the time period under consideration. Output and the wage gap both peaked around 1980 and reached a trough in 1982, a pattern that is not discernable in the subsequent business cycle. The magnitude of the drop in the wage gap from 1981 to 1982 might also owe to the legislative changes coming into force in early 1982 that banned THS placements in the construction sector, which hitherto constituted a significant fraction of total THS placements. Dragendorf, Heering and John (1988) attribute roughly one-third of the decline in the stock of THS employment over this period to this ban. Our own calculations based on the IABES indicate that average earnings of male THS workers holding jobs typically found in the construction sector were indeed about 19% lower than average earnings in the THS sector in 1981. The ban which came into force in early 1982 thus seems to account for a large fraction of the significant, yet temporary reduction in the wage gap observed at the time.

To gain a more differentiated view, we separately examine average real wage growth of men in THS and non-THS employment. Table 1 reports average annual growth rates in real earnings for both groups in 1975-1995 and in the sub-periods 1975-1984 and 1985-1995. Also included are the standard deviations of annual growth rates in these periods.

Table 1: Average Growth Rates p.a. in Male Gross Daily Real Earnings

Years	1975-1995	1975-1984	1985-1995
Mean growth rate (%):			
THS	-0.4	-0.5	-0.1
non-THS	1.5	1.5	1.5
Standard Deviation:			
THS	4.2	1.8	1.0
non-THS	1.4	0.3	0.2

Source: IABES 1975-1995.

The findings reported in Table 1 are astonishing indeed. Whereas mean real wages of male non-THS workers have grown at an average annual rate of 1.5 %, the respective figure for male THS workers is -0.4%. In other words, male THS workers have on average suffered a *real loss in earnings* of nearly 9 % over the 21 year period under consideration. The widening of the wage gap documented in Figure 2 therefore is driven by a significant decline in average real earnings in the THS sector. This decline is more marked in the first, than the second subperiod, the former representing the early phase of growth and consolidation of the industry since its legal introduction in 1972.

Table 1 also provides information on the relative variability of wages, as measured by the standard deviation of annual growth rates. THS wages are far more flexible according to this measure in all periods considered. On the one hand, this finding is to be expected. Contrary to the economy at large, THS wages are generally not collectively bargained. Nominal wage rigidities induced by annual wage settlements are therefore largely absent in this sector. Moreover, high turnover in the THS sector facilitates wage flexibility, as remuneration in new contracts can be more easily adjusted in accordance with changing economic conditions. On the other hand, however, this greater real wage flexibility is surprising, as THS employment is also far more volatile than non-THS employment. THS employment, as measured by workers currently in a placement, shows significant year to year and seasonal changes often exceeding 30%. The THS sector therefore markedly outscores the general labor market on *both* adjustment margins: the price *and* quantity of labor.

One cannot but note the similarity of the German THS industry with the US labor market on this count. The latter, governend by largely unfettered employment at will and a low degree of unionization, produces both numerical flexibility in the staffing policies of firms and real wage flexibility. The difference is that the THS industry in Germany constitutes a submarket imbedded in a general labor market beset with various institutional constraints circumscribing managerial prerogative in workforce matters. This comparative advantage of THS work might be a driving

force behind the rapid expansion of this industry, a hypothesis that has received empiricial support for the US (Autor, 2000). The link between this expansion and the real decline in average industry earnings documented above, however, is unclear, as demand of client firms for THS services depends on the fee charged by the agency and not in any direct way on the wage paid by the latter to the worker.

A multitude of factors could drive this increasing wedge in remuneration levels. First, growth in the supply of labor to THS firms might have outstripped growth in the labor demand of THS agencies, leading to excess supply of labor on the market which in turn caused wages to decline. However, casual evidence suggests that agencies find it hard to recruit workers to meet the demand for their services and employment growth in the industry has been exorbitant. If anything, therefore, excess demand should have been the norm and competition among agencies for workers should have driven up wages in the industry. However, our time series evidence on wage trends does not conform with this prediction. Second, changes in the profile of job placements over time could have biased the compositional structure of THS employment towards lower-skilled workers. If this specialization of the THS industry on the low wage sector occured against an opposing trend in the economy at large, we would naturally expect the unconditional wage gap to widen. Third, the occupational wage distribution might have altered, adversely affecting traditional skills provided in the THS industry. Fourth, competitive pressures among a sharply rising number of agencies in the expanding THS market might have led to severe price competition in fees charged, which in turn forced agencies to cut operating costs. As a labor intensive industry, this foremost implies reductions in the wage bill. With low barries to entry, signficiant growth in the number of agencies operating on the market, and continuing low levels of market concentration, such an explanation is quite plausible. To asses this hypothesis empirically would require time series data on fees charged, which, however, are not available. First evidence for the validity of this argument is provided by Barkume (1996) for the American THS market in the 1980s. Increased competition among agencies in this period of rapid employment growth in the industry has led to a decline in their gross margins, which in turn has spurred the demand for THS services by client firms. The study, however, does not comment about the implications of its findings for wages paid in the industry.

