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TEMPORARY WORK IN TURBULENT
TIMES: THE SWEDISH EXPERIENCE

Bertil Holmlund
Donald Storrie*

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Abstract

Sweden has experienced a substantial increase in temporary work over the 1990s, with most of the rise occurring during a severe macroeconomic recession with mass unemployment. By the early 1990s, workers on fixed-term contracts accounted for 10 percent of the number of employees; by the end of the decade they accounted for 16 percent. The paper presents the Swedish institutional setting, documents basic stylised facts about fixed-term contracts, and discusses the causes of their increased prevalence. Our analysis reveals that open-ended and temporary employment exhibit strikingly different cyclical behaviour with temporary employment being more volatile. A recession is associated with an initial decline in temporary employment followed by a sharp rise from the trough to the end of the recession. We argue that the severe recession of the 1990s is a major factor behind the rise in temporary work in Sweden. Adverse macroeconomic conditions make firms more prone to offer fixed-term contracts and workers more willing to accept them.

Keywords: temporary jobs, labour market dynamics, unemployment.

JEL Classification: J64, E32.

Bertil Holmlund
Department of Economics
Uppsala University
Box 513
SE-751 20 Uppsala
Sweden
Bertil.Holmlund@nek.uu.se

Donald Storrie
CELMS
Department of Economics
Box 640
SE-405 30 Göteborg
Sweden

1. Introduction

In the early 1990s, Sweden experienced a macroeconomic downturn unparalleled in the post-war period. GDP fell by six percent from the cyclical peak in the first quarter of 1990 to the trough in the first quarter of 1993. The unemployment rate stood at around 1.5 percent in 1989-1990 and had risen to 8.2 percent by 1993. The employment-to-population ratio fell over the same period by 10 percentage points. Signs of a sustained labour market recovery did not appear until the end of the century. The period from 1997 and onwards has seen a large decline in unemployment as well as rising employment, a rebound triggered by a marked increase in GDP growth. By the end of the year 2000, unemployment had fallen to 4 percent of the labour force.

An intriguing aspect of the Swedish experience is that the entire decline in employment during the downturn was the result of job losses among workers with "standard" open-ended contracts, i.e., those covered by fairly stringent employment protection provisions. In contrast, employment in fixed-term contracts (temporary work) *increased* substantially over most of the 1990s. By the end of the century, fixed-term contracts accounted for 16 percent of total wage and salary employment, to be compared with 10 percent in the early 1990s.

Among the other Nordic countries, only Finland has exhibited a similar growth in fixed-term contracts. Indeed, the Finnish experience during the 1990s has been even more dramatic than the Swedish one, with both a greater increase in unemployment and in fixed-term contracts. The macroeconomic conditions in Denmark and Norway were much less turbulent, with only modest changes in unemployment. Interestingly, neither of those two countries experienced any significant rise in fixed-term contracts.

The purpose of this paper is to describe and discuss the evolution of fixed-term employment in Sweden over the 1990s.[1] Our analysis is in part descriptive: we wish to document the broad stylised facts about temporary work in Sweden. We also want to shed some light on possible

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[1] We do not discuss temporary work agencies, a sector that accounts for less than one percent of total employment.

causes of the remarkable rise in temporary work. Is the rise driven by changes in labour demand, labour supply or labour market regulations?

We begin in Section 2 by presenting the institutional setting. Section 3 provides an overview of the development of temporary work since the late 1980s. We also make use of gross flow data to portray transitions between various labour market states. In Section 4 we estimate parsimonious time series models for transition rates and use the estimated equations to simulate the labour market responses to an adverse macroeconomic shock, focusing in particular on temporary and permanent employment. We find that a recession triggers an initial decline in temporary employment followed by a sharp rise from the trough to the end of the recession.

Section 5 of the paper takes stock of alternative explanations of the rise in temporary employment. We argue that legislative changes have had at most a marginal impact and we find no evidence that the rise is driven by changes in the composition of the labour force. What remain, then, are forces affecting firms' demand for labour. The empirical results indicate that an adverse macroeconomic shock can trigger a substantial and long-lasting increase in temporary employment. We argue that adverse macroeconomic conditions give firms stronger incentives to offer temporary rather than permanent contracts. Moreover, workers will be more willing to accept temporary jobs in a generally depressed labour market. This idea is broadly consistent with the observed evolutions of fixed-term contracts in Sweden and other Nordic countries.

2. The Regulation of Fixed-Term Contracts

2.1 Employment Protection in Labour Law

Swedish legislation dates back to the 1974 Employment Protection Act, which is still basically intact. The law presumes that, unless otherwise stipulated, an employment contract is valid until further notice. When terminating the contract the employer must provide a valid reason and advance notice. Compared to many other OECD countries, the periods of notice are lengthy but

no redundancy pay is stipulated. While the grounds for collective redundancies are very liberal they are to proceed in accordance with seniority. The presumption of the open-ended contract permeates labour law. For example, if it is unclear as to what type of contract was made, the Labour Court places the burden of proof on the party claiming that the contract was *not* open-ended, i.e., usually the employer.

Until 1997, the law listed a number of specific circumstances when the employer may use a fixed-term contract. By far the most common form is hiring a replacement for an absent employee (leave replacement). Another frequently used contract involves work that is intrinsically of a fixed duration, such as project work that is common in, for example, construction and research. Contracts for a probationary period and those motivated by a temporary increase in labour demand may be made for a maximum duration of six months.[2]

As regards the regulation of open-ended contracts the Swedish legislation has been judged to be roughly as strict as in Finland and Norway (OECD, 1999). The outlier in the Nordic context is Denmark, which is clearly placed in the Anglophone cluster of less regulated employment protection regimes. Denmark is also the least regulated country as regards fixed-term contracts. At least up to the mid-1990s, the regulation of fixed-term contracts in Finland and Norway was rather similar to that in Sweden.

2.2 Labour Law and Collective Bargaining

Any assessment of the impact of employment protection in Sweden must, in addition to statutory law, consider both the relationship between law and collective agreement and the content of collective agreements. In both respects Sweden is rather unique. In most countries statutory law is a floor of guaranteed minimum worker rights upon which collective agreements may build, but not erode, further protection for the employee. In Sweden, however, several paragraphs of the

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[2] What we refer to as fixed-term contracts may sometimes easily be terminated before their expiration date. A probationary contract, which can be terminated at any time by either party at will, is a case in point.

Employment Protection Law permit bargaining outcomes that may entail not only higher but also *lower* levels of protection.

