Essays on Temporary Work Agencies and the Economic Analysis of Law

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To my family
Abstract

This thesis consists of an introductory chapter and four self-contained papers on temporary work agencies and the economic analysis of law.

Paper [I] adds to the theoretical literature on the incentives of Temporary Work Agencies (TWAs). Using a principal-agent model with hidden action to model two main types of contracts between a TWA and a Client Firm (CF), the TWA is shown to potentially act against the best interest of the CF when helping to fill a vacant position. The results also suggest that the adverse effect of the incentive misalignment is larger when the worker is going to be leased instead of hired by the CF. However, this effect could potentially be offset by introducing a sufficient level of competition among the TWAs.

Paper [II] uses individual-level data on young adults to estimate how the probability of being employed in the Swedish temporary agency sector is affected by whether a partner or other family member has experience of temporary agency work. The results show a significant effect from all peer groups of a magnitude that correspond to the other most influential control variables. We also find that this cohort of the agency sector has a relatively high education level compared to the regular sector, and that there are predominately men working in this sector.

Paper [III] analyses possible effects on total employment, and the distribution between agency work and regular contracts as a consequence of the implementation of the EU Temporary and Agency Workers Directive in Sweden. The analysis is based on changes in the compensation to agency workers in a calibrated extension of a Mortensen-Pissarides search model. Even though the results suggest a negative net effect on total employment, the implementation is shown to increase (utilitarian) welfare, and an increased transition probability from the agency sector into regular employment will increase welfare even further.

Paper [IV] focuses on settlement probabilities for different types of representation within the Swedish Labour Court. Empirical estimates on a set of unjust dismissal cases show that private representatives are generally less likely to reach a settlement than their union counterparts. The settlement probabilities converge following court-mandated information disclosure, which suggests that information asymmetry is an important factor in explaining differences in settlement behaviour. Privately instigated negotiations are therefore in general insufficient for making cases with non-union representation reach the same settlement rate as cases with union representation.

Keywords: Temporary work agency, family work experience, young adults, Sweden, labour law, EU directive, unemployment, unjust dismissals, negotiations, settlements, labour unions
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Stockholm, October 2014
Morgan
This thesis consists of an introductory chapter and the following papers on temporary work agencies and the economic analysis of law:


“Essentially, all models are wrong, but some are useful”

Box & Draper (1987, p. 424)

“Everything should be made as simple as possible, but no simpler”

Paraphrased from “It can scarcely be denied that the supreme goal of all theory is to make the irreducible basic elements as simple and as few as possible without having to surrender the adequate representation of a single datum of experience”. Einstein (1934, p. 165)

1 Introduction

Labour and capital are the two essential inputs in most production processes, and how to allocate labour constitute one of the fundamental fields in economics. In an influential paper, Atkinson (1984) defined the different types of workforce flexibility that constitute the Flexible Firm: numerical flexibility (both internal and external), functional flexibility, and financial flexibility. However, as financial flexibility could be impeded by collectively negotiated wage agreements that stretch over several years, the employer may primarily respond to changes in the demand for the produced goods through either functional and/or numerical flexibility.

The former type of flexibility implies that the employer should be able to continuously reassign workers to their (marginally) most productive position, and the scope for functional flexibility is arguably quite extensive in Sweden (cf. Section 4.1). The latter flexibility type suggests that the workforce should be partitioned into a core of skilled and motivated workers on long-term contracts that are central to the firm’s production, while keeping a separate buffer of peripheral workers at different levels of commitment to the firm.

Swedish employers in search of numerical flexibility were in the past required to use external independent contractors, part-time contracts, and/or workers hired on either probationary or fixed-term employment agreements. The introduction of temporary work agencies (TWAs) has created additional possibilities for an employer wanting to obtain numerical flexibility (and arguably also some additional financial flexibility).

Whether employers actually adhere to the Flexible Firm theory and consciously utilise core-peripheral labour management strategies has been both debated and criticised (see e.g. Kalleberg, 2001). Other studies have also identified and emphasised several adverse effects from the use of similar flexibility strategies, and even challenged their alleged cost-effectiveness – especially with regard to the use of workers supplied through a TWA (see e.g. Nollen, 1996; Gibelman, 2005; Forde & Slater, 2005; Thommes & Weiland, 2010; Håkansson & Isidorsson, 2012; Walter, 2012).

The first three articles of this thesis add to the literature on TWAs. The analysis focuses on the potentially hidden costs associated with their incentive structure relative to their client firms (CFs), the composition of their workforce, and the effects from mitigating one of their comparative advantages: the wage paid to the TWA worker. The fourth article analyses the settlement behaviour in the Swedish Labour Court, particularly whether the settlement probability differs depending on the legal representation of the parties. Articles three and four directly apply economic methods to the study of how law, and the change in law, affects economic agents. Law constitutes an intuitive area of economic analysis as most economic issues are subjected to several institutional constraints.

1This is sometimes also referred to as the core-periphery model (cf. also to Handy’s, 1989, shamrock organization). These workers generally experience lower autonomy and lower employment protection (Kalleberg, 2001; However, cf. also Van Dyne & Ang, 1998, and Allvin et al., 2003).

2Indeed, Mackaay (2000, p. 89) states that “economic regulation denotes legal restraints upon market actors’ behaviour”.

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Furthermore, as new technologies evolve and economic agents find new uses for old products, new markets are continuously created. On this note, Mackaay (2000), referencing Heiner (1983), argues that although fixed rules might be both optimal and help facilitate the interaction between economic agents by allowing predictability at the time of their formation, the same permanence may also entail a sub-optimal result at a future point in time. The inherent dynamics of the economic systems thereby also require the law to be continuously evolving as well.

The notion in the introductory quotes by Box & Draper (1987) and Einstein (1934) captures an important inherent issue whenever modelling complex issues, such as legal analysis (with its traditional focus on the individual case study where the devil is often in the details), using economic methods (i.e. based on assumption on the relative level of information, costs and rationality of the involved agents; see e.g. Heiner, 1983)\(^3\). Following Einstein (1934), the necessity of adding an additional component to a model should be evaluated according to whether the marginal benefit of the inclusion outweighs its marginal cost. The notion carried by Box & Draper (1987) thereby becomes its logic consequence, and the results should always be interpreted with the underlying model and evaluation criteria in mind.

The introductory chapter of this thesis initially aims to provide a background to the evolution of the Swedish Model of regulating the labour market, and thereafter the emergence of the Swedish TWA sector. The following sections contain a brief summary of the sector’s main characteristics – primarily based on results from European studies. It also reviews the stated rationales for working in the sector, and why CFs utilise TWAs to either find matches to vacancies or to continuously lease workers.

The subsequent section focuses on the later aspect and discusses what liabilities the CF may be able to hedge by renting labour from an external agent – as the CF thereby, either directly or indirectly, utilise the TWA as a type of redundancy insurance. This is used as a segue into the settlement behaviour of different types of representation in the Swedish labour court analysed in paper four. The introductory chapter is thereafter concluded with a summary of the included articles.

### 2 The Swedish Model of Labour Market Relations

Following in the wake of the early stages of liberalisation and industrialisation in Sweden, the nineteenth century saw a large number of work stoppages, lockouts, and threats of such actions. The employment agreement was at that time negotiated between the employer and the individual worker, which often put the individual at a significant disadvantage, and the workers realised the need to collectively organise in order to form a counterweight towards the employer.

The first labour unions were formed in the 1870s, and in 1898 four organisations joined together in the national Swedish Trade Union Confederation (Landsorganisationen, LO). The employers formed the Swedish Employers Association (Svenska Arbetsgivareföreningen, SAF) four years later and the first national collective agreements were negotiated in the early 1900s (e.g. verkstadsavtalet, 1905)\(^4\).

The negotiated agreement in 1906 is an important milestone where SAF and LO, in what has been known as the December compromise, reached an agreement that among other provisions established two central aspects of what has become known as the employer prerogative (also referred to as the employers 32 § authority): the right to manage and employment at will. The labour unions conversely obtained the right to organise and collectively bargain over wages and working conditions (Glavå, 2011; Andersson et al., 2013).

The function and status of the collective agreement, as well as a general right of negotiation and association (mainly applicable for white-collar workers), was established by law in 1928 and 1936 respectively. Even though Numhauser-Henning (2001) suggests that this was mostly a legislation of an already established code of conduct between the labour market parties, it still established the main rules necessary for continuously regulating the labour market through treaties and other (collective) agreements (Glavå, 2011).

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\(^3\)See e.g. Miceli (2009) for a discussion of some of the critiques of economic analysis of law.

\(^4\)See Eklund in Schmidt et al. (1997) and Nycander (2008) for an overview of the political climate and the ties between the political parties and the labour market parties during the emergence and evolution of the Swedish model and the wage formation process. For an economic perspective see e.g. Anxo & Niklasson (2006) or Fregert & Jonung (2010). Delsen & van Veen (1992) and Elvander (2002) provide a comparative view.
Thereafter when the Swedish government initiated public investigations and pressed the labour market parties to limit collective actions under the threat that the labour market would otherwise be regulated by law, the parties chose to sign the Saltsjöbaden agreement in December of 1938. This was the first principal treaty (huvudavtal) on the labour market and facilitated (among other things) complements and adaptations to the rules on collective action.

More importantly is that it showed that the labour market parties were willing to accept responsibility and negotiate applicable rules and restrictions without interference or guidance by the government, which thereby ushered a new era of cooperation and consensus (Numhauser-Henning, 2001; Sigeman, 2010; Glavå, 2011; Andersson et al., 2013; Källström & Malmberg, 2013).

With some exceptions (see Glavå, 2011) the legislator refrained from additional interventions, and what has become known as the spirit of Saltsjöbaden prevailed until the late 1960s. Arguably, the most important issue from the viewpoint of this thesis was restricting the employer prerogative through the implementation of a limited employment protection in the April settlement in 1964 (a just-cause, see Section 4.2, requirement for dismissal on personal reasons), and that the parties engaged in centralised wage negotiations (Glavå, 2011, Andersson et al., 2013).

Both Sigeman (2008) and Glavå (2011) note that wage negotiations have become less centralised over time, and that today negotiations are carried out on an industry level with minor local amendments and adaptations. A continuous negotiation process nevertheless makes the Nash bargaining solution (where the parties divide any surplus according to their relative bargaining power, see e.g. Binmore et al., 1986) an intuitive choice for the (collective) wage formation process in paper [III]. It is also reasonable to attribute any real bargaining power to the collective of workers rather than the individual worker in most cases. The somewhat laissez faire attitude of the legislator changed in the 1970s following an increased demand for democratising the workplace and facilitating a higher degree of employee influence. This led to that more restrictions of the employer prerogative became codified through the Employment (Co-Determination in the Workplace) Act (SFS 1976:580, cit CWA), and the first Employment Protection Act (SFS 1974:12, followed by the current SFS 1982:80; cit EPA).

The CWA provides the signing labour union (and to a lesser extent the minority unions) the right to information and continuous negotiations. It also allows the signing union the mandate to interpret the workers scope of employment, and even in some instances to veto the decisions by the employer (see e.g. 38-39 §§ CWA). Even though having been continuously weakened over time, the EPA ended the notion of employment at will by introducing a legislated just-cause requirement for the employer to unilaterally end the employment. It also introduced an associated seniority principle, as well as adding provisions for fixed-term employment and re-hire clauses (Glavå, 2011).

However, the legislator did not abandon the established procedural order and allowed the labour market parties to deviate from some of these provisions through a centrally negotiated collective agreement (see e.g. 4 § CWA and 2 § EPA). Sweden’s membership in ESS, and later the EG/EU, has required Sweden to implement some directives through legislation while at the same time often utilising similar deviations through collective agreements, when applicable, in order to maintain the Swedish model.

The flexibility obtained through a central agreement with local addendums is suggested to not only safeguard the interest of the exposed worker but also gain legitimacy as the decisions are allowed to take local conditions into consideration (Glavå, 2011).

The evolution of Swedish labour law has been argued by Glavå (2011) and Sigeman (2010) to constitute a series of infringements on the employment at will part of the employer prerogative – except for the right to dismiss workers due to the lack of work-principle (Section 4.2) which has remained relatively unaltered. Glavå (2011) nevertheless also argues that the same provisions have in fact also strengthened the employer’s right to manage within the employer prerogative.

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5Legislation requiring equal treatment of men and women in the workplace (SFS 1979:1118) further restricted parts of the prerogative. The current act (SFS 2008:567) prohibits discrimination due to gender, ethnicity, religious belief (or lack thereof), sexual orientation, transgender identity, disabilities and/or age. It applies to a wide range of situations related to the labour market; e.g. when hiring, managing or dismissing, but also with regard to promotion, wages, and fringe benefits.

6This is analogous to the argument that no central authority may accumulate and interpret the same amount of information and complex relations as efficient as a continuously negotiating market.
The Swedish model today is characterised by (i) a high degree of organisation among both employers and employees with a low degree of inter-organisational competition, and (ii) that just-cause is required for the employer to unilaterally end the employment relationship, as well as (iii) a relatively high degree of autonomy through contractual freedom with the collective agreement as the main regulatory and normative document. This implies that many issues, even though regulated by law, may be deviated from in a negotiated collective agreement.

Other notable features are (iv) the absence of legislated minimum wages, and that (v) collective agreements cannot be made generally applicable (allmängiltigförklaras) for an entire industry. (Numhauser-Henning, 2001; Sigeman, 2010; Glavå, 2011) These characteristics constitute a base for the remainder of the introductory chapter, as well as providing an important framework for the contained articles.

3 The Temporary Work Agency Sector

The Swedish state monopoly on employment mediation (enforced by the 1935 Employment Mediation Act; SFS 1935:113, with amendment SFS 1942:209 that explicitly prohibited the leasing of workers to another company) was ended through two reforms in the wake of the economic downturn if the early 1990s. Since then the market for leasing workers to a CF through a TWA has grown considerably (Andersson-Joona & Wadensjö, 2010; Walter, 2012).

The first reform came through the first private mediation act (SFS 1991:746; enforced from Jan 1st 1992) which allowed temporary work agencies by disassociating the leasing of workers to another employee from the concept of mediated employment. There was nevertheless significant restrictions in that mediation required both permission (awarded for a maximum of one year by the erstwhile Swedish National Labour Market Board; Arbetsmarknadsstyrelsen AMS), and stated that it couldn’t be conducted for profit – although the mediator was allowed to charge some fees. There were also provisions stating that the activity should be acceptable from a broader labour marker perspective, and that the tasks should be of a temporary nature that couldn’t stretch for more than a total of four months. (Prop. 1990/91:124)

The second reform came in 1993 (Prop. 1992/93:218), one year after Sweden had revoked their 1950 ratification of ILO convention no. 96 (Fee-Charging Employment Agencies Convention, C096; through Prop. 1991/92:89). The reform replaced the previous act and removed the need to obtain permission from AMS to provide employment mediation services. It also allowed employment mediation to be conducted commercially, as well as removing the four month maximum duration requisite and the necessity of an underlying need for temporary labour.

The mediating company however was prohibited from requesting, negotiating, contracting or accepting compensation from the individual worker. The rules regarding the CF’s obligation to negotiate (when applicable) with the labour union before utilising a TWA (38-40 §§ CWA) was also left intact.

The introduction of TWAs on the labour market created a tripartite arrangement by disassociating the worker from the employee-employer concept. The worker carries out tasks under the supervision and guidance of the CF without being regarded as an employee of that CF (see also Spattini, 2012). The explicit employer is the TWA which thereby carries most of the associated labour law liabilities towards the worker. The relationship between the CF and the TWA is based on the written contract and thereby regulated through general contract law statutes. The result could be that the leased TWA workers may work on terms that do not apply to the workers directly employed by the CF (unless a collective agreement between the labour union and the CF includes specific provisions on the equal treatment of these two types of workers. However, see also Forde & Slater, 2005; Håkansson & Isidorsson, 2014).

The political opposition raised concerns about the hasty deregulation procedure, and they stated that there was a number of issues that had not been analysed in the proposition nor referenced to any preceding research. Specifically mentioned was the possibility of hollowing-out employment protection due to the tripartite arrangement, and the effects from any increased precariousness for the individual worker. Also brought up was the effects on the overall labour market dynamics; the impact on the matching and wage formation process, as well as the asserted efficiency gains in general. (Report 1992/93:AU16)
3.1 Rationales

The studies by Spermann (2011), Thommes & Weiland (2010), Tijdens et al. (2006) and ECORYS-NEI (2002) include surveys of a number of mainly European studies on both supply and demand side rationales for choosing labour supplied through a TWA. CFs (demand side) state that their rationales are to recruit and screen workers both for open-ended and fixed-term contracts, and both for anticipated and unanticipated increases in production demand, (see also Den Reijer, 2007, and Pfeifer, 2005), and replace absent workers as well as increasing flexibility by supplementing and adding buffer capacity.

The above aspects correspond well to the flexibility aspects in Atkinson’s (1984) model. The first types of rationales may be summarised into that a TWA is utilised for matching purposes when the supply of the required labour is uncertain (see Milner & Pinker, 2001, for a theoretical approach), as well as acting as a type of insurance that allows for short-term flexibility (see Koene et al., 2004). Other rationales include strategic cost-shifting in publicly traded companies and reducing human resource management costs.

Worker (supply side) motivations include hoping to increase the probability of finding a non-TWA job by being directly exposed to potential employers, while at the same time being a part of a flexible and dynamic environment through which they gain experience that could increase their overall employability. Other stated reasons are being able to better combine working life with leisure and also having a (complementary) source of income.

The supply side rationales could be summarised into two main categories: either the workers utilise TWA employment as a stepping-stone into regular employment and/or as a source of income (i.e. accepting rather than choosing). Other workers view this type of employment as a way of combining a dynamic professional working life with their preferences for leisure activities (i.e. choosing rather than accepting).

3.2 Matching

Permitting private employment mediation was assumed to allow vacancies to be filled with the right worker as soon as possible and that the employer would regularly benefit from having a larger pool of candidates to choose from (Report 1992/93:AU16). However, this is only true if candidates are defined as workers with at least sufficient characteristics, and not the overall sample of applicants – as that could arguably increase the cost of identifying and sorting the subset of eligible workers.

It is nevertheless reasonable to assume that the TWAs role as a specialised labour market intermediary allows it to benefit from technological advantages (such as specialised IT-systems, matching algorithms and classification systems; Walter, 2005) and economies of scale (Hevenstone, 2008) in order to quickly match a worker to a vacant position.

On the other hand, any possibility for the CF to capture nuances or unique qualities by continuously adapting the worker demand specification as a response to private information shared by the prospective worker during a personal interview could also be lost when outsourcing the recruitment process to an external agent (cf. Walter, 2005 & 2012). What constitutes the right worker could also depend on what point of view that is taken: the TWA, the worker, or the CF – unless they all have equivalent incentives and/or goal functions (cf. to the problem of over-education and mismatched TWA workers in De Graaf-Zijl, 2012, and Håkansson, Isaksson & Strauss-Raats, 2013).

In paper [I] we outline a principal-agent model with asymmetric information and hidden action where a TWA is tasked by a CF to supply a worker with an exogenously determined (i.e. true) minimum productivity for a vacancy that pays a certain wage. Our framework shows that the TWA most often will provide the first (random) match that fulfills the minimum productivity – regardless of any remaining time and resources available for carrying out additional searches.

*These rationales also correspond to those from the U.S. market (Houseman, 2001; Autor, 2001 & 2003). See also Gibelman (2005) or Forde & Slater (2005) for a review of both CF and worker rationales along with a critical discussion of the merits and potential hidden costs of using temporary agency workers.
We argue that these differing incentives could be a sufficient requirement to allow for a quicker matching procedure. However, we also show that the TWA may sometimes even have incentives to actively search for, and supply, the worker with the lowest (although still sufficient) productivity.

This type of search behaviour is furthermore not necessarily inconsistent with a desire to secure repeated business (see e.g. Neugart & Storrie, 2002), since it implies that a sufficient worker is indeed supplied whenever a match is found. The match is therefore, by definition, not a bad match per se and should not have a negative effect on their reputation, especially if the CF is unable to assess the matched worker’s relative productivity due to that they have little to no information on the foregone alternatives (i.e. the productivity distribution of the remaining workers in the sample).

Studies based on data from the late 1990s and early 2000s have found that workers in the Swedish temporary agency sector were often from groups that traditionally held a more marginal position on the labour market: youths, women, less educated people and immigrants (Andersson-Joona & Wadensjö, 2008, 2010; cf. also Forde & Slater, 2005). More recent studies however suggest an increased use of more skilled workers within the sector (Andersson-Joona & Wadensjö, 2012; Petersson, 2013; cf. also Tijdens et al., 2006). Although not being its primary purpose, the results in Paper [II] similarly suggests that the education level among young adults in the Swedish temporary agency sector in 2007 has increased compared to the estimates for the entire sector in 1999 (Andersson-Joona & Wadensjö, 2008). Moreover, we also find that within our sample of young adults there are now more men than women employed by TWAs.

Paper [I] discusses the possibility that the increased education level could be demand side driven due to the CFs exaggerating their worker demand profile in order to compensate for any differing search-incentives between them and the TWA. Walter (2012) offers a (complementary) supply side explanation by suggesting that supplying (too) highly educated personnel could be a consequence of the TWA’s need to continuously emphasise their superior matching ability.

3.3 Characteristics

In their survey of the relatively scarce literature on temporary agency workers’ physical work environment and work-related injuries, Håkansson, Isaksson & Strauss-Raats (2013) found that temporary agency workers perform riskier tasks and experience poorer working conditions than other types of employees (cf. Tijdens et al., 2006; MacEachen et al., 2012). Fabiano et al. (2008) find similar differences with regard to working conditions for Italian TWA workers who suffer more work-related injuries which also causes them to be absent from work for longer periods of time.

Håkansson, Isaksson & Strauss-Raats (2013) also concluded that temporary agency workers often receive an insufficient amount of training, safety information, and work place introduction at the CF. There are two main reasons mentioned: unclear responsibilities between the TWA and the CF for such education, and that the imminent and/or short-term demand for a worker might not leave sufficient time for similar information and training.

The theory of compensating wage differentials (see e.g. Rosen, 1986) suggests that workers will accept negative aspects in their occupation and work environment if they perceive that they are being compensated within other areas (usually wages). However, a number of European studies on the wage differentials between TWA workers and those employed directly by the CF find that there is a significant wage penalty for workers within the TWA sector (Forde & Slater, 2005; Tijdens et al., 2006; Böheim & Cardoso, 2009; Jahn, 2010; Andersson-Joona & Wadensjö, 2010, 2012; Jahn & Pozzoli, 2013). Most of the studies also find that the wage differences have been growing over time and cannot be fully explained by controlling for personal characteristics. There is also research suggesting that these differences exist even in the presence of national statutes compelling non-discrimination of TWA workers with regard to wages (Nienhüser & Matiaske, 2006; see also Jahn & Bentzen, 2012).

Therefore as TWA workers may be required to suffer even a negative wage difference, one factor that may possibly account for why an individual would choose TWA work, apart from being compelled to do so for pressing financial reasons or a lack of other options, is the view that temporary agency work serves as a stepping-stone into regular employment (ECORYS-NEI, 2002, Tijdens et al., 2006; and Spermann, 2011)\(^9\).

\(^9\)See also the agency sector dynamics in Neugart & Storrie (2002, 2006), and Baumann et al. (2011). Connell & Burgess (2002) similarly found that temporary agency workers will leave the current assignment if they are offered a better deal elsewhere, even if it too is temporary.
Amuedo-Dorantes, Malo & Muñoz-Bullón (2008) argue that the probability of transitioning into employment directly at the CF is conditional on (or at the very least indicative of) the CF’s underlying rationale for utilising this type of flexible labour. If the main rationale is to save on variable labour costs the CF may very well continuously maintain a pool of temporary agency workers indefinitely.

Forde & Slater (2005) similarly caution that as either entire operations or specific types of jobs are subcontracted to TWAs (instead of being carried out side-by-side with direct-hire employees), the temporary agency workers’ accumulation of CF-specific capital will also be reduced as compared to the direct-hires (see also Håkansson & Isidorsson, 2012). This could arguably reduce the probability that the temporary agency worker will transition into employment directly at the CF. However, if hiring a temporary agency worker is seen as a way for the CF to screen a candidate before offering a more typical type of employment, then temporary agency employment might indeed be a stepping-stone into a more sought after employment role.

Whether or not different types of temporary employment actually has an effect on the transition probability into regular employment has been surveyed by Zijl and van Leeuwen (2005) who established that there are considerable differences between the European countries. They concluded that there seems to be a strong positive effect on the transition probability in some parts of Italy. However, one of the referenced studies (Ichino et al., 2005) note that the positive effect from temporary agency work is conditional on the reference group including both atypically employed workers and unemployed individuals, and that the effect disappears when only comparing temporary agency workers to other workers on atypical contracts. It is therefore not certain that temporary agency work has a more pronounced stepping-stone effect compared to other types of non-standard employment in Italy.

Results based on data for the Netherlands show a strong positive effect on the transition probability from having temporary employment. A recent study by de Graaf-Zijl, Van den Berg & Heyma (2011) found that Dutch temporary workers (incl. temporary agency workers) have a slightly lower initial transition rate than unemployed workers, but that the transition rate increases over time. They also found that ethnic minorities benefit more than natives from temporary employment (cf. the surveyed studies in Tijdens et al., 2006). The authors suggest that larger personal networks or the accumulation of human capital might be the reason behind the increased transition rate.

The surveyed results in Zijl & van Leeuwen (2005) suggest a strong negative effect for the sample of several types of temporary workers in Spain (cf. García-Pérez & Muñoz Bullón, 2011, who found that tenure increases the transition probability for young workers, but also that repeated spells of temporary employment reduces it). Amuedo-Dorantes, Malo & Muñoz-Bullón (2008) even found that Spanish temporary agency workers have a lower likelihood of becoming hired on a permanent basis than similar direct-hire temporary workers. Similarly, while Zijl and van Leeuwen (2005) reported a moderate positive effect from temporary employment in Germany, more recent studies that target temporary agency work specifically (surveyed in Spermann, 2011) found either no evidence of a positive effect, or only so for the long-term unemployed.

In a Scandinavian setting, Jahn & Rosholm (2010) found a significant positive effect from temporary agency work in Denmark, especially for first- and second generation non-western immigrants and less educated workers. In the few available studies of the Swedish TWA sector, Andersson & Wadensjö (2004) found (weak) statistical evidence of a stepping-stone effect for workers with a specific type of immigration background. However, Hveem (2013) found a negative effect on the probability of obtaining a regular job if starting to work for a TWA compared to remaining unemployed (but not so for non-western immigrants).

It should be noted that both Andersson & Wadensjö (2004) and Hveem (2013) estimate the stepping-stone effect from TWA employment at the turn of the millennia. At that time the composition of the workers in the TWA sector was disproportionally comprised of youths, immigrants, less educated individuals and women (Andersson-Joona & Wadensjö, 2008).10

10The different results for temporary agency workers and other types of atypical employees further strengthen the notion that not all non-standard work arrangements share the same traits and impacts on the worker (De Cuyper et al., 2009. However cf. also De Witte & Näswall, 2003).

11In comparison, Liljeberg et al. (2010) found an internal stepping-stone effect for fixed-term employees hired directly at the (client) firm in Sweden.
Since then, Andersson-Joona & Wadensjö (2012) found that the negative wage differential between workers in the agency sector compared to other workers has been growing. This has occurred during the same time that paper [II] suggests that there has been a change in the composition of the TWA workforce to include significantly more men and also individuals with a higher education level (cf. also Petersson, 2013). To my knowledge, there is unfortunately no research on any associated changes in the transition rate.

The psychological impact and subjective perception of atypical employment is however not merely based on differences in wages, working conditions and the possibility to transition out of the sector. Rather, those aspects are theorised to be the result of the workers’ prior expectations and the realised outcome. Differences therein could constitute a breach of what is referred to in the literature as a psychological contract (see e.g. Rousseau, 1989; Isaksson et al., 2003; Guest, 2004) that a worker implicitly forms with the employer regarding the job’s expected characteristics.

Data from Statistics Sweden suggests that over half of the Swedish TWA workers (private sector, 1st qtr. 2014) are employed on what is defined as an open-ended contract. However the subjectively perceived level of precariousness is not necessarily determined by the underlying type of employment either. Employment protection in Sweden in some aspects is stricter for fixed-term employees compared to open-ended employees (Källström & Malmberg, 2013), each assignment at a CF is still (relatively) temporary (see also Forde & Slater, 2005; Spattini, 2012) and lack of work constitutes a just-cause to end an open-ended employment in Sweden (Glavå, 2011).

The relatively short duration aspect could potentially be quite strenuous in of itself, regardless of an underlying open-ended contract with the TWA, as it requires the individual to continuously adapt to new environments and co-workers (see the concept of job strain vs. employment uncertainty as a stressor in Lewchuk et al., 2003). It could arguably also negatively affect the development of intra-workplace social connections, while at the same time facilitating a wider inter-workplace network. Both of these aspects could influence the job satisfaction and productivity of the worker (cf. the arguments in Gibelman, 2005, and Böheim & Cardoso, 2009).

Håkansson, Isaksson & Strauss-Raats (2013) also surveyed the literature on the psychosocial environment of temporary agency workers and found clear evidence that temporary agency workers experience significantly less employment protection and employability (cf. Forde & Slater, 2005). Temporary agency workers are also found to be utilised primarily in jobs with either low expectations and low self-monitoring, or with high expectations and low self-monitoring (the authors use the terms passive and tense jobs to refer to the respective job types), as well as in jobs with a relatively high degree of repetitiveness.

They similarly concluded that temporary agency workers experience the lowest degree of autonomy (compared to fixed-term, open-ended, probationary and on-call workers), exhibit the highest incidences of feeling depressed (significantly more often than open-ended and on-call workers), and the lowest degree of overall job satisfaction (cf. Wilkin, 2013). The stress experienced by temporary agency workers is found to be alleviated through feeling supported socially. However, the surveyed studies also suggest that the TWA may not be fulfilling its expected role in this aspect either (cf. Kantelius, 2010).

It should be noted that temporary (agency) work is not necessarily experienced as something inevitably negative for all workers. Some individuals actively chose different types of temporary or agency employment due to their personal preferences (Loughlin & Barling, 1999; ECORYS-NEI, 2002; Guest, 2004; Tijdens et al., 2006). European temporary agency workers overall are e.g. seemingly quite happy with their working hours – with some of the surveyed studies in Håkansson, Isaksson & Strauss-Raats (2013) even suggesting that better control over working hours was a key rationale for choosing temporary agency work over the more regular types of employment.

Rogers (2000), De Cuyper & De Witte (2007), and De Cuyper et al. (2008) noted that factors such as culture, norms and individual expectations could influence the subjective perception of the individual worker and potentially mitigate some of the negative aspects (relating to the aforementioned literature on psychological contracts). Similarly, Koene et al. (2004) highlighted the importance of what they refer to as sociocultural dynamics; i.e. changes in attitudes, practices and national normative (work-related) values, when discussing the evolution of temporary agency work throughout Europe.
That TWA workers are heterogeneous with respect to skills and preferences (cf. Wilkin, 2013), and also toward other atypical employees (De Cuyper et al., 2009. However cf. also De Witte & Näswall, 2003) implies that some caution should be taken when making generalisations. Håkansson, Isaksson & Strauss-Raats (2013) nevertheless concluded that the psychosocial work environment for temporary agency workers is generally worse-off than for other types of atypical workers – even on-call workers.

Job content and the matching of the worker’s skills to the work tasks are especially important factors for reducing the strain on the worker, as well as the worker having a feeling of integration and support in the workplace (cf. Forde & Slater, 2005; Salvatori, 2009; Håkansson & Isidorsson, 2014). The surveyed literature further suggests that the sector does indeed share many of the traits that are regularly associated with a precarious job situation for the worker (see Sverke et al., 2004).

The results in Paper II show that, irrespective of the surveyed negative aspects and adverse working conditions, the Swedish TWA sector has a strong over-representation of workers with parents, siblings and/or partners that have had previous experience of working in the sector. We suggest some different rationales for these results, but the theory of compensating wage differentials suggests that working for a TWA is at the very least still preferable to remaining unemployed (cf. Skans et al., 2004), and that each possible recruitment channel is utilised to exit unemployment.

These results follow the previous findings that family and other reference groups do not only constitute one of the main recruitment channels (irrespective of contract type: fixed-term or open-ended), but will also have an impact on the outcome and career development of their younger peers due to their conveyed labour market experience (Dickinson & Emler, 1992; Penick & Jepsen, 1992; Young & Friesen, 1992; Morningstar, 1997; Barling et al., 1998; Loughlin & Barling, 2001; Whinston & Keller, 2004; Greg et al., 2012; Häksen-DeNew & Kind, 2012).

With regard to the negative wage difference for the workers in the TWA sector, and following the harmonised legislation for other exposed groups on the European labour market, the EU Temporary and Agency Workers Directive (2008/104/EC) was enacted on November 19th 2008. The directive was implemented into Swedish law (through SFS 2012:854) on January 1st 2013. The directive emphasises the exposed position of the TWA worker (Article 2 of the directive; see also Böheim & Cardoso, 2009, and Spattini, 2012) and implements a principle of equal treatment – implying that not only the wage, but also other working- and employment conditions, should correspond to those of a comparable worker employed directly at the CF.

The Swedish implementation of the directive utilises the provision to make exemptions from the principle of equal treatment through collective agreement (Article 5.3, and for workers on open-ended contracts that are receiving wages between assignments; Article 5.2). Exemptions are however only allowed through collective agreements as long as it does not deteriorate the overall level of protection for the worker intended by the directive (SOU 2011:5). Collective agreements also have both a normative effect on the rest of the labour market and are even deemed applicable when only the CF has a valid collective agreement (SOU 2011:5). In Paper III I therefore argue that the wage determination in the two largest collective agreements and their extensive coverage (together with associated substitute agreements; hängavtal) differ sufficiently from the wage setting of TWA workers in previous studies (Neugart & Storrie, 2006; Baumann et al. 2011) to model the theoretical effects of an implied principle of equal treatment with regard to wages.

13See Spattini (2012) for an extensive review of the content of the directive and a comparative analysis of temporary agency work characteristics throughout Europe.
14This exemption only applies to the nominal wage and not the real wage. The exemption is motivated by that it is considered a legislated minimum wage that does not belong in the Swedish model, but also that it should convince more workers to organise in labour unions (SOU 2011:5). The authors do however raise some concerns with the sufficiency of the Swedish implementation with regard to the exemptions when neither the TWA, nor the CF, have a collective agreement. This view is also shared by Malmberg (2010).
15The blue-collar (LO; 2012-2015) collective agreement states that the wage paid to the TWA worker should correspond to the average compensation for similar work at the CF, including performance pay, piece work pay, bonuses and provisions. The white-collar (Unionen/SSR; 2013-2016) collective agreement requires individual and differentiated wages that are to be negotiated in the same manner as elsewhere on the Swedish labour market. Both agreements contain minimum wages paid to workers currently not assigned to a CF. There are also some more specialised collective agreements, e.g. in the healthcare sector and for journalists.
16These two studies assume that the TWA may unilaterally determine the wage paid to the temporary agency worker. The wage is therefore set so that the worker becomes indifferent between being either unemployed, kept on retention, or being leased to a CF.
The results correspond to the review in Thommes & Weiland (2010) which stated that even though a majority of CFs, prior to a reform in Germany in 2004, indicated that even a marginal increase in the wages paid to TWA workers would make the use of TWAs unprofitable, the sector nevertheless continued to grow extensively following the reform’s implementation of an equal wages-regime. A history of poor compliance of similar national statutes in Europe, that were implemented prior to the directive and also requiring analogous non-discriminatory practises, further suggests that the real effects on TWA workers’ wages might be limited (Nienhüser & Matiaske, 2006) – especially since the labour market parties, which mainly monitor the compliance of the directive in Sweden, requested that exemptions were to be allowed (SOU 2011:5, cf. Jahn, 2010).

3.4 The Relative Cost and Insurance Aspect

The previously reviewed studies show temporary agency workers’ wages to be significantly lower than the wages paid to similar workers outside of the sector. However, the wage is only of indirect concern for the CF (apart from the argument of strategic cost shifting in Spermann, 2011; from fixed labour costs to flexible capital costs). The main issue is rather the fee charged by the TWA for finding and leasing the worker relative to the cost that the CF would have to incur if it had done the recruitment through another channel. Several authors have noted this and also questioned the perceived cost-effectiveness of utilising TWAs (e.g. Nollen, 1996; Kalleberg, 2000; Gibelman, 2005; Thommes & Weiland, 2010).