Descriptive evidence in support of the second hypothesis can be found in Table 2, which documents the compositional structure and trend changes therein of both THS and non-THS employment for various years. First, the THS workforce is on average younger and comprises relatively more male and foreign workers than the non-THS workforce.[17] Second, the share of low- and high-

[17] Note that women and foreigners have been excluded from the regression, and therefore cannot account for the increasing wage differential documented in Figure 2.

skilled blue collar workers is much lower in THS than in non-THS empoyment, and the share of white collar workers significantly smaller. THS services thus remain geared to the industrial sector of the economy. Third, THS workers are more frequently recruited among the unemployed, even the long-term unemployed on both definitions used (>1/2 year or > 1 year). Fourth, THS employment exhibits relatively more workers of the lowest, and less of the highest educational/vocational attainment. These structural differences apply to all years considered (except for recruitment among the previously long-term unemployed (> 1 year) for 1980, which is about zero for both groups).

Table 2: Compositional Structure of non-THS and THS Male Employment

Year	**1980**		**1985**		**1990**		**1995**	
Sample Characteristics (non-THS=1, THS=2)	**(1)**	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**
Background Characteristics:								
Average Age	39	**31**	39	**30**	38	**32**	39	**34**
Foreign (%) - whole sample	10	**15**	8	**11**	8	**19**	9	**22**
Women (%) - whole sample	33	**27**	33	**23**	33	**23**	33	**21**
Current Employment Characteristics (%):								
low-skilled blue collar	24	**33**	24	**31**	24	**36**	23	**36**
skilled blue collar	42	**57**	42	**62**	41	**52**	39	**52**
high-skilled blue collar	4	**0**	3	**0**	3	**0**	3	**1**
white collar	31	**10**	30	**7**	31	**12**	35	**12**
Previous Employment History (%):								
Unemployed	7	**18**	17	**50**	20	**37**	22	**47**
Unemployed > 1/2 year	1	**2**	5	**18**	6	**14**	7	**17**
Unemployed > 1 year	0	**0**	2	**7**	3	**8**	4	**9**
nonemployed >1/2 year	3	**14**	4	**14**	5	**11**	6	**9**
nonemployed >1 year (%)	2	**7**	3	**10**	4	**7**	5	**7**
Education & Vocational Training (VT) (%):								
lower secondary degree, no VT	22	**28**	20	**25**	17	**25**	14	**26**
lower secondary degree, VT	74	**69**	75	**72**	76	**69**	76	**70**
higher secondary degree	0	**2**	0	**1**	1	**2**	1	**0**
higher secondary degree, VT	1	**1**	1	**1**	2	**2**	3	**2**
polytechnic degree	2	**0**	2	**1**	3	**2**	3	**1**
university degree	1	**1**	2	**0**	2	**0**	3	**1**

Source: IABES 1975-1995.

Moreover, in crucial respects these relative differences have widened over time. The share of unskilled blue-collar workers in total employment shows opposing trends, while the increase in previously long-term unemployed workers is more marked for the THS sector. The decline in the share of the lowest educational attainment group in non-THS employment, on the other hand, is far more dramatic than that in THS employment. Thus both persistent strutural differences in

employment composition and trends therein suggest a relative specialization of THS work on the low-skill sector. It remains to be determined, in how far these trend developments or the persistent structural differences identified account for the widening gap in remuneration levels documented in Figure 2. It could well be a mixture in both, in that the THS industry has increasingly recruited workers whose labor market prospects have relatively worsened over time. Wage flexibility on the THS market might have produced downward wage adjustment in light of excess supply of labor of this type.

6 The Effect of THS Work on Current and Long-Term Earnings

In this section we will go beyond the mere comparison of unconditional mean differences in earnings between THS and non-THS workers. Three main questions of interest have been identified in Section 3 that we now want to address. First, in how far do differences in the compositional structure account for the significiant unconditional earnings gap documented in the previous section. Second, how does the earnings differential vary across different groups. And finally, what long-term effects, if any, does THS employment have on the future earnings of workers.

6.1 Identification Strategy

The primary target of our empirical analysis is an estimate of the effect of THS employment on the wages of THS workers. This "treatment effect on the treated" requires to construct an estimae of THS workers´ earnings had they not entered THS work. Estimating these counterfactual earnings is complicated by the fact that non-THS workers may not be an appropriate comparison group since, unlike in social experiments, individuals are not randomly assigned to THS work. Rather, workers self-select into THS employment based on observable or unobservable characteristics that may be correlated with their (potential) earnings in and out of THS work.

Heckman et. al. (1999) comprehensively discuss the assumptions and data requirements unerlying the different approaches for constructing the counterfactual in this situation. Statistical matching, instrumental variables, switching regression and fixed effects panel estimators are the most prominent among a wide range of methods. We employ the fixed effects estimator throughout because it is well suited for our data and avoids some of the undesireable assumptions of its rivals. Unlike the matching appraoch, it allows for self-selection into THS work on the basis (of the time-invariant component) of the unobservables. It neither requires strong distributional assumptions, nor does it force the analyst to make the conceptually awkward distinction between covariates determining merely the selection into THS work, wages, or both. Moreover, while our

administrative data does not contain the wealth of demographic information needed to successfully apply matching algorithms, it does provide a fairly long panel of individuals´earnings and labor market status histories. The particular version of the linear panel data model employed below (and introduced by Jacobson et. al. (1993) in their analysis of the earnings losses of displaced workers) neatly summarizes this longitudinal information.