As collective agreements cover practically the entire labour market, the potential impact of this "negotiated flexibility" is considerable. Collective agreements may lower worker protection in existing contractual forms, for example, by permitting longer than the statutory maximum probationary period of six months. They may even allow contractual forms that are not explicitly permitted in statutory law. For example, several agreements in the trade and transport sectors permit contracts termed "called when needed". However, it does not seem to be the case that the regulation of fixed-term contracts in collective agreements is generally more liberal than statutory law.[3]

International comparisons of employment protection indicate that Sweden has a fairly restrictive legislation, although it does not stand out as extreme by European standards. According to OECD (1999), the legislation in Sweden is less restrictive than, for example, in Germany and France but stricter than in Belgium and The Netherlands. However, these rankings have serious limitations as regards the enforcement of regulation, a point made by Bertola et al. (2000). The capacity of the employee to give effective voice to perceived violations of his or her legal rights is a vital factor in ensuring the observance of labour law. One would expect that the exceptionally high rate of union membership and the almost universal union presence at the workplace in Sweden would lead to both a high level of awareness of employment protection rights and provide the capabilities and resources to pursue these rights; first at the work place, and if need be, in the Labour Court. The costs for the employer for non-observance of the law are pecuniary (fines and damages) and court judgments that transfer a fixed-term to an open-ended contract.

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[3] Storrie (1995) found that the length of the probationary period in collective agreements for blue-collar workers in the private sector was generally shorter than the six months permitted in law.

2.3 Changes in Regulations During the 1990s

During the 1990s there have been no significant reforms of the Employment Protection Act concerning the termination of open-ended contracts. There have, however, been several changes to the statutory regulation of fixed-term contracts. In January 1994 the maximum permitted duration for probationary contracts and those motivated by a temporary increase in labour demand were prolonged from six to twelve months. However, this was immediately repealed in January 1995 when a Social Democratic government returned to power. Moreover, the impact of this law was minimal on actual regulation even during its brief validity as it had next to no impact on the content of collective agreements, and thus on the actual regulation at the work place (Storrie, 1995).

The law of 1997 was of considerably more *potential* importance. It introduced the opportunity for the employer to hire for a fixed duration without having to specify a particular reason. However, an employer could only use a maximum of five such contracts and a particular individual could not be employed under such a contract for more than twelve months during a three-year period. If the firm is newly established, the period may be extended to 18 months. The Bill stated that it was not the purpose of the Act to promote very short-term jobs and so the minimum permissible duration was set at one month.

The new law also addressed the difficult legal issue of repeated contracts of fixed duration. While this applied only to leave replacements, these are by far the most common form of fixed-term contract in Sweden and thus the revision of the law may have had considerable potential impact. The new law stated that if a leave replacement was employed for a total duration of three years during a five-year period then the contract becomes open-ended. This paragraph, announced in 1997, became law on 1st January 2000, presumably to enable employers to adjust and so it probably had an effect on hiring policy before 2000.

Perhaps the most important element of the 1997 law, and certainly that which met with most heated opposition from the trade unions, was the opportunity to strike collective agreements on derogations from statutory law regarding fixed-term contracts at the local level, provided that the parties had a central agreement in other matters. As collective agreements may lead to more liberal regulation than in statutory law, the trade unions were presumably concerned that employment protection rights would be eroded by bargaining at this lower level. Prior to 1997, these agreements could only be made at the central (usually national) level.

## 3. An Overview of Temporary Work in Sweden

3.1 The Aggregate Picture

Total employment in Sweden fell by 13 percent – close to 600 000 persons – between the first quarters of 1990 and 1994. This dramatic decline was due to sharply falling "permanent" employment and not the result of a decline in the number of fixed-term contracts. In fact, the number of workers with open-ended contracts fell by slightly *more* than 600 000 over the period 1990-1993 whereas the number of fixed-term contracts stood at approximately the same level in the first quarter of 1994 as it did four years earlier. The overall decline in total employment was marginally offset by a slight increase in self-employment.

Figure 3.1 displays the evolution of permanent and temporary employment over the period from 1987 and onwards.[4] The strikingly different developments of permanent and temporary employment stand out. When the economy approaches the cyclical peak, i.e., in the late 1980s, we observe rising permanent employment along with a decline in the number of fixed-term contracts. From the early 1990s and during most of the rest of the decade there is a remarkable increase in fixed-term contracts that amounts to roughly 50 percent. Measured relative to total wage and salary employment, the number of temporary workers rose from 10 percent to 16

percent; see Figure 3.2. Notice also the declining share of temporary workers over the past couple of years with strongly improving labour market conditions and falling unemployment, a development similar to the late 1980s.

Figure 3.1. Permanent wage and salary employment and
temporary employment, 1987.1 – 2001.3, (100). Seasonally adjusted data.
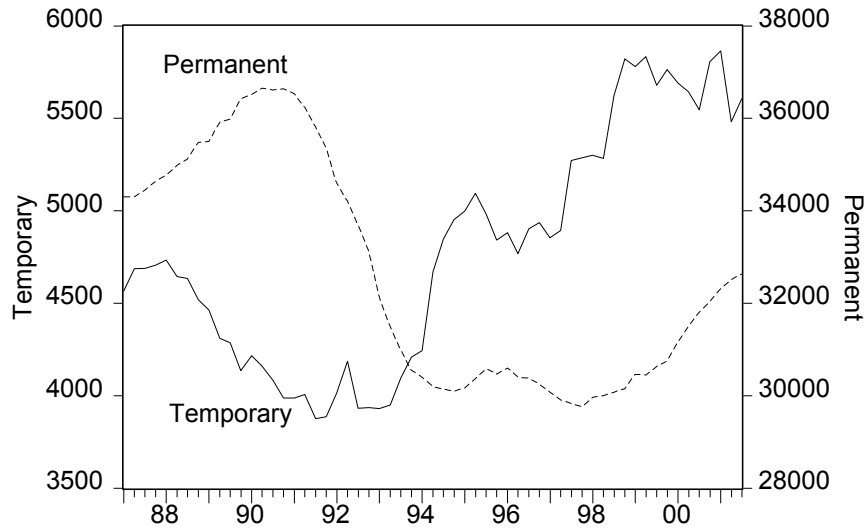
Source: Labour force surveys, Statistics Sweden.