When a CF is leasing a worker, the TWA assumes the role as the de facto employer and thereby assumes most of the uncertainties and liabilities associated with the contingent need for the worker (cf. Forde & Slater, 2005). Consequently, it serves much the same purpose as redundancy insurance for the CF if the demand for the produced goods would decline and the services of the worker would become redundant. The utilisation of TWAs has correspondingly also been shown to closely follow the business cycle (Tijdens et al., 2006; De Graaf-Zijl & Berkhout, 2007; Den Reijer, 2007; Antoni & Jahn, 2009; Spermann, 2011; Jahn & Bentzen, 2012). Neugart and Storrie (2002, 2006) and Baumann et al. (2011) also captured the insurance aspect in the way that they model the temporary agency market and their determination of the fee paid to the TWA.

However, as data on the size and structure of the fee are unfortunately not readily available, the existence of an assumed efficient price must rely on a qualitative analysis of the three main comparative advantages that the TWA might have relative to the CF (not including the possibility of paying lower relative wages); lower search costs, a more advanced matching technology, and reduced severance liabilities.

It is reasonable to assume that while having a vacancy the search-cost is lower for the TWA than the CF as the former arguably does not suffer foregone production to the same extent. The product of the TWA is the created match – regardless of whether the worker is to be continuously leased to the CF or merely matched before being employed directly by the CF, which only implies a difference w.r.t. the implied payment scheme. The TWA may as previously mentioned also invest in specialised software to keep databases with potential candidates, utilise specific and recurring advertisement channels, and streamline the recruitment process workflow which help to keep average costs low (Hevenstone, 2008).

With regard to alleviating the information deficit between firms with vacant positions, unemployed workers, workers kept on retention by the TWA, and already employed workers looking for a new opportunity, the TWA fills a similar role as the Swedish Public Employment Service (Arbetsförmedlingen; cit SPES). The costs and benefits of utilising a TWA to find a match must thereby arguably be seen in relation to the alternative of recruiting through the SPES which offers similar services for free. These services include, but are not limited to: advertising a vacant position (which in many instances will also show up in the TWAs’ vacancy databases), active matching by professional recruiters, recruitment events, and access to the candidate database as well as providing the client access to information, screening tools and forecasts.

17Other studies on the sector’s response to policy changes found that more liberal labour market policies increased the use of temporary workers (incl. temporary agency workers) in Canada (MacPhail & Bowles, 2008). However, Jahn & Bentzen (2012) argued that liberalisation of the rules regulating the TWA sector have on the contrary not been responsible for the sector’s growth in Germany.
The SPES arguably has the most comprehensive sample of unemployed workers as a requirement for obtaining unemployment benefits, and some types of social security benefits, is having to be registered with the SPES while also actively applying for jobs. However, the TWAs could potentially have an advantage in that those who already have a job might not be registered with the SPES to the same extent that they have registered with other intermediaries while performing on-the-job search.

Unlike the SPES, the TWA may furthermore choose to specialise and mainly offer a certain type of worker (within construction, IT, cleaning, etc.). Candidates could thereby self-select with the employment mediator that most closely corresponds to their characteristics and preferences. The business interest of the TWA further incentivises their recruiters to more actively create matches and may even offer a screened applicant a different position than what was originally applied for. Arguably, this effect may not be as prominent at the SPES where the responsibility of finding and applying for a job is regarded to be the responsibility of the individual prospective worker (although the SPES do offer similar services). These differences could potentially also correspond to a superior matching technology.

However, as highlighted in paper [I], the business interest could also entail some negative aspects for the CF with regard to the type of worker that is matched (cf. also Walter, 2012). Furthermore, any cost effectiveness in creating a match does not in itself justify the CF’s subsequent decision to continuously rent the worker from the TWA. Given that TWAs would be considered to produce better (and not just quicker) matches than other recruitment channels this decision is especially noteworthy.

Basic economic theory states that the CF will only continuously lease the worker if the expected benefit from this arrangement is deemed at least as profitable as employing the worker directly. This implies that the CF must consider not only the cost and the probability of being able to make match, but also the associated liabilities of employing the worker directly and then risk being stuck with unproductive labour or having to pay severance payments (corresponding to the dynamics in Neugart & Storrie, 2002 & 2006; Baumann et al., 2011). The demand for the services of a TWA (especially to continuously lease the worker) must therefore be seen in relation to the other possibilities of achieving flexibility that are available for the CF.

Based on the concepts of functional and numerical flexibility in Atkinson (1984), the final part of this introductory chapter contains a non-exhaustive review of the main provisions in the Swedish EPA (SFS 1982:80) concerning the employer’s ability to meet changes in the demand for its produced goods or services and the associated liability structure.

This provides a hint of the comparative advantages that a TWA could have relative to CFs by emphasising instances when the EPA allows for negotiated deviations and adaptations through a collective agreement.

I also discuss the economic risks carried by any firm when utilising certain types of employment contracts which serves as segue into paper [IV] and the rationales of pursuing settlements rather than seeking a court verdict when disputes arise.

4 Flexibility and Liabilities

4.1 Functional Flexibility

The delimitation of a worker’s obligation towards the employer is regulated by what has come to be known as the 29/29 principle (referencing to verdict no 29 in the Swedish Labour Court, Arbetsdomstolen; cit AD, in the year 1929; i.e. AD 1929 no 29). Since then the principle has been upheld in a number of subsequent verdicts through which its scope and restrictions has been defined (see e.g. AD 1978 no 89, AD 1980 no 51, AD 1993 no 160, AD 1998 no 39, AD 2008 no 40 and AD 2010 no 51).

A worker in Sweden is in summary generally obliged, within the applicable collective agreement area and in reciprocity of the wage, to carry out any task within the employer’s natural scope of business for which the worker is qualified (Andersson et al., 2013; Glavå, 2011). A written job description thereby only weakly limits an employee’s obligations towards the employer (see AD 2002 no 134).

18 It is also possible that the employer wants to either change the orientation or scope of the business – or even discontinue all production.

19 See e.g. 2 § EPA which allows deviations with regard to the types of fixed-term employment and terms for the probationary employment, dismissal priority principles, re-hire agreements, when to give due-notice etc. This follows Håkansson & Isidorsson (2014) in that labour unions could allow the use of TWAs to protect their members with more standard types of direct-hire contracts with the CF (see also Nollen, 1996; Ericcek et al., 2002; Jahn, 2010; Thommes & Weiland, 2010).
The principle, originating in the employer prerogative, constitutes a hidden and implicit clause within every collective agreement (unless explicitly stated otherwise, see AD 1933 no 159, AD 1986 no 127). Although not explicitly included in any codified law, it is also regarded as a core legal principle (rättsgrundsats) in Swedish labour law (see AD 1930 no 52, and AD 1932 no 100). This allows the principle to be applicable even if the affected worker is not a member of the labour union with whom the employer has signed a collective agreement (AD 2003 no 20).

The interpretation of the principle is more restrictive for white collar workers than blue collar workers (AD 1983 no 174, 1995 no 31), and even more so for public servants (AD 1980 no 51, AD 1995 no 101). There is however a trend in that the obligation for public servants approaches that of white collar workers (AD 2002 no 134).

The scope is also limited in that it cannot be discriminatory (see the Swedish Discrimination Act, SFS 2008:567), and cannot fundamentally alter the employment agreement in such a way that it constitutes a completely new employment altogether (Källström & Malmberg, 2013; see also AD 2000 no 76). It also cannot put the worker’s life and/or health at risk, or be impossible to carry out.

This establishes a rather far-reaching obligation for the worker to perform a large range of services for the employer – even outside of the written job description. The employer thereby has a correspondingly large degree of discretion on how to utilise the employees if there would be an unexpected change in demand for the produced goods or services. Källström and Malmberg (2013) summarises the overall notion well by stating that just because a worker has committed themself to carry out some specific task does not give him/her the right to do so.

4.2 Numerical Flexibility

Other than reaching a mutual (often economic) agreement with the worker, the employer may unilaterally end an employment agreement by either dismissing the worker (uppsägning; 7 § EPA), or terminating the agreement (avsked; 18 § EPA). Swedish labour law requires just-cause (7 § EPA) for both types – except in the case of probationary employment and with some restrictions for fixed-term contracts (both reviewed below).

Termination is always based on the former cause whereas a worker may be dismissed due to either cause. Termination regularly ends the relationship directly as a consequence of the employee grossly neglecting his duties towards the employer and thereby does not require the aforementioned review of less intervening actions.

Just-cause relates to either personal reasons (personliga skäl) or the concept of lack of work (arbetsbrist) and also requires that the employer following a relocation investigation has not been able to offer another job, adapting the workplace or help to increase the worker’s knowledge, skill or expertise (where applicable and within certain limits; Andersson et al., 2013).

Personal reasons relate to the individual worker and an array of factors interplay in the court’s verdict: e.g. misconduct, criminal actions, cooperation difficulties and/or insufficient knowledge, skill or expertise. It is also important as to whether the behaviour is recurrent, and if the worker has been made aware of that the behaviour is not accepted. Other factors include the size of the firm, documentation, proportionality, and the worker’s position, seniority and prognosis. (Glavå, 2011)

Lack of work is regularly, but not limited to, cases where the employee is deemed redundant due to the employer not having any tasks to be carried out. It also includes any other reason (i.e. reasons relating to the employer prerogative to organise and manage the company: e.g. AD 1993 no 101, AD 1994 no 122) to dismiss a worker that is not attributable to personal reasons.

The preparatory documents to the 1974 EPA (Prop. 1973:129) state that it regularly does not fall on the Swedish Labour Court to challenge the financial assessment of the firm when claiming lack of work\textsuperscript{20}. The employer is nevertheless required to present a basis for the underlying changes that is not too arbitrary or which mainly rely on highly uncertain appraisals (AD 2006 no 92).

\textsuperscript{20}This notion has since then been consistently reiterated and upheld by the Swedish Labour Court (e.g. AD 1984 no 26, AD 1997 no 121, AD 2009 no 6, and AD 2009 no 7. See also Andersson et al. (2013) and Glavå (2011).
A proper account of the factors that underlie the decision to reduce the number of employees may in principle not be challenged, and the employees are regarded as safeguarded primarily through the applicable statues regulating due-notice periods (11 § EPA), dismissal priority principles (cf. seniority rules; 22 § EPA), and re-hire agreements (25-27 §§ EPA). (AD 1993 no 101)

The provisions in all of these statutes could however be adapted through a collective agreement (2 §EPA). This implies a relatively large scope of discretion for the employer to (re)arrange the organisation and its staff to fit the current and future needs of the firm (see Glavå, 2011, for an elaborated discussion on the subject).

The dismissal notice period could thereby be seen as the soft liability of the firm as it defines a period during which the firm has an obligation to remunerate the worker, but cannot unconditionally expect the same productivity. The worker is nevertheless expected to remain loyal to the employer and carry out the assigned tasks as the employment agreement persists during the entire dismissal notice period. (Glavå, 2011)

The employer may however reduce these liabilities even further by choosing the appropriate employment type depending on the underlying situation.

The **probationary employment** (6 § EPA) allows the employer to test the presumptive worker at the workplace with the applicable tasks and colleagues during a pre-specified probationary period that normally cannot surpass six months. This allows the employer to assess the matched worker over several dimensions both work related and social.

A probationary employment nevertheless presupposes that such a need actually exists (cf. AD 1991 no 40 to AD 1991 no 92). This employment type is characterised by its limited liability since a dismissal does not require just-cause, and the dismissal notice period is limited to two weeks unless stated otherwise in a collective agreement. However, if the probationary period is not ended prematurely, the employment automatically transitions to an open-ended employment.

The probationary period leaves both parties in a state of relative uncertainty as to the other party’s intention of fulfilment. However, the employer is arguably the superior risk bearer (Posner & Rosenfield, 1977) through being able to reduce its risk of losing the worker by offering another employment type (e.g. a fixed-term employment) that guarantees the employer the services and productivity of the worker for the expected duration of the contract.

**Fixed-term employment** (5 § EPA) in Sweden is a collective term for: general fixed-term employment, substitute employment, seasonal employment and special rules regarding the employment of older workers (>67 years), but a collective agreement could contain provisions for other types as well. The fixed-term contract is often associated with the completion of some project, assignment or, similar to the probationary employment, with some pre-specified period of time. This employment type resembles a general contract where one party is compensated for carrying out a specific service for another party. The contract normally ends on the pre-determined date and there is usually no need for either party to give due notice.

The specific nature of the fixed-term contract generally precludes lack of work as a just cause, and either party might be entitled to economic compensation if the other party wants to end the employment relationship prematurely (Källström & Malmberg, 2013). This basically translates this employment type into a fixed cost for labour during a certain period.

The firm may also offer the same worker several sequential (or even non-sequential) fixed-term contracts over an extended period of time through which the associated liability is always bounded by the obligation to pay wages during the current assignment. The frequency which repeated fixed-term employment with the same worker may be used by a firm has been reviewed both by the Swedish Labour Court and the European Court of Justice (CURIA), and has seemingly been left to the discretion of the employer as long as some objective reasons have been put forth.

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21 It is possible to phrase the agreement so that both parties may end the employment prematurely following a notice period (see 11 § EPA, if nothing else has been negotiated) but also requires the employer to show just-cause. The notice period may however not stretch past the final date in the employment agreement which still limits the firm’s liability. (Källström & Malmberg, 2013)

22 See e.g. AD 1984 no 66 and AD 2002 no 3 for the national perspective, and C-53/04 (Marrossu and Sardino v. Azienda Ospedaliera Ospedale San Martino di Genova e Cliniche Universitarie Convenzionate), C-180/04 (Andrea Vassallo v. Azienda Ospedaliera Ospedale San Martino di Genova e Cliniche Universitarie Convenzionate), C-212/04 (Konstantinos Adeneler and Others v. Ellinikos Organismos Galaktos) or C-586/10 (Bianca Kücük v. Land Nordrhein-Westfalen) for the perspective of the CURIA.
A fixed-term employment automatically transitions into an open-ended employment if an employee has worked for the same employer for a total of two years during the previous five years (5.2 § EPA, unless stated otherwise in a collective agreement; 2 § EPA, or other legislation). The transition rule is however interpreted as being type dependent, i.e. implying that a mix of e.g. general fixed-term employment and substitute employment (where each type has a cumulated duration of less than two years) with the same employer does not trigger the transition rule. (Källström & Malmberg, 2013)

The open-ended employment constitutes the norm in Sweden (4 § EPA) and all employment contracts are presumed to be of this type unless explicitly stated otherwise. It is potentially also associated with the highest risk for the employer since the employment status remains intact for the duration of the conflict whenever an employee challenges a dismissal decision as being invalid and calls for an annulment (34 § EPA). The obligation for the employer to pay wages and for the employee to perform the assigned tasks thereby also remains until the conflict is resolved.

On the other hand, a termination regularly dissolves the relationship immediately, and thereby also cancels the reciprocal obligations. The termination decision can be invalidated in two ways. Either the court finds that there is not just-cause for a termination, although it’s still sufficient for a dismissal. In this case the worker is entitled to retroactively obtain economic damages corresponding to wages during the dismissal period and potentially additional economic and punitive damages. If the court would fully invalidate the decision to terminate the worker (stated reasons are not sufficient even for a dismissal), then the employment relationship is revived and the employer must pay the full retroactive wages from the time of the termination, and punitive damages as well. (Källström & Malmberg, 2013)

There are however some checks and balances to this system. During an ongoing dismissal validity dispute, the employer may request a preliminary injunction for the employment to end after the applicable dismissal notice period (34 § EPA, although not retroactively; AD 1984 no 7). The employer could similarly be found liable to pay wages during a termination validity dispute if the worker requests a preliminary injunction and the court assesses that the circumstances are such that there is not even reasonable just-cause for a dismissal (35 § EPA; see also AD 1974 no 57).

43 § EPA states that these types of disputes should be dealt with promptly, and the time from dismissal/termination until a verdict during 2005-2010 for cases where the worker has claimed invalidity has been reviewed in SOU 2012:62. The review suggested that these cases take on average just over one year (15 months) in the district courts, whereas the process in the Swedish Labour Court takes an average of almost two years (23 months). It should however be noted that the procedure in the Swedish Labour Court requires formal settlement negotiations, both prior to the actual court process and during this process, which could help explain the longer duration – at least in part.

However, the worker may never force an employer to actually reinstate him or her, which relates to the sentiment of the employer prerogative. An employer that is not willing to comply with the court’s verdict stating that the dismissal or termination is not valid may always end the employment relationship by paying the worker normative damages based on the preceding employment duration (39 § EPA). This possibility requires there to be a legally binding verdict to oppose, and the employer may therefore not pre-emptively pay the normative damages to unilaterally resolve the conflict.

Although non-exhaustive, this overview gives some indication of the monetary costs that may accumulate during a conflict – along with the cost of legal representation. This is presumably why the vast majority of disputes also become settled out of court (SOU 2012:26). Although there is a vast literature on litigation and settlement, there is very little research on the settlement process and behaviour in these types of cases in a Swedish setting (SOU 2012:62). Paper [IV] adds to this scarce literature by estimating a model on how the relative settlement probability evolves over time conditional on the type of representation based on a theoretical model initially developed by Spier (1992) and subsequently applied in different variations to settlement behaviour.

Invalidity cannot be claimed if the decision only violates the ordering of the affected workers (34 § EPA).

The employer could also be liable for not following the applicable procedural requirements: e.g. failing to negotiating/inform according to the provisions in the CWA or related paragraphs in the collective agreement, or be in violation of the provisions in the Discrimination Act, or even interfering with the workers freedom of association (7-9 §§ and 54, 55 §§ CWA).
5 Summary of Papers

Paper [I]: The Misaligned Incentives of Temporary Work Agencies and Their Client Firms
In this paper we analyse the search behaviour of a TWA in a principal-agent model with hidden action and asymmetric information between the TWA (agent) and the CF (principal). The productivity distribution of the applicants is known by the TWA, but not by the CF, as a consequence of the formers specialisation in creating vacancy/worker matches. Hidden action is an intuitive corollary to the CF minimising its involvement when outsourcing the recruitment process, and the CF is assumed to only be able to observe the actual output of the TWA (i.e. the supplied worker), but not the forgone alternatives.

The TWA screens the distribution of applicants in discrete time in search of a worker that fulfils some (exogenous) minimum productivity level and the remuneration to both the worker and the TWA is modelled as independent of the (marginal) productivity of the match. Instead, the wage paid to the worker is related to the vacant position whereas the fee paid to the TWA differs depending on the contract type.

The case where the TWA is tasked with identifying a candidate who then becomes employed directly at the CF is referred to as a Recruitment Contract. This contract type is modelled using three different payment types to the TWA: continuous payment throughout the search process, payment on delivery and payment at a predetermined point in time (conditional on a match being delivered). The results show that conditioning payment on delivery is a necessary condition for any search to be carried out. The TWA will also always supply the first sufficient match regardless of any remaining resources, and potentially even defer the search rather than utilising all available time.

The second contract type is a Recruit-and-Rent Contract where the fee to the TWA is determined by the time the TWA expects to be able to lease the worker to the CF. The duration of the lease is modelled to be negatively related to the productivity of the match as a more productive match is assumed to be employed by the CF, or will transition to another type of employment, quicker than a less productive worker. This gives the TWA incentives to perform additional search, but always for a less productive (but still sufficient) worker.

We thereafter show that the CF may potentially offset this search behaviour by increasing the number of TWAs competing for the contract. However, the CF might be unable to attract a sufficiently large number of competing TWAs as their expected payoff for any given match will also decrease with the degree of competition.

Paper [II]: Young Adults in the Swedish Temporary Agency Sector: Implications of Family Experience
Family (including friends and relatives) constitutes one of the most important channels for obtaining employment. Family is also regarded as the peer group that has the strongest influence on youth career development through an array of structural- and process variables, while also being one of the strongest identity determinants (second only to labour market affiliation). A person’s first exposure to working life is furthermore not considered to be the individual’s first job, but rather the experience and opinions conveyed by his or her family and other reference groups.

The reviewed literature on the working- and employment conditions for temporary agency workers suggests that this type of worker suffers lower wages and worse working conditions while carrying out primarily repetitive jobs with a low degree of autonomy and short average durations. The survey also shows that the temporary agency worker experiences notable adverse psychosocial effects such as a relatively high degree of depression syndromes and a very low degree of job satisfaction. Although some workers might actively choose agency employment, the associated precariousness could still arguably impact the information conveyed to the worker’s peer groups, either directly or indirectly.

In this paper we estimate the impact of immediate family members’ and the current partner’s previous work experience from the TWA sector on the observed individual’s relative probability of working in the sector. We focus on young individuals (age 18-34) not only because this cohort constitutes the largest subset of the Swedish agency sector, but also due to that the sector has only been deregulated for a relatively short period of time which directly affects the possibility of having (preferably older) peers with previous experience from the sector.
The focus on the younger cohorts also allows us to acknowledge the need to differentiate between those who are primarily gainfully employed and those we define as students. Not only could these two groups potentially differ greatly in their motives for accepting temporary agency work, but the student group has also been largely excluded in previous studies on the Swedish temporary agency sector.

The main results show that there is not only a highly significant impact from the work experience variables of all included peer groups, but the relative size of these effects also suggests that they are among the most influential determinants. Their importance and size is furthermore consistent for both the gainfully employed workers and the student group.

Other results show that even though the sector is primarily comprised of workers born in Sweden, an immigration background is still an influential determinant as the sector has a disproportionately large number of second-generation immigrant workers, and workers born in other countries. The transitory characteristic of the sector, either as a strive for employment outside of the sector (supply side) or that younger individuals might be favoured by the TWAs (demand side), could be discerned in the steadily declining relative number of TWA workers in the older cohorts.

The relatively high level of education in the sector, for both the gainfully employed and the student group, although individuals in the latter group most likely have not yet attained their final level of education, is also a noteworthy result. This result, along with noting that it is predominately men employed within the sector, constitute two notable differences compared with the results of a previous study of the Swedish TWA sector almost a decade earlier.

**Paper [III]: Employment Effects of the EU Temporary and Agency Workers Directive in Sweden**

Several statutes of European legislation are intended to protect the rights of certain groups on the labour market by guaranteeing them equal treatment in relation to their co-workers. The equal treatment concept is not only limited to wages, but includes all aspects such as access to training and fringe benefits.

Having only been allowed in Sweden since the early 1990’s, TWAs constitute a relatively new phenomenon on the labour market. The TWA worker carries out the assigned tasks within a characteristic tripartite relationship where the relationship between the worker and the agency is regulated by labour law, whereas the agreement between the CF and the TWA is governed by specific contracts limited by the general contract law statutes.

This has resulted in significant wage differentials and adverse working conditions as compared to workers on more standard forms of employment. It has thereby also brought a need for legislation in order to regulate some of the fundamental working conditions in the sector. The EU Temporary and Agency Worker Directive (2008/104/EC) ensures that the leased TWA worker should have the same wage and other benefits as those directly employed at the CF, while also facilitating that the worker may transition into employment directly at the CF.

The theoretical implications of the equal treatment principle is modelled using an augmented Mortensen-Pissarides search model with frictions and interacting (dual) labour markets: the regular labour market and the market for temporary agency workers. Vacancies in the agency sector may only be filled with unemployed workers, whereas vacancies in the regular sector may be matched with both unemployed workers and temporary agency workers.

Initially the model is calibrated to the situation prior to the implementation by applying insights from previous research, after which the effects on unemployment and the distribution of employment between each sector is estimated. This is done by increasing the compensation to the workers in the temporary agency sector until their valuation of working there corresponds with a job in the regular sector.

The results suggest that the overall wage rate in the labour market will increase both directly through the increased compensation paid to the TWA workers, and also indirectly due to agency employment becoming an alternative to regular employment rather than unemployment. This reduces the number of workers employed in the regular sector and the mark-up that the TWA is able to charge for their services. The reduced price of the TWAs’ services and the increased wage rate will nevertheless increase their market share through their relatively low search costs and the ability to hedge severance liabilities.

The positive impact on social welfare, modelled as the change to a utilitarian welfare function, suggests that the increased wage for temporary agency workers will nevertheless compensate for the reduced number of employed workers in the regular sector.
Paper [IV]: Information Asymmetries in the Swedish Labour Court
This paper estimates a (non-proportional) Cox model with time-varying effects to empirically test for different settlement probabilities in a sample of unjust dismissal cases from the Swedish Labour Court with either union representation or non-union (private) representation.

Underlying the hypotheses of potentially differing settlement probabilities is a sequential bargaining model where the defendant is assumed to form a Bayesian subjective prior assessment of the plaintiff’s minimum acceptable settlement amount. The structure of the model allows the time until a (potential) settlement is reached to be expressed as a discrete hazard function, which is only influenced by the size of the assessment and the costs associated with continued bargaining.

The cost structure, and its relation to the duration of the case, however is only discernible in cases that have been resolved through an enforced verdict. An initial test is therefore carried out, and there are no statistically significant differences in the cost structures between the two types of representatives. This enables the relative settlement probability (i.e. hazard) rate to be estimated, and any statistical difference attributed to a differing underlying liability assessment of that type of representation.

The relative hazard rate of the two types suggests that there are differences in the relative settlement probability where cases with private representation are significantly less probable to reach a settlement. However, these differences become non-significant when controlling for the timing of court mandated sharing of information. This suggests that privately instigated negotiations and private sharing of information is not sufficient for making the settlement hazard rate of cases with non-union representation reach that of cases with union representation.

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The Misaligned Incentives of Temporary Work Agencies and their Client Firms

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Abstract

This paper adds to the theoretical literature on the incentives of Temporary Work Agencies (TWAs). Using a principal-agent model with hidden action to analyse two main types of contracts between a TWA and a Client Firm (CF), the TWA is shown to potentially act against the best interest of the CF when helping to fill a vacant position. The results also suggest that the adverse effect of the incentive misalignment is larger when workers are leased rather than hired by the CF. However, this effect could potentially be offset by introducing a sufficient level of competition among TWAs.

Keywords: Temporary work agency, client firm, incentives, matching, contracts
JEL classification: J41, J44, J64

1 Introduction

The number of workers employed through a temporary work agency (TWA), either as a consultant employed by the TWA, or screened by the TWA before being hired by the client firm (CF), has risen substantially in the last decades (Andersson-Joona & Wadensjö, 2010; Forde & Slater, 2005). While it might seem as though the interests of the CF and TWA are aligned, i.e. one pays to fill a vacant position while the other gets paid to fill said position, we show that this is not necessarily the case (cf. Gibelman, 2005).

By outlining a principal-agent model with hidden action we are able to shed light on some important consequences of the differing incentive structures between the CF (principal) and the TWA (agent); among other things, the CF wants to lease the best possible worker for a given position, while the TWA may want to provide the least productive worker possible who is still sufficiently good at his/her job.

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The TWA is usually assumed to have some advantage(s) in the recruitment process through which it is argued to be able to supply a worker more quickly than the CF would be able to, and/or hedge certain liabilities of the CF towards the contingent TWA worker (Autor, 2001, 2003; Baumann, Mechtel, & Stähler, 2011; ECORYS-NEI, 2002; Houseman, 2001; Mitlacher, 2007; Neugart & Storrie, 2006; Westéus, 2014). The CF’s primary use of TWAs is thereby to either delegate search, i.e. identify prospective candidates for a vacant position and assess their productivity, and/or be able to (quickly) lease a worker to fill a vacant position (Beckmann & Kuhn, 2012; Forde, MacKenzie, & Robinson, 2008). Our principal-agent model therefore investigates two primary contract types: Recruitment Contracts and Recruit-and-Rent Contracts.

While not having been used in exactly this context, the principal-agent literature dates back to the 1970’s where Spence and Zeckhauser (1971) developed the first model, focusing on insurance. These types of models have since then been used to answer questions in various fields (see e.g. Miller, 2005, for a review). Bendor, Glazern, and Hammond (2001) offer a basic introduction to delegation, and Lewis (2012) contains a review of recent studies on delegated search. Milner and Pinker (2001) considered two types of problems; the first being when the productivity of a temporary worker is difficult to evaluate and subsequently the TWA is used for screening purposes, and the second one entailing the impossibility of creating a socially optimal labour supply contract between a CF and a TWA under hidden action, when the demanded quantity of sufficient, uniformly productive workers is uncertain when the unit price is negotiated.

Hidden action in this context implies that by only being able to observe the supplied worker(s) and not the process (cf. the findings in Beckmann & Kuhn, 2012; Connell & Burgess, 2002), the CF is only able to assess who they get, but not who the alternative workers were (cf. Gibelman, 2005), as any match is only privately observable by the TWA unless supplied to the CF (cf. Halac, 2013). This allows the TWA to match workers in a way that might not be optimal for the CF, and these differences have mostly been neglected in previous studies, even though they are potentially highly influential in determining the type of worker that the TWA will supply. One exception is Postl (2004), who found that when an agent is given two alternatives to evaluate, he may only have the incentive to evaluate one and then lie about the quality of the other, resulting in an efficiency loss, as the principal would base its decision on (possibly) incorrect information. Additionally, this aspect of the matching problem has been overlooked in other studies where the agent is contracted to evaluate and provide information on the quality of an already available alternative, or a stream of alternatives, under hidden action (see e.g. Chade & Kovrijnykh, 2012).

This paper expands on the reasoning of Postl (2004) and related papers, but extends the model by letting the TWA itself search for any number of alternatives and also by removing the assumption of a fixed search cost per alternative. This allows us to carry out a more thorough investigation into the outcome of the incentive misalignment resulting from hidden action.

The present paper adds to the existing literature by providing a complementary (or perhaps even an alternative) and structural explanation for the ability to quickly match a worker to a vacant position, which in previous studies has been assumed to be the result of some superior matching technology (Baumann et al., 2011; Neugart & Storrie, 2006). The results, similar to Beckmann and Kuhn (2012), suggest that CFs should use TWAs to only screen applicants (which are then employed directly at the CF), rather than continuously leasing the workers. We also discuss whether a logical extension of our theoretical results could provide an alternate (demand side) explanation to the increased level of education among the workers in the Swedish temporary work agency sector between 1999 (Andersson-Joona & Wadensjö, 2008) and 2007 (Westéus & Lindgren, 2014), in contrast to the (supply side) rationale offered by Walter (2012).
Furthermore, these results are independent of the price level of the TWAs’ services (see Baumann et al., 2011; Neugart & Storrie, 2006; Westéus, 2014), in that they only require the existence of a price that the CF is willing to pay and the TWA is willing to accept. This paper therefore does not need to consider optimal pricing for the TWAs’ services. The results instead rely on the assumptions of asymmetric information1 and an imperfect labour market where the offered wage is related to the vacant position rather than the productivity of the matched worker.

The body of research on the productivity of temporary (agency) employees uses different productivity measures and yields somewhat inconclusive results (compare e.g. Beckmann & Kuhn, 2012; Kleinknecht, Oostendorp, Pradhan, & Naastepad, 2006) and has not considered the potential incentive misalignment suggested in this paper (see Hirsch & Mueller, 2012; Nielen & Schiersch, 2011). This is why it will be up to future research to measure the importance of our contribution. To our knowledge, there are no studies on the performance of workers on fixed-term contracts employed directly at the CF, relative to temporary agency workers at the same firm who perform the same type of jobs. Our model therefore does not fully support or reject any of the results in previous studies from an individual worker productivity aspect, but rather it emphasises the difference in the type of worker the TWA might supply. It has similarly been argued by Walter (2012) that TWAs have an incentive to be able to continuously lease their workers, and therefore they might not only match for the specific traits requested by the CF.

The paper is outlined as follows: section two outlines the model for the two aforementioned main types of activities; a Recruitment Contract, or a Recruit-and-Ren Contract. The Recruitment Contract implies that the CF always employs the matched worker directly at the firm whereas the Recruit-and-Rent Contract allows the CF, at each point in time, to make a choice of either subsequently leasing or directly employing the matched worker2. Initially the analysis is concerned with the outcome of different types of contracts between the CF and a single TWA, whereas the last part of the analysis is concerned with the effects when there are several competing TWAs. The main results of the model are thereafter summarised, after which the final chapter contains a longer discussion of the models assumptions and implications.

2 Model

The model consists of two types of risk-neutral actors: a CF and one or more external recruitment agencies (TWAs), where the former is defined as any firm having established that there is a demand for an additional worker (i.e. a vacancy) that will be matched by a TWA.

For any vacancy we assume that there are J possible applicants and each individual j is identified by his/her unique productivity level, xj,3 where the set of available workers is assumed to follow a uniform distribution: \( X = \{x_1, \ldots, x_J\} \sim U [\xi, \overline{\xi}] \).4

1The CFs believe the TWAs to be superior in some aspect(s), making the CFs willing to use the TWAs’ services.
2The choice to employ the worker is final, and the CF may thereafter not lease the worker.
3For simplicity, we model the productivity as a scalar, but it could also be modeled as a multi-dimensional vector. The productivity vector would then consist of all possible traits that a worker may have (e.g. preferences on commute distance, age, education, previous job experience, family situation etc.) with a complete set of marginal rates of substitution between every pair of traits.
4This simplification is done to keep the mathematics as simple as possible and not divert from the qualitative implications of the model.
For each vacancy we assume that there is an objective (i.e. true) exogenous\(^5\) minimum productivity required: \(x^*\), and that the position pays a fixed wage: \(w\), to the worker once filled.\(^6\) The analysis is therefore delineated to when there is a proper non-empty subset \(\chi = \{x \in X \mid x \geq x^*\}\) containing \(K < J\) elements where each individual has a unique \(x_k\). This allows us to ignore the special cases when there are either no applicants at all, or when only unqualified workers will apply (market of lemons). It also implies that the TWA is expected to (asymptotically) be able to identify a worker with a sufficient productivity; \(x_m \in \chi\), which is denoted as a match. We define \(x_L (x_H)\) as a subsequent match that has a lower (higher) productivity than the first match, while still being sufficient, i.e. \(x^* \leq x_L < x_m < x_H\).

The shape and size of the distribution of workers and its subset is assumed to be known by the TWA, due to its specialisation in creating matches between vacancies and job seekers, but for the same reasons it is assumed to be unknown by the CF. The CF is also either incapable, or unwilling, to monitor any search effort by the TWA other than the actual output: the productivity of the supplied worker.

The model is outlined in discrete time \(t \in (0, 1, ..., T)\) where only one worker may be evaluated at each sub-period. The model also includes a perfect credit market with interest rate \(r\). Following prior simplifications, the constant probability of finding a match at each point in time becomes \(p = p(x_m \geq x^*) = \frac{K}{J} = \frac{x^*-x}{x}\). This allows the cumulative probability that a match will be found within a given amount of search periods to asymptotically approach one.\(^7\) For each time period the TWA searches, it incurs a constant cost \(c\).

Finally, a necessary (but not sufficient) condition for a TWA to accept the assignment is that the expected present value stream of payments from the CF, after netting off the TWA’s expected accumulated search cost, is non-negative. Because the model is not concerned with the explicit pricing of the TWA’s services, this condition will always be fulfilled by assumption, so that we are able to focus on the strategic search behaviour of the TWA.

### 2.1 Recruitment Contract

#### 2.1.1 Continuous Payment

A continuous payment contract stipulates that the CF will pay the TWA a fixed amount \(\varphi\) at each time period until a sufficient worker is supplied, or the contract expires at time \(T\). The TWA’s present value decision rule for accepting the recruitment assignment can be written as:

\[
\pi = \sum_{t=a}^{b} \left\{ \frac{\varphi}{(1+r)^t} \right\} - c \sum_{t=a}^{b} \left\{ \frac{e}{(1+r)^t} \right\} \geq 0, \tag{1}
\]

where \(c \in (0, 1)\) is the TWA’s discrete decision whether to exert effort or not over the time interval \([a, b] \subset [0, T]\). \(\Gamma \in [1, T]\) is when \(x_m\) is presented to the CF, or when the contract expires.

The assumption of hidden action makes the CF unable to monitor the actual (search) activity of the TWA. This removes the incentive for the TWA to carry out any search at all and thus the TWA always chooses \(e = 0\) to maximise its profit. This payment scheme thereby does not create any incentive for the TWA to actually carry out any search.

\(^5\)We discuss the implications of endogenising this parameter at the end of the section.

\(^6\)We argue that this construct is empirically relevant. Optimal marginal wage-setting requires the employer to be able to estimate the individual’s marginal productivity which, outside of a perfect labour market with either piece-work pay or low-cost alternative employment opportunities that allow the workers to self-select, is often quite hard - or even impossible.