The ensuing analysis is confined to the period 1980-1990. Omitting the first years of the IABES should eliminate most of the downward bias introduced by left-censoring in duration variables employed in the regression analysis. In addition, our preferred regression specification for estimating both the conditional average wage gap as well as the long-term effects on earnings of THS work (see equation 2 below) requires sufficient pre- and post-THS observations (years) on individual workers for the indentification of parameters in the model. For this reason, we also exclude the years 1991-1995 from the analysis. To further comparability of results obtained from various regression specifications, we have omitted these years entirely.[18]

6.2 Conditional Average Current Wage Gap

In the previous section, we have seen that significant differences exist in the compositional structure of employment between the THS industry and the general economy. Frequently these differences entail an accumulation of attributes for THS workers commonly identified with lower earnings per se. As documented in Table 2, the THS workforce comprises relatively more younger, foreign, low-skilled blue collar, less educated, and previously unemployed workers than employment in the economy at large. Comparing mere unconditional differences in earnings therefore fails to disentangle the effect of THS work status from that of attributes merely associated with THS work. The existing literature for Germany, as pointed out in Section 3, suffers from just this drawback.

To control for the latter, we run separate pooled regressions for men and women for the years 1980-1990 of the log of gross real daily earnings on a set of year dummies, a host of earnings-related attributes commonly included in wage regressions and a THS dummy variable.[19] The estimated coefficient of the THS indicator therefore provides an estimate of the *conditional* mean difference in earnings between THS and non-THS workers over the period 1980-1990, as we control for differences in employment composition between these two groups. To control for unobserved heterogeneity among individuals, we, in addition, introduce individual fixed effects (columns 2 and 4). The results are displayed in Table 3.

[18] See Section 6.4 for further discussion of this point.

[19] These earnings-related attributes comprise types of ocupation (four groups), measures of educational and vocational degress (six categories), two age categories, current job tenure, establishment size (7 categories), previous labor market status, and previous employment, unemployment, and non-employment durations. See also Table A1 in Appendix 1.

The unconditional mean real earnings gap for men and women in this period amounts to 30% and 25%, respectively. As Table 3 shows, controlling for differences in the compositional structure reduces these estimates of the wage gap to about 20% for both sexes. One third (one fourth) of the unconditional wage gap for male (female) THS workers can be thus be accounted for. Controlling in addition for permanent unobserved individual heterogeneity by running a fixed effect panel regression reduces the estimated wage gap to under 17% for men. For women, however, the estimate obtained is not materially altered. As expected, therefore, significant reductions have been achieved in the estimated wage gap, once differences in employment composition have been adequately controlled for. The estimate for men is halfed, the one for women reduced by one fourth. Compared to the existing descriptive evidence for Germany reviewed in Section 3, our regression estimates of the wage gap attached to THS work are significantly smaller, albeit still large.

Table 3: Conditional Mean Real Earnings Gap, 1980-1990

Dep. Variable: log real daily gross earnings				
	Estimated coefficients:			
	Men		Women	
	OLS	FE	OLS	FE
THS contract	$-.227^{***}$	$-.184^{***}$	$-.213^{***}$	$-.215^{***}$
	(0.04)	(0.04)	(0.008)	(0.007)
Hausman test[a]		1239.22^{***}		429.28^{***}
R^2	0.492	0.308	0.414	0.318
N of cases	39240	39240	15843	15843

Source: IABES. Years 1980-1990. *** indicates significance at the 1% level.

a: Random effects versus fixed effects regression.

6.3 Conditional Group-Specific Current Average Wage Gap

So far, we have only estimated the average effect of THS work on current wages. Now, we explore how the wage gap varies across different occupations, skill categories, and previous employment status. For this purpose, we include interactions of the THS dummy with these categories into our fixed effect panel model. As before, additional covariates are included in the regression, but omitted from the regression output in Table 4 (see footnote 19 above).

Male low-skilled blue collar THS workers experience an earnings discount three times larger than male white-collar THS workers, and almost twice as large as that of male skilled blue-collar THS workers. For female THS workers, these differences are far less marked. In addition, for skilled blue and white collar female THS workers, the respective discounts are virtually identical. For non-THS workers, both types of blue collar workers earn only about 11% less than white collar

workers. Occupational wage dispersion among THS workers is thus significantly more pronounced. The return to firm tenure for men in THS employment exceeds that in non-THS employment by half a percentage point. Although the estimate is statistically highly significant, economically it is not. Several years of THS employment would be required to but half the wage gap. Moreover, only rarely do THS workers reach such tenures. Previous unemployment duration in years has less of a negative effect on the current earnings for male - but not female - THS workers than for non-THS workers. For male non-THS workers, the return to an additional year spent in unemployment is -3% (omitted from the regression output in Table 4).