Figure 3.2. Temporary work as a share of wage and salary employment
and unemployment as share of the labour force, 1987.1-2001.3. Seasonally adjusted data.
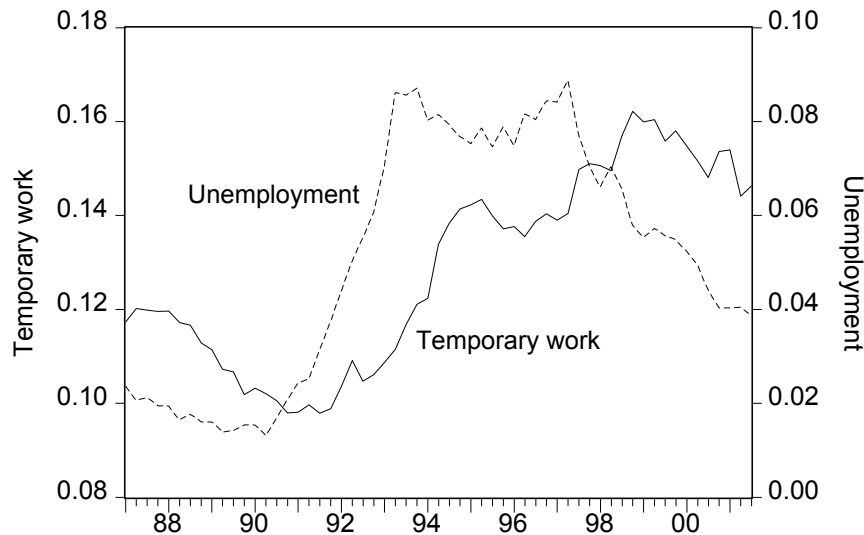
Source: Labour force surveys, Statistics Sweden.

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[4] Monthly information on fixed-term employment is available in the Swedish labour force surveys from 1987 and onwards. Some data for earlier years are presented in Statistics Sweden (1997); according to these data, temporary

The prevalence of fixed-term contracts is particularly visible among women, the young and foreign-born residents, and especially among young women. The higher fixed-term contract intensity of foreign-born residents is primarily to be found among the 25 to 44 year olds and is double that of native Swedes. By the turn of the century, 18 percent of the female employees were on fixed-term contracts, a figure to be compared with 13 percent for the male employees. The trend rise in temporary work is striking for both men and women. Among young women aged 16-24, close to 60 percent were in temporary work by the end of the century; the corresponding share for young men was around 40 percent. There is a marked trend rise in temporary work also among the young.

It is also worth noting that fixed-term contracts account for a much higher share of the total *flow* of new hires than of the total stock of employment. Available data for the private sector reveal that fixed-term contracts accounted for roughly 50 percent of all new hires in the late 1980s. By the late 1990s, they accounted for some 70 percent.[5]

3.2 Sector Distribution and Types of Fixed-Term Contracts

Temporary work has increased in every broad sector of the economy; see Table 3.1. Two sectors stand out. Financial and Business services exhibit both the greatest increase in fixed-term contract rate and share of all fixed-term contracts while Health and Care show the lowest growth rates in both these figures. We note, however, that the Health and care sector still accounts for one quarter of all fixed-term contracts in the labour market.

Labour law permits different forms of fixed-term contracts defined in terms of the employer's motivation to employ labour for a specified duration. Figure 3.3 shows the number

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work accounted on average for 10.6 percent of the total number of employees during 1984-87.

Table 3.1. Fixed-term contract rate (percent of wage and salary employment) and share (of all fixed-term contracts) by economic sector 1990 and 2000.

	1990		2000		% change	
	Rate (%)	Share (%)	Rate (%)	Share (%)	Rate	Share
Primary sectors	13.9	2.0	23.4	1.5	69.0	-25.7
Manufacturing & mining	4.3	9.8	7.9	10.5	84.5	7.0
Construction	6.8	4.5	11.4	3.6	67.0	-20.0
Communications	6.9	4.8	12.9	5.8	86.7	19.8
Trade	9.5	11.4	15.3	11.7	60.8	2.6
Financial & business services	6.7	5.6	13.5	11.1	100.9	98.4
Education & research	13.1	9.8	19.1	12.0	45.8	22.8
Health & care	17.3	36.8	18.8	25.0	8.5	-32.2
Personal & cultural services	18.2	10.7	29.7	13.8	63.1	28.4
Public administration	7.7	4.5	12.1	4.7	56.9	5.7
Unknown	14.6	0.2	30.9	0.3	111.9	76.2
Total	10.1	100.0	15.2	100.0	50.5	0.0

Source: Labour force surveys, Statistics Sweden.

employed in the major categories of fixed-term contracts.[6] By far the largest type of fixed-term contract involves replacement of absent workers. This is probably a feature fairly unique to Sweden, which has generous allowance for many forms of leave, particularly parental leave and long statutory holidays. The incidence of leave replacements has remained roughly constant at around 4-5 percent of total wage and salary employment. The number of leave replacements are almost entirely determined by the degree of leave taken by those on open-ended contracts, as opposed to an intrinsic propensity on part of firms to hire labour on a fixed-term contract due to the nature of the work to be done or other labour market conditions.

The entire rise in temporary work is accounted for by three categories: on-call contracts, project work and probationary employment. On-call contracts have increased most rapidly, from one percent to over three percent of the number of employees. Project work has also increased significantly. Probationary contracts declined sharply at the start of the decade but have

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[5] These data are based on establishment surveys undertaken by Statistics Sweden (Kortperiodisk sysselsättnings-statistik).
[6] We have access to these observations for the first quarters of each year from 1990 and onwards. Sven Nelander at LO (The Confederation of Swedish Trade Unions) has complied the data from unpublished tables of the labour force surveys.
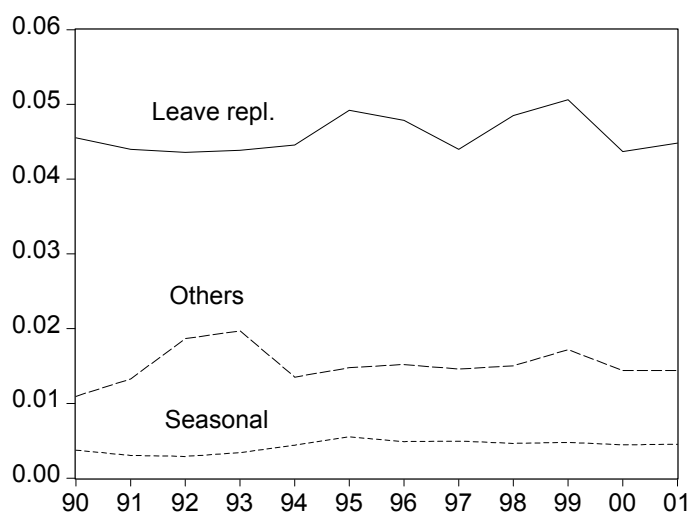
increased rapidly in recent years. Both seasonal work and the residual category, "others", have

remained quite stable over the period.[7]

Figure 3.3. Types of fixed-term contracts, 1990-2001
(share of total wage and salary employment).