\(^7\)The search duration will follow a geometric distribution due to the fixed probability of finding a match at each turn. We assume that there are either enough applicants, or that individuals may enter and leave the set which makes the best approximation of the probability of finding a match to be constant over time.
The observant reader might notice that \( \Gamma \) would be stochastic if the TWA would have incentives to reveal a match prior to \( T \). This however will not be the case, as the profit maximising strategy of the TWA does not include any search activity at all. It is not the sequential nature of the contract that drives this result, but rather that payment is not conditioned on the CF actually being supplied a sufficient worker. Conditioning payment on delivery thereby becomes necessary for any effort to be exerted at all.

2.1.2 Payment on Delivery

In order to incentivise the TWA to search, the CF could offer a contract where a fixed payment \( \phi \) is made when \( x_m \) has been supplied. This payment-on-delivery contract ensures that upon accepting the contract, the TWA will start searching immediately, yet it also implies that the TWA will receive the same payment for supplying any \( x_j \in \chi \). Thus there is no reason for the TWA to continue searching for \( x_H \), after having found \( x_m \), as any additional search effort will both increase the TWA’s costs and decrease its present value revenue.\(^8\) The optimal strategy by the TWA is therefore to immediately deliver its first match, whose expected productivity will be \( E(x_m) = \frac{x^* + x}{2} \).

**Proposition 1.** The TWA will never attempt to find an alternative candidate after having found the first match.

This behaviour could create a different outcome compared to the option that the CF would have preferred, as the TWA will stop searching even if there were resources left to conduct additional search.\(^9\) If the CF had perfect monitoring, and thereby a better ability to enforce continuous effort, then the first match would still have a random (but still sufficient) productivity. However any additional resources could then be spent on finding an even better worker until the expected marginal cost of additional search would surpass its expected additional benefit. We define this as searching for the **marginally most productive worker**, whom would have the expected productivity \( E(\tilde{x}_m) = \frac{x^* + x}{2} + \gamma \), where \( \gamma \geq 0 \) is the aforementioned productivity difference which is determined by how much additional search would have been profitable for the CF given the search cost and the residual probability of finding a more productive worker.

The search decision for this type of contract is sequential in nature and denoting \( \Xi_\tau \) as the set of draws prior to \( t = \tau \) the two conditions for search in the subsequent time period \( \tau \) become:

\[
\Xi_\tau \cap \chi = \emptyset \\
p\phi - c(1 + r) \geq 0
\]

Equation (2) means that the TWA has not found a sufficient worker in the previous period, and Equation (3) is a marginal condition saying that any additional search effort must have a positive expected profit\(^{10}\).

It does not matter if the TWA expects the CF to terminate the contract at some point\(^{11}\), because even though this would set an upper bound on search activity, no incentives will be altered as payment

\(^8\)The model will later be extended to relate the productivity of the worker to the expected revenue of the TWA.

\(^9\)If the TWA (by chance) would find and supply the most productive worker in the population \( (x_m = x) \), then matching is efficient even for the CF (as engaging in additional search would have a zero probability of finding a better worker). The same is true when the expected productivity gain of additional search is not expected to surpass its costs, had the CF carried out the search itself with the information and cost structure of the TWA. We will however focus our attention on when the best worker is not (necessarily) found right away and where additional search would have been an option.

\(^{10}\)This condition will always be fulfilled, as the contract has been accepted.

\(^{11}\)E.g. that the TWA is not supplying a match within a “reasonable” amount of time.
is immediate upon delivery. Implications of contractually specifying a fixed point in time when payment will be made, conditioned on delivery, will be discussed in the next subsection.

2.1.3 Payment at a Pre-specified Point in Time, $T$, Conditioned on Delivery

If the contract is designed in such a way that payment offered by the CF is made at time $T$, conditional on the TWA supplying $x_m$ at or prior to time $T$, then the TWA must consider its probability of finding $x_m$ over time. The present value at time $t = 0$ of the accumulated cost from searching an arbitrary number of periods $[a, b] \in [0, T]$ can be expressed as\(^{12}:

$$C(s) = \sum_{t=a}^{b} \left\{ \frac{c}{(1+r)^t} \right\}, \quad (4)$$

Denoting the fixed payment the TWA will obtain at $T$ if $x_m$ is supplied to the CF as $\phi$, the present value expected revenue at time $t = 0$ from searching up to $s$ time periods is:

$$E[R(s)] = [1 - (1 - p)^s] \left\{ \frac{\phi}{(1+r)^T} \right\}, \quad (5)$$

where the first term signifies the cumulative probability that a match will have been found during the $s$ periods of searching.

If there is some exogenous accumulated-cost constraint making the TWA unable to fund search during all periods $t \in (0, \ldots, T)$, then searching will be deferred towards $T$, to maximise the constrained probability of delivery. Given a positive interest rate and denoting the maximum number of time periods the TWA will afford to search as $s$, if starting to search immediately, and $\pi$ if searching towards the end, we have that $s \leq \pi$ for any contract where $s < T$,\(^{13}\) as any given search effort will have a lower present value cost the later it is expended. When the TWA has the option to choose when to search during the lifetime of the contract $t \in (0, 1, \ldots, T)$, it is clear that the TWA will prefer to exert search efforts later rather than sooner in order to maximise its present value expected profit.

**Proposition 2.** The TWA will find it optimal to defer searching due to discounting if $s < T$.

Given that the TWA has found $x_m$ prior to $T$, the design of the contract makes the TWA indifferent between delivering $x_m$ immediately, or waiting an arbitrary amount of time\(^{14}\), since the payment is independent of when $x_m$ is presented. Moreover, this aspect is not optimal for the CF, as it can hardly be worse off by being presented with the (first and final) match as soon as it has been discovered – especially since the first actual day on the job can be subsequently negotiated between the CF and the matched worker.

The model will now be extended to also include the option for the CF to either employ the worker directly, or lease the worker through the TWA. This follows e.g. Houseman (2001) and ECORYS-NEI (2002) in that the main rationale for utilising TWAs is to screen the productivity of a worker before making the decision to either employ the worker, end the collaboration, or continue to lease the worker. It also follows the transitory pattern between temporary agency workers and workers on standard employment contracts in Westéus (2014), Baumann et al. (2011) and Neugart and Storrie (2006).

\(^{12}\)The effort parameter $e$, previously used in Equation (1), is dropped in (4) as the present value of accepting a contract, and thereafter exerting no effort, will always be zero.

\(^{13}\)The first inequality is not strict due to the discrete nature of the model.

\(^{14}\)But no longer than until $T$. 

6
2.2 Recruit-and-Rent Contracts

2.2.1 A Single TWA

In this setup we assume that any supplied worker is initially always employed by the TWA and leased to the CF on an open-ended contract. At each subsequent point in time, the CF may either choose to continue to lease the worker, or employ the worker directly at the CF which will end the collaboration with the TWA. This corresponds to the TWA assuming all liabilities when the CF screens the productivity of the worker (see Neugart & Storrie, 2006; Westéus, 2014).

The probability that a sufficient worker will become employed directly at the CF is defined as the worker’s transition probability, and is assumed to be an increasing function of the worker’s residual productivity: i.e., \( f(x_i) = \hat{f}(x_i - x^*) \in ]0, 1[ \), with the added simplification that it is assumed to be constant over time. This assumption implies that a more productive worker may leave as a result of obtaining a better offer elsewhere (as argued by Walter, 2005), or will have a greater chance of obtaining a better offer elsewhere (as argued by Baumann et al., 2011 and Neugart and Storrie, 2006). Following Westéus (2014), we further assume that \( \sigma > 1 \) since paying the mark-up corresponds to a liability insurance for the CF.

The duration of the open-ended contract is \( T \) periods, where \( T \sim \text{Geo}[f(x_i)] \) due to the assumed constant transition probability. This implies that the expected duration of the contract for a worker with productivity \( x_i \) can be expressed as \( \bar{T}(x_i) = \frac{1}{f(x_i)} = N(x_i) + n(x_i) \); where \( N(x_i) = \left\lfloor \frac{1}{f(x_i)} \right\rfloor \) is the integer part, and \( n(x_i) = \frac{1}{f(x_i)} - N(x_i) \) is the fractional part.

The accumulated search cost for a TWA searching from \( t = 0 \) to \( \hat{s} \) when the match \( x_m \) is found becomes:

\[
C(\hat{s}) = \sum_{t=0}^{\hat{s}} \left[ c (1 + r)^t \right]
\]  

When the CF leases the worker, the TWA charges a wage-proportional fee \( \sigma \cdot w^* \) where \( \sigma > 1 \). The TWA in turn pays the worker \( \delta \cdot w^* \); \( \delta < \sigma \), resulting in a revenue of \( (\sigma - \delta) w^* \) for the TWA.\(^{15}\) Assuming that the profit from the fractional part is always incurred in the last time period, the expected present value profit for the TWA at time \( t = \hat{s} \) becomes:

\[
E(\pi \mid x_m) = -C(\hat{s}) + \left[ \sum_{\tau=0}^{N(x_m)} \frac{1}{(1 + r)^\tau} + \frac{n(x_m)}{(1 + r)^{\bar{T}(x_m)}} \right] (\sigma - \delta) w^*
\]  

The above definition of the expected duration, \( \bar{T}(x_i) \), of a contract states that a worker \( x_H(x_L) \) is expected to transition to employment directly at the CF faster (slower) than the current match as \( f(x_H) > f(x_m) > f(x_L) \), and consequently \( \bar{T}(x_H) < \bar{T}(x_m) < \bar{T}(x_L) \). This implies that the TWA can only expect to compensate for any additional search costs by finding a worker with a lower productivity: \( x_L \), for which the TWA expects to be able to collect its fee for a longer period of time.\(^{16}\)

In order to provide comparable expression for the difference between the expected values of two non-linear stochastic processes, we utilise the short duration of temporary assignments (see e.g. Forde & Slater, 2005) and apply the limit argument to the non-linear term (i.e., allow the interest rate to approach zero). Furthermore, in order to keep the notation simple we will only explicitly model the case when \( \bar{T}(x_L) - \bar{T}(x_m) \geq 1 \) and \( n(x_\theta) \equiv 0 \) for \( \theta = (L, m) \) as this setup relates to the discrete nature of the model the most.

\(^{15}\)A number of studies find \( \delta < 1 \), however the EU Temporary and Agency Workers Directive (2008/104/EC) intends to ensure \( \delta = 1 \) (Westéus, 2014). Following Westéus (2014), Baumann et al. (2011) and Neugart and Storrie (2006) we further assume that \( \sigma > 1 \) since paying the mark-up corresponds to a liability insurance for the CF.

\(^{16}\)If \( x_L \) is not found, then the TWA may still supply \( x_m \).
Since the productivity parameter is assumed to follow a uniform distribution, the conditional probability of finding a less productive match becomes
\[ q_L = q \left( x^* \leq x_L < x_m \right) = \frac{1}{x_m - x^* + 1}. \]
The linearised expressions for the expected additional revenue and cost for the TWA associated with additional search can thereby be written as:

\[ \lim_{r \to 0^+} E(\Delta R) = \lim_{r \to 0^+} \left[ q_L \sum_{\tau = T(x_m)}^{T(x_L)} \frac{(\sigma - \delta) w^*}{1 + r} \right] = q_L \left[ T(x_L) - T(x_m) \right] (\sigma - \delta) w^* \tag{8} \]

\[ \lim_{r \to 0^+} \Delta C = \lim_{r \to 0^+} \frac{c (\sigma - \delta) w^*}{1 + r} = c \tag{9} \]

**Proposition 3.** Using the above simplifications, additional search will be profitable for the TWA if
\[ q_L \left[ T(x_L) - T(x_m) \right] (\sigma - \delta) w^* > c. \]
However, any additional search will always be for a worker with a lower, but still sufficient, productivity.

The above proposition shows that there are situations where the TWA will have incentives to actively act against the best interest of the CF. We denote the resulting misaligned-incentive induced expected productivity level difference as \( \kappa \). Following Proposition 1, the expectation will go from \( E(\tilde{x}_m) = \frac{\tilde{x}_m + x^*}{2} \) to \( E(\tilde{x}_m) = \frac{\tilde{x}_m + x^*}{2} - \kappa \), where \( \kappa \geq 0 \) when using a Recruit-and-Rent Contract instead of a Recruitment Contract.

Assuming that TWAs have superior search capabilities, compared to the CF (similar to Baumann et al., 2011; Neugart & Storrie, 2006), then this would further increase the size of the difference in expected match quality because better matching technology would allow the TWA to screen a larger number of workers for the same amount of resources.

The difference may be mitigated by introducing an opportunity cost for any TWA that finds a match but does not supply him/her to the CF. This can be done by increasing the number of TWAs competing for the assignment, and stating that only the TWA with the most productive match will get to supply the worker to the CF.

2.2.2 Incentives Caused by Competition Among TWAs

In this setup we assume that the CF has engaged \( z \) TWAs to find a match for the vacant position. We also assume that there are significantly fewer TWAs than applicants (\( z \ll J \)) in order to maintain the delineation to only analyse situations where there is actual strategic search behaviour on behalf of the TWAs when searching for a match to the vacant position \((x^*, w^*)\). Each search assignment resembles a Bertrand game to some extent, as we assume that only the first TWA to find a match (and in the case of several TWAs making a match in the same period, then the best match) will get to supply the entire worker demand (fixed at one).

To facilitate the analysis we simplify by assuming that the contract duration for a (sufficient) worker is defined by the linear function: \( \tilde{T}(x_i | x_i \geq x^*) = T(x^*) - \beta(x_i - x^*) \), where \( T(x^*) \) is the maximum duration of the lease contract. We also define \( \tilde{T}(\bar{x}) = \alpha \geq 1 \) and express the integer part and fractional part of the expected duration as before: \( \tilde{T}(x_i) = N(x_i) + n(x_i) \).

\(^{17}\) As \( z \to \infty \) we would expect the best worker in the sample to always be found within one period of search and no strategic behaviour on behalf of the TWA could influence the outcome.
We additionally make the assumption that each TWA makes the assessment that any other TWA will always present any match in the same period that the worker is found, and thus cannot expect any strategic search behaviour from its competitors. This highly restrictive assumption simplifies the model by allowing us to disregard any feedback effects among the competing TWAs. It also minimises the TWA’s incentive not to present a match when found.

Assuming that the accumulation of search costs, and the dynamics of how the TWA expects the CF to lease the supplied worker, follows the outline in the preceding subsection, the expected present value profit at time \( t = \hat{s} \) for any of the \( z \) TWAs having found a match, \( x_m \) at that point in time becomes:

\[
E (\pi | x_m, z) = -C (\hat{s}) + \\
+ g (q_m) \cdot (\sigma - \delta) w^* \\
\cdot \left[ \sum_{t=0}^{N(x_m)} \frac{1}{(1+r)^t} + \frac{n (x_m)}{(1+r)^{T(x_m)}} \right]
\]

(10)

where \( g (q_m) = \left( \frac{q_m - q^* - 1}{\pi - \delta} \right)^{z-1} \) is the probability that none of the other TWAs have found an even more productive match than \( x_m \).

Finding \( x_H \) when conducting additional search will decrease the TWA’s expected lease time. However, \( x_H \) will also increase the overall chance of winning the contract – which is a necessary (but not sufficient) condition for obtaining any profit at all. As before, finding a less productive worker will increase the expected lease time for the TWA, conditional on winning the contract, but will now also reduce the probability that the given TWA is chosen to supply the worker. This is the main difference when adding competition as the TWA is no longer certain it will be awarded the contract when choosing to supply the matched worker to the CF.

To define when additional search is expected to be profitable for the TWA, we again assume that the expected lease duration difference for any two adjacent sufficient workers is at least one time period and \( n (x_k) \equiv 0 \), while at the same time we allow the interest rate to approach zero and apply the limit argument (cf. Subsection 2.2.1). We denote the \( \lim \) expected revenue from any given match \( x_m \) as \( E [R (x_m)] = g (q_m) \cdot \hat{T} (x_m) \cdot (\sigma - \delta) w^* \) and define \( \chi_\psi = \{ x \in \chi : E [R (x)] \geq E [R (x_m)] \} \) as the set of workers yielding a higher expected revenue than \( x_m \). We also define the number of elements in \( \chi_\psi \) as \( \mu_\psi \), and \( p_\psi \) as the probability of finding \( x_\psi \in \chi_\psi \). The linearised expression for the average expected revenue of the workers in \( \chi_\psi \), given \( x_m \) and \( \mu_\psi > 0 \), thereby becomes:

\[
E \left[ \hat{R} (x_\psi \in \chi_\psi) \right] = \lim_{r \to 0^+} \sum_{\psi \in \chi_\psi} \frac{E [R (x_\psi \in \chi_\psi)]}{\mu_\psi} = \sum_{x_\psi \in \chi_\psi} \frac{g (q_\psi) \hat{T} (x_\psi)}{\mu_\psi} (\sigma - \delta) w^*
\]

(11)

where \( g (q_\psi) \) is defined analogously to \( g (q_m) \) above. The expected revenue of searching for a worker with a higher expected revenue (while still retaining the possibility to provide \( x_m \)) becomes:

\[
E [R (x_\psi | x_m)] = p_\psi E [\hat{R} (x_\psi \in \chi_\psi)] + (1 - p_\psi) E [R (x_m)]
\]

(12)

and taking into account that no other TWA supplies a worker in the current period, i.e. \( g (q^*) = \left( \frac{q^* - q - 1}{\pi - \delta} \right)^{z-1} \), the expected change in revenue from additional search can be expressed as:

\[\]
\[ E (\Delta R) = g \left( q^* \right) \left\{ E [R(x \mid x_m)] - E [R(x)] \right\} = \]
\[ = g \left( q^* \right) p_\psi \left\{ \sum_{x \in \chi_{q_\psi}} g(q_\psi) \frac{\hat{T}(x_{\psi})}{\mu_{q_\psi}} - g(q_m) \frac{\hat{T}(x_m)}{\mu_{q_m}} \right\} \cdot (\sigma - \delta) w^* \]  
(13)

The linearised additional search cost follows Equation (9): \( \lim_{\tau \to 0} \Delta C = c \), and the condition for when the TWA will find it profitable to search for another worker becomes:

\[ g \left( q^* \right) p_\psi \left\{ \sum_{x \in \chi_{q_\psi}} g(q_\psi) \frac{\hat{T}(x_{\psi})}{\mu_{q_\psi}} - g(q_m) \frac{\hat{T}(x_m)}{\mu_{q_m}} \right\} \cdot (\sigma - \delta) w^* \geq c \]  
(14)

**Proposition 4.** After introducing competition among \( z \) TWAs within the given framework, additional search will still take place if

\[ g \left( q^* \right) p_\psi \left\{ \sum_{x \in \chi_{q_\psi}} g(q_\psi) \frac{\hat{T}(x_{\psi})}{\mu_{q_\psi}} - g(q_m) \frac{\hat{T}(x_m)}{\mu_{q_m}} \right\} \cdot (\sigma - \delta) w^* \geq c. \]

The resulting expression is quite intuitive; given an initial match, the TWA will conduct additional search if it expects additional revenue to surpass its costs. As previously mentioned, competition introduces an additional trade-off regarding the type of worker that will be matched, compared to the preceding subsection with only one TWA where the only trade-off was between expected contract duration and additional search cost. As increasing the number of competing TWAs decreases all individual TWA’s probability of winning, the contract becomes relatively more important to the TWA than the expected duration of the lease. Therefore the worker with the highest expected revenue for the TWA moves to the right in the distribution – i.e. towards a more productive worker. However, increasing the number of competing TWAs also lowers the expected revenue as the probability of being the TWA with the most productive match decreases accordingly.

To facilitate the analysis we plot the expected revenue curves for \( z = \{2, 3, 5, 10\} \) in Figure 1, while assuming that the number of sufficient workers is no larger than the number of non-sufficient workers. Given these parameters, the worker yielding the highest expected revenue for the TWA in the \( z = 2 \) case is still the \( x^* \) worker (similar to the result in Subsection 2.2.1).

![Figure 1: Expected revenue for varying levels of competition](image-url)
Figure 1 shows that even though the CF would benefit from having several TWAs competing for the contract\textsuperscript{19}, the decreasing expected revenue for each TWA will most likely restrict the number of TWAs that are willing to compete. Determining the optimal number of competing TWAs from the CF’s point of view will be left for future research, as the model should then include a hiring cost per TWA and also an opportunity cost for the CF for recruiting in-house and assuming all liabilities, which is outside the scope of this paper.

3 Summary

The model in this paper provides a number of important insights regarding the search behaviour of an external TWA hired by a CF to match a worker with a vacant position when the CF is unable to monitor anything else other than the productivity of the supplied worker. Subsection 2.1 utilises the TWA as a filter to find an appropriate candidate, whereas in Subsection 2.2 the TWA (initially) employs the worker while the CF leases the worker. The established search behaviour of the TWA for each contract type is shown to generally differ from trying to find the marginally most productive worker given the available resources.

The implications of the differing incentives establish that a payment-on-delivery contract is a necessary (but not sufficient) prerequisite for the TWA to carry out any actual search, as the TWA could otherwise merely claim to be searching. Subsection 2.1.3 then shows that any long-term worker supply planning on behalf of the CF (modelled as a fixed delivery date prior to which the CF does not need the matched worker; i.e. when planning vacations, etc.) could very well be negated by the TWA, as any search will occur as close to the last time period as possible.

The main result from Subsection 2.1 is nevertheless that the TWA will never have any incentives to provide another worker other than the first sufficient candidate. As this corresponds to a random match from the subset of sufficient workers, it may result in a match with a lower average productivity compared to an instance when any remaining resources would have been spent searching for the marginally most productive worker.

Arguably, this also implies that a vacancy (on average) is likely to be filled more rapidly by a TWA even if it would screen prospective candidates somewhat slower than the CF. The relatively quick vacancy/worker matching by TWAs (Autor, 2001, 2003; Houseman, 2001; Mitlacher, 2007), suggested to be the consequence of better matching technologies (Baumann et al., 2011; Neugart & Storrie, 2006), could thereby be explained by the differing incentives shown in this paper – either in conjunction with actual differences in the available search technologies, or by the incentive structure itself.

Subsection 2.2 outlines a Recruit-and-Rent contract setup where the TWA can be shown to under certain circumstances (Proposition 3), gain from spending additional resources to find the marginally least productive (but still sufficient) worker after a first (random) match has been found. This will result in an even lower average productivity among the supplied matches than in the recruitment case. The theoretical predictions of our model thereby match the empirical results from a panel data study by Beckmann and Kuhn (2012) which found that firms which only use the TWA for screening purposes are found to be more productive than firms that continuously lease their temporary workforce. However, as the TWA now has incentives to conduct additional search, it is less certain that they, on average, will be able to recruit faster than the CF, as argued in the preceding subsection.

\textsuperscript{19}Indeed, if \( z \) would be very large, then \( x \) would most likely be supplied within one search period.
The introduced competition in Subsection 2.2.2 reduces the TWA’s incentives to perform additional search by adding an opportunity cost in that it also provides the other TWAs with another possibility to find an even better match. Here, the results are less clear and ultimately depend on the parameters of the model.

At a low level of competition the TWA would like to approach $x^*$, but as the competition increases there is a possibility that the TWA may decide to supply a worker with relatively high productivity in order to win the contract. However, there is also a trade-off in that the number of TWAs that the CF will be able to engage depends on the revenue that each TWA expects to make from being awarded the contract – a variable that decreases with the number of TWAs.

4 Discussion

The principal-agent model with hidden action presented here is a relevant framework for studying the recruitment of labour, since one of the main reasons to use a TWA is disengage from the recruitment process (and thereby reduce the foregone productivity associated with having to filter all prospective candidates; cf. Beckmann & Kuhn, 2012; Connell & Burgess, 2002). Leasing workers from a TWA is also similar to when the employer signs redundancy insurance, which directly relates back to the first principal-agent model by Spence and Zeckhauser (1971). We further claim that the offered wage is more often associated with the specific position rather than the (maximum) productivity of the worker.

The assumed constant probability of finding a match is arguably less intuitive than allowing the set of remaining applicants to shrink after each screening. However, a constant probability of finding a match is a more restrictive assumption that will not only keep the mathematics more comprehensible, but will also provide more conservative results. We also argue that it mimics, to some extent, a dynamic distribution of applicants where individuals could both enter and leave during the search duration.

Any limited liability for the TWA towards the CF (as the model assumes that there is no penalty for not supplying a worker) could potentially facilitate moral hazard problems by inducing TWAs to accept assignments that they do not expect to complete. The TWA will also always have plausible deniability since the time until a match is found (or not) is stochastic. Determining any suboptimal behaviour would thereby require the CFs to either share information among each other, or to utilise the same TWA for a long succession of similar assignments (within a full information framework) – which are both highly implausible. Furthermore, the CF will have a hard time proving any suboptimal behaviour of the TWA whenever a worker is supplied since a match is always sufficient by definition.

Every TWA will have incentives to claim that they are able to provide the best match, which will make the screening of available TWAs a delicate task for the CF. Ironically, to some extent, this also corresponds to the underlying problem of choosing the right applicant to fill a vacancy – particularly in the presence of complex pricing, the minimum involvement by the CF, and that a number of verdicts from the Swedish Market Court (Marknadsdomstolen) suggest that no TWA has been able to objectively verify that they have any comparative advantage over their competitors that allows them to supply a better match\ref{note:12}.

Any advantages for the TWA in screening prospective candidates in the recruitment case would also increase the misaligned-incentive induced expected productivity difference even further. This is because any sufficient relative difference (that could be quite small in absolute terms) would allow the TWA to supply a match faster than the CF, while still rejecting any candidates with a higher productivity than the current least productive match.

\begin{footnotesize}
\begin{enumerate}
\item[\ref{note:12}]See e.g. Poolia AB v. Student Consulting Sweden AB (MD 2011:23), Manpower AB v. Proffice AB (MD 2010:18), or Poolia AB v. Want AB (MD 2007:34).
\end{enumerate}
\end{footnotesize}
With an exogenously determined minimum productivity level (and in the absence of several competing TWAs) the model suggests that while the most productive individuals have the same (random) chance as any other sufficient worker of being matched in the recruitment case, they would suffer the greatest penalty in their probability of being chosen for leased contingent work.

However, the CF should arguably be able to mitigate the negative effect on the expected productivity of the supplied worker by endogenising the requested minimum productivity level; \( x^{**} > x^* \). Using formal education as a proxy for the productivity parameter and comparing the situation in Sweden in 1999 (when private employment mediation agencies had only been available for 6-7 years; Andersson-Joona & Wadensjö, 2008) to 2007 (Westéus & Lindgren, 2014), there is evidence that the education level in the temporary work sector has increased considerably, and even surpassed that in the regular sector (i.e. any employment that is not through a TWA. See Andersson-Joona & Wadensjö, 2012; Petersson, 2013; Walter, 2012). This could suggest that the CFs’ have realised the need to overstate the minimum requirements for a vacant position to be filled with a TWA worker. In this case, the results from our model offer a demand side explanation for the increased education level in the TWA sector that is based on the TWA’s profit maximisation, without the need to introduce supply-side effects such as reputation (see e.g. Walter, 2012).

A worker that is matched to a position claimed to require \( x^{**} \) that objectively only requires \( x^* \), would arguably also feel overqualified and/or mismatched (cf. Loughlin & Barling, 2001; Petersson, 2013) to a larger extent – especially in combination with the sectors lower wages (Andersson-Joona & Wadensjö, 2012), and adverse working conditions (Håkansson, Isidorsson, & Strauss-Raats, 2013). Evidence of this is found by de Graaf-Zijl (2012) in that agency workers with the highest educational attainment show the largest negative difference in job satisfaction (which relates mostly to the content of their job and to job insecurity only to a lesser extent) compared to what the author denotes regular workers.

This paper contributes to the theoretical literature and leaves it open to future research to measure its importance. The next step could be to empirically analyse the assumptions of limited liabilities when a worker is not supplied, and thereafter aim to de-construct the pricing mechanism of the services of TWAs under the misaligned incentives framework that has been outlined above. Future research could also focus on evaluating the relative productivity of agency workers compared to temporary workers employed directly at the CF to test this model’s theoretical predictions. Another possible direction would be to investigate potential gains from eliminating any incentive misalignment, as they could arguably be significant.

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ABSTRACT

A person’s first experience of working life is not the individual’s actual first job, but rather the perception conveyed by their family and other reference groups. Using Swedish register data on young adults (aged 18-34), and controlling for personal characteristics, we find that individuals with family members or partners with work experience from the temporary agency sector are highly over-represented in the sector. The peer groups previous experience is also found to be among the most influential variables determining the relative probability that an individual will work in the temporary agency sector.

JEL classification: J12, J42, J82,

Keywords: Temporary work agency, family work experience, young adults, Sweden

1 Introduction

An increasing body of research explores the effect of the parents’ working life experience on the labour market outcome of their children. Whinston and Keller (2004) survey the literature on family impact on youth career development and find that the family, in their role of “informal role models” (Morningstar, 1997), have a stronger influence than any other reference group – either through structural variables (education, occupation and socioeconomic status) or process variables (relationships, aspirations and support; see also Davis-Kean, 2005; Penick & Jepsen, 1992; Young & Friesen, 1992).

While having a job provides economic opportunities, self-sufficiency and relative independence for the worker – the stress of an increased risk of becoming unemployed does not only relate to the potential negative impact on individual wealth, and the opportunity for temporal reallocation of that wealth (Kalleberg, 2009). It also includes significant non-pecuniary costs (Winkelmann & Winkelmann, 1998) due to employment being the feature – other than family affiliation – that individuals most associate their identity with (Skans, 2009). Job insecurity has been shown to result in lower private consumption (Benito, 2006) and Darity and Goldsmith (1996) claim that living with job insecurity might even induce more stress than actually losing the job. This is as the former implies a state of uncertainty, whereas the latter forces the individual to adapt to a realised situation (cf. Sverke et al., 2004; De Cuyper & De Witte, 2005).
Barling et al. (1998) find that seeing their parents go through downsizing, layoffs and job insecurity will also have a negative effect on the children’s preconceptions, perceptions and attitudes towards working life. Similarly, Haisken-DeNew & Kind (2012) find a lasting negative impact on the subjective well-being of sons of fathers who became (involuntarily) unemployed, and Greg et al. (2012) find that children of displaced fathers run a higher risk of getting lower grades, earning lower wages, or even becoming unemployed themselves.

A person’s first experience of working life is therefore arguably not the individual’s first employment per se, but rather the experience conveyed by various reference groups through their experiences and economic circumstances (see also Dickinson & Enm€€, 1992; Barling et al., 1998).

It is important to note that atypical employment arrangements are not always negative per se. Individuals who actively choose this type of employment (due to their personal preferences and skills) are more likely to experience the positive aspects of such work arrangements (Loughlin & Barling, 1999; Guest, 2004). Some authors also note that there could even be important cultural differences (Rogers, 2000), or differences in norms and expectations (De Cuyper et al., 2008; De Cuyper & De Witte, 2007), that influence how the individual will perceive atypical work. It is when the flexibility is perceived as being precarious that the negative effects arise (Sverke et al., 2004).

The main purpose of this paper is to estimate the relative effect on the probability of working in the Swedish temporary agency sector for a cohort of young adult workers (aged 18-34 in 2007) having parents, siblings and/or a partner with previous experience of working for a temporary work agency (TWA). We also control for multiple individual characteristics that influenced the relative probability of working in the Swedish temporary agency sector in 1999 (Andersson-Joona & Wadensj€€, 2008).

Younger workers were chosen due to the Swedish temporary agency sector’s relative youth (having been deregulated in 1993), and also as this age cohort is the largest within the Swedish temporary agency sector (Andersson-Joona & Wadensj€€, 2012). That these workers are in the process of forming their own experiences and expectations of the labour market makes this cohort a particularly relevant object to study – especially as Macky et al. (2008) suggest that these traits will remain stable into adulthood.

TWA employment was chosen since most register data delineates this specific type of atypical employment. The surveyed literature in the following section also suggests that the temporary agency sector is characterised by a significant wage penalty and other adverse working conditions. There is also no evidence of temporary agency employment being a stepping-stone into regular employment in Sweden (except for some groups of immigrants). Stressors such as these contribute to poorer well-being and could also constitute a precarious job situation (Sverke et al., 2004). As a consequence, partners and family members of temporary agency workers might (either actively or passively) become dissuaded from working in the sector themselves.

Conversely, the close personal networks of friends and family constitute one of the most common ways of obtaining employment in Sweden; 15-20 percent of the open-ended contracts, and 20-25 percent of the fixed-term contracts, while fewer than ten percent obtain their employment through the Swedish Public Employment Service (SCB, 2013). This could possibly imply an effect opposite to the one suggested above – perhaps even regardless of the surveyed negative aspects.

The paper also includes a detailed analysis of both primarily gainfully employed workers (f€€rverarbetande) and a group that we denote as students. We argue that this is a potentially important distinction as these groups could differ in respect of their incentives for working through a TWA. The individuals in the student-group have been largely excluded in previous studies of the Swedish temporary agency sector (see e.g. Andersson & Wadensj€€, 2004; Andersson-Joona & Wadensj€€, 2008, 2010) which makes this an important addition.

The remainder of the chapter surveys the research on the characteristics of the temporary agency sector. Chapter 2 describes the data and outlines the model. Chapter 3 presents the results for the full sample and the two sub-samples; students and gainfully employed. The following chapter (4) summarises the results, and the final chapter (5) includes a discussion of the results and issues that remain to be investigated in future research.

1This is the largest cohort in the Swedish temporary agency sector (Andersson-Joona & Wadensj€€, 2012).

2The Swedish TWA employer organisation presents a survey according to which more than two thirds of the workers would recommend work in the temporary agency sector to their friends and family, whereas only about 20 percent state that they would not recommend employment in the agency sector (B€€ckstr€€m, 2012).

3The classification of gainfully employed workers mainly follows ILO’s definition (working at least one hour/week). SCB uses a model-based approach to triangulate this information from official income statements (wages, income and employment transfers), gender, age and qualitative answers from the Labour Force Survey into the RAMS data-base.
1.1 Work in the temporary agency sector

The temporary agency sector in Sweden has grown considerably after having been deregulated in the early 1990s (Andersson-Joona & Wadensjö, 2010; Johnson, 2010), and has, in previous studies, been found to consist mainly of workers with a traditionally weak position on the labour market; youths, low-educated/unskilled workers, immigrants and women (Andersson-Joona & Wadensjö, 2008, 2010).

The worker in the temporary agency sector is employed by the TWA, but continuously leased to a client firm (CF) to work under the supervision and guidance of that firm (either with specific tasks, or side-by-side with the regular workforce of the CF). This creates the sector’s characteristic tripartite relationship where the liabilities between the worker and the TWA are regulated by labour law, while the arrangement between the TWA and the CF is delimited by general contract law statutes.

Employment protection for the temporary agency worker is arguably lower than for direct hire employees (cf. Häkansson, Isidorsson & Strauss-Raats, 2013) as claiming just-cause for dismissing the worker due to a lack of work becomes easier when the assignment with the CF has in fact been discontinued. There is also evidence that temporary agency workers are indeed used as a buffer to more easily adjust the size of the labour force while protecting the core of regularly employed workers (Spermann, 2011; Häkansson & Isidorsson, 2014). This practice is also found to be more common in companies that are experiencing a more volatile demand for their products (Salvatori, 2009; Thommes & Weiland, 2010).

A more liberal view by the labour unions with regard to the use of temporary agency workers could also allow for a reduced level of employment protection by permitting deviations by means of a collective agreement. This could e.g. allow for other types of atypical employment that do not apply to direct hire workers, or potentially even remove the Swedish norm of seniority-based employment protection.

With regard to the characteristics of temporary agency employment, Andersson-Joona & Wadensjö (2012) show a significant, and (mostly) increasing, wage penalty for Swedish temporary agency workers from 1998-2008. The wage penalty is persistent even when controlling for individual characteristics. In a previous study, the authors find the same pattern even when controlling for sample selection biases (such as the over-representation of physicians and highly qualified IT personnel), and also conclude that the workers who are leaving the temporary agency sector for a job outside the sector enjoy the highest wage increase (Andersson-Joona & Wadensjö, 2010).