Table 4: Group-Specific Mean Earnings Gap

Dep. Variable: log real daily gross earnings		
	Estimated coefficients:	
	Men	Women
THS×unskilled blue collar	$-.285^{***}$ (0.006)	$-.267^{***}$ (0.015)
THS×skilled blue collar	$-.164^{***}$ (0.005)	$-.224^{***}$ (0.062)
THS×white collar	$-.093^{***}$ (0.011)	$-.222^{***}$ (0.009)
THS×firm tenure	$.006^{***}$ (0.002)	$.014^{***}$ (0.004)
THS×previous unemployment duration	$.024^{***}$ (0.006)	.014 (0.013)
THS×previously nonemployed >1yr.	$-.006$ (0.015)	.022 (0.026)
R^2	0.295	0.306
N of observations	38386	15812
N of persons	6116	2767

Source: IABES. Years 1980-1990. Base category: white collar non-THS workers with lower secondary degree and no VET who were employed prior to their current job and are aged 18-29.

*** indicates significance at the 1% level.

6.4 THS Work and Individual Earning Paths

In our preferred specification, we explicitly allow THS employment to have lasting effects in that we include a set of dummy variables $THS_{k,it}$ with k equal to the number of years the current observation is apart from the THS employment spell. Thus k > 0 (k < 0) identifies observations of workers k years after (before) their THS employment spell (k = 0). We include leading indicators for THS work, i.e. $THS_{k,it}$ for k < 0, as THS workers might have experienced a deterioration in their earnings prior to entering the THS market, caused, for instance, by job loss, plant closure, or general career setback. Part of the wage gap observed for THS workers, therefore, might be attributable to these events, rather than THS work per se. Although we have controlled for the

previous labor market status and history of THS workers in the previous regressions, we have not explicitly differentiated between pre-THS earnings far removed from the THS employment spell and those immediately preceding it. If THS workers do indeed suffer such a dip in their earnings before taking a job in the THS sector, then prior earnings of the individual worker far removed from the actual THS work spell do not constitute a valid benchmark in the calculation of the THS wage gap. More recent earnings rather than those of the distant past are likely to reflect actual current earnings potential and thus constitute a more appropriate comparison wage. Our regression model thus takes the form

$$y_{it} = \theta_t + \sum_{k=-m}^{m} \gamma_k THS_{k,it} + x_{it}\acute{}\beta + \alpha_i + u_{it} \quad , t = 1980, ..., 1990 \tag{2}$$

where θ_t is a set of year dummies and we eliminated from our sample workers with more than one spell of THS work[20]. The vector x_{it} contains earnings-related attributes, listed in footnote 19, that were also used in the previous regressions. The above model is identified by the assumption that $\gamma_k = 0$ in $|k| > m$, i.e. in periods more than k years removed from the THS work spell. In addition, identification of the parameters γ_k rests on the correct specifications of the indicators $THS_{k,it}$ for each individual included in the regression. This requires sufficient observations on individuals´ THS status, both before and after those observations actually included in the regression. For instance, a worker might be in THS employment for the first time in 1996. However, as the IABES only covers the period 1975-1995, this worker would exhibit $THS_{k,it} = 0$ for all k<0 and t smaller or equal to 1995, and thus be misclassified in the analysis as a no-time THS worker. Omitting the last years of the IABES from the actual regression, but using their information on THS membership for creating our leading indicators for future THS work for the years included in the analysis, avoids this misspecification. Segal and Sullivan (1997) in their study on the THS market in Washington State have failed to control for this problem in their specifications of both leading and lagging indicators for THS work. As a consequence, four out of the eleven years of the data used in their analysis are potentially affected by this misspecification.

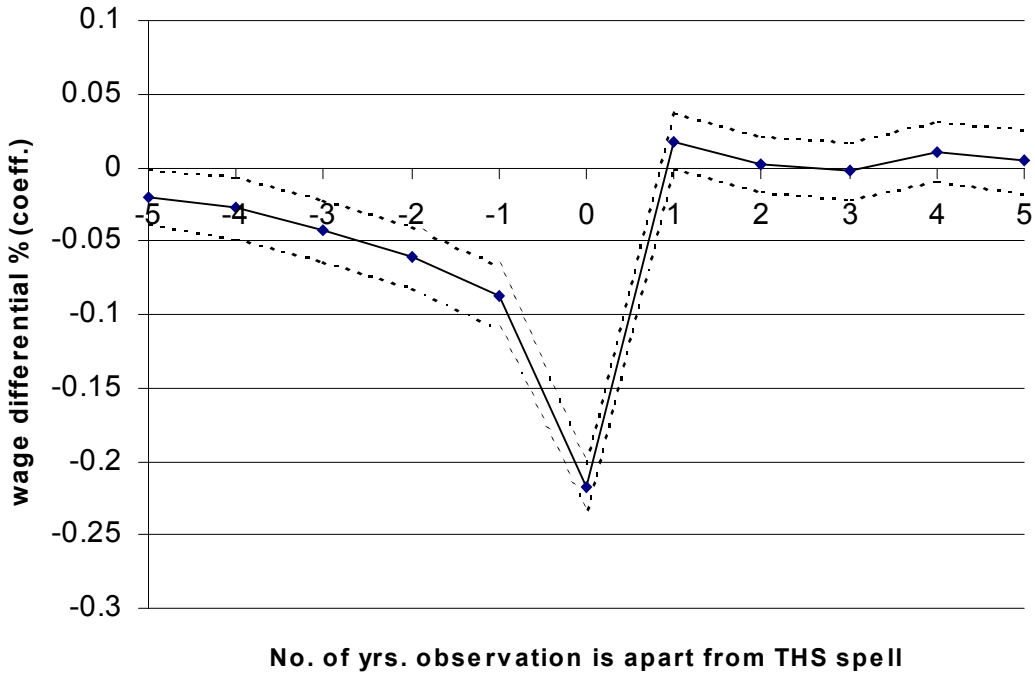
Variants of this approach has been widely used in the displacement literature (see, for example, Jacobson, LaLonde, Sullivan, 1993). However, a notable difference exists in the use of the estimated lead coefficients in the calculation of the wage penalty associated with job loss in the displacement literature and the wage gap in our application. Displacement or firm closure might already have effects on the earnings of workers prior to the date they are ultimately laid off. Earnings in periods immediately preceding displacement might therefore not be independent of the ensuing