A. On-call, projects and probationary.
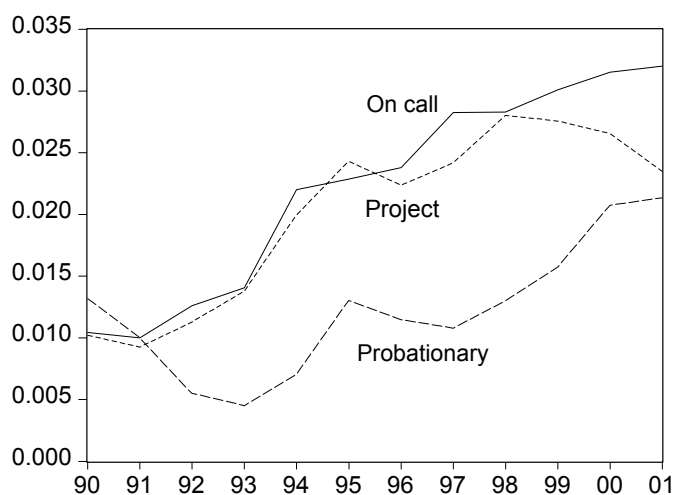
B. Leave replacement, seasonal and others.

Source: Labour force surveys, Statistics Sweden.

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[7] The large majority of participants in active labor market programs are classified as being out-of-the labor force. However, individuals engaged in "relief work" (subsidised employment) belong to the labour force and are classified as "others" in Figure 3.2. The rise in the "others" category during 1991-93 is primarily due to a rise in relief work.

Available survey evidence indicates substantial heterogeneity among fixed-term workers with regard to self-reported job satisfaction (Aronsson *et al*, 2000). On-call contracts are associated with "bad" working conditions along a number of dimensions whereas project work, and, in particular, probationary contracts are perceived as more attractive. It is noteworthy that women account for some 65 percent of all on-call contracts whereas they represent less than 40 percent of the project workers.

3.3 Temporary Work and Labour Market Transitions

By using data on gross labour flows we can shed light on the dynamics of temporary work. Respondents in the monthly labour force surveys stay in the survey for two years and are asked every third month about their current labour market status. The design of the survey is such that 7/8 of the sample in month *t* will remain in the sample at month *t+3*. The data are reported as quarterly flows, i.e., averages of the flows computed from three pairs of panels. The tabulations are available since 1987. The panel records transitions between several labour force states but the data at our disposal include no information on job-to-job transitions, unless the transitions involved a change of contract (from temporary to permanent or vice versa).[8]

Let *U* denote the number (stock) of unemployed and *O* the number of nonparticipants (out-of-the labour force). Employment can be disaggregated into three states: permanent contracts (*P*), temporary contracts (*T*), and self-employment (*S*). For the flows the notation is *ZX* for flows from state *Z* to state *X*. For example, *TU* is the flow from *T* to *U*. A transition rate is defined as the ratio between a particular flow and the stock that represents the relevant population at risk. In general, the transition rate from *Z* to *X* is denoted *ZXR* and is defined as *ZXR=ZX/Z*; for example, the transition rate from *T* to *U* is given by *TUR=TU/T*.

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[8] We have access to flow data for the period up to the second quarter of 2000. There are well-known problems with flow data that have been discussed by, for example, Abowd and Zellner (1985) and Blanchard and Diamond (1990). One problem is misclassification; another is lack of information on multiple transitions between the interviews.

Table 3.2 shows transition rates pertaining to the five labour market states mentioned above. We show averages for the period from 1987 to 2000 as well as two sub-periods: boom (1989-1990) and slump (1993-1996). Note that the total outflow rate from fixed-term contracts is more than ten times larger than the outflow rate from permanent employment. Temporary workers typically end up in non-participation or in permanent jobs. On average for the period, 10 percent of workers on temporary contracts had made a transition to permanent jobs after one quarter.

By using the data on flows and stocks we can obtain crude estimates of the average duration of various spells. The exercise reveals that permanent employment is the most persistent state with an average duration of over 40 quarters (10 years). Self-employment is also quite persistent with an average spell length of 30 quarters. Temporary employment, by contrast, lasts for only three quarters on average. Unemployment is the most fluid state with average durations between 1.7 to 2.3 quarters.[9]

The flow data also reveal that the remarkable rise in temporary employment over the 1990s is entirely driven by a rise in the *inflow* to the stock. In fact, the *duration* of fixed-term employment spells has shown a trend decline over the period. As was seen in Figure 3.3, a major shift in the composition of fixed-term contracts over the period was the increase of "on-call" jobs that typically are of very short duration.

We proceed by looking at the cyclical patterns of transition rates, focusing on permanent and temporary employment. To emphasize proportional changes we show transition rate diagrams in natural logarithms with the data seasonally adjusted and smoothed by a 3-quarter centred moving average. Figure 3.4 displays transition rates between permanent and temporary employment. The *TP* transition rates are about 15 times higher than the *PT* rates. However, the two series exhibit similar cyclical patterns. From the trough in 1993 and onwards, both transition rates roughly doubled. By the end of 2000, both rates are close to their peaks of late 1989.

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[9] We made use of the steady-state relationship, i.e., stock=(flow)×(duration), with the flow measured as the average of inflows and outflows.

Table 3.2. Worker flows by origin and destination states (transition rates).

Origin state	Destination state					Outflow rate
	P	**T**	**S**	**U**	**O**	
P	.978 (.979) [.976]	.007 (.008) [.006]	.002 (.003) [.002]	.005 (.003) [.008]	.009 (.008) [.009]	.022 (.021) [.024]
T	.097 (.129) [.082]	.707 (.708) [.688]	.005 (.006) [.005]	.064 (.031) [.093]	.128 (.126) [.131]	.293 (.292) [.312]
S	.009 (.012) [.007]	.006 (.006) [.006]	.970 (.972) [.969]	.005 (.002) [.007]	.010 (.009) [.011]	.030 (.028) [.031]
U	.065 (.135) [.036]	.207 (.267) [.155]	.010 (.013) [.009]	.505 (.406) [.574]	.212 (.179) [.227]	.495 (.594) [.426]
O	.019 (.034) [.013]	.076 (.088) [.067]	.004 (.004) [.004]	.050 (.019) [.074]	.851 (.856) [.843]	.149 (.144) [.157]

Notes: Figures in parentheses refer to the boom (1989-1990), figures in squared brackets to the slump (1993-1996).
Source: Labour force surveys, Statistics Sweden.

Transition rates pertaining to *P*, *T*, *U* and *O* are shown in Figure 3.5. Notice the broadly parallel pro-cyclical evolution of *UPR* and *OPR*, i.e., transitions to permanent employment. The former rate is more than three times larger than the latter, but the relative decline during the downturn in the early 1990s is of the same order of magnitude. Both the unemployed and the non-participants are much more likely to end up in temporary jobs than in permanent ones. A comparison between *TPR* and *UPR* reveals an interesting pattern of initial co-movement and subsequent divergence. Over the period 1988-1991, *TPR* and *UPR* are of similar magnitudes and move fairly closely together. From 1992 and onwards, there is a widening gap between the two transition rates. By the year 2000, *TPR* is twice as large as *UPR*. It appears thus to have become increasingly difficult to make a transition from unemployment to permanent employment. In contrast, transitions from temporary to permanent employment occur at roughly the same rates in the year 2000 as a decade earlier.