Studies in other European countries have also yielded similar wage penalties for temporary agency workers (Forde & Slater, 2005; Tijdens et al., 2006; Böheim & Cardoso, 2009; Jahn, 2010), and Nienhüser & Matiaske (2006) even find that the negative wage penalties exist regardless of national legislation requiring the temporary agency workers’ wages to correspond to that of similar workers employed directly at the CF. Forde & Slater (2005), Salvatori (2009) and Häkansson & Isidorsson (2014) even state that carrying out an equivalent job for a lower wage, and under worse working conditions, may facilitate a view that temporary agency workers are a type of second-tier employee.

Häkansson, Isidorsson & Strauss-Raats (2013) survey the literature on the temporary agency sector’s physical and psychosocial work environment and find that workers in the sector experience the lowest degree of autonomy and overall job satisfaction compared to other types of employees. They also find that workers in the temporary agency sector exhibit a significantly higher risk of feeling depressed and that working conditions for temporary agency workers are significantly worse than for similar workers employed directly at the CF (see also Tijdens et al., 2006; Fabiano et al., 2008).

Another stated rationale for working in the temporary agency sector is that it is assumed to facilitate a transition into regular employment (compared to having remained unemployed)4. However, using data from 2000-2008 in a difference-in-difference model, Hveem (2013) finds no evidence of a stepping-stone effect in Sweden. The results rather suggest that temporary agency employment increases the time until the worker obtains employment in the regular sector (although not so for non-western immigrants, cf. Andersson & Wadensjö, 2004).

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4See e.g. Tijdens et al. (2006) or Spermann (2011). Bäckström (2012) reports that more than sixty percent of those employed by a TWA in Sweden 2012 would rather work directly at the CF. However, the same study also shows that very few are offered the chance to make this transition and that only about one third got a new assignment with the TWA when their current assignment expired.
Güell & Petrolongo (2007) argue that the probability to transition from temporary employment into what we in this paper denote the regular sector is mainly affected by outside options, and the ability of the worker to credibly threaten to quit the temporary job (cf. also Loughlin & Barling, 2001). Koslowsky (1998) and De Witte & Näswall (2003) note that the combination of (involuntary) temporary employment and job insecurity is the worst combination for the worker, and that the associated negative effects of these two factors could very well strengthen each other multiplicatively rather than additively.

The reviewed characteristics of the sector furthermore correspond to several of the stressors that could constitute a precarious job situation for the worker (Sverke et al., 2004). However, the results in De Cuyper & De Witte (2007) also suggest that the impact of similar characteristics could be less negative for temporary workers than for open-ended employees.

2 Model and Data

We estimate a binary logistic (LOGIT) model for all young adult workers (aged 18-34) in Sweden over the relative probability (i.e., the odds ratio) of being employed in the TWA sector in 2007, while controlling for a set of background characteristics, such as immigration status, education, etc.\footnote{A similar set of background variables has been found by Andersson-Joona & Wadensjö (2008) to influence the probability of being employed in the Swedish temporary agency sector in 1999.} We also include a set of dichotomous variables that capture the work experience of parents, siblings and partners (where applicable). Either parent or sibling is regarded as having experience of the Swedish temporary agency sector if they have been registered as working in the sector during any year from 2000 to 2007. The data on the current partner is more limited and the effect is instead estimated on the experience during 2004 to 2007. The data is compiled from a number of Swedish register databases – primarily LOUISE/LISA (Longitudinal Database on Education, Income and Occupation) and RAMS (Labour Statistics Based on Administrative Sources).\footnote{The data is collected during a week in November which could potentially underestimate the total number of workers in the sector during any given year due to large seasonal variations and the high turnover rate in the temporary agency sector. The appendix contains detailed information and descriptive statistics on all variables.}

The country of birth classification is the most disaggregate that the data allows, and corresponds largely to that used by Andersson-Joona & Wadensjö (2008). Second-generation immigrants are defined as individuals born in Sweden, but with at least one parent having a different country of birth. More than two years of upper secondary school is chosen as the reference level for education as it corresponds to the norm in Sweden (even though school is only compulsory through primary school).

TWA workers are identified through the Swedish Standard Industrial Classification (SNI02) if being specifically involved in either labour recruitment or the provision of personnel activities. The former are workers employed directly at the TWA, whereas the latter are workers being leased to external client companies. While there could potentially be some differences in the two groups’ experience of the TWA sector, aggregating them allows for a better comparison with earlier studies (Andersson-Joona & Wadensjö, 2008, utilise the SNI92 classification which does not distinguish between these groups).

To be identified as a student, the individual must have obtained financial study assistance (grants or loans) from the Swedish National Board of Student Aid (CSN), while also not being registered as a gainfully employed worker. An individual may otherwise have received financial study assistance for the first part of the year but transitioned into primarily gainful employment during the late part of the second half when the data was collected.

3 Results

While controlling for a number of characteristics found to be influential by Andersson-Joona & Wadensjö (2008), we may conclude from the results at the top of Table 1 that there is indeed a significant effect from the work experience of family members and partners. The results show that previous experience of temporary agency sector employment in any of these peer groups greatly increases the probability of the young adult also being employed in the sector. The most prominent effect in this category comes from the experience of the partner – suggesting that an individual is between two and a half to three times as likely to work in the sector if his or her partner has experience from the temporary agency sector.
<table>
<thead>
<tr>
<th>Family TWA Experience</th>
<th>O.R.</th>
<th>S.E.</th>
<th>Sig.</th>
<th>LO</th>
<th>HI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>1.802</td>
<td>0.030</td>
<td>***</td>
<td>1.698</td>
<td>1.912</td>
</tr>
<tr>
<td>Father</td>
<td>1.866</td>
<td>0.032</td>
<td>***</td>
<td>1.752</td>
<td>1.987</td>
</tr>
<tr>
<td>Sibling</td>
<td>1.971</td>
<td>0.016</td>
<td>***</td>
<td>1.911</td>
<td>2.034</td>
</tr>
<tr>
<td>Partner</td>
<td>2.746</td>
<td>0.047</td>
<td>***</td>
<td>2.506</td>
<td>3.010</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Ref.</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-20 years</td>
<td>Ref.</td>
<td>1.168</td>
<td>0.016</td>
</tr>
<tr>
<td>21-22 years</td>
<td></td>
<td>1.004</td>
<td>0.017</td>
</tr>
<tr>
<td>23-24 years</td>
<td></td>
<td>0.881</td>
<td>0.018</td>
</tr>
<tr>
<td>25-26 years</td>
<td></td>
<td>0.722</td>
<td>0.020</td>
</tr>
<tr>
<td>27-28 years</td>
<td></td>
<td>0.576</td>
<td>0.022</td>
</tr>
<tr>
<td>29-30 years</td>
<td></td>
<td>0.472</td>
<td>0.024</td>
</tr>
<tr>
<td>31-32 years</td>
<td></td>
<td>0.403</td>
<td>0.025</td>
</tr>
<tr>
<td>33-34 years</td>
<td></td>
<td>0.403</td>
<td>0.025</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary school (&lt; 9 years)</td>
<td>1.092</td>
<td>0.075</td>
<td>0.24</td>
<td>0.943</td>
</tr>
<tr>
<td>Primary school (9-10 years)</td>
<td>0.722</td>
<td>0.017</td>
<td>***</td>
<td>0.698</td>
</tr>
<tr>
<td>Upper secondary (≤ 2 years)</td>
<td>1.191</td>
<td>0.019</td>
<td>***</td>
<td>1.148</td>
</tr>
<tr>
<td>Upper secondary (&gt; 2 years)</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher education (&lt; 3 years)</td>
<td>1.531</td>
<td>0.014</td>
<td>***</td>
<td>1.490</td>
</tr>
<tr>
<td>Higher education (≥ 3 years)</td>
<td>1.377</td>
<td>0.015</td>
<td>***</td>
<td>1.338</td>
</tr>
<tr>
<td>Postgraduate education</td>
<td>0.383</td>
<td>0.187</td>
<td>***</td>
<td>0.266</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country of Birth</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweden</td>
<td>Ref.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Nordic country</td>
<td>1.562</td>
<td>0.062</td>
<td>***</td>
<td>1.384</td>
</tr>
<tr>
<td>Central Europe</td>
<td>1.629</td>
<td>0.077</td>
<td>***</td>
<td>1.400</td>
</tr>
<tr>
<td>Southern Europe</td>
<td>1.548</td>
<td>0.072</td>
<td>***</td>
<td>1.343</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>2.141</td>
<td>0.024</td>
<td>**</td>
<td>2.042</td>
</tr>
<tr>
<td>Former Soviet Union</td>
<td>2.024</td>
<td>0.077</td>
<td>***</td>
<td>1.740</td>
</tr>
<tr>
<td>USA, Canada, Australia, New Zealand</td>
<td>1.250</td>
<td>0.144</td>
<td>0.12</td>
<td>0.943</td>
</tr>
<tr>
<td>Other North-, Central- or South America</td>
<td>1.983</td>
<td>0.043</td>
<td>***</td>
<td>1.822</td>
</tr>
<tr>
<td>North Africa or Middle East</td>
<td>2.337</td>
<td>0.024</td>
<td>***</td>
<td>2.229</td>
</tr>
<tr>
<td>Other Africa</td>
<td>2.969</td>
<td>0.043</td>
<td>***</td>
<td>2.731</td>
</tr>
<tr>
<td>Other Asian countries or other Oceania</td>
<td>1.586</td>
<td>0.044</td>
<td>***</td>
<td>1.455</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Other Attributes</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second-generation immigrant</td>
<td>1.627</td>
<td>0.019</td>
<td>***</td>
<td>1.568</td>
</tr>
<tr>
<td>Metropolitan municipality</td>
<td>1.200</td>
<td>0.010</td>
<td>***</td>
<td>1.177</td>
</tr>
<tr>
<td>Student</td>
<td>0.963</td>
<td>0.014</td>
<td>***</td>
<td>0.937</td>
</tr>
<tr>
<td>Children (at least one child)</td>
<td>0.762</td>
<td>0.015</td>
<td>***</td>
<td>0.740</td>
</tr>
<tr>
<td>Female</td>
<td>0.657</td>
<td>0.010</td>
<td>***</td>
<td>0.644</td>
</tr>
</tbody>
</table>

*** = sig. < 0.01, ** = sig. < 0.05, * = sig. < 0.1
As stated in the introductory section of this paper, and as we will see for some of the personal characteristics that we control for, there could potentially be several important differences between young adult workers who are gainfully employed and the group defined as students. The results for the family experience variables in Table 1 are nevertheless among the variables that show very similar effects for the two groups (Table 2). Another interesting aspect is that the effects of these variables are strikingly large compared to most other control variables, and only some effects relating to the immigration background are of a similar magnitude.

<table>
<thead>
<tr>
<th>Family TWA experience*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gainfully employed</td>
</tr>
<tr>
<td>(n = 1,236,610)</td>
</tr>
<tr>
<td>Student</td>
</tr>
<tr>
<td>(n = 227,453)</td>
</tr>
<tr>
<td>O.R.</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Mother</td>
</tr>
<tr>
<td>Father</td>
</tr>
<tr>
<td>Sibling</td>
</tr>
<tr>
<td>Partner</td>
</tr>
</tbody>
</table>

*) All applicable variables in Table 1 were also included when estimating the above effects.

The results for the age-group of the individual (Table 1) show a small hump shape in the relative propensity to work in the TWA sector; the odds ratio for the lower age cohorts initially increases and thereafter diminishes steadily in the higher ranges. This indirectly justifies our choice to focus our study on the cohort of young adults and corroborates the findings from the Swedish temporary agency sector in 1999 (Andersson-Joona & Wadensjö, 2008). However, the Andersson-Joona & Wadensjö study uses a different definition of the temporary agency sector, combined with another reference age cohort (41-45 years) that is not available in our sample. This makes any exact comparison difficult and we may only establish that almost a decade later the sector is still seemingly constituted primarily of relatively young workers.

Disaggregating the age effects into gainfully employed and students (Table 3) shows that the hump-shaped effect is attributable to the student group; showing two peaks at 21-22 years and 25-26 years, and then diminishing until there is no statistical difference for the older age cohorts. Gainfully employed workers on the other hand show a steadily diminishing odds ratio from the reference level (corresponding to one) down to just over thirty percent.

<table>
<thead>
<tr>
<th>Age*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gainfully employed</td>
</tr>
<tr>
<td>(95% C.I.)</td>
</tr>
<tr>
<td>Student</td>
</tr>
<tr>
<td>(95% C.I.)</td>
</tr>
<tr>
<td>18-20 years</td>
</tr>
<tr>
<td>21-22 years</td>
</tr>
<tr>
<td>23-24 years</td>
</tr>
<tr>
<td>25-26 years</td>
</tr>
<tr>
<td>27-28 years</td>
</tr>
<tr>
<td>29-30 years</td>
</tr>
<tr>
<td>31-32 years</td>
</tr>
</tbody>
</table>

*) All applicable variables in Table 1 were also included when estimating the above effects.
This pattern arguably reflects the temporary agency sector’s intermediary characteristics as the workers seemingly move on to employment in the regular sector; implying that the worker indeed prefers working in the regular sector. However, working in the Swedish temporary agency sector does not necessarily increase the probability of getting a job in the regular sector compared to if the individual had remained unemployed (Andersson & Wadensjö, 2004; Hveem, 2013).

The results in Table 1 regarding highest education level attained show that young adult workers with a relatively high education (with the exception of those with a postgraduate degree) are over-represented in the temporary agency sector. Table 4 similarly shows that even the education level among TWA workers in the student group is relatively high – even though they might not yet have attained their final education level. Flexible working hours could potentially be a coveted feature for this group rather than entailing a high degree of stress-inducing precariousness. However, the results also show that there is an even stronger over-representation of TWA workers with a relatively high education level (except for those with a postgraduate degree) among the gainfully employed.

<table>
<thead>
<tr>
<th>Education*</th>
<th>Gainfully employed</th>
<th>Student</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O.R.</td>
<td>S.E.</td>
</tr>
<tr>
<td>Primary school (&lt; 9 years)</td>
<td>1.103</td>
<td>0.103</td>
</tr>
<tr>
<td>Primary school (9-10 years)</td>
<td>0.868</td>
<td>0.020</td>
</tr>
<tr>
<td>Upper secondary (≤ 2 years)</td>
<td>1.186</td>
<td>0.022</td>
</tr>
<tr>
<td>Upper secondary (&gt; 2 years)</td>
<td>Ref.</td>
<td>Ref.</td>
</tr>
<tr>
<td>Higher education (&lt; 3 years)</td>
<td>1.624</td>
<td>0.016</td>
</tr>
<tr>
<td>Higher education (&gt; 3 years)</td>
<td>1.446</td>
<td>0.017</td>
</tr>
<tr>
<td>Postgraduate education</td>
<td>0.438</td>
<td>0.194</td>
</tr>
</tbody>
</table>

*) All applicable variables in Table 1 were also included when estimating the above effects.

The results in Table 1 on the country of birth show that there is a relative over-representation of workers born outside Sweden in the temporary agency sector – with a weak exception for those in the group consisting of USA, Canada, Australia and New Zealand. The group with the highest relative odds ratio comes from the sub-Saharan parts of Africa, followed by workers from countries in North Africa, Eastern Europe, the former Soviet Union, and Latin American countries, respectively. There are also relatively many TWA workers who come from other European countries. The relative over-representation of workers born outside of Sweden is also consistent for both the student group and the gainfully employed, as shown in Table 5. The disaggregated results show mostly minor variations, except for workers from the former Soviet Union and Eastern Europe.

7The result for students with postgraduate education is potentially a statistical anomaly as a consequence of there being very few with that characteristic within the sample.
8Andersson-Joona & Wadensjö (2008) find that there is an over-representation of workers from North America while there is an under-representation of a similar proportion of workers from Oceania (which in general is constituted of Australia and New Zealand). Unfortunately, the data in this study does not allow for any additional disaggregation.
9Guyana, Surinam and Jamaica are not Latin American countries, but are included in this subgroup due to their geographical proximity to the Latin American countries.

7
Table 5
Country of birth*

<table>
<thead>
<tr>
<th>Country of birth*</th>
<th>Gainfully employed 95% C.I.</th>
<th>Student 95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O.R.  S.E. Sig. LO HI</td>
<td>O.R.  S.E. Sig. LO HI</td>
</tr>
<tr>
<td>Sweden</td>
<td>Ref.</td>
<td>Ref.</td>
</tr>
<tr>
<td>Other Nordic country</td>
<td>1.475 0.074 *** 1.276 1.705</td>
<td>1.500 0.153 *** 1.111 2.026</td>
</tr>
<tr>
<td>Central Europe</td>
<td>1.515 0.098 *** 1.249 1.838</td>
<td>1.758 0.144 *** 1.325 2.333</td>
</tr>
<tr>
<td>Southern Europe</td>
<td>1.502 0.089 *** 1.263 1.787</td>
<td>1.672 0.153 *** 1.239 2.256</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>1.985 0.030 *** 1.873 2.104</td>
<td>2.389 0.052 *** 2.157 2.646</td>
</tr>
<tr>
<td>Former Soviet Union</td>
<td>2.215 0.098 *** 1.828 2.684</td>
<td>1.761 0.135 *** 1.352 2.294</td>
</tr>
<tr>
<td>USA, Canada, Australia, New Zealand</td>
<td>1.301 0.178 0.14 0.917 1.846</td>
<td>1.096 0.266 0.73 0.651 1.844</td>
</tr>
<tr>
<td>Other North-, Central- or South America</td>
<td>1.985 0.053 *** 1.788 2.204</td>
<td>1.826 0.085 *** 1.546 2.156</td>
</tr>
<tr>
<td>North Africa or Middle East</td>
<td>2.269 0.030 *** 2.139 2.408</td>
<td>2.260 0.048 *** 2.056 2.486</td>
</tr>
<tr>
<td>Other Africa</td>
<td>2.783 0.056 *** 2.494 3.107</td>
<td>2.771 0.081 *** 2.363 3.249</td>
</tr>
<tr>
<td>Other Asian countries or other Oceania</td>
<td>1.455 0.058 *** 1.297 1.631</td>
<td>1.733 0.074 *** 1.498 2.005</td>
</tr>
</tbody>
</table>

*) All applicable variables in Table 1 were also included when estimating the above effects.

Table 1 show that there is an over-representation of second-generation immigrants, and that temporary agency workers are utilised to a larger extent within the municipalities of the three largest cities in Sweden. This could possibly be explained by a higher cost of living (supply side) and that new ventures and businesses are both concentrated, and primarily created, in the metropolitan municipalities – which could arguably create a higher demand for (TWA) workers. Contrary to the situation for all age groups in 1999 (Andersson-Joona & Wadensjö, 2008), the young adult cohort in 2007 is shown to predominantly consist of men.

Table 6
Other attributes*

<table>
<thead>
<tr>
<th>Other attributes*</th>
<th>Gainfully employed 95% C.I.</th>
<th>Student 95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O.R.  S.E. Sig. LO HI</td>
<td>O.R.  S.E. Sig. LO HI</td>
</tr>
<tr>
<td>Second-generation immigrant</td>
<td>1.497 0.023 *** 1.431 1.565</td>
<td>2.098 0.040 *** 1.941 2.267</td>
</tr>
<tr>
<td>Metropolitan municipality</td>
<td>1.155 0.011 *** 1.130 1.181</td>
<td>1.409 0.022 *** 1.348 1.472</td>
</tr>
<tr>
<td>Children (at least one child)</td>
<td>0.762 0.017 *** 0.737 0.787</td>
<td>0.743 0.058 *** 0.663 0.834</td>
</tr>
<tr>
<td>Female</td>
<td>0.704 0.011 *** 0.688 0.719</td>
<td>0.533 0.023 *** 0.509 0.557</td>
</tr>
</tbody>
</table>

*) All applicable variables in Table 1 were also included when estimating the above effects.

The odds ratios for the remaining variables (Table 6), establish that there are some differences between the gainfully employed and the student-group, even though the overall effects follow the same pattern with regard to over and under-representation as in the full sample. In the student-sample, there is both a relatively larger representation of second-generation immigrants and workers in metropolitan municipalities, but also an even more accentuated under-representation of women compared to workers classified as gainfully employed.
4 Conclusion

A growing body of research emphasises the importance of family and other peer groups’ conveyed experience on the outcomes of the individual; e.g. criminal activity, education choice and labour market outcome—especially in the presence of job insecurity (e.g. Newman, 2004; Davis-Kean, 2005; Greg et al., 2012; Haisken-DeNew & Kind, 2012, or see Whinston & Keller, 2004, for a review). Statistics Sweden (SCB, 2013) also reports that personal connections and recommendations by family and friends constitute the most common recruitment channel in Sweden, regardless of employment type.

The surveyed characteristics of working in the temporary agency sector is established to impact the psychosocial and physical work environment of the worker in several negative ways (Håkansson, Isidorsson, & Strauss-Raats, 2013), and includes many of the stressors associated with a precarious job situation. We argue that this could potentially impact the propensity to (actively) recommend this type of employment to family, friends and peers—or even make individuals opt out of working in the temporary agency sector after having (passively) experienced their peers working under these conditions.

The results nevertheless show that there is a significant positive effect from the previous work experience of temporary agency work for each included peer group. These effects are also among the most influential of all explanatory variables in the model in determining the relative probability of an individual working in the temporary agency sector. In addition, the size of the effects are more or less equal for gainfully employed workers and for the individuals in the student-group. This could potentially corroborate that family members and partners constitute an important recruitment channel, even regardless of the many negative aspects associated with temporary agency work. However, the established correlation between the labour market experience of the included peer groups does not automatically imply causality and supplementary future research is therefore required following these initial findings.

The results for gainfully employed workers and for the student-group shows that there are some other important differences that have not been captured by previous studies. For instance, there are relatively many temporary agency workers in some of the lower age cohorts in the student-sample, whereas the gainfully employed show an almost linear decay in the relative probability of being employed in the agency sector as they grow older. A noteworthy result that is very similar in all samples, but quite different to the findings in 1999 by Andersson-Joona & Wadensjö (2008), is the relatively high education level among the younger cohorts of the temporary agency sector (cf. also Andersson-Joona & Wadensjö, 2012; Petersson, 2013).

The overall results of this study further establish that there is still an over-representation of individuals with an immigrant background, but also that there is a predominance of men who are employed in the younger cohorts of the temporary agency sector.

5 Discussion

Macky, Gardner and Forsyth (2008) write in an editorial introduction and overview on generational differences at work that the development of beliefs, expectations and values is theorised to be influenced by early environmental stimuli and human socialisation—and that these features remain stable into adulthood. Major socioeconomic events; such as important changes to the family work pattern, pervading unemployment rates and the deterioration of job security through downsizing and offshoring/outsourcing, are mentioned specifically as highly influential factors (cf. Egri & Ralston, 2004). The reviewed findings by Penick & Jepsen (1992), Young & Friesen (1992), Barling et al. (1998), Whinston & Keller (2004), Davis-Kean (2005), Gregg et al. (2012), Haisken-DeNew & Kind (2012) lead further support to these theories.

Loughlin and Barling (2001) similarly argue that a person’s first contact with working life is the experience, perceptions and opinions conveyed by his or her family and other immediate reference groups. The impact of these reference groups with regard to (atypical) employment, occupational health and safety, management, and labour unions thus becomes especially important to include when studying the labour market outcome for the cohort of young adults. The results presented in this paper show that having parents, siblings, or partners who have worked in the temporary agency sector will greatly increase the probability that the observed individual will also work in that sector.
The theories on psychological contracts (Argyris, 1960; Koslowsky, 1998) suggest that the worker's subjective perception of a job is based on the compliance of the prior expectations with the realised outcome. A worker that expects adverse working conditions may consequently not experience the situation in the same way that another worker with different expectations does. One possible explanation for the results may therefore lie in different labour market cultures, norms and expectations (Rogers, 2000; De Cuyper & De Witte, 2007; De Cuyper et al., 2008).

The norm in Sweden is that all employment contracts are assumed to be open-ended (if the parties have not explicitly stated otherwise), which may not be the case in all countries. Sweden also has a seniority principle where the total length of employment in a firm is directly related to the level of employment protection. Such a principle is given as an example by Sverke et al. (2004) of a social and cultural norm that affects the perception of working life. Immigration status could thus potentially influence an individual's expectation and experience of flexible (or even precarious) employment.

Loughlin & Barling (2001) suggest that contemporary young workers do not consider work to be an investment in their future with the particular company they are currently working for, but rather that they seek immediate payoff. This could constitute a rationale for choosing temporary agency employment if the individual was compensated for any negative aspects. However, the temporary agency worker seemingly does not only receive a wage penalty (rather than compensation) for the reviewed associated negative physical and psychosocial aspects, but temporary agency employment in Sweden has even been found to prolong the time until the worker gets a regular job rather than being a stepping-stone (Hveem, 2013).

Another plausible explanation for our results is that unemployment is considered to represent even lower status and opportunities than any type of employment – regardless of its content (Sverke et al., 2004). Workers thus utilise any and all recruitment possibilities, where family and close personal networks represent an important channel, to obtain any job rather than holding out for a specific job with certain characteristics. That individuals might be accepting – rather than actively choosing – to work within the sector is a recurring theme in the literature (see e.g. Bernasek & Kinnear, 1999; Andersson & Wadensjö, 2004; Forde & Slater, 2005; Jahn, 2010; Hveem, 2013).

This theory has some support in that the temporary agency sector workforce shows an over-representation of groups that traditionally have had a weaker position on the labour market; e.g. young people and immigrants. It could also help explain the findings of Barling et al. (1998), Greg et al. (2012), and Haisken-DeNew & Kind (2012), that the children of parents who have experienced job precariousness run a higher risk of earning lower wages, or even experiencing precarious job situations themselves.

The relatively high education level in the temporary agency sector among both gainfully employed workers and the student-group is an interesting result that is not only seemingly different from the situation in 1999 (Andersson-Joona & Wadensjö, 2008), but also somewhat challenges the argument of accepting rather than choosing temporary agency employment.

An increased education level should allow for more opportunities and outside options (cf. Güell & Pترولوندو, 2007) for the temporary agency worker. This could in turn also allow for a higher transition rate into regular employment if the CF would primarily utilise the TWA in order to screen potential workers. However, for this to hold true it is arguably also important, and perhaps even a prerequisite, that the temporary agency worker is used for such tasks that allow them to accumulate firm-specific human capital (Forde & Slater, 2005). It is nevertheless interesting to note that the education level seems to have increased during the same time that Andersson-Joona & Wadensjö (2012) finds that the temporary agency sector’s negative wage difference, compared to the regular sector, has grown.

Having to accept (rather than choose) temporary agency employment, despite having obtained a relatively high level of education, may further augment the difference between expectation and outcome. Indeed, Loughlin & Barling (2001) caution that many young adults with an education that required them to think for themselves and who are anticipating motivating work may find themselves at a loss given the increased use of TWAs by the hiring firms. Evidence of this is found by De Graaf-Zijl (2012) who finds that temporary agency workers with the highest education also experience the largest negative difference in job satisfaction compared to similar workers on regular contracts.

Walter (2012) suggests that the increased education level could be a result of the TWAs need to continuously market themselves as providers of the most skilled labour. Westéus & Raattamaa (2014) on the other hand suggest that the increased education level could be a CF response to the misaligned incentives of the CF and the TWA.
Parents could arguably be more inclined to accept temporary agency employment (rather than to remain unemployed) in order to provide for their offspring. However, both Table 1 and Table 6 suggest that this is not the case. If the relatively few individuals with children in the temporary agency sector is a result of a conscious decision to abstain from having children until the job situation is more stable (cf. Benito, 2006), then the growth of the sector (and atypical employment in general) could have negative effects on society as a whole – and not only for the individual. Through a quantitative approach this study has shown that the previous labour market experience of certain close family peer groups appears to impact the labour market outcome of the young adult. This concluding discussion has debated some of the results and their conformity with previous findings, and put forward some plausible explanatory theories. However, the specific reasons and underlying mechanics of why (and if) family members explicitly recommend this type of employment despite the surveyed negative characteristics of the sector is left for future research.

Another important question is whether individuals in general (and young adults in particular) choose or accept temporary agency work – especially in the light of an increased relative education level, the sector’s adverse working conditions and decreasing relative wages. It would also be interesting to make comparative studies with other countries; e.g. Spain (low probability to transition into regular employment; Amuedo-Dorantes et al., 2008), or Denmark (high transition probability; Jahn & Rosholm, 2010).

References


The data unfortunately does not allow us to estimate any effect regarding the size of the family since the data for the children-variable is only categorically coded for the presence of children or not (and not their actual number), and this possibility is therefore left for future research.


SCB, (2013), Statistics Sweden, Recruitment Tables, AKU, 15-74 years, Quarterly Data, (Rekryteringstabeller AKU, 15-74 år, Kvartal).


Appendix

A.1 Classification of variables

[Dependent]
Binary response variable (dummy) on whether or not the individual is working in the Swedish agency sector in 2007 (according to SNI02). Missing values (incl. individuals that are either unemployed or outside of the workforce) are excluded.

Mother/Father/Sibling
Binary response variables on whether or not any of these relatives are recorded as having worked in the Swedish agency sector during some point in time between 2000-2007. Missing values (e.g. omitted information, working outside of Sweden, being unemployed, or not being in the workforce) are regarded as indicating that the individual did not have agency employment experience for that year.

Partner
Binary response variable on whether or not the individual has a partner recorded as working in the agency sector at any point in time from 2004 to 2007 (due to limited data availability). Missing values are classified as that the individual does not have a partner with prior experience.

AGE GROUP-category
The age group to which the individual belongs.

EDUCATION-category
The highest level of education attained at the time of measurement.

COUNTRY OF BIRTH-category
The recorded country of birth of the individual, aggregated into a standard classification.

Second-generation immigrant
Binary response variable. The individual is regarded as a second-generation immigrant if the individual is born in Sweden, and has at least one parent who was born outside of Sweden.

Metropolitan municipality
Binary response variable indicating whether the individual is registered in a municipality belonging to one of Sweden’s three largest cities (Stockholm, Gothenburg and Malmö).

Student
Binary response variable. The worker is defined as a student if he/she obtained financial study aid in 2007, and is not registered as being gainfully employed.

Children
Binary response variable on whether the individual is recorded as having at least one child.

Female
Binary response variable on the gender of the individual.
## A.2 Descriptive Statistics

### Table A

#### Descriptive statistics

<table>
<thead>
<tr>
<th>FULL SAMPLE</th>
<th>TWA WORKERS</th>
<th>GAINFULLY EMP.</th>
<th>STUDENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.</td>
<td>% of FULL</td>
<td>No.</td>
<td>% of TWA</td>
</tr>
<tr>
<td>1 532 879</td>
<td>47 450 (3.10%)</td>
<td>1 236 610 (80.67%)</td>
<td>227 453 (14.84%)</td>
</tr>
</tbody>
</table>

#### Family Influence

<table>
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<tr>
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<th>% of FULL</th>
<th>No.</th>
<th>% of TWA</th>
<th>No.</th>
<th>% of G. EMP.</th>
<th>No.</th>
<th>% of STUD.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother</td>
<td>20 877 (1.36%)</td>
<td>1 225 (2.58%)</td>
<td>16 276 (1.32%)</td>
<td>3 583 (1.58%)</td>
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<td></td>
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</tr>
<tr>
<td>Father</td>
<td>17 243 (1.12%)</td>
<td>1 094 (2.31%)</td>
<td>13 282 (1.07%)</td>
<td>3 005 (1.32%)</td>
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</tr>
<tr>
<td>Sibling</td>
<td>73 609 (4.80%)</td>
<td>4 844 (10.21%)</td>
<td>54 827 (4.43%)</td>
<td>14 465 (6.36%)</td>
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</tr>
<tr>
<td>Partner</td>
<td>8 892 (0.58%)</td>
<td>519 (1.09%)</td>
<td>8 056 (0.65%)</td>
<td>474 (0.21%)</td>
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#### Age

<table>
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<th>No.</th>
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<th>No.</th>
<th>% of TWA</th>
<th>No.</th>
<th>% of G. EMP.</th>
<th>No.</th>
<th>% of STUD.</th>
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<tbody>
<tr>
<td>18-20 years</td>
<td>274 024 (17.88%)</td>
<td>9 202 (19.39%)</td>
<td>150 191 (12.15%)</td>
<td>112 540 (49.48%)</td>
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<tr>
<td>21-22 years</td>
<td>184 529 (12.04%)</td>
<td>8 781 (18.51%)</td>
<td>134 223 (10.85%)</td>
<td>37 465 (16.47%)</td>
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<tr>
<td>23-26 years</td>
<td>172 401 (11.25%)</td>
<td>7 411 (15.62%)</td>
<td>133 907 (10.83%)</td>
<td>29 463 (12.95%)</td>
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</tr>
<tr>
<td>27-28 years</td>
<td>176 671 (11.53%)</td>
<td>5 318 (11.21%)</td>
<td>157 633 (12.75%)</td>
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<tr>
<td>29-30 years</td>
<td>172 359 (11.24%)</td>
<td>3 945 (8.31%)</td>
<td>159 533 (12.90%)</td>
<td>4 753 (2.09%)</td>
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<tr>
<td>31-32 years</td>
<td>176 671 (11.53%)</td>
<td>5 318 (11.21%)</td>
<td>157 633 (12.75%)</td>
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<tr>
<td>33-34 years</td>
<td>172 401 (11.25%)</td>
<td>7 411 (15.62%)</td>
<td>133 907 (10.83%)</td>
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#### Education

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<th></th>
<th>No.</th>
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<th>% of TWA</th>
<th>No.</th>
<th>% of G. EMP.</th>
<th>No.</th>
<th>% of STUD.</th>
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<tbody>
<tr>
<td>Primary school (&lt; 9 years)</td>
<td>4 045 (0.26%)</td>
<td>198 (0.42%)</td>
<td>2 349 (0.91%)</td>
<td>822 (0.36%)</td>
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<tr>
<td>Primary school (9-10 years)</td>
<td>201 920 (13.30%)</td>
<td>5 097 (10.74%)</td>
<td>113 337 (9.17%)</td>
<td>74 856 (32.91%)</td>
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<tr>
<td>Upper secondary (≤ 2 years)</td>
<td>124 637 (8.13%)</td>
<td>3 659 (7.71%)</td>
<td>107 543 (8.70%)</td>
<td>8 469 (3.72%)</td>
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<tr>
<td>Upper secondary (&gt; 2 years)</td>
<td>669 079 (43.65%)</td>
<td>20 227 (42.63%)</td>
<td>580 544 (46.95%)</td>
<td>57 222 (25.16%)</td>
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<tr>
<td>Higher education (&lt; 3 years)</td>
<td>215 708 (14.07%)</td>
<td>9 437 (19.89%)</td>
<td>149 008 (12.05%)</td>
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<tr>
<td>Higher education (≥ 3 years)</td>
<td>310 912 (20.28%)</td>
<td>8 803 (22.61%)</td>
<td>279 543 (22.61%)</td>
<td>25 129 (11.05%)</td>
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<tr>
<td>Postgraduate education</td>
<td>4 578 (0.30%)</td>
<td>29 (0.06%)</td>
<td>4 286 (0.35%)</td>
<td>36 (0.02%)</td>
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#### Country of Birth

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<th>% of TWA</th>
<th>No.</th>
<th>% of G. EMP.</th>
<th>No.</th>
<th>% of STUD.</th>
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<tr>
<td>Sweden</td>
<td>1 420 765 (92.69%)</td>
<td>40 747 (85.87%)</td>
<td>1 158 341 (93.67%)</td>
<td>201 851 (88.74%)</td>
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<tr>
<td>Other Nordic country</td>
<td>7 621 (0.50%)</td>
<td>279 (0.59%)</td>
<td>6 046 (0.49%)</td>
<td>995 (0.44%)</td>
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<tr>
<td>Central Europe</td>
<td>3 925 (0.26%)</td>
<td>178 (0.38%)</td>
<td>2 838 (0.23%)</td>
<td>829 (0.36%)</td>
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<tr>
<td>Southern Europe</td>
<td>5 157 (0.34%)</td>
<td>203 (0.43%)</td>
<td>3 817 (0.31%)</td>
<td>847 (0.37%)</td>
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<tr>
<td>Eastern Europe</td>
<td>31 881 (2.08%)</td>
<td>1 965 (4.14%)</td>
<td>23 570 (1.91%)</td>
<td>6 199 (2.73%)</td>
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<tr>
<td>Former Soviet Union</td>
<td>2 977 (0.19%)</td>
<td>184 (0.39%)</td>
<td>1 955 (0.15%)</td>
<td>1 118 (0.49%)</td>
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<tr>
<td>USA, Canada, Australia, New Zealand</td>
<td>1 371 (0.09%)</td>
<td>51 (0.11%)</td>
<td>917 (0.07%)</td>
<td>370 (0.16%)</td>
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<tr>
<td>Other, Central- or South America</td>
<td>11 042 (0.72%)</td>
<td>503 (1.25%)</td>
<td>7 711 (0.62%)</td>
<td>2 526 (1.11%)</td>
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<tr>
<td>North Africa or Middle East</td>
<td>28 360 (1.85%)</td>
<td>2 057 (4.34%)</td>
<td>19 152 (1.55%)</td>
<td>6 723 (2.96%)</td>
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<tr>
<td>Other Africa</td>
<td>7 216 (0.47%)</td>
<td>633 (1.33%)</td>
<td>4 565 (0.37%)</td>
<td>2 080 (0.91%)</td>
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<tr>
<td>Other Asian countries or other Oceania</td>
<td>12 564 (0.82%)</td>
<td>560 (1.18%)</td>
<td>7 958 (0.64%)</td>
<td>3 915 (1.72%)</td>
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#### Other Attributes

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<th>% of TWA</th>
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<th>% of G. EMP.</th>
<th>No.</th>
<th>% of STUD.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second-generation immigrant</td>
<td>71 488 (4.66%)</td>
<td>3 419 (7.21%)</td>
<td>54 614 (4.42%)</td>
<td>11 782 (5.18%)</td>
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<tr>
<td>Metropolitan municipality</td>
<td>644 494 (42.04%)</td>
<td>22 878 (48.21%)</td>
<td>522 990 (42.99%)</td>
<td>93 816 (41.25%)</td>
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<tr>
<td>Student</td>
<td>227 453 (14.84%)</td>
<td>8 672 (18.28%)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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</tr>
<tr>
<td>Children (at least one child)</td>
<td>407 792 (26.60%)</td>
<td>7 197 (15.17%)</td>
<td>379 810 (30.74%)</td>
<td>13 186 (5.80%)</td>
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</tr>
<tr>
<td>Female</td>
<td>744 535 (48.57%)</td>
<td>18 740 (39.49%)</td>
<td>588 708 (47.61%)</td>
<td>123 465 (54.28%)</td>
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</table>
III
EMPLOYMENT EFFECTS OF THE EU TEMPORARY AND AGENCY WORKERS DIRECTIVE IN SWEDEN

MORGAN WESTÉUS∗†

Abstract

This paper analyses possible effects on total employment, and the distribution between agency work and regular contracts as a consequence of the Swedish implementation of the EU Temporary and Agency Workers Directive in a dual labour market Mortensen-Pissarides search model. The directive states that the basic working and employment conditions for agency workers should be equal to those for a comparable employee at the client firm, and that all parties should actively facilitate the transition from agency employment to employment directly at the client firm. Even though the results suggest a negative net effect on total employment, the implementation is shown to have a positive impact on overall welfare, and that an increased transition probability from the agency sector into regular employment would contribute even more.