[20] Almost 70% of workers who at some point in time work in the THS sector exhibit only one spell in this industry, as identified by our annual industry identifer.

displacement event and therefore do not qualify as a valid benchmark in the calculation of total losses incurred by job loss. If so, then earnings observations sufficiently far removed from and thus unaffected by the actual displacement event are to be preferred.

In our application, however, THS work status cannot be assumed to affect the earnings of workers prior to their engagement in the THS industry, but only their current, and possibly, future earnings. As pointed out above, therefore, the most recent earnings observation prior to the THS spell are more likely to reflect the labor market (earnings) opportunities of THS workers, and are thus to be prefered as the appropriate benchmark. The estimated coefficients of the leading and lagging indicators for THS spells along with the one of the actual spell are plotted in Figure 3. The regression output is included in Appendix 2. As can be seen in the figure, setting |m| to 5 periods is not restrictive, as the estimated coefficients are statistically insignificantly different from zero at times far removed from the actual spell in THS employment.

Figure 3: Relative Pre- and Post-THS Real Earnings of Men



Source: IABES 1975-1995. Base category: Continuing non-THS jobs of workers never in THS employment in 1975-1995 and THS workers > 5 years apart form their actual THS spell.
- - - denote 95% confidence interval.

Average earnings of male workers start to fall well in advance of the actual THS spell, drop significantly at the time workers hold a THS job, but recover fully and immediately to average

earnings of the base category thereafter. While the same earnings profile applies to women, both the magnitude of the decline in their pre-THS earnings and the actual THS wage gap are more pronounced. This earnings profile is also consistent with that estimated by Segal and Sullivan (1997) for THS workers in the state of Washington. However, the magnitude of their estimates of both pre-THS earnings in k = -1 and the THS wage gap is merely half that reported in Figure 3. Moreover, relative pre-THS earnings start to decline but in the last year before the actual THS spell, whereas we find the decline to set in several years in advance. While the reasons for this are unclear, it makes the subsequent recovery for German THS workers all the more remarkable, both in terms of the magnitude involved and in light of the duration of pre-THS earnings decline. The observed earnings profile is surprisingly robust across different subgroups of THS workers. Appendix 3 contains graphical representations of the estimated profiles for different age cohorts, and vocational qualifications.

We have pointed out that previous earnings of THS workers in the more distant past are unlikely to be a valid benchmark for the calculation of the contemporaneous wage gap attached to THS work, as these do not capture the earnings potential of the individual at the time he holds a job in the THS sector. As the theoretically preferable counterfactual earnings in k = 0 itself are unobserved, we take the most recent pre-THS earnings as our best estimate instead. The estimated wage gap thus arrived at amounts to 12% for men, and 10% for women.[21] These estimates are smaller than those reported in Table 3, and significantly smaller than those cited in the existing literature on Germany. In addition, as pre-THS earnings steadily declined up to the actual THS employment spell and might have continued to do so, our estimates have to be seen as an upper bound for the true average wage gap attached to THS work. Estimates of the contemporaneous wage gaps for various sub-groups of workers are contained in Table 5 below. A number of findings emerge. First, women joining THS work earn significantly less than women in non-THS work prior to their actual engagement in the industry. As a direct consequence, and although their relative earnings in THS work are markedly lower than those of their male counterparts, the estimated wage gap for women in THS work is smaller than that for men. Second, younger workers suffer more of a wage discount than older workers from holding a THS job. This could be driven by lack of sufficient work experience for the former group, arguably necessary for the immediate productive placement of THS workers. And finally, workers without any vocational degree suffer a significantly larger wage gap than those who do have completed such training, a finding that is consistent with human captial theory.

[21] Calculated, respectively, as 100*(exp(-.217-(-.088))-1) and 100*(exp(-261-(-.152))-1) using the estimated regression coefficients of Table A3.