Figure 3.4. Transitions between temporary and permanent employment (log transition rates).
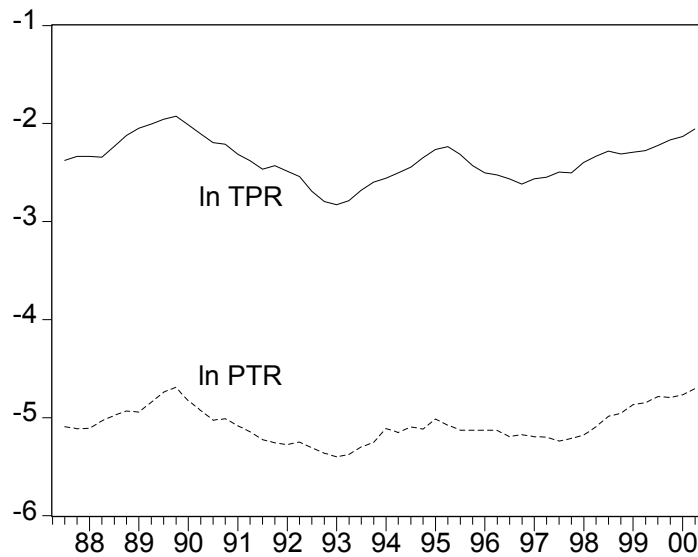

Panel B in Figure 3.5 reveals strong cyclical patterns in exits from employment to unemployment but much weaker (or nonexistent) cyclicality in exits to nonparticipation. It is noteworthy that the relative increase in exit rates to unemployment is larger among workers on open-ended contracts than among those on fixed-term contracts; the rise in *PUR* from boom to slump (580 percent) is larger than the increase in *TUR* (380 percent) during the same period.

In summary, our ocular inspections of transition rates reveal pronounced pro-cyclical transition rates from both unemployment and nonparticipation to permanent and temporary employment. Separation rates involving unemployment are strongly counter-cyclical, whereas there appears to be negligible cyclicality in transition rates from employment to nonparticipation. We proceed to a more formal analysis of these transition rates and their implications for the cyclical behaviour of stocks and flows.

Figure 3.5. Transitions between employment and nonemployment (log transition rates).

A. From nonemployment to temporary and permanent employment.
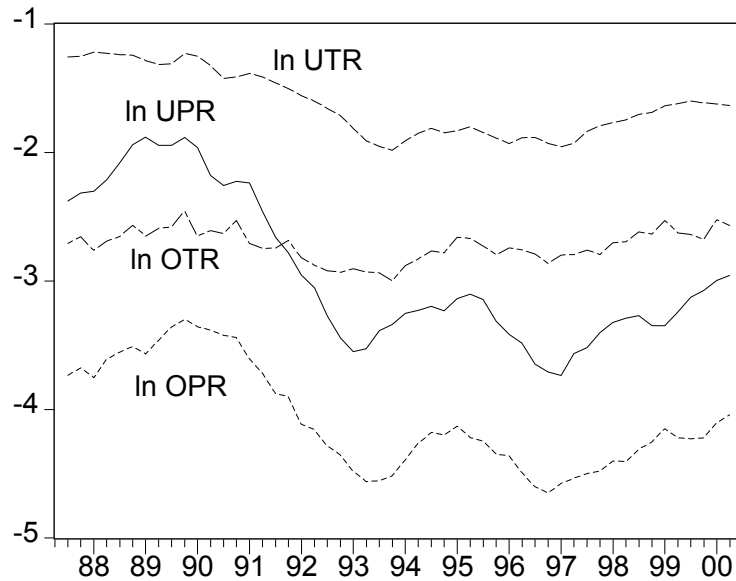
B. From employment to unemployment and nonparticipation.
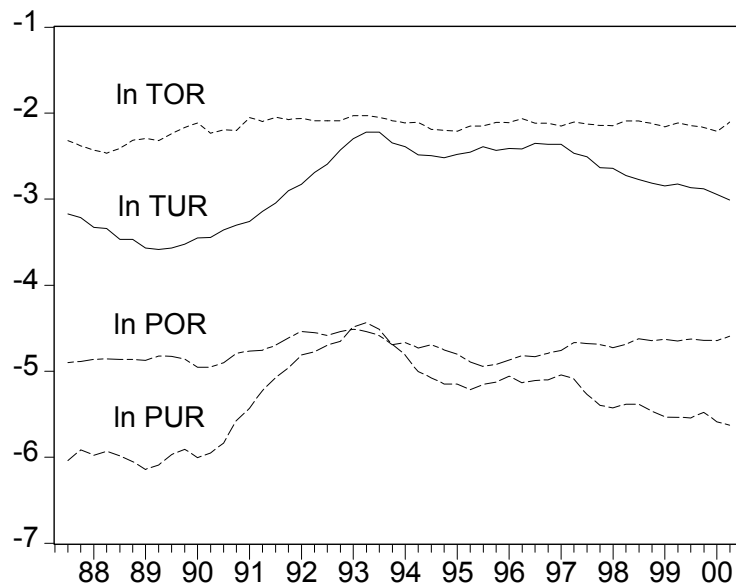
4. The Cyclicality of Temporary Work

4.1 Estimation of Transition Rate Models

We have estimated a number of transition rate equations using as cyclical variable a measure of the GDP-gap defined as the log ratio of GDP to trend GDP and denoted *YDEV*. To obtain a series on trend GDP we regressed quarterly values of log GDP on a linear time trend and

seasonal dummies. The period chosen for the estimation of the trend is 1975.1 – 1990.1. The equation is used to predict trend GDP values for the period 1987.2 – 2000.2. (See Holmlund and Vejsiu (2001) for more details.) The estimated transition rate models are parsimoniously specified. We always include a constant and three seasonal dummies. Other variables considered were lagged *YDEV* and changes in *YDEV* (Δ*YDEV*), one lag on the dependent variable (to capture sluggish adjustment), a linear time trend and a dummy for the first quarter of 1993 (capturing effects of changes in measurement methods). Insignificant variables among the group of "others" were dropped.

An appendix available on request presents estimation results for transitions between four states: *P*, *T*, *U* and *O* (thus excluding self-employment). A second set of estimations includes all states but with *P* and *S* aggregated into one state, denoted *P** and (also) referred to as 'permanent' employment. We have already noted that *P* and *S* are fairly similar in terms of the duration of the spells. Moreover, it turns out that transitions involving self-employment are more difficult to predict than other transitions. The four states are thus *P**, *T*, *U* and *O*, the sum of which is the total population aged 16-64. The estimated equations are displayed in Table 4.1. Significant cyclical effects are always present except for transitions from permanent employment to nonparticipation. Positive and significant trend coefficients are estimated for transitions to temporary work from permanent employment and nonparticipation. [10] Negative and significant trend coefficients are estimated for transitions from both states of nonemployment to permanent employment.