JEL classification: E24, J21, J42, J48, J64, K31

Keywords: Labour law, EU directive implementation, temporary agency work, unemployment

1 Introduction

Legislation at the Swedish national level and at the European level has aimed at strengthening the position of atypical employees; such as part-time and fixed-term employees, by enforcing principles of equal treatment with regard to the wages and working conditions that apply to their co-workers on open-ended contracts1. However, labour legislation and collective agreements regularly presuppose that the worker is an employee at the firm for which the actual work is carried out.

The relationship between the worker and the temporary work agency (TWA) is an employment agreement, and thereby regulated by specific labour laws and collective agreements (when applicable), whereas the partnership between the TWA and the client firm is, on the other hand, regulated by contract law. The client firm will nevertheless continuously manage the leased worker, and the worker is obliged to carry out the assigned tasks for the client firm.

The tripartite relationship between the worker, the client firm and the TWA therefore implies that some provisions that only apply between the employer and the employee do not become applicable between the client firm and a worker leased from a TWA. This has resulted in the situation that workers performing the same tasks at the same workplace could have very different working conditions and wages depending on whether they are direct hires or rented workers from a TWA (cf. Forde & Slater, 2005; Håkansson, Isaksson & Strauss-Raats, 2013). The absence of minimum wage laws and opportunities to deviate from employment norms through collective agreements may have strengthened these aspects even further (Jahn & Bentzen, 2012; Håkansson & Isidorsson, 2014).

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†Acknowledgements: The author wishes to thank Thomas Aronsson, Karl-Gustaf Löfgren, Daniel Halvarsson, Discussants Magnus Wikström and David Granlund, as well as the seminar participants at the Department of Economics. The paper has also benefited greatly from the comments given at the 9th annual Italian Society of Law & Economics (SIDE/ISLE) conference in Lugano, Switzerland.

The EU Temporary and Agency Workers Directive (2008/104/EC, hereafter referred to as “the directive”) is intended to entitle agency workers to the same wages and working conditions (including specific rules on working time, resting periods, annual leave and paid holidays etc.) as those for workers employed directly by the client firm – thereby including the agency workers in the appropriate frame of reference. The directive also emphasises the role of agency work as a stepping stone into regular employment by not only passively encouraging client firms to hire agency workers on regular contracts, but also actively prohibiting any and all measures taken to hinder such transitions.

The directive is a piece of the harmonised legislation within the European Union enforced to prevent social dumping. The directive and previously implemented similar legislation aim at removing incentives for member states to engage in a race-to-the-bottom by successively lowering the standards for workers in order to attract firms. This is meant to ultimately ensure the members of the European Union a higher standard of living and an improved quality of life. The directive was agreed upon in late 2008 and the member states were given until the end of 2011 to implement the directive into the legal framework of each member state. However, the Swedish government did not issue its proposal to the Swedish parliament until the autumn of 2012 with the implementation being enforced as of January 1st 2013.

The Swedish implementation utilises the provision to allow exemptions from the principle of equal treatment; both through collective agreements and for TWA workers on open-ended contracts who receive wages between assignments. However, as the first type of exemptions are only allowed as long as they still ensure the exempt workers the intended objectives of the directive (2008/104/EG: Section 5.3), this will have little impact on the modelling approach. The preparatory documents of the national implementation suggest that workers on open-ended contracts where neither the TWA nor the client firm has signed a collective agreement carry the biggest risk of non-compliant terms. For those workers, the normative effect of Swedish collective agreements is argued to nevertheless provide a sufficient level of protection. (SOU 2011:5)

This paper adds to the existing literature by examining the effects on total unemployment following the implementation of the directive in Sweden, as well as the distribution between regular employment and agency employment. The chosen method is numerical simulations based on a general equilibrium model calibrated to the Swedish economy. Previous studies have also used similar methodologies to analyse the interplay between labour market sectors in general (Krause & Lubik, 2007), and the agency sector in particular (Neugart & Storrie, 2006; Baumann et al., 2011).

The theoretical model is similar to the one outlined by Neugart & Storrie (2006), but is also based on an extension of the Mortensen-Pissarides search model with frictions utilised in the KIMOD model of the Swedish economy developed by the Swedish National Institute of Economic Research (NIER). The extension separates the agency sector, defined as any employment through a TWA with the purpose of being rented out to a client firm, from the regular sector, defined as any employment outside of the agency sector.

The paper will also explore the effects of an increase in the relative search efficiency from the agency sector towards the regular labour market following the implementation, as the directive explicitly states that all parties should actively facilitate the transition of agency workers into regular employment. The model therefore allows for on-the-job search in the agency sector; implying that a vacant position in the regular sector could be filled with either an unemployed individual or an agency worker. That workers accept agency employment not only as an alternative to unemployment, but also as a way of obtaining regular employment is well established (see e.g. Tijdens et al., 2006; Spermann, 2011; Hveem, 2013).

The paper is organised as follows; the remainder of this section describes the difference between agency work and employment in the regular labour market sector. Section 2 outlines the theoretical model. Section 3 calibrates the model to the Swedish framework prior to the implementation of the directive, before exploring the effects of the implementation through the new equilibrium assumptions. The final section summarises and concludes the paper with a discussion.

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3NIER is a government agency financed mainly through the Ministry of Finance. Their main objective is to conduct research, perform analyses of, and forecasts about the Swedish economy. The labour market part of the KIMOD model is described extensively by Lindén (2004).

4Several other types of atypical employments directly at the client firm, regulated through 5-6 §§ in the Employment Protection Act (SFS 1980:82, cit EPA), are thereby defined as belonging to the regular sector. This is consistent with the aforementioned directives ensuring equal wages and working conditions for fixed-term and part-time employees compared to employees on open-ended contracts.
1.1 Temporary Agency Work in Sweden and the EU

Providing labour through a TWA, or even running private employment agencies or services, was largely prohibited in Sweden for a long period of time (1942-1993)\(^5\). The Swedish temporary agency sector has since then grown steadily (Andersson-Joona & Wadensjö, 2010; Hveem, 2013). The rationales for utilising TWAs to supply parts of the labour force has been surveyed by Tijdens et al. (2006), Andersson-Joona & Wadensjö (2010), and Spermann (2011)\(^6\). Some rationales relate to the possibility of screening the productivity of the worker, while other arguments relate to the associated costs of advertising, interviewing and recruiting personnel which could be feasible given an underlying long-term employment commitment, but might prove inhibitive if the expected duration of the employment is too short.

Obtaining labour through a TWA could be seen as division of labour where the TWA specialises in producing matches, and the client firm specialises in producing goods or services. However, the potentially differing incentives of the TWA and the client firm could result in differences in what the client firm would optimally want and the type of worker that will be supplied (cf. the argumentation in Walter, 2012; Westéus & Raattamaa, 2014).

The main reason put forward in the literature is nevertheless that the TWA is assumed to produce a match for a posted vacancy faster than going through traditional mediation services.

The client firms are also suggested to hedge against shocks during times of recovery by re-stocking their workforce with agency workers through a TWA, rather than risk being stuck with regularly employed workers should there be another shock to the market. (see the referenced studies in Andersson-Joona & Wadensjö, 2010; and also Forde & Slater, 2005; Jahn & Bentzen, 2012). Heywood et al. (2011) find that firms that can easily influence the effort of their workers utilise TWA workers to a lesser extent.

Similarly, Thommes & Weiland (2010) find that firms with a relatively stable demand for the produced goods utilise temporary labour to much a lesser extent than firms with higher demand volatility. The authors also find that firms that are going through large personnel restructuring make use of temporary workers to a larger extent. Salvatori (2009) also states that agency workers are sometimes viewed by the labour unions as a buffer for the core of workers with open-ended contracts and that this approach to personnel management creates a relatively high labour turnover rate. This suggests that the cost associated with the dismissal of an agency worker is arguably lower than for a worker in the regular sector.

Even though there is no readily available data on the fee charged by the TWA to the client firm, the relative wage paid to the worker has been shown to be less than one\(^7\). Andersson-Joona & Wadensjö (2010 & 2012) find that there is a significant wage penalty for workers within the Swedish agency sector compared to workers on the regular market. The wage differential has also been growing over time and is persistent even when controlling for individual characteristics and certain types of jobs.

Jahn (2010) finds a negative wage difference for temporary workers in Germany (controlling for personal characteristics and individual specific fixed effects), however the gap becomes smaller with seniority within the agency sector (Jahn & Pozzoli, 2013). Böheim & Cardoso (2009) find a similar wage difference in Portugal, and so do also Forde & Slater (2005) in the U.K. (cf also. Spermann, 2011; Tijdens et al., 2006) Nienhüser & Matiaske (2006) even find that wage differences exist regardless of national statutes requiring equal treatment of agency workers.

The directive also focuses on the relative working conditions in the two sectors. Fabiano et al. (2008) find that workers employed through a TWA in Italy suffer work related injuries to a larger extent than regular employees with comparable tasks, and that they are absent from work for longer periods of time. Their quantitative analysis is complemented by a case study that also suggests substantial negative differences with regard to the working conditions. Similar findings are also reported by Tijdens et al. (2006) and Håkansson, Isaksson & Strauss-Raats (2013).

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\(^5\)TWAs were allowed through a licensing system in 1991, however private mediation of workers did not become fully available until 1993 with the amendment that the mediation agency was not allowed to charge the (prospective) worker any fee for the mediation service (SOU 2011:5; based on a provision from ILO, 1933, and implemented through The Private Employment Agencies and Temporary Labour Act; SFS 1993:440).


\(^7\)The concept of wage also includes different types of non-monetary remuneration. The implied principle of equal treatment in the directive therefore also includes access to staff areas, health club memberships, paid annual leave, and other benefits.
Holst et al. (2008), Jahn & Pozzoli (2013), and Håkansson & Isidorsson (2014) even suggest that agency workers could sometimes be regarded as a type of second-tier worker since they are performing the same tasks as workers with regular employment for only a fraction of the wage. These differences for agency workers compared to workers on other types of contracts are some of the reasons why a strengthening of the position of the agency workers throughout the European Union was deemed necessary. This should also be seen in light of the preceding legislative harmonisation which had already strengthened the position for fixed-term and part-time workers.

2 Theoretical model

The theoretical model is an extension of the dynamic general equilibrium labour market section of NIER’s KIMOD model used for macroeconomic medium term forecasts. At any (discrete) point in time $t$ the total labour force $N_t$ is defined as either being employed in sector $j$ or unemployed $(U)$. The model is augmented to differentiate between employment in either the regular sector $(j = E)$ or in the agency sector $(j = A)$, with the relative number of workers in either state written as:

$$u_t = \frac{U_t}{N_t}, \quad e_t = \frac{E_t}{N_t}, \quad a_t = \frac{A_t}{N_t}$$

(1)

Employment dynamics

This model allows for on-the-job search for a regular job while employed in the agency state. A vacancy in the regular sector can therefore be filled with either an unemployed worker or an agency worker, whereas vacancies in the agency sector are assumed to only match with unemployed individuals. These dynamics follow the assumptions in Neugart & Storrie (2006) and Baumann et al. (2011), and that workers generally seek to transition from agency employment into the regular sector (Tijdens et al., 2006; Spermann, 2011; Hvem, 2013).

Matching between a vacant job in each state and a job searcher is assumed to take place according to a state specific matching function, $X^E_t = f\left(x^E_0, V^E_t, S^E_t\right) = x^E_0 \cdot \left(V^E_t\right)^{\eta} \cdot \left(S^E_t\right)^{1-\eta}$, where $x^E_0$ is the sector specific baseline matching efficiency and $V^E_t$ is the number of vacancies in sector $E$.

The search intensity function $S^E_t$ in the regular sector becomes $S^E_t = u_t + \delta^A \cdot a_t$ since both unemployed workers and those employed in the agency sector may apply for these jobs. The $\delta^A$-parameter depicts the relative search effectiveness for those employed in the agency sector relative to unemployed individuals. Similarly, the search intensity function for the agency sector becomes $S^A_t = u_t$.

Expressing the rate at which vacancies are being filled in terms of the sector specific labour market tightness (defined as the number of vacancies per job searcher; $\theta^E_t = V^E_t/u_t$) yields:

$$\frac{X^E_t}{V^E_t} = f\left(x^E_0, 1, \frac{1}{\theta^E_t}\right) = x^E_0 \cdot \left(\theta^E_t\right)^{\eta-1} = q(\theta^E_t)$$

$$\frac{X^A_t}{V^A_t} = f\left(x^A_0, 1, \frac{1}{\theta^A_t}\right) = x^A_0 \cdot \left(\theta^A_t\right)^{\eta-1} = q(\theta^A_t)$$

The rate at which unemployed individuals find a new job in the regular sector and the agency sector becomes:

$$\frac{X^E_t}{S^E_t} = f\left(x^E_0, 1, \theta^E_t\right) = x^E_0 \cdot \left(\theta^E_t\right)^{\eta} = \alpha(\theta^E_t)$$

$$\frac{X^A_t}{S^A_t} = f\left(x^A_0, 1, \theta^A_t\right) = x^A_0 \cdot \left(\theta^A_t\right)^{\eta} = \alpha(\theta^A_t)$$
Between each time period, the labour force grows with a rate of \( n_t \); \( N_t = n_t N_{t-1} \). It is also assumed that only a proportion \((1 - \pi_t)\) of the labour force remains into the next period, which implies that \((1 - \pi_t) N_{t-1}\) exit either state of employment and unemployment proportionally. This makes the number of workers entering the labour market as unemployed at the beginning of each period \((n_t - \pi_t) N_{t-1}\).

A job in either sector is hit by an exogenous shock with probability \( \lambda_t^E \), which renders the job unproductive. The position of unemployed workers.

\[
U_t = \pi_t \cdot U_{t-1} + (n_t - \pi_t) N_{t-1} + \lambda_t^E \cdot E_t - \alpha (\theta_t^E) U_t + \lambda_t^A \cdot A_t - q (\theta_t^A) V_t^A
\]  

\[
E_t = \pi_t \cdot E_{t-1} - \lambda_t^E \cdot E_t + q (\theta_t^E) V_t^E
\]

\[
A_t = \pi_t \cdot A_{t-1} - \left[ \lambda_t^A + \delta^A \cdot \alpha (\theta_t^E) \right] A_t + q (\theta_t^A) V_t^A
\]

The number of unemployed workers (2) are those still unemployed from the previous period that have not left the labour force to add to the net inflow of new workers and those entering, or leaving, either type of employment. The number of workers with regular employment (3) includes those remaining from the previous period, reduced by those that have transitioned into unemployment, and increased by the number of matches to any posted vacancies.

The number of workers in the agency sector (4) is interpreted similarly but here the outflow may occur in two directions; either into regular employment or into unemployment. Inflow comes solely from the pool of unemployed workers.

The relative number of employed and unemployed workers in steady-state is solved for in Appendix A.1 by using (1) in expressions (2) through (4) together with the growth rate of the labour force.

\[
u = \frac{n \left[ 1 + \lambda^E + c + \lambda^A (1 - c) \right]}{n \left[ 1 + \lambda^A + \alpha (\theta^E) + \alpha (\theta^A) \right]} - \pi
\]

\[
c = \frac{n \cdot \alpha (\theta^E) \left[ u + \delta^A (1 - u) \right]}{n (1 + \lambda^E + \delta^A \cdot \alpha (\theta^E))} - \pi
\]

\[
a = 1 - u - c
\]

**The Client Firm and the TWA**

The economy is assumed to consist of many identical competitive firms producing a homogenous good according to a sector specific production function, \( Y_{j,t} \), under constant returns to scale. Each job within a firm may be either vacant (V) or filled (F) by a worker from either the regular sector or the agency sector. A firm with a vacancy in the regular sector suffers a search cost \( \gamma^E \) (proportional to the wage). The position becomes filled in the next period with probability \( q (\theta_t^E) \), and remains vacant with probability \( 1 - q (\theta_t^E) \) which determines the value function of a vacancy in the regular sector:

\[
\Lambda_{t+1}^{V,E} = \frac{-q^E (1 + \pi_t^E) W_t}{P_{t}^{Y_E}} + \left[ \frac{q (\theta_t^E)}{1 + r_t} \right] \Lambda_{t+1}^{F,E} + \left[ \frac{1 - q (\theta_t^E)}{1 + r_t} \right] \Lambda_{t+1}^{V,E}
\]

where \( r_t \) is the producer price real interest rate defined by Lindén (2004) as \( (1 + r_t) = (1 + R_t) \cdot P_t^Y/P_{t-1}^Y \); i.e. the nominal interest rate \( R_t \) adjusted for any changes in the relative price of the produced good, \( P_t^Y \).

A firm with a filled job in the regular sector earns the marginal product of labour, \( Y_{E,t} \), for which the firm pays the prevailing wage and an additional employer tax, \( \tau^e \).
In the upcoming period, the firm expects the worker to remain in the workforce with probability \( \pi_t \). Of those workers, the firm expects to lose a certain fraction \( \lambda^E_t \) due to the job becoming unproductive as a consequence of an exogenous shock, in which case the firm is liable to pay the worker a wage-proportional severance payment: \( \delta^S \).

The value for the firm of a filled job in the regular sector thereby becomes:

\[
\Lambda^{F,E}_t = \gamma^{F,E}_{t,t} = \left( 1 + \pi_t \cdot \lambda^E_t \cdot \delta^S \right) \frac{(1 + \tau_t)}{p^Y_t} \cdot w_t + \left[ \frac{\pi_t \cdot (1 - \lambda^E_t)}{1 + \tau_t} \right] \Lambda^{F,E}_{t+1} + \\
\left[ \frac{1 - \pi_t(1 - \lambda^E_t)}{1 + \tau_t} \right] \Lambda^{V,E}_{t+1}
\]

(9)

The firm also has the option of opening a vacancy in the agency sector. Doing so incurs different costs and has different dynamics than in the regular sector. Each period a firm with a vacant job in the agency sector does not manage to find a matching worker, it suffers a cost \( \gamma^A_{FIRM} > 0 \) proportional to the cost of renting an agency worker. The firm expects the position to become filled in the next period with probability \( q(\theta^A_t) \) through which the value of a vacancy to be filled with an agency worker can be expressed as:

\[
\Lambda^{V,A}_t = -\gamma^A_{FIRM} \left( \frac{\delta^{TW,A}}{p^Y_t} \right) \left( 1 + \tau_t \right) \cdot w_t + \left[ \frac{q(\theta^A_t)}{1 + \tau_t} \right] \Lambda^{F,A}_{t+1} + \\
\left[ \frac{1 - q(\theta^A_t)}{1 + \tau_t} \right] \Lambda^{V,A}_{t+1}
\]

(10)

An agency worker will work at the marginal productivity in that sector for which the client firm will pay the TWA a fee that is proportional, \( \delta^{TW,A} \), to the wage in the regular sector. The client firm expects a job in the agency sector to remain filled in the next period with probability \( \pi_t \left( 1 - \lambda^A_t \right) \left( 1 - \delta^A \cdot \alpha(\theta^E_t) \right) \); which is the number of agency workers who have remained in the workforce \( \left( \pi_t \right) \), that have not suffered an exogenous shock \( 1 - \lambda^A_t \) and have not found a job in the regular sector \( 1 - \delta^A \cdot \alpha(\theta^E_t) \). The value for the client firm of a filled job in the agency sector thereby becomes:

\[
\Lambda^{F,A}_t = \gamma^{F,A}_{t,t} = \left( 1 + \pi_t \cdot \lambda^A_t \cdot \delta^A \cdot \alpha \left( \theta^E_t \right) \right) \frac{(1 + \tau_t)}{p^Y_t} \cdot w_t + \left[ \frac{\pi_t \cdot (1 - \lambda^A_t) \cdot (1 - \delta^A \cdot \alpha(\theta^E_t))}{1 + \tau_t} \right] \Lambda^{F,A}_{t+1} + \\
\left[ \frac{1 - \pi_t(1 - \lambda^A_t) \cdot (1 - \delta^A \cdot \alpha(\theta^E_t))}{1 + \tau_t} \right] \Lambda^{V,E}_{t+1}
\]

(11)

Following Neugart & Storrie (2006) and Baumann et al. (2011), the steady-state value of \( \delta^{TW,A} \) is determined so that the client firm becomes indifferent between hiring and renting the worker (where \( w = (1 + \tau)^W/p^Y \) is an abbreviation for the real wage paid by the firm). The rationale for this assumption is discussed more thoroughly below.

\[
\delta^{TW,A} = \frac{q(\theta^A) \cdot q(\theta^E) \cdot \left[ (Y_A - Y_E) + (1 + \pi_t \cdot \lambda^E \cdot \delta^S) \cdot w \right] - (\pi_t \cdot \gamma_E) \cdot (1 - \lambda^E) \cdot w}{q(\theta^A) \cdot q(\theta^A) \cdot (1 - \lambda^A \cdot (\pi_t \cdot \gamma^A_{FIRM}) \cdot (1 - \delta^A \cdot \alpha(\theta^E))) \cdot w}
\]

(12)

While it is the client firm that has the explicit demand for the agency worker, it will be the TWA that determines the supply (and thereby the demand from the pool of unemployed workers) given the costs and revenues of the TWA. The TWA suffers a search cost when having a vacant position in the agency sector, \( \gamma^A_{TW,A} \) and the vacancy is expected to be filled with probability \( q(\theta^A_t) \).

Filling a vacancy implies renting the worker to a client firm – however this does not earn the TWA any production revenues in the regular sense. The profit for the TWA comes from the difference between the fee charged to the client firm and the wage paid to the worker. The wage paid to the agency worker is expressed as a proportion, \( \delta^w \), of the wage earned by a worker in the regular sector. The value of an open vacancy, and a filled job, for the TWA becomes:

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8Garibaldi & Violante (2005) find that the largest cost when downsizing the labour force is severance payments. Neugart & Storrie (2006), Baumann et al. (2011) and Baumann (2012) similarly model employment protection as a cost imposed on terminating an unproductive job. Severance payments could relate to decreased productivity during the dismissal notice period (11 § EPA), or even a (preemptive) settlement offer which at least indirectly relates to an expectation of the economic, punitive (38 § EPA) and normative damages (39 § EPA) that the employer might be liable for (cf. SOU 2012:62).

9The client firm is never liable for any severance payment when a job in the agency state is terminated because it is not the employer per definition, and any liability therefore rests with the TWA.
\begin{align}
\Lambda_t^{V,TWA} &= -\gamma_{TWA}^2(\delta^{TWA})_t(1+\tau_t^w)W_t + \left[1-q(\theta_t^A)\right]\Lambda_{t+1}^{F,TWA} + \\
&\quad + \left[1-q(\theta_t^A)\right]_t \Lambda_{t+1}^{V,TWA} \\
\Lambda_t^{F,TWA} &= \left(\delta^{TWA}-\delta^w\right)(1+\tau_t^w)W_t + \left[\pi_t(1-\lambda_t^A)(1-\delta^A\alpha(\theta_t^E))\right]\Lambda_{t+1}^{F,TWA} + \\
&\quad + \left[1-\pi_t(1-\lambda_t^A)(1-\delta^A\alpha(\theta_t^E))\right]_t \Lambda_{t+1}^{V,TWA}
\end{align}

The Worker

A worker in the regular sector earns the current wage which is subject to an income tax \(\tau_t^w\). All workers are assumed to purchase a consumption good at price \(P_t\), that is subject to a consumer tax, \(\tau_t^c\). As previously defined, any individual worker remains in the work force with probability \(\pi_t\). A fraction of the remaining workers, \(\lambda_t^E\), are hit by an adverse shock which transitions them into unemployment, but also awards the affected worker the wage proportional severance payment from the firm. The value function of a worker employed in the regular sector at time \(t\) becomes:

\[\psi_t^E = \left(1+\pi_t \cdot \lambda_t^E \cdot \delta^w\right)(1+\tau_t^w)W_t + \left[\pi_t(1-\lambda_t^A)(1+\tau_t^E)\right]_t \Lambda_{t+1}^{E} + \left[\pi_t \cdot \lambda_t^E \cdot \frac{1}{1+\tau_t^E}\right]_t \Lambda_{t+1}^{U}\]

where \(\tau_t^E\), the consumer price real interest rate, is defined as \((1+\tau_t^E) = (1+R_t)\cdot \frac{1+\tau_t^c}{1+\tau_t^c} \cdot \frac{P_t^c}{P_t^e}\). A worker employed in the agency sector earns a wage that is proportional \((\delta^w)\) to the wage in the regular sector. The agency worker is also subject to the same consumer and income taxes, and purchases the same consumption good for the same price as the regularly employed workers.

The agency worker also remains in the work force with the same probability, and transitions into unemployment due to an exogenous shock with the previously defined probability \(\Lambda_t^A\), which in this case does not warrant a severance payment transfer to the agency worker. The agency worker is also expected to transition into regular employment with probability \(\delta^A \cdot \alpha(\theta_t^E)\).\(^{10}\) The value function of an unemployed worker thereby becomes:

\[\psi_t^U = \delta^u(1+\tau_t^u)W_t + \left[\pi_t(1-\lambda_t^A)(\delta^A \cdot \alpha(\theta_t^E))\right]_t \Lambda_{t+1}^{E} + \left[\pi_t \cdot \lambda_t^E \cdot \frac{1}{1+\tau_t^E}\right]_t \Lambda_{t+1}^{U}\]

Finally, an unemployed worker earns wage-proportional unemployment benefits, \(\delta^B\), that are determined exogenously by the government. If the worker remains in the work force, he/she will expect to find employment in the regular sector with probability \(\alpha(\theta_t^E)\) or in the agency sector with probability \(\alpha(\theta_t^A)\). Consequently, if the worker remains in the work force in the next period he/she expects to remain unemployed with probability \(1 - \alpha(\theta_t^E) + \alpha(\theta_t^A)\). The value function of an unemployed worker can thereby be written as:

\[\psi_t^U = \delta^u(1+\tau_t^u)W_t + \left[\pi_t \cdot \alpha(\theta_t^E)\right]_t \Lambda_{t+1}^{E} + \left[\pi_t \cdot \alpha(\theta_t^A)\right]_t \Lambda_{t+1}^{U}\]

\(^{10}\)As mentioned before, the TWA may not (legally) charge a prospective worker for the mediation service. An unemployed worker may therefore also not pay any sort of fee to become employed through the TWA and thereby enjoy any increased search-efficiency towards the coveted employment within the regular sector.
Wage Determination

The theoretical model in this paper assumes the same wage formation process as in Neugart & Storrie (2006) and Baumann et al. (2011) where wage negotiations are carried out between the firm and the labour union on behalf of the workers in the regular sector without any formal minimum wage limitations. This also follows the Swedish model of labour market relations and the Swedish wage setting framework where the labour unions and employer confederations negotiate collective agreements that regulate wages and working conditions. Non-union workers may also be regarded as being tied to the wage level set through the collective bargaining of the labour unions (SOU 2011:5).

That the labour union thereby also negotiates the wage level for non-members might seem counterintuitive as those workers are allowed to free-ride on the wage negotiations without paying any fees or contributing to the collective bargaining power of the labour unions. However, by making the employer pay the same wage for union members as for non-unionised workers the labour unions avoid a race-to-the-bottom where workers underbid each other for the sake of getting any wage at all.

It also removes the possibility of employers paying non-members a higher wage in order to influence workers to not join a labour union, or even influence existing members to quit. Furthermore, NIER (2011) suggests that having one sector establishing an accepted norm lowers the baseline unemployment rate, and also lowers the risk of other sectors using strategies that are non-optimal in the long run in order to obtain short-term gains.

Both the firm and the labour union determine the profit from a successful negotiation and the cost of not reaching an agreement and split the rent according to each party’s relative bargaining strength, $\beta$. A successful agreement results in the job becoming filled by a worker in the regular sector. The fall-back option for the firm is to keep the position vacant and continue to search for a worker, whereas the fall-back for the worker is to remain unemployed and obtain unemployment benefits instead of the negotiated wage. The wage is thereby determined by maximising the weighted Nash product, $\Omega_t$, with regard to the wage. $\Omega_t = \left[ \psi^E_t E_t - \psi^U_t U_t \right] \beta \left[ \Lambda^F_t E_t - \Lambda^V_t E_t \right]^{1-\beta}$

The negotiated wage, along with the demand for workers in the regular sector and the agency sector, determines the labour market tightness in the two sectors – which in turn determines the relative number of workers in each sector via expressions (5) through (7).

3 Equilibrium analysis

Previous studies utilising similar models that distinguish between employment in the regular sector and the agency sector have made the assumption that TWAs may unilaterally determine the agency worker’s proportional wage parameter, $\delta^A$, and the mark-up charged by the TWA to supply an agency worker in the agency sector, $\delta^TWA$ (Neugart & Storrie, 2006; Baumann et al., 2011). The TWA is assumed to determine the wage paid to the agency worker so that the worker becomes indifferent to accepting agency employment or remaining unemployed; $\psi^A = \psi^U$, under the additional assumption that a worker will always accept an offer of (agency) employment over unemployment.

This assumption is justified by the relatively marginal position of the agency worker in the labour force and the low degree of unionisation within the sector (see Neugart & Storrie, 2006, referencing Storrie, 2002, and Dolado et al., 2000. Cf. also Forde & Slater, 2005). Holst et al. (2008) even suggest that agency workers are not seen as equal members by the labour unions. Håkansson & Isidorsson (2014) argues that union representation in the Swedish agency sector could be weaker than in the regular sector due to the composition of the temporary agency workforce (see Andersson-Joona & Wadensjö, 2008; Westén & Lindgren, 2014).

\[11\text{In the Swedish framework (for most types of employment) it is more reasonable to attribute the bargaining power to the existence of labour unions rather than to the individual prospective worker. Any individual worker would have a negligible amount of bargaining power – especially given the assumed homogenous skills, homogenous tasks, lack of on-the-job training, and the existence of available substitute workers (Cahuc et al., 2006). For an extensive overview, interpretation and importance of the relative bargaining parameter, and the need to closely motivate the use of the Nash bargaining solution, see Binmore et al. (1986).}

\[12\text{Appendix A.3 (before the legislation implementation) and Appendix A.4 (following the implementation) includes a complete derivation of the wage, both within and outside of steady state.} \]
Sweden has a regressive unemployment benefit system; the size of the unemployment benefit is determined in relation to the previous wage, but also capped at a certain threshold. It also becomes successively lower with time, and rejecting a reasonable job offer could potentially disqualify the worker from any subsequent unemployment benefits, which also justifies the \( \psi^A = \psi^U \) simplification. This is therefore taken as the optimal strategy for the TWA prior to the implementation of the directive (the \emph{PRE-model}).

The main aim of the directive is to raise the position of the agency worker to that of a worker employed in the regular sector with regard to the real wage (incl. working conditions etc.). The directive thereby restricts the compensation from the TWA to a level where the worker (at least) becomes indifferent to work in the regular sector and in the agency sector; \( \psi^A \geq \psi^E \). The optimal choice for the TWA becomes to pay the least amount that fulfils this weak inequality, i.e. determining \( \delta^w \) so that \( \psi^A = \psi^E \). This becomes the central component of the \emph{POST-model} following the implementation.

The directive also explicitly aims to facilitate the transition from agency work into regular employment by prohibiting any measures to hinder such transitions, either directly or indirectly, by the client firm or the TWA. The second part of the analysis will therefore be concerned with evaluating the effects on employment and overall welfare from an increase in the relative search efficiency parameter \( \delta^A \) following the implementation.