Table 5: Group-Specific Mean Real Earnings Gap for THS Workers, 1980-1990

Workers	$\hat{\gamma}_{-1}$	$\hat{\gamma}_0$	$\hat{\gamma}_0 - \hat{\gamma}_{-1}$	Wage Gap (%)
Men	$-.088^{***}$ (0.011)	$-.217^{***}$ (0.098)	$-.129^{***}$ (0.011)	-12.11
Women	$-.152^{***}$ (0.022)	$-.261^{***}$ (0.016)	$-.109^{***}$ (0.022)	-10.31
born in 1955-1962	$-.023$ (0.020)	$-.214^{***}$ (0.014)	$-.191^{***}$ (0.021)	-17.41
born in 1930-1954	$-.107^{***}$ (0.013)	$-.247^{***}$ (0.010)	$-.140^{***}$ (0.015)	-13.09
with VT	$-.092^{***}$ (0.013)	$-.184^{***}$ (0.010)	$-.092^{***}$ (0.014)	-8.77
w/o VT	$-.082^{***}$ (0.020)	$-.283^{***}$ (0.016)	$-.201^{***}$ (0.021)	-15.21

Source: IABES. Years 1980-1990.

Last four regressions for men only. *** indicates significance at the 1% level.

This deterioration in pre-THS earnings of workers could well have influenced their decision to work in the THS sector, even if this, on average, temporarily implied a large scale earnings loss. One of the arguments for an expected negative earnings differential in THS work we presented in Section 2 has been the claim that THS jobs could act as a stepping-stone to regular jobs, aiding individuals in their job search and improving the match quality of subsequent employment relationships thus formed. While THS workers implicitly pay for these services in the form of a contemporaneus wage discount, on average they seem to recoup their outlay on this investment through improved subsequent earnings. This hypothesis, while not the only one, is consistent with the evidence in Figure 3. THS workers seem indeed on average able to permanently stop the downward trend in their pre-THS earnings profiles. This would attest the THS industry an important intermediary function in the general labor market, i.e that of a successful employment agencies geared towards the first labor market. If this is indeed the case, then the documented wage gap attached to THS work, rather than a cause of concern for social policy makers, constitutes a valuable investment of the worker in her future labor market prospects.

While consistent with our findings, it may well be that other factors account for part of the contemporaneous wage gap attached to THS work. Collective wage bargaining in the THS sector, unlike on the general labor market, is the exception rather than the rule. Wage floors introduced by collective wage determination are thus largely absent on this submarket. The observed wage gap, therefore, rather than being caused by THS work per se, might in part reflect the true market wage as determined by competitive market forces for the type of labor typically provided by THS agencies. Such an explanation is consistent with the ´access-to-work´ function of THS firms, where agencies offer low-productivity workers the opportunity to price themselves back into work (entry-level jobs), access to which might be denied to them on the general labor market for lack

of sufficient wage dispersion.

Our results in Figure 3 do not allow to adjudicate between these two hypotheses. However, the observable negative trend in earnings prior to THS work is put to a halt in subsequent employment. Permanent earning losses of THS workers, due to stigma effects or low skill upgrading caused by insufficient on-the-job training in the industry are thus on average not discernable.

7 Conclusion

We have investigated the contemporary wage differential associated with THS employment, as well as the long-term earning paths of former THS workers. Average wages of men in the THS industry have fallen in real terms over the 21 year time span under consideration, leading to an overall real loss of nearly 9%. The average male THS worker in 1995 thus earns less in real terms than the average THS worker in 1975. This decline is all the more remarkable given that it has occured against the background of strong employment growth in this sector. We have but tentatively explored potential reasons behind this trend change in earnings. Changes in the compositional structure of THS employment, worsening labor market prospects of those type of workers traditionally employed in the THS sector, or fierce price competition between increasing numbers of agencies have been identified as potential casues. Future research will have to adjudicate between these competing, yet potentially complementary explanations.

We have seen that a large part of the unconditional average wage gap associated with THS work can be explained by differences in the compositional structure of THS and non-THS employment. Controlling in addition for individual fixed effects reduces the male, but not the female THS wage differential.

Moreover, the wage gap has been found to vary significantly across different occupations, with low-skilled blue collar workers suffering the greatest discount. It has been argued that such a discount might be the price to be paid for ´access to work´ otherwise denied to these low-skilled workers on the general labor market. As wages are not collectively bargained in the THS industry, they are free to adjust to imbalances in the supply and demand of types of labor.

In light of the short durations of THS employment spells, however, it is the long-term effects of THS work on the earnings of workers, and not the wage gap attached to THS work that is of primary interest. THS workers have been found to suffer a marked deterioration in their earnings prior to holding a job in the THS industry, yet do not seem to be adversely affected by the latter in their future earnings prospects. Quite to the contrary, with the THS employment spell this earnings decline, on average, has been all but eliminated. Moreover, setting THS earnings in relation to the latest pre-THS earnings of workers as a proxy for their counterfactual earnings potential at the

time they hold a job in the industry substantially reduces our estimate of the wage gap attached to THS work to 12% for men and 10% for women. It has to be noted that part of these wage gaps might be attributable to the need of the agencies to recoup fixed outlays on recruitment, while being faced with exceedingly high labor turnover in the industry. Short employment durations preclude the possibility to spread these costs across time, and might hence necessitate larger per-period wage discounts. In adition, idiosyncracies of the legal framework governing the operation of the German THS market, such as the re-employment ban of recently fired THS workers, are likely to increase hiring costs.