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[10] The estimated trend coefficients will obviously be sensitive to how trend GDP is measured. Holmlund and Vejsiu (2001) report some results of checks for robustness.

Table 4.1. Estimated transition rate equations (permanent and temporary employment, unemployment and out-of-the labour force).

	TP*R (1)	P*TR (2)	UP*R (3)	UTR (4)	OP*R (5)	OTR (6)	P*UR (7)	P*OR (8)	TUR (9)	TOR (10)	OUR (11)	UOR (12)
Constant (first quarter)	-.750 (4.24)	-3.330 (5.90)	-1.448 (6.94)	-.817 (6.94)	-2.390 (7.30)	-3.978 (13.74)	-1.845 (3.97)	-1.726 (4.16)	-1.644 (5.08)	-2.172 (12.02)	-1.958 (8.76)	-1.341 (6.13)
$YDEV_{t-1}$	1.267 (2.57)	2.537 (3.36)	6.264 (4.85)	2.632 (3.97)	3.941 (4.08)	4.197 (5.72)	-5.052 (3.77)		-6.170 (5.31)	-1.673 (3.90)	-6.696 (8.58)	-1.151 (1.97)
$\Delta YDEV_t$	3.849 (4.47)	3.326 (2.96)	6.979 (4.66)	3.547 (5.61)	2.488 (1.79)	5.778 (4.85)	-6.227 (4.82)		-4.981 (4.74)			-2.261 (2.27)
Lagged dep. variable	.629 (8.01)	.367 (3.35)	.387 (3.83)	.597 (6.53)	.334 (3.58)	-.235 (2.55)	.617 (7.72)	.645 (7.50)	.454 (4.70)	.164 (1.50)	.506 (9.80)	.245 (1.92)
Trend		.0042 (2.86)	-.0068 (3.32)		-.0057 (3.23)	.0056 (3.68)	-.0043 (2.21)	.0017 (2.01)			.0030 (1.94)	.0042 (2.70)
$\overline{R}^2$	.786	.524	.900	.923	.819	.907	.878	.730	.920	.945	.951	.655
SE	.103	.129	.172	.079	.161	.151	.175	.088	.129	.113	.136	.122
DW	1.766	2.121	1.809	2.184	1.918	2.269	1.795	2.416	2.189	1.735	1.980	1.819

Notes: The transition rates are in natural logarithms. *P** denotes permanent employment (including self-employment), *T* is temporary employment, *U* is unemployment and *O* is out-of-the labour force. A transition rate, from *U* to *T*, say, is denoted *UTR*. Seasonal dummies are always included. The estimation method is seemingly unrelated regression. Estimation period: 1987.3-2000.2. A dummy for the first quarter of 1993 is included whenever found significant to capture changes in measurement methods.

The next step is to make use of the estimated equations in a comprehensive aggregate flow model of the labour market. The objective is to shed light on how a recessionary shock is propagated.[11]

4.2 Labour Market Responses to an Adverse Shock

How does permanent and temporary employment respond to a recessionary shock? We use the model to simulate a recession and compare the outcomes with those implied by a reference case without a recession. The reference case involves *YDEV*=0. The effects of the recession are taken as the differences – either in relative or absolute terms – between the values of the endogenous variables in the two scenarios. The shock involves a "V-turn" of *YDEV* that lasts for 5 years, with a trough after 10 quarters with GDP 3 percent below trend, i.e., *YDEV* = -0.03. The downturn takes place gradually to the trough and analogously there is a gradual rise in *YDEV* towards the end of the recession after 20 quarters; hence the label "V-turn". In the graphs that follow, the hypothetical recession sets in during quarter 7 and has ended by quarter 27.

Figure 4.1 shows the cyclical responses of permanent and temporary employment. When the recession strikes, there is an initial steep fall in temporary employment. By the trough of the recession, temporary employment has fallen by more than four percent. From (roughly) the trough and onwards, temporary employment rises steeply, being four percent above its reference level by the end of the recession. From this point and onwards, temporary employment gradually falls back to normal. The evolution of permanent employment is very different. The relative decline during the downturn is less pronounced compared to the development of temporary employment. Permanent employment rises near the end of the recession but there is no "overshooting" relative to the reference level.

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[11] We have examined how the model performs in dynamic simulations over the sample period. The model tracks the evolution of stocks and flows reasonably well. For example, unemployment and labour force participation rates are

Figure 4.1. Temporary and permanent employment during a recession
(relative deviations compared to the levels in the reference case).
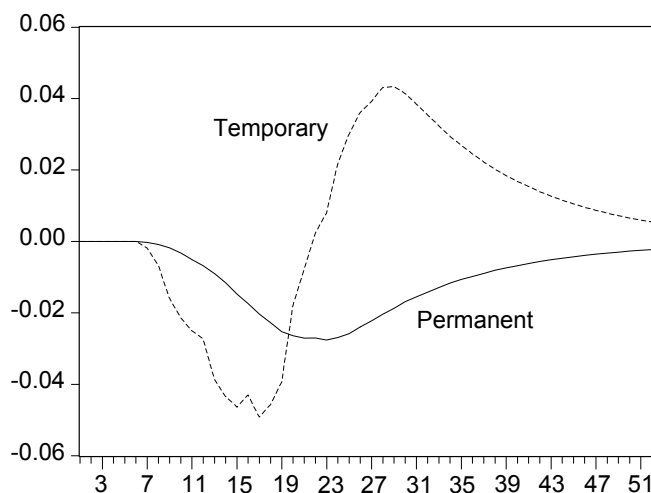
The patterns displayed in Figure 4.1 imply that the share of temporary work in total employment falls slightly during the first half of the recession, whereas it rises markedly from the trough to the end of recession. For the relatively "mild" recession considered here, the rise is small, amounting to around 0.5 percent of total employment by the end of the recession. For a sharper cyclical downturn, the effects are larger. Suppose that the recession is twice as deep, with output 6 percent below the trend at the trough. The share of temporary work would then be 1.5 percentage points above the reference level at the end of the recession. These examples suggest that the rise in temporary employment seen in Sweden can, at least in part, be accounted for by the deep recession of the 1990s when the fall in GDP from peak to trough amounted to roughly 10 percentage points.

How much of the rise in temporary work in Sweden can be explained by business cycle factors and how much has to be attributed to a residual upward trend? A simulation with GDP always on its trend path reveals a trend rise in the share of temporary work irrespective of business cycle conditions. This "pure" trend rise amounts to around two percentage points if we

predicted with mean absolute errors of 0.6 percentage points. See Holmlund and Vejsiu (2001) for further details.

compare the late 1980s with the late 1990s. This number should be taken with a due grain of salt, however, since it is bound to be sensitive to how one measures the GDP gap.