The \textbf{PRE-Model}

The steady-state result from (18) gives the wage setting curve (\( WS \)) for the regular sector in wage/tightness space:

\[
\begin{align*}
w &= \frac{\beta \cdot Y_E}{(1 + \pi \cdot \lambda^E \cdot \delta^S) - \pi \cdot \beta \cdot \gamma^E \cdot \theta^E} \\
&= (1 - \beta) \cdot \frac{(1 + \pi \cdot \lambda^E \cdot \delta^S) - \pi \cdot \beta \cdot \gamma^E \cdot \theta^E}{(1 + \pi \cdot \lambda^E \cdot \delta^S) - \pi \cdot (1 - \lambda^E)} \quad \text{(19)}
\end{align*}
\]

Assuming that vacancies will be opened until all additional profits have been exhausted \( \Lambda^{V,E} = \Lambda^{V,A} = 0 \), and rewriting the steady-state expression for the value of a filled job in the regular sector \( (9) \) in terms of the real wage yields the labour demand \( LD \) curve in wage/tightness space\(^{13}\). The intersection of the \( WS \)-curve and the \( LD \)-curve gives the equilibrium regular sector labour market tightness:

\[
\theta^E = \frac{(1 - \beta) \cdot (1 + \pi \cdot \lambda^E \cdot \delta^S)}{(1 + \pi \cdot \gamma^E)} - \frac{(1 + r) - \pi (1 - \lambda^E)}{\pi \cdot q (\theta^E)} \quad \text{(20)}
\]

The proportion of the wage paid to the agency worker by the TWA is determined such that \( \psi^A = \psi^U \):

\[
\delta^w = \frac{\pi \cdot \alpha (\theta^E) (1 + r) - \pi (1 - \lambda^E)}{(1 + r) - \pi (1 - \alpha (\theta^E) - \lambda^A)} \quad \text{(21)}
\]

\( \delta^w \) is thus a function of both the labour market tightness in the regular sector and the unemployment benefits. Following Neugart & Storrie (2006) and Baumann et al. (2011) the TWAs’ demand for workers is determined by (13) and (14) conditional on that \( \Lambda^{V,TWA} = 0 \). The demand for agency workers is shown to be a function of the tightness in the regular market (see Appendix A.3).

\[
q (\theta^A) = \frac{\gamma_{TWA} \cdot \delta^{TWA} \cdot \pi (1 - \lambda^A) (1 - \delta^A \cdot \alpha (\theta^E)) - (1 + r)}{\delta^w - \delta^{TWA}} \quad \text{(22)}
\]

The \textbf{POST-Model}

The wage setting expression in the POST-model (23) solves similar to (19), with the difference that the expression now also contains \( \theta^A \).

\[
\begin{align*}
\begin{align*}
w &= \frac{\beta \cdot Y_E}{(1 + \pi \cdot \lambda^E \cdot \delta^S) - \pi \cdot \beta \cdot \gamma^E \left( \theta^E + \frac{\alpha (\delta^A)}{q (\theta^E)} \right)} \\
&= (1 - \beta) \cdot \frac{(1 + \pi \cdot \lambda^E \cdot \delta^S) - \pi \cdot \beta \cdot \gamma^E \left( \theta^E + \frac{\alpha (\delta^A)}{q (\theta^E)} \right)}{(1 + \pi \cdot \lambda^E \cdot \delta^S) - \pi \cdot (1 - \lambda^E)} \quad \text{(23)}
\end{align*}
\end{align*}
\]

\(^{13}\)The wage setting curve is upward sloping, whereas the demand for labour is downward sloping, in wage/tightness space.
The expression for $\delta^\text{TWA}$ is the same as in (12), this is also true for the firms’ demand for regular sector workers ($LD$) and the TWAs’ demand for workers (22). The relative wage paid to the agency worker following the implementation is now determined so that a worker values the agency sector equal to the regular sector ($\psi^A = \psi^E$). The agency workers’ proportional wage-parameter expression thereby becomes:

$$\delta^w = \left(1 + \pi \cdot \lambda^E \cdot \delta^S \right) - \frac{\pi \left( \lambda^E - \lambda^A \right) \left( 1 + \pi \cdot \lambda^E \cdot \delta^S - \delta^B \right)}{\left(1 + r^c\right) - \pi \left( 1 - \alpha \left( \theta^E \right) - \alpha \left( \theta^A \right) - \lambda^E \right)}$$ (24)

The PRE-model will solve sequentially given the set of calibration values for the exogenous variables, whereas the labour market tightness in the two states of the POST-model have to be solved simultaneously (since the expression for the equilibrium value of $\theta^E$ now also includes $\theta^A$). The wage proportional parameters $\delta^w$ and $\delta^\text{TWA}$ may be solved in sequence thereafter.

### 3.1 Results and Numerical Example

The PRE-model is initially calibrated with empirically relevant figures which are thereafter transferred into the POST-model to show the impact of the legislation implementation. There are three different taxes in the model. Both the wage tax ($\tau^w_t$) and employer tax ($\tau^e_t$) are calibrated at thirty percent (average levels in 2011) whereas the consumer tax ($\tau^c_t$) is set at the VAT-tax level of twenty-five percent. The relative price level between consumer and producer prices is determined so that the real wage paid by the firm equals the real wage obtained by the worker.

Similarly, the producer and consumer real interest rates will be set at the same level. The unemployment benefit-parameter follow the argumentation on the regressive benefit system and corresponds to half the wage rate. The workers relative bargaining power corresponds to the surveyed quantitative results in Lindén (1995). The model does not contain any effort-related transition probability or tenure increasing productivity, and it is therefore assumed that there are no differences in the productivity between the two sectors. The relative search efficiency parameter from the agency sector follows the empirical findings of Hveem (2013, cf. also Anderson & Wadensjö, 2004).

Previous studies have assumed that the advantage of the TWA lies in the baseline matching parameter. This paper assumes that the advantage rather lies in a lower search cost for the TWA. This assumption is based on the fact that the TWA focuses solely on producing matches (e.g. specialised recruitment channels and a register of prospective job searchers) and does not have to divert any production resources when matching a vacancy to a worker. Recruiting a worker in the regular sector is assumed to be the result of a steady increase in demand that warrants a long-term commitment which lowers the average recruitment cost. The need for additional agency workers is conversely determined on a short-term basis where similar recruitment costs might prove inhibitive due to the short expected period of employment (Jahn & Bentzen, 2012).

<table>
<thead>
<tr>
<th>Table 3.1 Monthly Calibration Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Survival probability</strong></td>
</tr>
<tr>
<td><strong>Population growth</strong></td>
</tr>
<tr>
<td><strong>Interest rate</strong></td>
</tr>
<tr>
<td><strong>Worker’s share of the profit</strong></td>
</tr>
<tr>
<td><strong>Employer’s tax and wage tax</strong></td>
</tr>
<tr>
<td><strong>Consumer tax</strong></td>
</tr>
<tr>
<td><strong>Severance payments</strong></td>
</tr>
<tr>
<td><strong>Unemployment benefits</strong></td>
</tr>
<tr>
<td><strong>Matching elasticity</strong></td>
</tr>
</tbody>
</table>
The exogenous shock rates are set so that the average duration of a job in the agency sector is only four months, while being much longer in the regular sector\textsuperscript{14}(cf. Forde & Slater, 2005). Severance payments are set equal to three months wages in the event of the worker being dismissed (cf. SOU 2012:62). The severance payment is not only made up of the purely monetary transfer that the employer could be obliged to pay the worker, but could also include other aspects such as lowered productivity during the dismissal notice period when a worker might not perform at the full productivity level.

The calibration values for the PRE-model coincide well with the empirical situation in Sweden. Unemployment levels in Sweden have varied between six and nine percent since 2001, and have remained stable at around eight percent since 2011. Official statistics suggest that the Swedish agency sector employed just below one and a half percent in 2012\textsuperscript{15}.

However, a steady-state size for the agency sector of about two percent is not unreasonable since the sector is still growing. Transferring the baseline calibration values for the PRE-model into the POST-model will show the impact on unemployment and employment in either of the two sectors as a result of the implementation of the directive, ceteris paribus\textsuperscript{16}.

The implementation of the directive will increase the average wage level through two effects; indirectly through the increase in the $\delta_w$-parameter, but also more directly due to agency employment becoming an alternative to regular employment, rather than an alternative to unemployment. The latter effect is the (slope-increasing) feedback between the agency sector and the regular sector that constitutes the difference in wage expression (23) relative to (19).

The increased slope of the $WS$ curve, together with that the regular-sector labour demand expression does not change, implies that unemployment will rise as fewer individuals become employed in the regular sector. The increased number of unemployed workers will also reduce labour market tightness in both sectors as there are now more job seekers. The results are shown in Table 3.2.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|c|c|c|}
\hline
 & $e$ & $\Delta e$ & $a$ & $\Delta a$ & $u$ & $\Delta u$ \\
\hline
PRE-model & 90.00 % & 1.99 % & 8.01 % & & & \\
POST-model & 88.60 % & (−) & 2.11 % & (+) & 9.29 % & (+) \\
\hline
\end{tabular}
\caption{Results}
\end{table}

The increased wage level will also reduce the value of a filled regular position for the firm, which also reduces the price the TWA is able to charge since the mark-up $\delta^{TWA}$ is determined such that $\Lambda^F,E = \Lambda^F,A$. This decrease in the price for supplying a worker together with the increase in the compensation paid to the agency worker reduces the rent of the TWA substantially. It is therefore an interesting result that the size of the agency sector is actually increasing.

The TWA will nevertheless still make some rent due to their cost advantages. This result is therefore mainly due to the lowered labour market tightness in the regular sector which also lowers the transition rate into the regular sector from the agency sector. The TWA is still willing to supply basically the same number of workers even after the implementation of the directive.

\textsuperscript{14}I claim that it is likely that the contracts in the agency sector constitute several sequential (short duration) assignments in order to achieve the sought-after flexibility. Even though OECD data suggests that the regular sector average employment duration is even longer (~10-12 years), the figures here allow for significantly longer durations than in Neugart & Storrie (2006) and Baumann \textit{et al.} (2011).

\textsuperscript{15}Andersson-Joona & Wadensjö (2010) suggests that the official statistics could underestimate the full scope of the sector by not capturing e.g. seasonal variations etc.

\textsuperscript{16}There are two (real) roots that will satisfy (18) when $\eta = 0.5$. However, the quantitative figures will only differ slightly and the qualitative results of either solution for $\psi^E$ are robust (w.r.t. all endogenous variables). The POST-model also has multiple solutions, but only one will fulfill the additional restrictions; being real valued, having $\delta^{TWA} > \delta_w \geq 1$ (to compensate for the difference in $\lambda^j$) and $Y_j' \geq w > 0$.
3.2 Welfare analysis

While the key feature of the directive is to remove any wage differentials between agency workers and those employed directly by the firm, it also explicitly aims to facilitate the transition from agency work into regular employment. This section simulates the effects of an increase in the relative search efficiency parameter of a worker in the agency sector relative to that of an unemployed worker. The net effects on welfare are measured by a utilitarian welfare function that sums the weighted value functions for the firm, the TWA and the worker.

\[
Z = \left( \Lambda^{F,E} + \psi^E \right) e + \left( \Lambda^{F,A} + \Lambda^{F,TWA} + \psi^A \right) a + \left( \psi^U \right) u
\] (25)

Estimating and normalising the utilitarian welfare to the level prior to the implementation provides a baseline to compare any welfare changes following the implementation. This pre-implementation baseline is shown as the black dashed line in Figure 3.1, whereas the continuous line represents the welfare following the implementation. The grey dotted line is a reference level for the initial standardised welfare measure.

Previous studies applying equilibrium conditions similar to the situation prior to the implementation have shown that (utilitarian) welfare is increasing with the search-efficiency between the agency- and regular labour market over the same interval (Neugart & Storrie, 2006). Figure 3.1 shows that welfare is increasing both as a direct consequence of the implementation, but also when simulating an increase in the relative search-efficiency – and that the welfare increase is of similar relative magnitude as prior to the implementation.

![Figure 3.1](image)

The preceding section has shown that unemployment will increase following the implementation. The increased wage rate also lowers the value of a filled job for both the firm and the TWA respectively. The TWA is not able to exert the same rent as prior to the implementation. The welfare increasing effect following the implementation is therefore mainly driven by the increase in welfare for the employed workers in both sectors (and the agency sector in particular). Both employment and welfare will increase even further if the directive also manages to increase the relative search-efficiency from the agency sector, as can be seen in Table 3.3.

<table>
<thead>
<tr>
<th>(\delta^A)</th>
<th>90%</th>
<th>95%</th>
<th>100%</th>
<th>105%</th>
<th>110%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment</td>
<td>9.32%</td>
<td>9.29%</td>
<td>9.26%</td>
<td>9.23%</td>
<td>9.21%</td>
</tr>
<tr>
<td>Employment (E)</td>
<td>88.57%</td>
<td>88.66%</td>
<td>88.75%</td>
<td>88.83%</td>
<td>88.90%</td>
</tr>
<tr>
<td>Employment (A)</td>
<td>2.11%</td>
<td>2.05%</td>
<td>1.99%</td>
<td>1.94%</td>
<td>1.89%</td>
</tr>
</tbody>
</table>
Increasing the relative search efficiency will increase the overall probability that the firm will fill a vacant position in the regular sector, with the associated positive effect of a shorter average duration of a vacancy. This will increase the number of workers employed in the regular sector while also having an increasing effect on the wage rate. This is because the increased search efficiency will have the same effect as if there were more job-seekers for each vacant job.

The TWA will experience that the average duration of an assignment becomes shorter since increasing the relative search efficiency will increase the outflow from the agency sector. The relative compensation paid by the TWA to the worker will decrease since the worker does not need to be compensated to the same extent to fulfill the equilibrium condition $\psi^A = \psi^E$. The TWA is at the same time also able to charge a higher mark-up for supplying the worker and the TWA will thereby be able to exert an even higher rent per worker.

4 Summary and Discussion

The objective of this paper has been to theoretically analyse the impact on overall employment and the relative size of the temporary agency sector following the Swedish implementation of the EU Temporary and Agency Workers Directive, and its implied principle of equal treatment with regard to the (real) wage. The chosen general equilibrium model provides a powerful framework for analysing economic systems with complex relations and feedback effects. While the situation prior to the implementation (the PRE-model) can be solved sequentially, the model of the situation following the legislation (the POST-model) must be solved as a system of equations.

The complexity and non-linearity of the model both prior to, and following the implementation, suggest that the effects must be interpreted conditional on the specific level of the exogenous variables. This further implies that the selection of the calibration values is paramount. Calibration of the model with relevant empirical values will quantify the results by providing a numerical example on the equilibrium, or at the very least suggest the relevant size and direction of the effects. The approach both allows for estimation of the impact of changes in the exogenous variables, as well as an examination of the (conditional) dynamics of the model.

The previously implemented directives (guaranteeing other types of flexible or atypical workers equal treatment and wages) are included in the model by assuming that all workers other than agency workers are a part of the regular labour market. However, including other atypical workers into the regular sector will also increase the exogenous shock rate. This is the motivation for the separation rate calibration value being set slightly higher than suggested by OECD data on the duration of open-ended contracts. This also makes the client firm unable to obtain short term labour in any other way than through a TWA, which thereby also allows the TWA to unilaterally determine the mark-up.

Although there is no readily available data on the mark-up charged by the TWA, the strong growth of the agency sector suggests that the TWA is able to exert significant rent. The rent in the theoretical model following the implementation of the equal wages regime is a consequence of the TWA’s lower average recruitment costs and limited severance liability, whereas any empirical rent could be attributed to a low degree of competition (Andersson-Joona & Wadensjö, 2010).

Given that both TWAs and the client firm are subject to the same regulatory framework regarding dismissals, then the client firm should arguably be better suited to hedge against any liabilities by a more accurate forecast of their demand for labour (through a better knowledge of the market). The TWAs on the other hand could (potentially) more easily reassign their workers and thereby circumvent any severance liabilities (although not explicitly modelled here, this could also impact the type of worker that the TWA will choose to supply, cf. Walter, 2012).

Baumann et al. (2011) also show that the TWA is willing to supply fewer workers if its severance liabilities approaches that of the client firm. The competitive factor of the TWAs would then become its superior matching efficiency rather than a maintained limited severance liability. It has nevertheless been suggested that labour unions act more leniently towards TWAs in order to protect the core of organised employees in the regular sector (Salvatori, 2009; Håkansson & Isidorsson, 2014; cf. also Thommes & Weiland, 2010; Jahn & Bentzen, 2012).
That allowing exemptions from the principle of equal treatment was in part requested by the Swedish labour unions (SOU 2011:5) is arguably also somewhat indicative of this view. Provided that the proposed lenient attitude from the labour unions stems from a relatively low number of union members in the agency sector, it is possible that the limited liability assumption becomes less applicable if the sectors union density rate increases.

In the framework describing the dynamics prior to the implementation of the directive, both the equilibrium wage level and the labour market tightness become independent of the relative transition probability. Any increase in the relative transition probability parameter thereby allows the TWA to charge a higher price for supplying the agency worker while simultaneously lowering the relative compensation paid to the worker.

This keeps the worker valuation of being employed in the agency sector constant when the probability of being matched towards a regular sector employment in the upcoming period increases. This effect is still present in the post-implementation framework, although becomes mitigated by the feedback between the labour market tightness in the two sectors.

The demand for agency workers is dependent on the tightness in the regular sector, both prior to and following the implementation of the legislation. An increase in the probability of filling a vacancy in the regular sector will at the same time decrease the probability that a vacancy is filled in the agency sector. This coincides well with that the agency sector is utilised to a higher extent when it is more difficult to secure a job in the regular sector; e.g., when there is a higher degree of uncertainty in the market for the produced goods (cf. Forde & Slater, 2005; Salvatori, 2009; Thommes & Weiland, 2010; Jahn & Bentzen, 2012).

The results suggest that the relative number of agency workers will stay basically the same. This implies that even though the relative compensation paid to the agency worker will increase, the TWA will still supply basically the same amount of labour (cf. the referenced literature in Thommes & Weiland, 2010, regarding the implementation of an equal treatment legislation in Germany. See also Jahn & Bentzen, 2012).

The model thereby also captures that the firms will still retain a buffer of agency workers to be able to adjust the workforce if there is a lower demand for the produced goods. We may also conclude that the agency sector, as expected, also show significantly shorter durations for vacant positions compared to the regular sector – both prior to and following the implementation.

The qualitative results suggest that the implementation of the directive will increase the overall wage level, which in turn will reduce the total number of employed individuals, as the agency sector becomes included in the wage negotiations in a more explicit way than prior to the implementation. The directive has nevertheless been shown to be (utilitarian) welfare increasing, and thereby Kaldor-Hicks efficient, over the relevant range of calibration values. While all workers will experience a welfare increase through the wage effect, the highest increase in welfare will be enjoyed by those in the agency sector.

The level of compliance constitute the crucial condition for whether the compensation to the TWA worker is allowed to approach that of the worker in the regular sector (cf. Nienhüser & Matiaske, 2006; Jahn, 2010). The preparatory documents underlying the implementation states that making exemptions to the principle of equal treatment is supported by both the employer confederations and the labour unions (SOU 2011:5) which could constitute a potential problem as the enforcement mainly rests on the labour market parties.

Objective monitoring of the compliance thereby becomes especially important as the self-interest of these groups could potentially interfere with the intended purpose of strengthening the position of the temporary agency workers (cf. Spermann, 2011; Håkansson & Isidorsson, 2014 see also the discussion regarding collective agreements in Jahn & Bentzen, 2012, and that firms with local works councils utilise agency workers to a larger extent than other firms; Thommes & Weiland, 2010).

The implementation of the directive could help to remove any stigma associated with temporary agency work by ensuring similar working and employment conditions, and also facilitating the transition of agency workers into direct employment at the client firm (cf. Forde & Slater, 2005). Unfortunately, the TWAs only have weak incentives to aid in such transitions. Their optimal strategy is rather to increase the duration of each contract with the client firm in order to obtain more rent for each supplied worker.

This is arguably most easily accomplished by impeding the worker’s transition from the agency sector to the regular sector (cf. Westéus & Raattamaa, 2014). It is therefore important for future research to not only monitor the relative wage rate, but also the transition rate from agency employment into regular employment (i.e. the stepping-stone effect).
References


Appendix

A.1 The relative number of workers in each sector

Expression (2) is reproduced below to provide the general solution concept.

\[ U_t = \pi_t \cdot U_{t-1} + (n_t - \pi_t) N_{t-1} + \lambda_t^E \cdot E_t - \alpha (\theta_t^E) U_t + \lambda_t^A \cdot A_t - q (\theta_t^A) V_t^A \]

Divide the expression above by \( N_t = n_t \cdot N_{t-1} \) to get the relative ratios of worker unemployment, and sector specific employment and vacancies and rewrite these according to (1).

\[ u_t = \frac{\pi_t}{n_t} \cdot u_{t-1} + \left(1 - \frac{\pi_t}{n_t}\right) + \lambda_t^E \cdot e_t + \lambda_t^A \cdot a_t - \alpha (\theta_t^E) u_t - q (\theta_t^A) v_t^A \]

In steady-state both the relative and absolute number of unemployed workers will be constant; \( U_t = U_{t-1} = U \) and \( u_t = u_{t-1} = u \), implying that all time indexes may be removed. We may also rewrite \( \lambda_t^E = \alpha (\theta_t^E) u \) since agency sector vacancies are filled at the same rate as workers leave unemployment for work in the agency sector. We may also substitute \( a = 1 - e - u \) according to (7).

\[ u = \frac{\pi}{n} \cdot u + \left(1 - \frac{\pi}{n}\right) + \lambda^E \cdot e + \lambda^A \cdot \left(1 - e - u\right) - \alpha (\theta^E) u - \alpha (\theta^A) u \]

Finally, collect all \( u \)-terms.

\[ u = \frac{n \left[1 + \lambda^E \cdot e + \lambda^A \cdot (1 - e)\right] - \pi}{n \left[1 + \lambda^A + \alpha (\theta^E) + \alpha (\theta^A)\right] - \pi} \]

The relative number of workers in the regular sector (6) is solved for in the same way, but the flow of workers into the sector is rewritten as \( q (\theta^E) v^E = \alpha (\theta^E) u + \delta^A \cdot \alpha (\theta^E) \cdot (1 - e - u) \) in order to capture the inflow of workers from both unemployment and employment in the agency sector.

A.2 The optimal mark-up charged by the TWA, \( \delta^{TWA} \)

Following Neugart & Storrie (2006) and Baumann et al. (2011), the optimal mark-up charged by the TWA is obtained by determining the mark-up so that the client firm values renting a worker through the TWA equal to employing the worker directly. Equations (8) to (11) for the firm are reproduced here for convenience.

\[ \Lambda^{V,E}_{t,E} = -\gamma^E \left(1 + \tau_t^E\right) W_t + \left[ \frac{q (\theta_t^E)}{1 + r_t}\right] \Lambda^{F,E}_{t+1} + \left[ \frac{1 - q (\theta_t^E)}{1 + r_t}\right] \Lambda^{V,E}_{t+1} \]

\[ \Lambda^{F,E}_{t,E} = Y^{E}_{t,E} - \frac{\left[1 + \pi \cdot \lambda_t^E \cdot \delta^E\right] \left(1 + \tau_t^E\right) W_t}{P_t^E} + \left[ \frac{\tau_t (1 - \lambda_t^E)}{1 + r_t}\right] \Lambda^{F,E}_{t+1} + \left[ \frac{1 - \tau_t (1 - \lambda_t^E)}{1 + r_t}\right] \Lambda^{V,E}_{t+1} \]

\[ \Lambda^{V,A}_{t} = -\gamma^{A}_{FIRM} \left(1 + \tau_t^A\right) W_t + \left[ \frac{q (\theta_t^A)}{1 + r_t}\right] \Lambda^{F,A}_{t+1} + \left[ \frac{1 - q (\theta_t^A)}{1 + r_t}\right] \Lambda^{V,A}_{t+1} \]

\[ \Lambda^{F,A}_{t,A} = Y^{A}_{t,A} - \delta^{TWA} \left(1 + \tau_t^A\right) W_t + \left[ \frac{\tau_t (1 - \lambda_t^A) (1 - \delta^A \cdot \alpha (\theta_t^E))}{1 + r_t}\right] \Lambda^{F,A}_{t+1} + \left[ \frac{1 - \tau_t (1 - \lambda_t^A) (1 - \delta^A \cdot \alpha (\theta_t^E))}{1 + r_t}\right] \Lambda^{V,A}_{t+1} \]

\[ \Lambda^{V,E}_{t} = -\gamma^{E}_{FIRM} \left(1 + \tau_t^E\right) W_t + \left[ \frac{q (\theta_t^E)}{1 + r_t}\right] \Lambda^{F,E}_{t+1} + \left[ \frac{1 - q (\theta_t^E)}{1 + r_t}\right] \Lambda^{V,E}_{t+1} \]
The firm will open new vacancies until the value of an additional vacancy is zero, \( \Delta_Y = \Delta_A = 0 \) which also implies that \( \Delta_Y + \Delta_A = 0 \). Rewriting and solving (8) and (10) for the value of a filled position in the upcoming period yields:

\[
0 = -\gamma_Y q^{t+1} \frac{W_t}{P_t} + \frac{q^t \theta^E}{1+\tau_t} \Delta_Y + \frac{q^t \theta^A}{1+\tau_t} \Delta_A \\
0 = -\gamma_A q^{t+1} \frac{W_t}{P_t} + \frac{q^t \theta^E}{1+\tau_t} \Delta_Y + \frac{q^t \theta^A}{1+\tau_t} \Delta_A
\]

Substituting these expressions for a filled position in each respective sector with their equivalence in (9) and (11) yields:

\[
\Delta_Y^{F,E} = \frac{Y_{E,t}}{P_t^f} \left[ \frac{1 + \pi \cdot \lambda^E \cdot \delta}{1 + \tau_t} \right] W_t + \frac{\pi_t \left( 1 - \lambda^E \right)}{1 + \tau_t} + \frac{\gamma^E (1 + \tau_t) W_t}{q^t \theta^E} \\
\Delta_Y^{F,A} = \frac{Y_{A,t}}{P_t^f} \left[ \frac{1 + \pi \cdot \lambda^A \cdot \delta}{1 + \tau_t} \right] W_t + \frac{\pi_t \left( 1 - \lambda^A \right)}{1 + \tau_t} + \frac{\gamma^A (1 + \tau_t) W_t}{q^t \theta^A}
\]

Setting these two expressions equal to each other, abbreviating the real wage \((1+\tau_t)W_t/P_t^f = w_t\), and solving for the mark-up parameter yields:

\[
\delta^{TWA} = \frac{q^t \theta^A \left[ q^t \theta^E \left( Y_{E,t}^{t+1} - Y_{A,t}^{t+1} + w_t \left( 1 + \pi_t \cdot \lambda^E \cdot \delta \right) - w_t \left( 1 - \lambda^E \right) (\pi_t \cdot \gamma^E) \right) \right]}{q^t \theta^A - w_t q^t \theta^A - (1 - \lambda^E) (\pi_t \cdot \gamma_{FIRM}^A) (1 + \lambda^E \cdot \gamma_{FIRM}^A)}
\]

A.3 The PRE-Model

1. Agency Worker Relative Wage

The TWA will determine \( \delta^w \) in such a way that the worker values being employed in the agency sector equal to being unemployed; \( \psi_i^d = \psi_i^U \). The expressions for the worker valuation of either state are reproduced from (15), (16) and (17) respectively.

\[
\psi_i^E = \frac{1 + \pi_t \cdot \lambda_i^E \cdot \delta}{1 - \tau_i} W_t + \frac{\pi_t \left( 1 - \lambda_i^E \right)}{1 + \tau_t} \psi_i^{E,t+1} + \frac{\pi_t \cdot \lambda_i^E}{1 + \tau_t} \psi_i^{U,t+1}
\]

\[
\psi_i^A = \frac{\delta^w (1 - \tau_i^A) W_t}{1 - \tau_i} + \frac{\pi_t (1 - \lambda_i^A) \alpha(\theta_i^E)}{1 + \tau_t} \psi_i^{E,t+1} + \frac{\pi_t \alpha(\theta_i^A)}{1 + \tau_t} \psi_i^{A,t+1} + ...
\]

\[
\psi_i^U = \frac{\delta^w (1 - \tau_i^U) W_t}{1 - \tau_i} + \frac{\pi_t \alpha(\theta_i^E)}{1 + \tau_t} \psi_i^{E,t+1} + \frac{\pi_t \alpha(\theta_i^A)}{1 + \tau_t} \psi_i^{A,t+1} + ...
\]

Setting the last two expressions equal to each other under the steady-state condition that \( \psi_i^d = \psi_i^{t+1} = \psi_i^A \), and substituting all \( \psi_i^E \)-terms for the steady-state version of (17) yields the following when solving for the \( \delta^w \)-parameter:

\[
\delta^w = \frac{\pi_t \alpha(\theta_i^E) \left( 1 + \lambda_i^E \cdot \delta \right)}{1 + \tau_t} \left( 1 + \lambda_i^A \cdot \delta \right) \left( 1 + \lambda_i^A \cdot \delta \right) \psi_i^{A,t+1} + ...
\]

\[
+ \frac{\pi_t \alpha(\theta_i^A) \left( 1 + \lambda_i^E \cdot \delta \right)}{1 + \tau_t} \left( 1 + \lambda_i^A \cdot \delta \right) \psi_i^{A,t+1} + ...
\]

\[
... + \frac{\pi_t \alpha(\theta_i^E) \left( 1 + \lambda_i^A \cdot \delta \right)}{1 + \tau_t} \left( 1 + \lambda_i^A \cdot \delta \right) \psi_i^{A,t+1} + ...
\]

\[
+ \frac{\pi_t \alpha(\theta_i^A) \left( 1 + \lambda_i^A \cdot \delta \right)}{1 + \tau_t} \left( 1 + \lambda_i^A \cdot \delta \right) \psi_i^{A,t+1} + ...
\]
2. Wage Setting (WS)

The wage is determined through the Nash-product in (18):

$$\max_{W_t} \Omega = [\psi^E_t - \psi^U_t]^\beta \left[ \Lambda^F,E_t - \Lambda^V,E_t \right]^{1-\beta}$$

The first term within brackets is obtained by subtracting (15) from (17) under the assumption that the worker values \(\psi^E_t = \psi^U_t\) as determined in the preceding section. The second term is similarly obtained by subtracting (9) from (8). Collecting terms yields:

$$\psi^E_t - \psi^U_t = \left[ 1 + \pi^t_t \cdot \lambda^E_t \cdot \delta^S - \delta^B \right] (1 - \tau^w_t) W_t + \pi^t_t \cdot \left[ 1 - (\lambda^E_t + \alpha \cdot \bar{\phi}^E) \right] \left( \psi^E_{t+1} - \psi^U_{t+1} \right)$$

$$\Lambda^F,E_t - \Lambda^V,E_t = Y^t_{E,t} - \left[ 1 + \pi^t_t \cdot \lambda^E_t \cdot \delta^S - \gamma^E \right] (1 + \tau^r_t) W_t + \pi^t_t \cdot \left[ 1 - (\lambda^E_t + \alpha \cdot \bar{\phi}^E) \right] \left( \Lambda^F,E_{t+1} - \Lambda^V,E_{t+1} \right)$$

Setting the F.O.C. from (18) equal to zero (for an optimum, where the expressions within brackets have been substituted with (27) and (28) respectively) may be written as (29) after collecting terms and simplifying the expression.

$$\psi^E_t - \psi^U_t = \frac{\beta}{1 - \beta} \cdot \frac{1 + \pi^t_t \cdot \lambda^E_t \cdot \delta^S - \delta^B}{1 + \pi^t_t \cdot \lambda^E_t \cdot \delta^B} \cdot \frac{(1 - \tau^w_t)}{(1 + \tau^r_t)} \cdot P^Y_t \cdot \left( \Lambda^F,E_t - \Lambda^V,E_t \right)$$

Substitute the L.H. side of (26) with the R.H. side of (28). Also substitute the expression for \(\psi^E_{t+1} - \psi^U_{t+1}\) in (27) with the second-period equivalence of (29) and collect terms to get \(\Lambda^F,E_t - \Lambda^V,E_t\) on the L.H. side.

$$\Lambda^F,E_t - \Lambda^V,E_t = \frac{1 - \beta}{\beta} \cdot \frac{1 + \pi^t_t \cdot \lambda^E_t \cdot \delta^S}{1 + \pi^t_t \cdot \lambda^E_t \cdot \delta^B} \cdot \frac{(1 - \tau^w_t)}{(1 + \tau^r_t)} \cdot \frac{\pi^t_t \cdot \left[ 1 - (\lambda^E_t + \alpha \cdot \bar{\phi}^E) \right]}{1 + \tau^r_t} \cdot \frac{P^c}{P^e_t} \cdot \frac{P^c}{P^c_t} \cdot \frac{P^c}{P^c_{t+1}} \cdot \frac{P^c}{P^c_{t+1}} \cdot \left( \Lambda^F,E_{t+1} - \Lambda^V,E_{t+1} \right)$$

Following Lindén (2004) the expression may be simplified further by defining the change in the tax wedge between the employers tax and the wage tax as \(1 - \tau_{t+1}\), and also the ratio between the consumer real interest rate and the firm real interest rate, \(1 + r^c_t / (1 + r^c_{t+1})\), to get rid of the relative price levels and consumer taxes. We also make use of the short-hand notation for the real-wage paid by the firm, \(w_t\), from (26):

$$1 - \tau_{t+1} = \frac{(1 + r^c_t) / (1 - \tau^w_t)}{(1 + r^c_{t+1}) / (1 + r^c_{t+1})}$$

$$\frac{1 + r^c_t}{1 + r^c_{t+1}} = \frac{(1 - \tau^w_t)}{(1 + \tau^r_{t+1})} \cdot \frac{P^c}{P^c_t} \cdot \frac{P^c}{P^c_{t+1}}$$

$$w_t = \frac{(1 + \tau^r_t)}{(1 + r^c_{t+1})} W_t$$

This allows us to simplify the above expression to:

$$\Lambda^F,E_t - \Lambda^V,E_t = \frac{1 - \beta}{\beta} \cdot \left[ 1 + \pi^t_t \cdot \lambda^E_t \cdot \delta^S \right] w_t \cdot \pi^t_t \cdot \left[ 1 - (\lambda^E_t + \alpha \cdot \bar{\phi}^E) \right] (1 - \tau_{t+1}) \cdot \left( \Lambda^F,E_{t+1} - \Lambda^V,E_{t+1} \right)$$

Substituting the L.H. side with the expression from (28), and collecting terms with \(\left( \Lambda^F,E_{t+1} - \Lambda^V,E_{t+1} \right)\) yields:
Finally, applying the free-entry condition (firms will open vacancies until the value of an additional vacancy is zero, \( \Lambda_{t+1}^{V,E} = 0 \), which gives an expression for \( \Lambda_{t+1}^{V,E} \) through (9) and solving for the wage outside of steady-state yields:

\[
w_t = \frac{\beta \cdot Y'_E \cdot q(\theta_E)}{1 + \pi_t \cdot \lambda^E \cdot \delta^S - \pi \cdot \beta \cdot \gamma^E \cdot \theta_E^t} - \pi \cdot \tau_{t+1} \left[ \beta \cdot \gamma^E \left( 1 - \lambda^E - \alpha(\theta_E^t) \right) \right]
\]

In steady-state, the change in the tax-wedge will be constant \((1 - \tau_{t+1} = 1 \rightarrow \tau_{t+1} = 0)\), which gives us the wage-setting curve (WS) in wage/tightness-space for the PRE-model:

\[
w = \frac{\beta \cdot Y'_E}{1 + \pi (\lambda^E \cdot \delta^S - \beta \cdot \gamma^E \cdot \theta_E)}
\]

3. Labour Demand (LD) and Sector Tightness

The labour demand curve on the regular labour market is solved for by defining steady-state versions of the wage-setting curve (WS) in wage/tightness-space for the PRE-model:

\[
\Lambda^{F,E} = Y'_E - [1 + \pi \cdot \lambda^E \cdot \delta^S] w + \left[ \pi(1-\lambda^E) \right] \Rightarrow \Lambda^{F,E} = \frac{\gamma^E \cdot w(1+r)}{q(\theta_E)}
\]

Setting these two expressions equal and solving for the real wage yields the labour demand curve (LD) for the regular sector:

\[
w = \frac{q(\theta_E)Y'_E}{1 + \pi \cdot \lambda^E \cdot \delta^S - \beta \cdot \gamma^E \cdot \theta_E} = \frac{Y'_E}{1 + \pi \cdot \lambda^E \cdot \delta^S + \frac{\pi(1-\lambda^E)}{q(\theta_E)}}
\]

The equilibrium wage and labour market tightness in the regular sector is obtained by setting WS = LD and solving for the value(s) of \( \theta_E \) that fulfills the equality.

\[
\frac{\beta \cdot Y'_E}{1 + \pi (\lambda^E \cdot \delta^S - \beta \cdot \gamma^E \cdot \theta_E)} = \frac{Y'_E}{1 + \pi \cdot \lambda^E \cdot \delta^S + \frac{\pi(1-\lambda^E)}{q(\theta_E)}}
\]

The labour market tightness in the agency sector, \( \theta^A \), solves similarly by defining the corresponding steady-state expressions for the TWA.
\[
\frac{\gamma^A_{TWA} \cdot \delta^{TWA} \cdot (1 + r) w}{q (\theta^A)} = \frac{(1 + r) (\delta^{TWA} - \delta^w) w}{(1 + r) - \pi (1 - \lambda^A) (1 - \delta^A \cdot \alpha (\theta^E))} \Rightarrow \\
q (\theta^A) = \frac{\gamma^A_{TWA} \cdot \delta^{TWA} \cdot [\pi (1 - \lambda^A) (1 - \delta^A \cdot \alpha (\theta^E)) - (1 + r)]}{\delta^w - \delta^{TWA}}
\]

A.4 The POST-Model

1. Agency Worker Relative Wage

Following the implementation of the directive, the TWA will determine \(\delta^w\) in (16) so that the worker values being employed in the agency sector equal to being employed in the regular sector; \(\psi^A = \psi^E\). The worker valuation expressions for either state are stated in (15), (16) and (17), and will not be reproduced here. The \(\delta^w\)-parameter is solved for in the same manner as in the PRE-model and becomes:

\[
\delta^w = (1 + \pi \cdot \lambda^E \cdot \delta^S) - \frac{\pi (\lambda^E - \lambda^A) (1 + \pi \cdot \lambda^E \cdot \delta^S - \delta^E)}{(1 + r^E) - \pi (1 - \alpha (\theta^E) - \alpha (\theta^A) - \lambda^E)}
\]

2. Wage Setting (WS)

The wage is solved for in the same way as in the PRE-model with the exception that the worker valuation from being employed in the agency sector is not equal to being unemployed, but rather set so that \(\psi^A = \psi^E\). This changes (26) to read:

\[
\psi^E_i - \psi^U_i = \frac{1 + \pi t \cdot \lambda^E \cdot \delta^S - \delta^E}{1 + \pi t} \frac{[1 - \tau_{t+1}]}{P^E_t} \left[ \frac{1 + \pi t \cdot \lambda^E \cdot \delta^S - \delta^E}{1 + \pi t} \right] + \frac{\pi t [1 - (\lambda^E + \alpha (\theta^E) + \alpha (\theta^A))]}{1 + \pi t} \left[ \psi^E_{i+1} - \psi^U_{i+1} \right]
\]

The WS-curve is solved for in the same manner as in the PRE-model (appendix section A.3.2) above which yields the following expression for the WS-curve in wage/tightness-space:

\[
w_t = \frac{\beta \cdot Y'_E}{(1 + \pi t \cdot \lambda^E \cdot \delta^S) - \pi t \cdot \beta \cdot \gamma^E \frac{\alpha (\theta^E) + \alpha (\theta^A)}{q(\theta^E)}}
\]

In steady-state, the change in the wage tax rate is constant, \((1 - \tau_{t+1}) = 1 \Rightarrow \tau_{t+1} = 0\), and the expression for the WS-curve in wage/tightness-space becomes:

\[
w = \frac{\beta \cdot Y'_E}{(1 + \pi \cdot \lambda^E \cdot \delta^S) - \pi \cdot \beta \cdot \gamma^E \frac{\alpha (\theta^E) + \alpha (\theta^A)}{q(\theta^E)}}
\]

3. Labour Demand (LD) and Sector Tightness

The expression for the steady-state demand for labour in the regular sector (LD) is unaffected by the implementation of the directive and is consequently the same as in the PRE-model.

\[
w = \frac{Y'_E}{[1 + \pi \cdot \lambda^E \cdot \delta^S] + \frac{\gamma^E}{q(\theta^E)} [(1 + r) - \pi (1 - \lambda^E)]}
\]

The labour market tightness in the regular sector is solved for by setting WS = LD and simplifying:

\[
\theta^E = \frac{(1 - \beta)}{\beta} \cdot \frac{(1 + \pi \cdot \lambda^E \cdot \delta^S)}{\pi \cdot \gamma^E} = \frac{(1 + r) - \pi (1 - \lambda^E - \alpha (\theta^A))}{q(\theta^E) \pi}
\]
The labour market tightness in the agency sector is determined in the same manner as in the PRE-model:

\[ q(\theta^A) = \frac{\gamma^A_{TWA} \cdot \delta^{TWA} \left[ \pi (1 - \lambda^A) \left( 1 - \delta^A \cdot \alpha (\theta^E) \right) - (1 + r) \right]}{\delta^w - \delta^{TWA}} \]

Substitute \( \delta^w \) and \( \delta^{TWA} \) with expressions (24) and (12) respectively and solve the expression. However, since \( \theta^A = f(\theta^E) \) and \( \theta^E = g(\theta^A) \) the two parameters are to be solved for simultaneously.
Settlement probability asymmetries in the Swedish Labour Court

Morgan Westéus

Abstract This paper focuses on settlement probabilities for different types of representation within the Swedish Labour Court. Empirical estimates on a set of cases concerned with unjust dismissals show that private representatives are generally less likely to reach a settlement than their union counterparts. The settlement probabilities converge following court-mandated information disclosure, which suggests that information asymmetry is an important factor in explaining differences in settlement behaviour and that private negotiations are not sufficient in general.