While this analysis has provided improved quantitative estimates on one dimension of earnings (THS wage gap) and derived first evidence on another (long-term earnings effects of THS work) for Germany, the driving factors behind these findings are still in the dark. Future research will have to investigate these in greater detail and try to adjudicate between the rival explanations hinted at in the text. Until then, whether or not a wage gap for THS workers gives reason for concern, let alone justifies the use of corrective policy measures, is a question begging the facts.

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Appendix 1: Variables and Restrictions

Table A1: Description of Variables used in the Analysis

Variable	Description
Background Characteristics:	
AGE	= age in years
FEMALE	= 1 if female
FOREIGN	= 1 if foreign
EDUC1	= 1 if lower secondary and no vocational degree
EDUC2	= 1 if lower secondary and vocational degree
EDUC3	= 1 if higher secondary and no vocational degree
EDUC4	= 1 if higher secondary and vocational degree
EDUC5	= 1 if polytechnic degree
EDUC6	= 1 if university degree
Current Job Characteristics:	
THS	= 1 if THS employment spell
TENURE	= current firm tenure in years
OCC1	= 1 if unskilled blue collar
OCC2	= 1 if skilled blue-collar
OCC3	= 1 if highly skilled blue-collar
OCC4	= 1 if white-collar
RWAGE	= real gross daily earnings
ESTSIZE1	= 1 if establishment has 1 employee
ESTSIZE2	= 1 if establishment has 2-9 employees
ESTSIZE3	= 1 if establishment has 10-19 employees
ESTSIZE4	= 1 if establishment has 20-49 employees
ESTSIZE5	= 1 if establishment has 50-99 employees
ESTSIZE6	= 1 if establishment has 100-499 employees
ESTSIZE7	= 1 if establishment has 500-999 employees
ESTSIZE8	= 1 if establishment has 1000- employees
Previous Employment History	
PRE_INDJ	= 1 if previously employed
PRE_DURJ	= duration of previous employment in years
PRE_DURU	= duration of previous unemployment in years
PRE_INDN	= 1 if previously non-employed
PRE_DURN	= duration of previous nonemployment in years

Table A2: Job Types excluded from the Analysis

Years	**1975-1995**	
Job Type (%)	**non-THS**	**THS**
Apprentices	7.60	**0.34**
Tele workers	0.18	**0.01**
Part-time workers	7.16	**1.74**

Source: IABES 1980-1990.

Appendix 2: Regression Output for Figure 3

Table A3: Earnings Paths of THS Workers, 1980-90

Dep. Variable: log real daily gross earnings		
	Men	Women
THS*lead5	−.020**	−.006
	(0.010)	(0.019)
THS*lead4	−.028**	−.045**
	(0.011)	(0.020)
THS*lead3	−.043***	−.124***
	(0.011)	(0.021)
THS*lead2	−.061***	−.128***
	(0.011)	(0.021)
THS*lead1	−.088***	−.152***
	(0.011)	(0.022)
THS	−.217***	−.261***
	(0.009)	(0.016)
new perm	−.008	−.023***
	(0.010)	(0.08)
THS*lag1	.018*	−.023
	(0.010)	(0.018)
THS*lag2	.003	−.023
	(0.010)	(0.018)
THS*lag3	−.002	−.019
	(0.010)	(0.019)
THS*lag4	.011	−.004
	(0.010)	(0.018)
THS*lag5	.004	.010
	(0.011)	(0.019)
F-test lags	0.98	0.76
R^2	0.28	0.23
N of obs.	18395	8241
N of persons	3486	1779

Source: IABES 1975-1995.