A further perspective on the adjustment of employment is obtained by examining the simulated flows. We focus here on flows involving employment and unemployment. Figure 4.2 reveals that permanent and temporary workers contribute by roughly similar (absolute) numbers to the flow into unemployment. Panel B shows the effects of the recession on the outflows from unemployment to employment. The flow from unemployment into both types of employment rises during the recession, with the rise into temporary work being particularly strong.

The marked positive correlations between unemployment inflows and outflows illustrated in Figure 4.2 are similar to what have been found in data for other countries; see Blanchard and Diamond (1990) for the US, and Burda and Wyplosz (1994) for some European countries. As revealed by ocular inspections of transition rates (Figure 3.5) and the regressions in Table 4.1, a recession causes a decline in transition rates from unemployment to employment and an increase in transition rates from employment to unemployment. However, as the pool of unemployed builds up, more workers become available to match with job vacancies. This "matching effect" dominates during most of the recession and the *level* of the flows from unemployment to employment is therefore higher in a recession than in a boom.

This concludes our exposition of how adverse business cycle conditions impact on temporary employment. It is time to take stock of alternative explanations of why Sweden has experienced a remarkable rise in temporary work during the 1990s.

Figure 4.2. Flows from and to unemployment during a recession
(absolute deviations compared to the levels in the reference case in units of 100 workers).

A. Inflows to unemployment.

B. Outflows from unemployment.
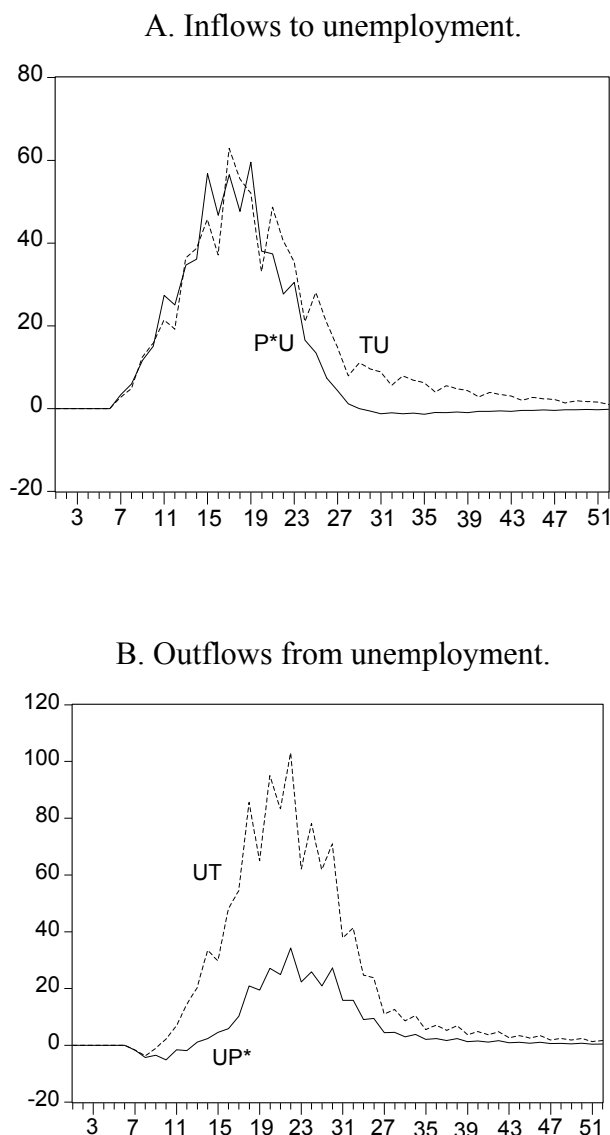
5. What Caused the Rise in Temporary Work?

5.1 Changes in Legislation

What has caused the rise in temporary work in Sweden during the 1990s? We distinguish between three broad hypotheses, beginning with changes in legislation. As have been documented above, some regulatory changes have taken place during the 1990s. The 1994 reform involved an increase in the duration of probationary employment from sex to twelve months. However, this reform must have had at most a marginal effect on the regulations facing

the firm, as the law did not affect the content of the existing collective agreements. Moreover, the law was repealed in 1995. The law of 1997 was a more significant piece of legislation since it allowed hiring on a temporary basis without specifying a particular reason. The fact that the use of the new contract was limited to five employees per establishment suggests, however, that the impact of the reform would be marginal. [12]

Moreover, when one considers that the 1997 law also restricted the use of leave replacements, there are grounds to argue that the restrictive element in the legislation may even have dominated the liberalising element, particularly when one recognizes that leave replacements are the most common form of fixed-term contract in Sweden. Furthermore, since 1993, Sweden has one of the most liberal statutory regulations of temporary work agencies in the OECD. Evidence from various countries, reported in Storrie (2002), shows that the replacement of absent employees is among the most important of reasons for employers to use agency workers. Thus both the restriction of leave replacements and the liberalisation of temporary work agencies have reduced the opportunity to meet absenteeism with a fixed-term contract relative to using agency workers and may even have resulted in a shift from fixed-term to open-ended contracts. Employment in a temporary work agency in Sweden is, as in all sectors, presumed to be on an open-ended contract. This statutory presumption is backed-up by collective agreements which since the spring of 2000 cover practically the entire work agency sector (Storrie, 2002). Moreover, as we have documented above, the major increase in fixed-term contracts occurred prior to the reform of 1997.

What role, then, remains for regulation in explaining the evolution of fixed-term contracts in the 1990s? A distinct feature of employment protection in Sweden is the importance of the collective agreement for the formation of the rules at the work place. This gives rise to considerable leeway for "negotiated flexibility" at the local level. There is at least some scattered

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[12] There are no comprehensive statistics on the incidence of this form of fixed-term contract. However a governmental inquiry reported that there are very few of this type of contract. The private employer association

evidence suggesting that the regulation of fixed-term contracts in collective agreements has become more lax (SOU 1997:27). As the outcome of both collective bargaining and the subsequent agreement's day-to-day implementation at the local level is largely a result of relative bargaining power, one could expect the mass unemployment of the 1990s to have led to a more liberal regulation than previously was the case. The possibility for the employer to successfully press for greater flexibility was probably further enhanced by the 1997 law that permitted the agreement to be struck at the local level. Thus if legislation played any role we would argue that the shift to the local level of bargaining is the most likely candidate. Again, this cannot explain the bulk of the rise in temporary work during the 1990s.