Keywords Unjust dismissals · Negotiations · Settlements · Trade unions

JEL Classification D81 · D82 · J52 · K31 · K41

1 Introduction

Being involved in a lawsuit is among the highest stake gambles that many individuals will ever be a part of, irrespective of whether the reason for the lawsuit is the expectation of economic reparations, general restoration or affirmation. The ability to determine the associated expected costs and the probability of either winning or settling the case are key issues in making informed decisions and thus to promote efficiency. An important mechanism within civil lawsuits aimed at promoting efficiency is the possibility of reaching an agreement outside the court. This ends the conflict with both parties accepting a compromise, rather than the alternative ‘winner takes all’ approach. The purpose of this paper is to examine whether the probability of reaching a settlement differs between the two types of
representation available in the Swedish Labour Court—either private or union affiliated.

In an early model, Bebchuck (1984) concludes that information differences are the main reason for parties failing to settle, a notion also advocated by Cooter and Rubinfeld (1994). The conflicting prediction, held by Shavell (1989) and Hay (1994) among others, states that settlements are not facilitated by mandatory pre-trial negotiations since informal negotiations (e.g. outside of court and on the sole initiative of the parties) are deemed sufficient. However, in a study that analysed the changes in the Taiwanese court’s structural system Huang (2009) finds that the inclusion of a mandatory Pre-Trial Hearing (PTH) in the litigation process promotes settlement by significantly increasing the settlement rate.

Fournier and Zuehlke (1998) examine how the structure of the legal system affects the behaviour of the litigants within civil cases during the settlement process. They estimate the settlement effect of the mean trial award (as a crude expected value conditional on winning in court), its variance (a measure of the uncertainty of the odds facing the litigants) and the accurateness of the assessed subjective damages. They find that a more accurate estimate of the recovery rate conditional on winning and a better subjective valuation of the inflicted damages increase the settlement rate.

In a laboratory simulation, Korobkin and Doherty (2009) find that both accurate predictions of reservation price as well as the level of the initial offer account for a substantial part of the variation in settlement outcomes. This may suggest the presence of an anchoring phenomenon in that any deviations from a similar estimation of both the inflicted and requested damages will prolong the settlement process. These findings confirm the importance of similar information sets between the representatives of the defendant and the plaintiff for settlement to occur relatively early. When examining several types of labour dispute cases in Taiwan that are settled out of court and the characteristics of the involved parties Huang et al. (2010) found evidence that increasing stakes decrease the probability of settlement and increase the risk of a final verdict after negotiations have failed, whereas information disclosure promotes settlements.

Previous research thereby suggest that it is the cost of negotiations, the size and assessment of the liability, and the question of the necessity of court-mandated disclosure of private information that will influence the process through which a settlement is reached. This study uses a dynamic bargaining model with Bayesian updates which is extended to allow for different settlement probabilities as a consequence of both information disclosure and the cost of negotiations in relation to the cost of losing the dispute.

The theoretical model is based on the defendant having to assess the plaintiff’s settlement reservation price to avoid the risk, delay and lingering cost of going

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1 Taiwan keeps an electronic database of key characteristics covering both the litigants and the case in general, which allows for an excellent basis for estimation, something that is not available in Sweden. There are, however, differences with regard to institutional factors, such as the development of the trade union movement, formal employment protection and the coverage of the collective bargaining agreements that makes any precise comparisons with Sweden somewhat inaccurate.

2 This type of (often formalised) disclosure is sometimes referred to as discovery hearings in the literature.
through another round of negotiations or even a main hearing. The plaintiff is defined as the one who has been wrongfully dismissed from employment, and the defendant is the one who is liable for the damages suffered by the plaintiff. Information disclosure in the theoretical model updates the subjective prior of the defendants’ representation over the liable amount. The subjective prior consists of both the commonly known and the private information of the case merits, as well as any previous experience and the formal education of the representation.

The defendant is assumed to have no prior experience or any information other than what is provided by the representation and is consequently assumed to negotiate based on the assessment of the information conveyed by the representation. This ties the settlement probability to the assessment of the representation rather than the defendant and allows two otherwise identical defendants to behave in different ways since their legal representatives could potentially make different assessments about the legal merits of the case. A better assessment regarding the inflicted damages more efficiently delineates the issue and promotes settlement. A less accurate interpretation of the conveyed information will increase the variance of the subjective prior which translates into a settlement probability rate that increases relatively slowly.

This study is the first of its kind to empirically estimate settlement probabilities using Swedish Labour Court data. The paper further adds to the existing literature by (i) relating the probability of settlement to the two distinct types of representation available in the Swedish Labour Court through their interpretation of the merits and stakes of the case. It also focuses on (ii) how the settlement probability changes over a regime of information disclosure nodes. These information disclosure nodes are the PTH and the main trial which divide the settlement negotiation process into three distinct bargaining states: before the pre-trial hearing, between the pre-trial hearing and the main hearing and after the main hearing but before a final verdict has gained legal force. The empirical findings support the importance of court-mandated negotiations and also provide valuable insights on settlement probability asymmetries within the pre-trial negotiation process.

The remainder of Sect. 1 summarises the Swedish institutional framework for solving conflicts in the labour market. Section 2 outlines the underlying theoretical model. Section 3 describes the data and Sect. 4 evaluates the possibility of cost level asymmetries that may affect the settlement timing. Section 5 estimates the type-dependent settlement probabilities attributed to different interpretations of information. The results are presented in Sect. 6 and Sect. 7 summarises and discusses the results.

1.1 The swedish model

The Swedish model of organising and regulating the labour market is founded on a framework of negotiations between the trade unions and the employer confederations, with the government providing and upholding the applicable legislation. The concept dates back to 1906, when the Swedish Trade Union Confederation

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3 This assumption follows Zhou (2008) in that it is the representatives that usually set the scope and intensity of the negotiations.
(Landsorganisationen, LO) and the Swedish Employers Confederation (Svenska Arbetsgivareföreningen, SAF, since 2001 known as Svenskt Näringsliv) reached an agreement. Its key features established the right-to-manage monopoly of the employer, which gave the employer the right to manage and distribute the tasks of the firm as he/she saw fit. Furthermore, it established a basis for employment-at-will, while also precluding the enforcement of any closed-shop agreements. During the following decades, these features have changed in favour of the employee through legislation prohibiting discrimination (SFS 2008:567), enforcing rehire agreements and just-cause dismissal doctrines, as regulated by the Employment Protection Act (SFS 1982:80, cit EPA). This evolution constitutes the basis for the possibility of filing an unjust dismissal claim towards an employer.

The Swedish Labour Court was established in 1928 to regulate conflicts and oversee the compliance of the statutes regulating the conditions in the labour market. Over time, the focus of the Labour Court has shifted from collective rights towards interpreting law on an individual level and upholding individual employment agreements. The court functions as an arbitrage court and consists of seven members, including the president, the vice president and a public servant member, which are not representing either the employer or the employee’s side. Of the remaining four members, two are appointed by the Swedish Employers’ Confederation and the other two are appointed by three of the largest trade unions (LO, TCO and SACO).

The judicial process within the Labour Court is regulated by law (SFS 1974:371). Both employees and employers may, through their respective unions, bring an issue before the Labour Court with no fixed costs associated with the filing of a lawsuit. If the union chooses not to represent the individual as a plaintiff, the lawsuit first has to be brought before a District Court (Tingsrätt). The District Court verdict may, in turn, be appealed to the Labour Court for a new and independent assessment of the underlying conflict. The Labour Court verdict is final and cannot be appealed further. This study makes a width-for-depth

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4 This has become known as the December Compromise, and was distinguished as a general principle of law by the Labour Court in the early 1930s, through which the agreement became as potent as any written law within Swedish legislation.

5 In return the Trade Union Confederation established the right to organise workers and raise the bargaining position of the employees to an equal position relative to the employer, something that was never really manifested according to Lundh (2006).

6 The Labour Court has since then been validated as an independent and impartial court by the Court of Justice of the European Union (CURIA) in several instances (see SOU 2006:022 for an overview).

7 This is the general composition. There are other types of cases (discrimination law, procedural law etc.) where the composition of the Labour Court might be different.

8 The public servant member (ämbetsmannaledamoten) has a special insight with regard to labour market conditions, and usually possesses a prominent position in a governmental organisation.

9 This is in contrast to some appeal processes within the general court system (de allmänna domstolarna), where an appeal may be decided solely on how the evidence was presented at the preceding trial, i.e. video playback.

10 Exceptions can be found in cases where obvious conditions were present which would lead to a mistrial based upon the principles of general administrative law (disqualification etc.) or due process (rättssäkerhet).
trade-off by only dealing with one type of underlying issue: wrongful dismissal, regardless of whether the dismissal has the properties of a wrongful termination (avsked) or a wrongful discharge (uppsägning). While there are differences between these types of cases with regard to the severity of the underlying conflict, the practical course of action is to file a type of two-step litigation which allows these types of cases to be pooled together.

1.2 The settlement process

The filing of a lawsuit initiates the settlement process between the two parties. The focus of this paper will be the different types of representation available for the two parties. The first type of representation is the union representative (subindex $u$), which constitutes two thirds of all settled cases. This type is defined as a jurist being affiliated with either a trade union or an employer confederation. The second type is the private representation (subindex $p$), defined as any other type of representation. If the lawsuit is filed directly to the Labour Court, the court will summon both parties to appear at a PTH where the case merits are presented before a judge in order to facilitate a solution through mediation.

Following the PTH a trial date will be set. This divides the settlement bargaining process into three distinct states with regard to the disclosure of private information: (i) prior to the PTH, (ii) between the PTH and the main trial and (iii) after the main trial.

The plaintiff and the defendant may negotiate privately throughout the process and come to a settlement solution without any formal involvement of the court (other than the lingering threat of trial). If the case is decided upon via a verdict, the trial costs are allocated through the english rule: the winner will get paid by the losing party for the amount of hours put into the case. The trade union is assumed to set the price of their representation equal to the cost of private representation. The difference on behalf of the individual is that the union membership is equivalent of obtaining representation insurance. Given risk-neutrality and accurate predictions of

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11 If a person is wrongfully terminated, it is seen as a much more intervening action on behalf of the employer and higher punitive damages are applicable. If the case is found to be a wrongful discharge, the employee generally has the right to retain his/her job, something that may not be applicable if the case is declared to be a wrongful termination.

12 The representative of the plaintiff argues that the case should primarily be tried as wrongful termination. But if the court finds that the case does not satisfy the stipulated prerequisites for a wrongful termination, then the case should be tried as a wrongful discharge. This approach lowers both litigation costs and the time needed to resolve the case, but it creates some ambiguity within the classification of the data.

13 Although the representation of the defendant is the focus throughout the paper, the underlying assessment by the representation of the plaintiff (denoted $p$ in the theoretical section) also plays a pivotal role. Appendix 1 contains further details on this matter.

14 This type of representation could be either a jurist (with or without a speciality in labour law), some type of lawyer (e.g. barrister or solicitor) or any other type of representation (with or without any formal background or training in labour law). The distinction is made to further emphasise the possibility of asymmetries with regard to any prior beliefs, interpretations or assessments—partly due to education, but primarily due to experience.

15 If the case is appealed from the District Court there will be no PTH, unless explicitly requested.
the chance of being in an unjust dismissal lawsuit the expected cost of these two options will be equal (the accurateness of this expectation is tested in Sect. 4).

2 Theoretical model

The theoretical model in this paper is an extension of the sequential bargaining model between two risk-neutral parties initially outlined by Spier (1992) and later applied by Fenn and Rickman (1999, 2001) and Zhou (2008, 2010). The expected damage that the defendant is liable for is assessed by the representation of the plaintiff and is denoted \( \varphi \). The assessment is the product of the probability of winning the case and the associated awarded damages; both punitive and economical. The value of \( \varphi \) defines the type of the plaintiff and can be described as being drawn from a distribution with probability density function (PDF), \( f(\varphi) \), assumed to be strictly positive on its support \( [\varphi_1, \varphi_2] \). The settlement hazard rate is defined as \( \frac{f(\varphi)}{1-F(\varphi)} \), where \( F(\varphi) \) is the cumulative distribution function (CDF), which is assumed to be strictly increasing and corresponds to the instantaneous probability of the case being settled.

The realisation of \( \varphi \) initiates the game by signalling that the plaintiff has been wrongfully dismissed and that the defendant is liable. Information asymmetry is introduced by assuming that the realised value of \( \varphi \) is known only to the plaintiff whereas the defendant is assumed only to have a subjective prior probability distribution over \( \varphi \). The prior is assumed to be distributed over \( [0, n] \) relating to the perceived damages. The \( \xi \)-scalar is interpreted as a severity parameter since it is scaling both the mean and the variance of the subjective prior. Boyd and Hoffman (2010) provide a detailed overview of several types of uncertainties in a judicial context that may be assumed to determine the size of the \( \xi \)-scalar.

The judicial negotiation process is modelled as a finite-horizon bargaining game in which only one party—the defendant—makes all the offers and is solved by backward induction to find the perfect Bayesian equilibrium (PBE). Making the assumption that the distribution from which \( \varphi \) is drawn and the distribution over the subjective prior both are uniform distributions will allow the PBE solution to be unique.

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16 The model by Fenn and Rickman (1999) and Zhou (2008) differs from Spier’s (1992) and Zhou’s (2010) model in that the offers are made by the defendant rather than the plaintiff, which provides a more intuitive bargaining process in a Swedish context. However, the cost structure outlined in Fenn & Rickman differs from that employed in this framework.

17 While this assumption puts all of the bargaining strength in the hands of the plaintiff, the simplification enables the model to avoid the possibility of multiple equilibria associated with updated beliefs. However, the plaintiff’s assessment of the stakes of the case may be inaccurate from an objective point of view and should therefore be interpreted not as an absolute amount but rather as something that the defendant’s assessment should be seen as relative towards. See Appendix 1 for more details on this matter.

18 In the PBE both parties are assumed to behave rationally at each point in time with regard to their expected values given their beliefs. These beliefs are derived from Bayes rule and each player’s information and equilibrium strategies. The reader is referred to Spier (1992) for a detailed description of the theoretical concept and variations.

19 Spier (1992) states that although the choice of distribution influences the effect of all other variables, the assumption of a uniformly distributed assessment of damages will allow for the existence of a unique PBE.
Settlement negotiations are assumed to be associated with a non-negative activity cost \((c \geq 0)\) paid by the defendant as a fee to the defendant’s representation each time an offer is given to the plaintiff. An additional fixed cost \((k \geq 0)\) is also imposed on the defendant if the case is not settled, but ends up being resolved through an official court verdict. This cost may be interpreted as a point cost associated with the defendant’s representatives having to prepare for court once any further negotiations would cost more than what the defendant expects to lose if the court would find the defendant liable. The two costs are determined exogenously whereas the trial date is determined semi-exogenously\(^{20}\).

During the pre-trial negotiations the defendant is allowed to make one offer (denoted \(s_t\)) in each subperiod \(t\), which outlines a sequence of settlement offers where the total time \(T\) corresponds to the maximum number of offers that the defendant will want to make. \(T\) is assumed to be proportional to the expected time it will take to reach a settlement since each offer will take time to make and evaluate. The plaintiff will either accept or decline the offer based on the private information of \(\varphi\). The game is repeated until an offer is accepted or the trial (i.e. the main hearing) is reached at \(t = T + 1\).

The intuition behind the settlement bargaining process is that since the expected cost of going to court is positive for the defendant, the gains from earlier settlement becomes the (discounted) negotiation costs that may be avoided.

Defining the common discount rate of both the plaintiff and the defendant as \(\delta \in (0, 1)\) the number of offers \((T)\) the defendant is willing to make must satisfy:

\[
\sum_{i=1}^{T-1} \delta^i \cdot c \leq \delta^T (\xi + k) \tag{1}
\]

If (1) does not hold, the defendant will offer \(s_1^* = \delta^T (\xi + k) + \sum_{i=1}^{T-1} \delta^i \cdot c\) and hold out for a verdict if the plaintiff rejects that offer.\(^{21}\) However, if (1) holds the equilibrium sequence of offers \(s_t (t \in [1, T])\) offered to the plaintiff become:

\[
s_1^* = \delta^T (\varphi_1 + k + \sum_{i=1}^{T} \delta^{-i} \cdot c) + \sum_{i=1}^{T} \delta^i \cdot c \tag{2}
\]

\[
s_t^* = s_1^* \cdot \delta^{(t-1)} \tag{3}
\]

Before each settlement offer, the defendant assesses the remaining types of plaintiffs replacing the initial assessment \(\varphi_1 (= \varphi) = 0\) (by definition of the prior)

\(^{20}\) The semi-exogenous nature of the trial date comes from the fact that the trial date is set (exogenously) by the court, but extensions for further negotiations are accepted as long as the extension does not infringe on the rights associated with due process. This implies that the parties will be guaranteed a sufficient time to negotiate a settlement, but neither party may prolong the process indefinitely. The specific nature of the time-until-trial is not important within this section, but becomes vital when testing the cost structure in Sect. 4.

\(^{21}\) The existence of a formal negotiation participation constraint in this type of lawsuit is suggested by Huang et al. (2010) who conclude that the stakes need to be sufficiently high relative the costs of negotiation to include a sufficient incentive to settle. This also follows an often-cited theoretical bargaining model by Nalebuff (1987) which also advocates the necessity of a credibility constraint in lawsuits.
with $\varphi_t(t \in [2, T])$ for each subsequent period where $\varphi_{T+1}$ represents the minimum type of plaintiff the defendant will face when the trial is reached.

$\varphi_1 = (\varphi) = 0$  \hspace{1cm} (4)

$\varphi_{t \in [2, T]} = \varphi_{t-1} + \frac{c}{\delta(T+1-t)}$  \hspace{1cm} (5)

$\varphi_{T+1} = \varphi_T + k + \sum_{i=1}^{T} \delta^{-i} \cdot c$  \hspace{1cm} (6)

The formal derivation is shown in Appendix 1. Both $\{\varphi_t\}_{t=1}^T$ and $\{s_i\}_{i=1}^T$ are increasing sequences over time. A plaintiff with private knowledge of a low $\varphi$ will settle early, whereas a plaintiff with private knowledge of a high $\varphi$ will hold out for a higher settlement offer. This effect is due to the differences in gain from going to court for the two types. The parties cannot improve their positions by avoiding the inefficient delay and sharing the gains from an early settlement, since there is no way to credibly signal the privately held information on the suffered damages except by going through the lawsuit with its associated costs. The (discrete) hazard rate of reaching a settlement at each point in time also corresponds to the theoretical probability of reaching a settlement.

The settlement hazard/probability rate is estimated by the number of cases that are being settled in this time period conditioned on all remaining cases. Conditional on (4), (5) and that (1) holds, the settlement hazard rate for $t = 1, 2, \ldots, (T-1)$ becomes:

$$h(t; \xi, c, T, \delta, k) = \frac{\varphi_{t+1} - \varphi_t}{\varphi_T - \varphi_t} = \frac{c(1 - \delta)\delta^t}{\delta^t(1 - \delta)(\xi + k) - c(\delta - \delta^t)}$$  \hspace{1cm} (7)

where $\varphi_T$ is rewritten in terms of (1), where $\sum_{i=1}^{T-1} \delta^i \cdot c = \delta^T(\xi + k)$. The impact of the different variables on the probability of reaching a settlement becomes:

$$h_\xi = \frac{\partial h(t; \xi, c, T, \delta, k)}{\partial \xi} < 0$$  \hspace{1cm} (8)

$$h_c = \frac{\partial h(t; \xi, c, T, \delta, k)}{\partial c} > 0$$  \hspace{1cm} (9)

$$h_k = \frac{\partial h(t; \xi, c, T, \delta, k)}{\partial k} < 0$$  \hspace{1cm} (10)

There is a positive effect on the probability of settlement with regard to the activity fee whereas the probability of reaching a settlement is a decreasing function of both the severity parameter of the subjective prior and the fixed fee. This implies that a relatively high estimate of $\xi$ will make the hazard rate increase relatively slowly. Finally, it should be noted that there is no absolute guarantee that the two parties will settle the case at all. If the subjective prior does not include the value of the plaintiff’s expected damages ($\varphi \notin [0, \xi]$) the parties will never settle at any offer and the case is decided upon by the court.
Making the assumption that it is the representation of the defendant that assesses the spread of the subjective prior based on the merits of the case, rather than the defendant himself/herself, motivates that there could potentially be a difference in the subjective prior which is dependent on the chosen type of representation. The theoretical model could thereby be extended to provide a framework to test for any differences in the probability of reaching a settlement, conditional on the type of representation; either union or private, \( l = \{u, p\} \). Both types of representation get paid regardless of the outcome of the case which merits the assumed risk neutrality of the model better than when individuals negotiate over an uncertain outcome. By also assuming that the two types of representation have the same discount rate \( \delta_u = \delta_p = \delta \) the type-dependant probability of reaching a settlement can be defined as:

\[
h_l(t; \xi_l, c_l, T, \delta, k_l) = \frac{c_l(1 - \delta)\delta^T}{\delta^T(1 - \delta)(\xi_l + k_l) - c_l(\delta - \delta^T)}
\]

The above assumptions thereby attributes any differences to either differences in the costs, see (9) and (10), or differences in the severity parameter of the subjective prior (8) according to the theoretical model. The null hypotheses when estimating the settlement probability (hazard) rate is that there are no differences between the two types, \( h_p = h_u \), implying \( (\xi_p = \xi_u, c_p = c_u, k_p = k_u) \). As the alternative, the settlements will occur at different rates, i.e. \( h_p \neq h_u \). The problem then becomes to be able to differentiate between the impact of the different variables since the comparative statics show that \( h_{c_l} < 0, h_{c_i} > 0 \) and \( h_{k_l} < 0 \) for each type of representation.

The explicit size of the subjective prior for any of the two types \( (\xi_l) \) cannot be observed directly. However, if there are no significant differences in the two types of costs for any type of representation then we may attribute any observed differences in the settlement rate to the subjective prior’s severity parameter according to the theoretical model. Consequently, the first issue that needs to be addressed is the possibility of differing costs between the two types of representation (i.e. if \( c_p = c_u, k_p = k_u \)). Section 4 will test for any cost differences between the two types of representation, whereas the settlement hazard analysis is carried out in Sects. 5 and 6.

3 Data

The data is obtained through the Swedish Labour Court’s internal registration system. The settlement data contains all settled cases that were finalised between 01-01-2003 and 27-02-2010. The data in Sect. 4 consists of \( j = 119 \) unjust

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22 The representation is assumed to only assess the liability and does not try to affect the number of bids made by the defendant thereafter, thereby removing any agency-problems that otherwise could have appeared.

23 No differences are expected since the cost structure presented in Sect. 1.2 suggests that there are no fixed costs and the activity fee charged by the labour union is expected to correspond to the activity fee charged by the private representation.

24 There are no ongoing cases present in the sample. This mitigates, and even eliminates, some of the complications associated with survival analysis (Cleves et al. 2010).
dismissal cases (of which 50% have had private representation) between 01-01-1999 and 27-02-2010, where the court verdict has been enforced and where the case duration, representation type and cost are available.\textsuperscript{25}

The Labour Court administrative system is sorted by the general applicable statute and thereafter divided into several subsystems which are neither interconnected nor normalised into specific classifications. There is no standardised classification of the case-specific level which can leave the researcher to select the relevant cases. A case under the Employment Protection Act (SFS 1982:80) may be subclassified as dealing with ‘punitive damages’ while not specifying the underlying cause: whether unjust dismissal or any other issue.

However, all cases that are included are validated as unjust dismissal cases and the arguments in note 17 motivates why a case is regarded as having private representation if at least one party is represented by this type.

The Labour Court always makes its own assessment and overturns 25% of the cases appealed from the District Courts. This conversion rate should be seen in comparison to other civil cases that are appealed from the District Court to the Court of Appeal (Hovrätten). Knutson (2011) publishes a note on Sweden’s largest Court of Appeal (Svea hovrätt), where the verdicts are overturned in 39–56% of the cases during the second half of 2010. Even though the Court of Appeal may deliver a verdict by only reviewing video playback of facts and witnesses as they were presented in the District Court, a different interpretation of the evidence constituted almost a quarter of the changes. The official statistics from the Swedish National Courts Administration (Domstolsverket) over the past five years show that the total frequency of overturned civil cases ranges between 18.7 and 42.4%.\textsuperscript{26}

The data suggests that in cases that are being resolved by a Labour Court verdict, the recovery rate of the punitive damages is between [0–300%], with an average recovery rate of about two thirds. The recovery rate of the economic damages (conditional on the employee winning the case) is [94–100%]. The probability of an employee winning an unjust dismissal case (that is not settled) is just below 50%. If the case is appealed from the District Court by the employee, the chance of overturning the verdict in the Labour Court is only about 13%. This should be compared with a 50% appeal success rate for the employer.\textsuperscript{27}

The conclusion of Boyd and Hoffman (2010) in general and the above statements in particular is that it is the framework in which an issue is analysed that is of utmost importance regarding being able to predict the outcome. This especially holds true when there is an associated judgment call, which often is the case regarding whether

\textsuperscript{25} The data utilised in Sect. 4 may not be used to estimate the duration model due to a change in the administrative routines of Swedish courts in 2003 when the responsibility to keep a coherent archive was consigned to each individual court, having formerly been a task for the Swedish National Courts Administration.

\textsuperscript{26} Tures (1999) shows, as an historical comparison, that rulings appealed to the Supreme Court (Högsta domstolen) from the Court of Appeal have sometimes been overturned in as many as seven out of 10 cases.

\textsuperscript{27} These numbers suggest a high degree of uncertainty, both with respect to the probability of winning the case and the recovered damages. This validates the application of a subjective prior distribution with a positive severity parameter, $\xi$. 

\textsuperscript{2} Springer
or not a person has been unjustly dismissed from employment. Because of this, the cases that are appealed from the District Court become classified as being settled prior to any PTH.

3.1 Truncation

An initial truncation has been made with regard to the length of the cases analysed in Sect. 5. The reason for this is the short time span for when a case has to be filed to the Labour Court\textsuperscript{28}, the non-existent cost of filing a lawsuit, together with distorted data of cases being settled very early after the suit has been filed. This suggests that suits may be filed before any adequate investigation of the merits of the case has been undertaken. The registered data is unable to separate between cases where a settlement has been reached or when a case has been dropped due to a lack of merit. To circumvent this problem, only cases lasting more than three months (90 days) are chosen. The rationale is described more extensively in Sect. 3.3. Two cases (duration of 818 and 859 days) have been removed as non-representative outliers.\textsuperscript{29}

3.2 Case duration

Often in studies of the bargaining/settlement process, proxy variables are used to measure the length of the process, see for instance Fournier and Zuehlke (1998) and Kessler (1996). The data in this paper contain exact dates for each event, such as the start of the legal process (defined as when the case was handed to the court), the PTH (the court-mandated informal negotiation process in front of legal expertise which allows each party to lay bare both the essentials of the case and the particular details), the date of the official court trial and the precise date for a reached settlement.\textsuperscript{30} As such, the data set allows us to ignore possible biases caused by the use of inaccurate proxy variables with respect to duration times. A settlement may even be reached after the trial since the verdict is not delivered at once, but rather made official some time after the main hearing.\textsuperscript{31}

\textsuperscript{28} The Employment Discrimination Act (SFS 1982:80, 40–41 §§) states that an annulment of the dismissal must be raised within two weeks if the dismissal has followed the correct administrative procedures, but may be extended to one month if important administrative deviations are present.

\textsuperscript{29} The underlying reason could be that some intervening issue might have to be resolved before the unjust dismissal dispute. Another issue could be that one party, or the Swedish Labour Court, has requested a reference for a preliminary ruling (förhandsavgörande). This procedure enables national courts to inquire the CURIA on the interpretation of European law or the validity of the national statutes in a European framework. The cases are A149/05 and A232/07.

\textsuperscript{30} A graphical examination (not included) suggests that the duration of the settled cases can be described by a Poisson distribution, implying that the distribution is completely determined by its mean, hinting at some initial support for a difference in settlement hazards between the two types of representation, as seen in Table 1.

\textsuperscript{31} The data suggests that the verdict is delivered within two months (mean), but the duration stretches up to four months. This allows the parties more time to settle – even after the trial.
3.3 The settlement rate

The importance of closely defining the settlement rate has been treated extensively by Eisenberg and Lanvers (2009), who find that both the fee structure and the nature, or characteristics, of the parties may help to explain settlement rate variations. They conclude that there are no agreed methods of transforming the actual outcomes into the dichotomous variable of settlement or no settlement. However due to the underlying theoretical outline and the available data the settlement rate is defined as suggested by Clermont (2008); where cases dropped by the plaintiff as a consequence of an expected non-positive pay-off are also included (conditional on the above definition of mature cases [90 days duration), while cases dropped due to inadmissibility are not included in the sample. This renders a selection of court-approved cases which could have reached trial but were settled before any formal judgment had been delivered.

4 Cost asymmetries

To be able to interpret any differences in the settlement hazard rate, it should first be established whether there are any differences in the costs of each type of representation and if these follow the theoretical expectation from Sect. 1.2. To test for any differences in the costs between each type of representation a linear LSDV model is estimated, where the duration in days \((TIME_j)\) of each case \((j = 1, \ldots, 119)\)

\[
\begin{array}{lll}
 n & \% & \text{Average duration (days)} \\
\hline
\text{Total settlements} & 591 & - \\
\text{Truncated} & 495 & 84 \\
\text{Before PTH} & 91 & 18 \\
\text{Between PTH and trial} & 338 & 68 \\
\text{Post trial} & 66 & 13 \\
\text{Union} & 372 & (75)^a \\
\text{Before PTH} & 52 & 14 \\
\text{Between PTH and trial} & 280 & 75 \\
\text{Post trial} & 40 & 11 \\
\text{Private} & 123 & (25)^a \\
\text{Before PTH} & 39 & 32 \\
\text{Between PTH and trial} & 58 & 47 \\
\text{Post trial} & 26 & 21 \\
\end{array}
\]

\(^a\) Percentages within parentheses represents ratio within the truncated sample

32 The observed settlement rates are within the 95 \% confidence interval estimated by Trubek et al. (1986) and the overview presented by Eisenberg and Lanvers (2009). The data in this paper supports the same conclusions when examined annually.
functions as a proxy for the settlement negotiation intensity of the representation. Since the sample is quite small and the data is expected to be heteroscedastic, the standard errors are estimated by the robust HC3-method. To demarcate between the two types of representation a type-dependent variable, indicating private representation ($D_p$), accounts for the possibility of differences in the fixed cost (intercept) as well as in the activity cost (slope) coefficients.

The following model is estimated:

$$COST_j = \beta_0 + \beta_1 \cdot D_p + \beta_2 \cdot TIME_j + \beta_3 \cdot D_p \cdot TIME_j + \epsilon_j$$  \hspace{1cm} (12)

The intercept coefficients represents the $k_l$-variables; $\beta_0 = k_u$ and $\beta_0 + \beta_1 \cdot D_p = k_p$, and the slope coefficients represent the $c_l$-variables; $\beta_2 = c_u$ and $\beta + \beta_3 \cdot D_p = c_p$ from the theoretical model, but with some inherent instrumental properties (see note 33). Given the theoretical cost structure in Sect. 1.2 the null hypothesis becomes $k_p = k_u = 0$ and $c_p = c_u = 0$.

The case length ($TIME_j$) variable shows an expected positive and statistically confirmed ($P < 0.01$) relationship with no intra-group differences; $c_p = c_u > 0$. The absence of any statistical evidence for a fixed fee for any type of representation ($k_u = k_p = 0$) further supports the presumption of a cost structure that is only based on the activity carried out by the representation. Appendix 2 presents the complete estimation results.

Higher costs for any type would affect the probability of reaching a settlement through (9) and (10). Since there are no such differences, the estimated hazard model allows the interpretation of any differences in the relative settlement hazard rate to be the result of differing information sets.

5 The settlement hazard ratio

Since the theoretical model does not make any distributional assumptions regarding the sample from which the hazard function is to be estimated, any pre-parametrisations of the underlying distributions should be avoided. Consequently, a non-parametric or semi-parametric approach should underline the estimates. The Cox (1972) semi-parametric proportional hazard ($PH$) model is a framework that is often applied when modelling lifetimes of various variables. While a non-parametric model

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33 Performed activities are not recorded homogenously at the Swedish Labour Court with regard to the type of activity, which part performs the activity or the extent of the activity. As a consequence, time is used as a proxy for the level of activity.

34 As initially suggested by MacKinnon and White (1985) and later shown by Long and Ervin (1998, 2000) via Monte Carlo simulations to be a superior method for obtaining correct inference in small samples ($25 < n < 250$).