***,**;* indicate significance at 1%,5%,10% level.

Appendix 3: Earnings Paths

Figure A1: Relative Pre- and Post-THS Real Earnings of Men born in 1955-1962

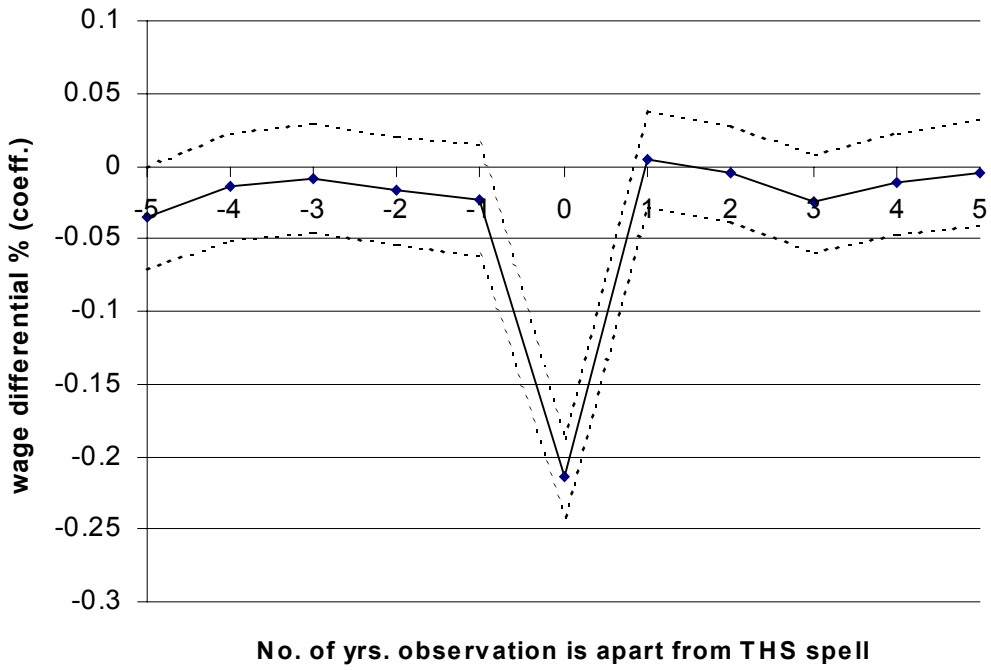

Figure A2: Relative Pre- and Post-THS Real Earnings of Men born in 1930-1954

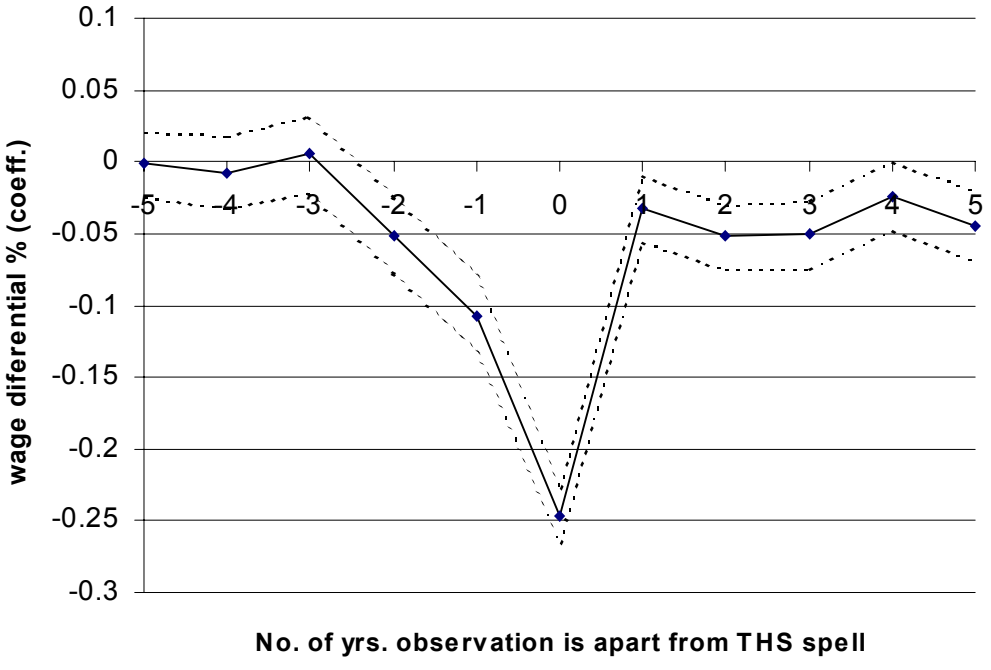

Figure A3: Relative Pre- and Post-THS Real Earnings of Men without VET

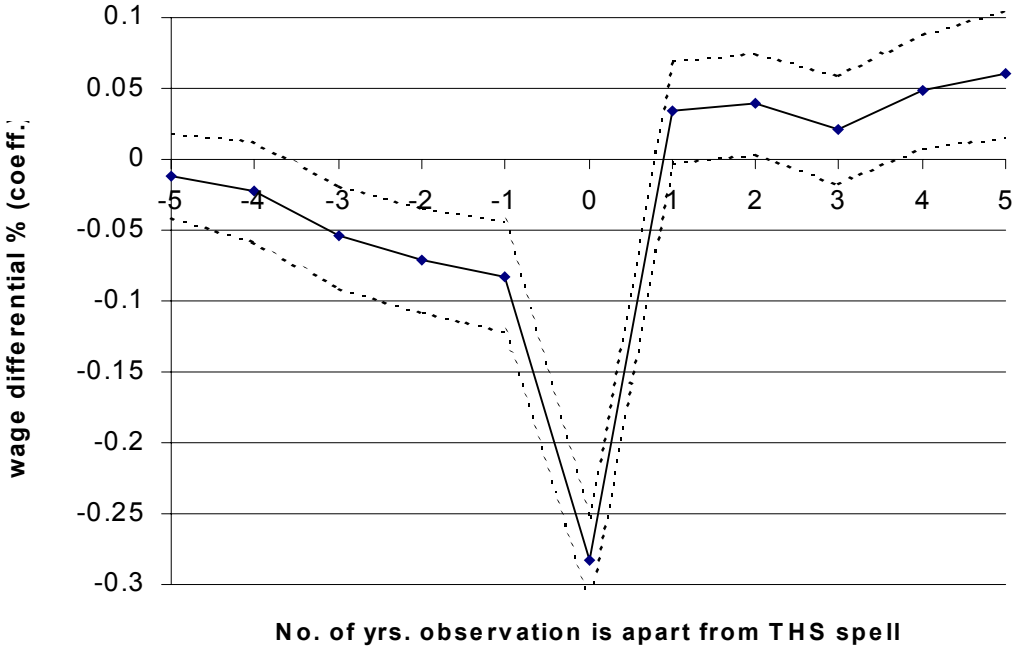

Figure A4: Relative Pre- and Post-THS Real Earnings of Men with VET