35 The court is fully funded by the government and provides the institutional framework as well as the structure for litigation and mandated settlement negotiations (7 § 4 Ch. SFS 1974:371, referring to the right to negotiations and information in SFS 1976:580). Since both types of representation work on a per-activity basis, no statistically significant intercept is expected. Zhou (2008, 2010) also expects $k = 0$. The activity fee also includes the concept of loss of time ($tidsspillan$: time where the counsels time is claimed although no productive work can be carried out), which will influence the estimated level, but not the structure.
only uses the observations belonging to each specific group when estimating the hazard function, the model suggested by Cox uses the entire sample to estimate a PH model—something that becomes very useful in small samples such as this.\textsuperscript{36} The sample consists of \(m = 1, \ldots, 495 = M\) unjust dismissal cases occurring over time \(t = 1, \ldots, T\), where the time of settlement for each individual case is \(t_m\) and \(t_M = T\).

The model has two components; the baseline hazard function, \(h_0(t)\), and the relative hazard function, \(\exp(X_n\beta_n)\).

\[
h(t|X_n) = h_0(t) \cdot \exp(x_1\beta_1 + x_2\beta_2 + \cdots + x_n\beta_n) = h_0(t) \cdot \exp(X_n\beta_n) \quad (13)
\]

The baseline function is defined as the derivative of the cumulative baseline function, \(H_0(t)\), but the empirical cumulative baseline function is indeterminate since it is a stepwise (discrete) function and thereby has a derivative equal to zero at all times other than at each failure time for which it is undefined (infinite). Kalbfleisch and Prentice (2002) suggest applying a smoothing kernel \((K_t)\) after having defined the empirical hazard contribution function, \(\hat{D}^h(t_m)\);

\[
\Delta \hat{h}(t_m) = \hat{h}(t_m) - \hat{h}(t_{m-1}) \quad \text{ where } \hat{h}(t_m) = \sum_{m \leq M} \frac{d_{tm}}{g_{tm}} \quad (14)
\]

where \(g_{tm}\) is the number of cases at risk of being settled at time \(t_m\), \(d_{tm}\) is the number of settlements at time \(t_m\) and \(\hat{h}(t_m)\) is the semi-parametric baseline contribution. The Epanechnikov kernel is applied since it minimises the AMISE\textsuperscript{37} and does not force any additional assumptions on the density function. Following Cleves et al. (2010), the smoothed baseline hazard function becomes:

\[
\hat{h}_0(t) = [b^{-1}] \cdot \sum_{m=1}^{M} K_r\left(\frac{t - t_m}{b}\right) \cdot \Delta \hat{h}(t_m) \quad (15)
\]

where the optimal bandwidth \((b)\) is determined through the Silverman (1986) approximation.

Since two groups are being compared, the results will be presented as the relative probability of reaching a settlement; the hazard ratio (HR).\textsuperscript{38}

\[
HR = \frac{\hat{h}(t|x_p)}{\hat{h}(t|x_u)} = \frac{h_0(t) \cdot \exp(x_p\beta_n)}{h_0(t) \cdot \exp(x_u\beta_n)} = \exp[\beta_n(x_p - x_u)] \quad (16)
\]

The inclusion of a dichotomous variable, signifying either union or private representation, reduces (16) to \(HR = \exp(\beta_n)\) and provides a straightforward interpretation of the results as the impact of the type of representation on the (relative) probability of reaching a settlement. When estimating the HR in the Cox PH model the same weights are applied to early observations (affecting relatively many events) and

\textsuperscript{36} The estimation results from a non-parametric Nelson (1972) and Aalen (1978) model produces the same results as the Cox model and is available upon request from the author.

\textsuperscript{37} The performance of the smoothing kernel is regularly measured by Mean Integrated Squared Error (MISE) or AMISE (asymptotic MISE).

\textsuperscript{38} This is the common abbreviation for the relative measure between two hazard rates found in the literature and should not be confused with the (absolute) hazard rate for any individual type of representation.
late observations (which only affect the few cases still at risk at the end of the sample). If \((16)\) holds with the same ratio at all times while comparing the two types of representation; \(l = p, u\), the Cox model will provide unbiased estimates. However if the \(HR\) changes over time, then the Cox \(PH\) model will provide biased results.

To circumvent this problem Schemper (1992) suggests generalising the exponential part of the model by allowing the duration elasticity to vary with time as well as with the vector of explanatory variables. A non-\(PH\) Cox model, where \(h_l(t; x_l(t), z_l(t))\) is the hazard rate at time \(t\) conditional on a vector of \(z \leq n\) covariates with time dependent (\(TD\)) effects for representation type \(l\) and some function of time \(\omega_{z,\phi}(t)\), will allow for such time dependence without applying a fully parametric model.

Due to the parsimoniousness of the theoretical model and by not attributing a specific role to the passage of time, the time variable will function as a proxy for variables other than the ones included in the model (Cleves et al. 2010). Because of this, the empirical model should also be specified as a shared frailty model to account for any unobserved heterogeneity by including a group-specific multiplicative effect, \(z_l \sim \Gamma(1, \theta)\).

If \(v_l(\theta) = ln(a_l)\), the hazard of reaching a settlement in \((13)\) may be rewritten as in \((17)\) and \(v_l(\theta)\) becomes an analogue to a random effect (\(RE\)) in a standard linear model. Barker and Henderson (2005) note that adding a multiplicative \(RE\) to detect unobserved heterogeneity in a univariate framework is equivalent to assuming that the data is drawn from the non-\(PH\) hazard marginal distribution. The effects being captured through \(\omega_{z,\phi}(t)\) should thereby account for the majority of any unobserved heterogeneity, while also allowing for an intuitive interpretation of the results through the \(TIME\) \(EFFECTS\) notation. The \(RE\) parameter is nevertheless included to identify any effects not captured through the non-\(PH\) framework.

Any statistically ambiguous empirical estimates of the \(RE\) variance will be interpreted in light of the findings by Barker and Henderson (2005) who conclude that in a finite sample, both the estimated variance and the parameters themselves become underestimated. The regularly applied K-M approach only identifies unobserved heterogeneity through the order in which the events occur. Any additional heterogeneity is ignored and underestimates the variance.

---

39 One approach to explicitly test the \(PH\) assumption is to analyse the Schoenfeld (1982) residuals or, when there are time-dependent coefficients or effects, the scaled Schoenfeld residuals (Therneau and Grambsch 1994).

40 See for instance O’Quigley and Pessione (1991) for a discussion about the possible impacts.

41 It is important to not confound time-varying effects (a covariate affects the hazard differently at different times) with time-varying covariates (e.g. if a person is a smoker or not, which may change several times).

42 In this paper a linear function of time is applied. The intercept in the \(TD\) (non-\(PH\)) model is subsumed in the baseline function, and any difference within the model is manifested as a multiplicative shift. Adding an intercept to the model would only change the already undefined baseline hazard function. For a technical explanation, see Kalbfleisch and Prentice (2002).

43 Abbring and van den Berg (2005) advocate the application of a gamma distributed random effect since many (both univariate and multivariate) studies have shown that the distribution of survivors converges to a gamma distribution. Also, the gamma distributions mathematical convenience, high degree of flexibility and non-negativity make it a suitable choice.

44 If \(\theta = 0\Rightarrow v_l(\theta) = 0\Rightarrow z_l = 1\) and \((17)\) reduces to the non-\(PH\) Cox model without random effects. The concept was suggested by Vaupel et al. (1979). For a rigorous proof see Cleves et al. (2010).

45 Any statistically ambiguous empirical estimates of the \(RE\) variance will be interpreted in light of the findings by Barker and Henderson (2005) who conclude that in a finite sample, both the estimated variance and the parameters themselves become underestimated. The regularly applied K-M approach only identifies unobserved heterogeneity through the order in which the events occur. Any additional heterogeneity is ignored and underestimates the variance.
\[
h_1(t; x_l(t), \omega_z(t), x_l) = h_0(t) \cdot x_l^{\beta_l} \cdot \exp \{x_l(t) \beta_l\} = \cdots
\]

\[
= h_0(t) \cdot \exp \left[ \frac{x_l \beta_l + \omega_z(t) \cdot x_l(t) \beta_z + \nu_l(\theta)}{PH \cdot TD \cdot RE} \right]_{z \leq n}
\]

Expression (17) is very similar to a parametric model, but since no explicit distribution is predefined the model is still regarded as a semi-parametric model (Box-Steffensmeier and Zorn 2001). The technique suggested by Efron (1977), which uses probability weights to determine the approximation of the exact marginal time of settlement, is applied to any tied settlement times.

The lawsuit may be settled at the \((S = 3; \text{i, ii, iii})\) distinct states of the trial process established in Sect. 1.2: (i) before the PTH, (ii) between the PTH and the main trial and (iii) the period after the main trial but before a verdict has gained legal force. By linking each lawsuit with its (mutually exhaustive) settlement state into the covariate vector \(x_{\text{til}}(t)\) the estimates from (17) will be identical to those of a competing-risk model since the probability of reaching a settlement is allowed to be fundamentally different in each state. Since no fully parametric assumptions have been made, the demand for any additional assumption regarding the independence condition for the heterogeneity of each competing risk is also eliminated. The log-likelihood function for lawsuits that settles in any of the \(S\) distinct states at time \(t \leq T\) become:

\[
\ln \lambda = \sum_{s=1}^{S} \sum_{t=1}^{T} \ln h_1(t; x_{\text{til}}(t), \omega_{z|s}(t), x_{\text{til}})\]

6 Estimation results

The estimation results from the global model (Table 2) suggests that the model fits the data well.\(^{46}\) The \(PH\) estimates show that cases where at least one of the parties have had private representation are on average about 70 % (72 %) as likely to reach a settlement compared with when both parties are represented by a union representative (independent of whether any information has been shared). This ratio is expected to lie between 59 and 90 % according to the interval in column (D). However, the Schoenfeld residual in column (E) suggests that the \(PH\) assumption might not be fulfilled (\(h_0: \text{PH assumption holds}, P > \chi^2: 0.056\)), which would suggest that the result could be biased.

When modelled with \textsc{time effects} the results suggest no statistically significant differences in the settlement probabilities at the beginning of the sample (@ \(t = 1\)), but the \(HR\) diverge over time by about 0.2 % per additional day. This suggests that the relative probability of reaching a settlement decreases over time in a case with private representation relative the probability of reaching a settlement with trade union representation.

\(^{46}\) The Cox and Snell (1968) residual analysis (not included) and the log-ratio (LR, \(P > \chi^2: 0.0019\)) suggests that the model is a very good fit to the data.
Table 2  Global cox regression private representation relative union representation

<table>
<thead>
<tr>
<th></th>
<th>(A)</th>
<th>(B)</th>
<th>(C)</th>
<th>(D)</th>
<th>(E)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HR</td>
<td>S.E.</td>
<td>P-value</td>
<td>95 % C.I.</td>
<td>Schoenfeld</td>
</tr>
<tr>
<td>Prop. hazard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>0.722</td>
<td>0.078</td>
<td>0.002</td>
<td>0.585</td>
<td>0.891</td>
</tr>
<tr>
<td>Time effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ t = 1*</td>
<td>1.175</td>
<td>0.309</td>
<td>0.540</td>
<td>0.702</td>
<td>1.966</td>
</tr>
<tr>
<td>ΔHR(t)**</td>
<td>0.998</td>
<td>0.001</td>
<td>0.046</td>
<td>0.996</td>
<td>0.999</td>
</tr>
</tbody>
</table>

* The proportional HR at time \( t = 1 \); defined as the beginning of the total sample
** The change in the proportional HR over time

Table 3  State i)—Cases that settle prior to the PTH

<table>
<thead>
<tr>
<th></th>
<th>(A)</th>
<th>(B)</th>
<th>(C)</th>
<th>(D)</th>
<th>(E)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>HR</td>
<td>S.E.</td>
<td>P-value</td>
<td>95 % C.I.</td>
<td>Schoenfeld</td>
</tr>
<tr>
<td>Prop. hazard</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>0.629</td>
<td>0.135</td>
<td>0.031</td>
<td>0.413</td>
<td>0.959</td>
</tr>
<tr>
<td>Time effects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ t = 1</td>
<td>0.355</td>
<td>0.131</td>
<td>0.005</td>
<td>0.172</td>
<td>0.730</td>
</tr>
<tr>
<td>ΔHR(t)</td>
<td>1.008</td>
<td>0.004</td>
<td>0.051</td>
<td>0.999</td>
<td>1.016</td>
</tr>
</tbody>
</table>

Tables 3, 4 and 5 will present the estimation results for each bargaining state. By stratifying the already quite small total sample over three states for both types of representation may induce small-sample inference problems for some of the subsamples. Godfrey and Pesaran (1983) show that when the sample becomes too small the Cox model tends to overestimate the true standard errors which should be kept in mind when interpreting the estimation results.

In the first state (i, Table 3) the parties only have the information supplied through the private negotiations which has preceded the PTH. Despite the high statistical significance indicating a difference between the two groups after having estimated the HR under the assumption of PH, the analysis the Schoenfeld residual suggests that there likely is a persistent (linear) pattern in the residuals [column (E): \( P > \chi^2: 0.057 \)] and that the PH HR thereby is biased. Similar to the global model this implies that the model should include time-varying effects (TIME EFFECTS). The HR is initially (\( @ t = 1 \)) shown to be only about 36 %, but then increases (\( ΔHR(t) > 1 \)) by approximately 0.80 % for each additional time unit (day). The estimated relative PH of about 63 % is consequently too high at the beginning of the sample and too small towards the end.

\[ \text{Table 2} \]  Global cox regression private representation relative union representation

\[ \text{Table 3} \]  State i)—Cases that settle prior to the PTH

\[ \text{Table 4} \]  \[ \text{Table 5} \]  ...
The **HR** for those cases that settle in the second state (ii, Table 4) is estimated on two overlapping periods of time. The first period is defined from the beginning of the total sample (at the 90 days truncation; $t = 1$) until all the cases have been settled ($t = T$). This effect corresponds to the contribution to the global **HR** from these cases. The second time period is defined from the time of the PTH until the cases settle. Any difference in the **HR** between these two time periods will thereby implicitly define the **HR** up until the PTH for these cases (which cannot be estimated explicitly since none of these cases will be settled until after the PTH).

The Schoenfeld residuals in Table 4 (E) suggests that the PH assumption might not hold for the contributory **HR** ($t = 1, \ldots, T$). Estimating the contributory **HR** with time effects yields some (weak) evidence of a diverging **HR** over time with an initial **HR** which is not statistically different from one.

Turning our attention to the post PTH **HR** it can be concluded that the PH assumption now holds and that there is no statistical difference between the two types of representation. The cases that settle in the third state (iii, Table 5) is also estimated with a global **HR** contribution effect but the second time period effect is measured from the main trial until when the cases have settled, rather than from the PTH.

The contributory **HR** ($t = 1, \ldots, T$) in the third state suggests that there is a statistically significant difference in the relative probability of reaching a settlement for the type of cases that does not become settled until after the trial. The effect is also (weakly) persistent when estimating the **HR** from the time of the trial until when the case settles ($t = Trial, \ldots, T$).

The global model suggests that the relative settlement probability will diverge over time, while being initially statistically equivalent for both types of representation. The theoretical model attributes this to a subjective prior with a larger variance for the private representatives than the union representatives. The confidence intervals in the global model and all of the state-specific models show that cases with private representation is less than, or as likely as, cases with only union representatives to settle at any point in time. However the global model does not capture all effects.

### Table 4 State ii)—Cases that settle between the PTH and trial

<table>
<thead>
<tr>
<th>(A)</th>
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<th>(D)</th>
<th>(E)</th>
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<tbody>
<tr>
<td><strong>HR</strong></td>
<td>S.E.</td>
<td>$P$-value</td>
<td>95% C.I.</td>
<td>Schoenfeld</td>
</tr>
<tr>
<td>$(t = 1, \ldots, T)$</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Prop. hazard</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Private</td>
<td>0.799</td>
<td>0.118</td>
<td>0.131</td>
<td>0.599</td>
</tr>
<tr>
<td>Time effects</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>$@ t = 1$</td>
<td>1.156</td>
<td>0.556</td>
<td>0.305</td>
<td>0.703</td>
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<tr>
<td>$\Delta HR(t)$</td>
<td>0.997</td>
<td>0.002</td>
<td>0.088</td>
<td>0.994</td>
</tr>
<tr>
<td>$(t = PTH, \ldots, T)$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prop. hazard</td>
<td></td>
<td></td>
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<tr>
<td>Private</td>
<td>0.891</td>
<td>0.131</td>
<td>0.433</td>
<td>0.668</td>
</tr>
</tbody>
</table>

The **HR** for those cases that settle in the second state (ii, Table 4) is estimated on two overlapping periods of time. The first period is defined from the beginning of the total sample (at the 90 days truncation; $t = 1$) until all the cases have been settled ($t = T$). This effect corresponds to the contribution to the global **HR** from these cases. The second time period is defined from the time of the PTH until the cases settle. Any difference in the **HR** between these two time periods will thereby implicitly define the **HR** up until the PTH for these cases (which cannot be estimated explicitly since none of these cases will be settled until after the PTH).

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Prior to the PTH there are two countervailing effects; the HR for those cases that will be settled in the first stratum is converging (Table 3) whereas the HR for those cases that will not settle until after the PTH is diverging (Table 4). The net effect over this time interval is what mainly drives the diverging effect in the global model. The HR conditional on the sharing of information at the PTH until the cases have settled is statistically indistinguishable from one another ($t = \text{PTH}, \ldots, T$). This suggests that the global model is discontinuous as a consequence of the subjective prior being updated at the PTH. The difference is seen in Figs. 1 and 2 below where

<table>
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<tr>
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<tr>
<td>$HR$</td>
<td>S.E.</td>
<td>$P$-value</td>
<td>95% C.I.</td>
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</tr>
<tr>
<td>$t = 1, \ldots, T$</td>
<td></td>
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<td>Prop. hazard</td>
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<tr>
<td>Private</td>
<td>0.593</td>
<td>0.159</td>
<td>0.051</td>
<td>0.350</td>
</tr>
<tr>
<td>$t = \text{Trial}, \ldots, T$</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Prop. hazard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private</td>
<td>0.675</td>
<td>0.174</td>
<td>0.126</td>
<td>0.408</td>
</tr>
</tbody>
</table>

**Fig. 1** Global $HR$

**Fig. 2** $HR$ conditional on the sharing of information
the continuous black line and dotted grey lines is the HR and the associated confidence intervals respectively. The thicker dotted line is the reference level.

The distinct break in the HR at the time of the PTH corroborates the findings by Huang (2009) and Huang et al. (2010) that information disclosure has a positive effect on the probability of reaching a settlement. It also justifies the theoretical assumption of differing information sets and the argument by Boyd and Hoffman (2010); that the bargaining environment influences the interpretation of evidence, and that the bargaining environment is vital for the assessment of the liability issue. The global model is thereby a good initial estimate of the settlement process, but the settlement probability can be even more accurately estimated conditional on that the PTH or main trial has been reached.

7 Summary and discussion

The aim of this paper is to examine the two types of representation available in the Swedish Labour Court and their impact on the probability of reaching a settlement as a consequence of either asymmetric interpretation of information or bargaining costs. These two underlying issues were the basis of the theoretical model initially outlined by Spier (1992) and applied to settlement negotiation data by Fenn and Rickman (1999, 2001) and Zhou (2008, 2010). Their results validates that the dynamics and predictions of the theoretical model. The results presented in this paper follow those of Fournier and Zuehlke (1998), Korobkin and Doherty (2009), Huang (2009) and Huang et al. (2010).

The existence of a court system in general and the number of overturned cases in particular conveys a notion that there is no such thing as an absolute, and objectively accurate, interpretation of the law. Shavell (1989) and Hay (1994) show that if all evidence was assessed equally (as in a full information doctrine) there would be no distinguishable difference in the settlement hazard rate, regardless of the type of representation. The results presented in the preceding section have shown that this is not the case and that negotiations entail either asymmetric information or asymmetric interpretation of information. In a later publication Shavell (1999) sways with regard to the sufficiency of privately instigated negotiations in the presence of asymmetric information. However, Shavell still remains sceptic about any general superiority of court-mandated settlement bargaining.

The results in this paper have shown that the information disclosure at the court-mandated PTH really does facilitate settlement and that private disclosure of information is not sufficient when asymmetric information is present. If negotiations outside the court would be sufficient, then the liability assessment of the parties after three months (the initial 90 days truncation) should include any information that the parties wishes to communicate. Furthermore, the evidence presented at the PTH is made within a formal framework and even though there might be ambiguities associated with the exact interpretation by the court of the evidence, there is arguably less risk of any party wilfully deceiving the other than during private negotiations. The court-mandated PTH could thereby be
seen as uncovering additional information which might not have been shared otherwise.

Even though this paper attributes the established differences in the settlement probability to a theoretical subjective prior of the representatives, there could still be other mechanisms underlying the results. The observed asymmetries could be a direct consequence of (or influenced by) learning, have strategic considerations or be due to differences in risk awareness.

A subjective prior with a relatively small variance for the trade unions could be motivated with that this type of representation negotiates on a repeated basis more often than the private type of representation for which these types of negotiations are comparably rare or even unique. The labour union may thereby have specific negotiators that have acquired an extensive experience with settlement negotiations and the assessment of the claim made by the other side. The presence of a learning effect is thereby arguably a possible explanation, but the aggregation level of the data prevents any formal proof and the matter is left for future research.

The recurring nature of settlement negotiations for the union representation may also include an effect from the intrinsic uncertainty of an infinitely repeated game. By always choosing to fight (not settle) rather than to concede (settle), the trade union representative also risks that the other side may use the same strategy in the next round (tit for tat). This type of strategy could potentially be associated with higher costs compared to a strategy that is advocating an open climate with inherent back scratching. The empirical evidence suggests that the union representatives generally are more likely than the private representation to settle post trial which could indicate the proposed solidarity. The party that assesses that they are winning might accept a settlement so as to facilitate a culture of leniency in future conflicts, rather than to enforce a verdict that will be made official. The effects observed post-trial in the relative settlement probability could thereby be due to logrolling, i.e. trading of favours.

The theoretical model which underlies the interpretation assumes both risk neutrality and a common discount rate. A more risk-seeking individual will not accept a settlement offer as readily as anyone relatively more risk averse which would delay the settlement, or perhaps not resulting in a settlement at all. Attitudes towards risk could potentially be indicated by whether or not the individual has acquired any insurance covering legal aid in the event of an unjust-dismissal lawsuit (a union membership). However the data cannot identify such possibilities or even distinguish between if the individual isn’t a member in a trade union, or if the trade union merely has chosen not to represent its member after having assessed the underlying circumstances. This possibility must thereby be left for future research as well.

Acknowledgments The author wishes to thank Thomas Aronsson, Karl-Gustaf Löfgren, Kurt Brännäs, Daniel Halvarsson and the staff at the Swedish Labour Court. The paper has also benefitted greatly from the comments given by an anonymous referee and the participants at the EALE Conference 2012 and the Swedish National Conference in Economics 2012.
Appendix 1

The plaintiff is assumed not to suffer any costs throughout the process, and has the following (expected) current value pay-off if the case goes to trial:

\[ V_{P,T+1} = (p_{\text{win}} \cdot \text{estimated damages}) = \varphi \]  (19)

The defendant is assumed not to know the size of \( \varphi \), but is assumed to have a subjective prior \( U[0, \xi] \) over the amount. Any differences in the perception of the estimated damages or the probability that the plaintiff will win the case are assumed to be included in the subjective prior of the defendant and consequently there is no need to explicitly model the components of \( \varphi \). Since the plaintiff cannot know with certainty that there will be any (additional) offers, the plaintiff will always accept the first prudent settlement offer.

The relative costs of negotiation and the stakes of the case divides the subjective prior into \( T \) offers through (1). The settlement offer \( (s_t) \) in period \( t \) will be made under the assumption that the (remaining) type of plaintiff will lie between \( (\varphi_t) \) and \( (\varphi_{t+1}) \). \( \varphi \) is assumed to be drawn from \( U(\varphi, \overline{\varphi}) \), however, the subjective prior of the defendant truncates those boundaries over \( U[0, \xi] \) which defines the CDF and PDF of the remaining types of plaintiffs \( \varphi_t \) at any point in time as:

\[ F(\varphi_t) = \frac{\varphi_t - \varphi}{\overline{\varphi} - \varphi} \frac{\varphi_t}{\xi} \text{ since } (\varphi = 0) \text{and } (\xi \propto \overline{\varphi}) \]  (20)

\[ f(\varphi_t) = \frac{1}{\overline{\varphi} - \varphi} \frac{1}{\xi} \text{ since } (\varphi = 0) \text{and } f(\varphi_t) = \frac{\partial F(\varphi_t)}{\partial \varphi_t} \]  (21)

It is the sequence over the remaining types of plaintiffs that is used to derive the settlement hazard function in (7). The solution concept for the \( s_t \) and \( \varphi_t \) sequences will follow that of Spier (1992) and Qiao (2011). The model is shown to hold at \( (T = 1) \), then at \( (T = 2) \) and finally generalised to hold for \( (T = T) \) with trial date at \( (t = T + 1) \) in each respective case. If all settlement offers \( (s_t : t = 1, \ldots, T) \) are rejected the case will go to trial, which also entails a fixed cost \( k \geq 0 \). The defendant will have sunk all previous negotiation costs and expects the remaining plaintiff type to be between \( (\varphi_{T+1}) \) and \( (\xi) \). The expected cost of the defendant conditional on the case going to trial can therefore be written as:

\[ V_{D,T+1} = \delta^T \left[ \left( k + \sum_{i=1}^{T} \delta^{-i} \cdot c \right) + E(\varphi | \xi, \varphi_{T+1}) \right] = \cdots \]  (22)

\[ = \delta^T \left[ \left( k + \sum_{i=1}^{T} \delta^{-i} \cdot c \right) + \int_{\varphi_{T+1}}^{\xi} \varphi dF(\varphi) \right] \]
One period \((T = 1)\)

In the one-period negotiation the defendant is only allowed to make one settlement offer, and if that is not accepted by the plaintiff the case will go to trial. The plaintiff will accept any settlement offer \((s_{t=1})\) that fulfils (23) which also defines the acceptance level (i.e. the type) of the plaintiff.

\[ s_1 \geq \delta \cdot \varphi_2 \rightarrow \varphi_2 = \delta^{-1} \cdot s_1 \]  

(23)

The lower bound of the type of plaintiff that the defendant assumes to face before the first offer is made is \(\varphi_1 = 0\) (by assumption of the size of the subjective prior). Given this assumption, the defendant chooses the settlement offer which minimises his/her expected cost function, \(\Omega_{T=1}^*\).

\[
\min_{s_1} \Omega_1 = \left[ F(\varphi_2) - F(\varphi_1) \right] \cdot [s_1] + \cdots
+ \left[ 1 - F(\varphi_2) \right] \cdot \delta [k] + \left[ 1 - F(\varphi_1) \right] \cdot \delta \int_{\varphi_2}^{\varphi_1} \varphi dF(\varphi) 
\]

(24)

The chain rule yields \(\frac{\partial F(\varphi_{T+1})}{\partial s_1} = \frac{\partial F(\varphi_2)}{\partial \varphi_2(\varphi_1)} \cdot \frac{\partial \varphi_2(\varphi_1)}{\partial s_1} = \frac{f(\varphi_2)}{\delta}\), through which the FOC of (24) becomes:

\[
\frac{\partial \Omega_1}{\partial s_1} = [F(\varphi_2) - F(\varphi_1)] + \frac{f(\varphi_2)}{\delta} \cdot [s_1 - \delta(\varphi_2 + k + \delta^{-1} \cdot c)]
\]

(25)

The optimal first-period negotiation offer, \(s_1^*\), is solved for by evaluating (25) equal to zero for a minimum, using (23) to substitute \(\varphi_2 = \delta^{-1} \cdot s_1\) and the characteristics of the subjective prior from (20) and (21). The optimal offer becomes:

\[ s_1^* = \delta (\varphi_1 + k + \delta^{-1} \cdot c) = \delta \cdot k + c \]  

(26)

Given that \(s_1^*\) becomes rejected, the next truncation of the type of plaintiff is deduced by substituting (26) in (23). In the \((T = 1)\) framework this will be the plaintiff facing the defendant in court.

\[ \varphi_{T+1=2} = \varphi_1 + \delta^{-1} \cdot s_1^* = \varphi_1 + \delta^{-1} \cdot (\delta \cdot k + c) = k + \delta^{-1} \cdot c \] 

(27)

Two periods \((T = 2)\)

The offer sequence is extended to allow for a second round of settlement negotiations. (27) gives:

\[ \varphi_{T+1=3} = \varphi_2 + \left( k + \sum_{i=1}^{2} \delta^{-i} \cdot c \right) \] 

(28)
In the second period, \((t = 2)\), the bidding sequence \((s_t)\) must fulfil the following two conditions:

\[
\begin{align*}
    s_2 &\geq \delta \cdot \varphi_3 \\
    s_2 &\Rightarrow \frac{s_1}{\delta} \\
\end{align*}
\]

The bid must be at least as large as the discounted value of the truncation in the upcoming (last) period and the plaintiff’s assumed indifference between accepting a sufficiently large bid in the first or second period means that \(s_1 = \delta \cdot s_2\) must also hold. (28) and (29) gives \(\varphi_2\) as a function of \(s_1\),

\[
\varphi_2 = \frac{s_1}{\delta^2} - \left( k + \sum_{i=1}^{2} \delta^{-i} \cdot c \right)
\]

The solution concept is the same as in the one-period framework. The defendant chooses the initial settlement offer to minimise his/her expected cost. In the \((T = 2)\) framework the cost function becomes:

\[
\min_{s_1} \Omega_2 = [F(\varphi_2) - F(\varphi_1)] \cdot s_1 + c + \cdots + \left( [F(\varphi_3) - F(\varphi_2)] \cdot s_2 + [1 - F(\varphi_2)] \cdot c \right) \cdot \delta + \cdots + \left( [1 - F(\varphi_3)] \cdot \left( k + \sum_{i=1}^{2} \delta^{-i} \cdot c \right) + \int_{\varphi_3}^{s_1} \varphi \ dF(\varphi) \right) \cdot \delta^2
\]

The FOC of \(\Omega_2\) is solved for by rewriting all \(s_2\) and \(\varphi_2\) in terms of \(s_1\) by (29) and (30). The optimal sequences for the settlement offers and truncations are obtained through the Envelope Theorem (collecting all \(\varphi_t > \bar{T}\) terms in a vector, \(Z\), which is held fixed and evaluated at its optimum, \(Z = Z^*(s_1)\)). This since the defendant only optimises over the available \((t = \bar{T})\) settlement periods.

\[
\frac{\partial \Omega_2(Z, s_1)}{\partial s_1} \bigg|_{Z = Z^*(s_1)} = [F(\varphi_2) - F(\varphi_1)] + \frac{f(\varphi_2)}{\delta^2} \cdot s_1 - \frac{f(\varphi_2)}{\delta} \cdot \left( \frac{\varphi_1}{\delta} + c \right)
\]

(32) is used in (29) to obtain \(s_1^*\)

\[
s_1^* = \frac{\delta^2 \cdot \left( \varphi_1 + k + \sum_{i=1}^{2} \delta^{-i} \cdot c \right) + \delta \cdot c}{\varphi_1 + \sum_{i=1}^{2} \delta^{-i} \cdot c}
\]
In the next section, the model is generalised to hold true when the length of the sequence is \((2 \leq t \leq T)\).

**T periods** \((\bar{T} = T)\)

Spier (1992) notes that the total length (including trial) in a \((\bar{T} = T)\) game is \(T + 1\) period. Given this, the continuation of a game starting in the 2nd period of a \(T + 1\) period game has a length of \(T\) periods. Even though \((\varphi_1 = 0)\) by definition, its inclusion in (35) facilitates the proof that the solution concept holds for \((\bar{T} = T)\) periods. Following Spier (1992) and substituting all \(s_1\) for \(s_2\), all \(\varphi_1\) for \(\varphi_2\) and generalising the discount rate over \(T\) periods, (35) can be specified in a \((\bar{T} = T)\) framework.

\[
s_2 = \delta^{T-1} \cdot \left( \varphi_2 + k + \sum_{i=1}^{T} \delta^{-i} \cdot c \right) + \sum_{i=1}^{T-1} \delta^i \cdot c \bigg\} \quad \text{solve} \quad \varphi_2(s_1)
\]

\[
\varphi_2(s_1) = \frac{s_1}{\delta^T} - \frac{\sum_{i=1}^{T-1} \delta^i \cdot c}{\delta^{T-1}} - \left( k - \sum_{i=1}^{T} \delta^{-i} \cdot c \right)
\]

Following (25) and (31), the target function minimised by the defendant becomes:

\[
\min_{s_1} \Omega_T = \left[ F(\varphi_2) - F(\varphi_1) \right] \cdot s_1 + \left[ 1 - F(\varphi_1) \right] \cdot c + \cdots
\]

\[
+ \left[ F(\varphi_3) - F(\varphi_2) \right] \cdot s_2 + \left[ 1 - F(\varphi_2) \right] \cdot c + \{ \cdots \}
\]

\[
+ \left[ 1 - F(\varphi_{T+1}) \right] \cdot V_{D,(T+1)} \cdot \delta^T
\]

where \(V_{D,(T+1)}\) is specified in (22).

The FOC (set equal to zero for a minimum point) and the indifference of the plaintiff between two offers made at different points in time, \(s_2 = s_1/\delta\), are used to solve for the level determining the remaining types of plaintiffs at \(t = 2\).

\[
\varphi_2 = \varphi_1 - \frac{s_1}{\delta^T} + \frac{s_2 + c}{\delta^{T-1}} = \varphi_1 + \frac{c}{\delta^{T-1}} \bigg|_{s_2 = \frac{s_1}{\delta}}
\]

\[(37)\) and (38) can then be used to solve for the optimal settlement offer in the first of the \(\bar{T} = T\) periods available to make pre-trial negotiation offers.

\[
\varphi_2 = \frac{s_1}{\delta^T} - \frac{\sum_{i=1}^{T-1} \delta^i \cdot c}{\delta^{T-1}} - \left( k - \sum_{i=1}^{T} \delta^{-i} \cdot c \right) \bigg\} \quad \text{solve} \quad s_1
\]

\[
\varphi_2 = \varphi_1 + \frac{c}{\delta^{T-1}}
\]

\[
s_1 = \delta^T \cdot \left( \varphi_1 + k + \sum_{i=1}^{T} \delta^{-i} \cdot c \right) + \sum_{i=1}^{T} \delta^i \cdot c
\]
Summary

Given what has been demonstrated above, the PBE offer sequence and the sequence of the type of plaintiff that is still remaining in the bidding sequence after an offer has been refused can be written as:

\[ s_1 = \delta^T \left( \varphi_1 + k + \sum_{i=1}^{T} \delta^{-i} \cdot c \right) + \sum_{i=1}^{T} \delta^i \cdot c \]  

\[ s_t = s_1 \frac{d}{\delta^{t-1}} \]  

for \( t = 2, \ldots, T \)  

\[ \varphi_1 = 0 \]  

by definition  

\[ \varphi_t = \varphi_{t-1} + \frac{c}{\delta^{T+1-t}} \]  

for \( t = 2, \ldots, T \)  

\[ \varphi_{T+1} = \varphi_T + k + \sum_{i=1}^{T} \delta^{-i} \cdot c \]

Appendix 2

See Appendix Table 6

Table 6 Results: linear LSDV model (Sect. 4)

<table>
<thead>
<tr>
<th>Variable</th>
<th>( \beta )-coef.</th>
<th>Robust HC3 S.E.</th>
<th>t</th>
<th>P &gt;</th>
<th>95% C.I.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \beta_0 )_Union</td>
<td>7.718</td>
<td>46.658</td>
<td>0.17</td>
<td>0.584</td>
<td>–84,703</td>
</tr>
<tr>
<td>( \beta_1\cdot D_p )_Private</td>
<td>–134,818</td>
<td>245,831</td>
<td>–0.55</td>
<td>0.869</td>
<td>–621,763</td>
</tr>
<tr>
<td>Activity cost</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \beta_2 )_Union</td>
<td>377.72</td>
<td>145.28</td>
<td>2.60</td>
<td>0.011</td>
<td>89.94</td>
</tr>
<tr>
<td>( \beta_3 \cdot D_p )_Private</td>
<td>366.16</td>
<td>735.97</td>
<td>0.50</td>
<td>0.620</td>
<td>–1,091.65</td>
</tr>
</tbody>
</table>

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