5.2 The Supply Side

Open-ended contracts generally impose costs on the employer but not on the employee. It is difficult to see reasons why an employee would prefer fixed-term relative to open-ended contracts, all else equal. Moreover, there is to our knowledge no evidence suggesting that fixed-term workers are offered wage premiums that compensate for the higher separation risks. On the contrary, the Swedish evidence at hand indicates that there is a *wage penalty* associated with temporary work. Standard Mincer-type wage equations estimated on microdata for the mid-1980s as well as the mid-1990s suggest a wage penalty of around 10 percent.[13] There is also survey evidence suggesting that working conditions among fixed-term workers are generally inferior to those experienced by workers with open-ended contracts (Aronsson *et al*, 2000).

The rise in temporary work is a phenomenon pervasive across broad demographic groups. Over the 1990s, temporary contracts became increasingly common among all age and gender

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stated that many collective agreements prohibited their use; see SKr (1999/2000).

[13] We grateful to Altin Vejsiu for estimating these equations. The data used were extracted from the "HUS" database, a representative sample of Swedish households. A host of human capital and personal characteristics as well as industry affiliation were controlled for in these estimations. Booth *el al* (2000) report qualitatively similar results for the United Kingdom.

categories. We have used data from the labour force surveys and performed a simple shift-share analysis based on 14 demographic categories (men, women and seven age groups). It turns out that demographic shifts have worked *against* a rise in temporary work. Workers on fixed-term contracts accounted for 10.1 percent of the total number of employees in 1990 and 15.2 percent in 2000. However, if the demographic composition of 2000 were applied to the group-specific temporary work shares of 1990, the implied total share of temporary work would be only 8.5 percent. Demographic groups with relatively low rates of temporary work in 1990 exhibited relatively high growth rates during the decade.

It is conceivable but unlikely that the rise in temporary work is driven by changes in worker preferences regarding "flexibility" and job security. The available evidence suggests that there is a very strong preference for job security in Sweden. For example, responses from a representative sample of Swedish employees in the International Social Survey Programme ranked job security as the most important of the factors listed (Edlund and Svallfors, 1997). Other evidence, such as the study by Furåker and Berglund (2001), suggest that having a fixed-term contract has a highly significant negative effect on the perception that "My job is secure". Berlin (1995, 1997) reports on investigations asking representative samples of the labour force on the preferred contractual form. Over 95 percent of the respondents expressed preference for open-ended contracts. Aronsson and Göransson (1999) present even more striking results from another questionnaire. They find that of workers on open-ended contracts who were not working in their *preferred* occupation, only 25 percent would prefer a fixed-term contract in their *desired* occupation. Of those who had a fixed-term contract in their desired occupation, 58 percent would be willing to abandon their preferred occupation if they could obtain another job with a open-ended contract.

A final possibility involving the supply side can be envisaged. It is plausible that there will be a downward adjustment of reservation wages, in broad terms, as labor market conditions

deteriorate. Unemployed workers will then presumably be more willing to accept "bad" jobs, including temporary jobs. This adjustment, however, is best seen as a response to more fundamental forces that caused the decline in labour demand in the first place.

5.2 Changes in Labour Demand

If legislative changes or supply-side shifts are ruled out as main explanations, what remains is the possibility that employers have become increasingly prone to hire workers on fixed-term contracts. We consider four types of demand-side explanations: (i) shifts in labour demand towards industries that are intensive in the use of fixed-term contracts; (ii) a general decline in the profitability of hiring labour; (iii) a rise in incentives to use fixed-term contracts to screen job applicants; and (iv) increased volatility in technology or product demand conditions.

Consider first the sectoral shift hypothesis. We have explored the effects of sectoral shifts by a simple shift-share analysis pertaining to 48 industries covering the whole economy, using data for 1990 and 2000 from the labour force surveys. This exercise suggests that sectoral shifts explain virtually nothing of the rise in the overall share of temporary work. If the sectoral employment figures of 2000 were applied to the sector-specific temporary work shares of 1990, the implied total share of temporary work would be 10.4 percent, to be compared to actual shares of 10.2 percent in 1990 and 15.2 percent in 2000. Thus, sectoral shifts cannot be an explanation.

The second hypothesis concerns how firms choose between temporary and permanent contracts.[14] Consider a firm that takes wages as given and can choose between two types of jobs (or contracts), labeled temporary and permanent. Temporary jobs carry no firing costs but entail high separation rates. Permanent jobs, on the other hand, involve high firing costs but also low separation rates. Temporary jobs thus force the firm to engage frequently in search for new workers, a cost that has to be weighed against the advantage of low firing costs. Permanent jobs

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[14] This discussion is inspired by a paper by Wasmer (1999), where the standard matching model of equilibrium unemployment is extended to incorporate both temporary and permanent jobs.

have the disadvantage of high firing costs but entail less need to engage in costly search for job applicants. In the Appendix we show by means of a simple model that firms are more prone to use temporary contracts in periods of generally low profitability of hiring labour. A tighter labour market makes it relatively more advantageous to hire workers on long-term contracts since those "insure" the firm against worker separations that are more costly when workers are more difficult to find. [15]

The third candidate explanation is a conjecture that revolves around the firms' incentives to use fixed-term contracts as a screening device during periods of high unemployment. Suppose that recruiting firms in general can extract more information about job applicants that search while employed than about unemployed applicants. Offering a temporary job may be a means to gain information about the worker's productivity. The fraction of unemployed searchers in the pool of job applicants is much higher in a recession than in a booming economy, a phenomenon that may trigger the use of fixed-term contracts. This conjecture is not rejected by a simple regression exercise. We have taken the ratio between the number of temporary and permanent hires as dependent variable and regressed it on the number unemployed and the number of on-the-job searchers over the period 1989-1998. A typical result looks like the following[16]:

$$\ln\left(H^T/H^P\right) = \underset{(3.1)}{0.23}\ln U - \underset{(3.9)}{0.66}\ln OJS + \underset{(2.0)}{0.31}\ln\left(H^T/H^P\right)_{-1} \ldots$$

where H^T is the number of new hires on temporary contracts, H^P the number hires on open-ended contracts, U the number of unemployed, and OJS the number of on-the-job searchers. Absolute t-values are shown underneath the estimated coefficients. A constant and seasonals are

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[15] Our discussion takes wages as given. In the model of Wasmer (1999), wages are endogenous and it is shown that the equilibrium may involve both temporary and permanent jobs. A decline in the growth of labour productivity brings about a rise in temporary employment. The mechanism is essentially a variant of the "capitalization effect" of growth discussed in Pissarides (1990/2000) and Aghion and Howitt (1994). With slower growth, firms are less inclined to hire and also less eager to retain workers by offering them long-term contracts. Other contributions to the theoretical analysis of temporary and permanent employment include Bentolila and Saint-Paul (1992), Booth (1997), Cabrales and Hopenhayn (1997), Guell (2000) and Blanchard and Landier (2000).

[16] We used quarterly data for hires in the private sector and quarterly data for total open unemployment from the labor force surveys. Data on on-the-job search are only available on an annual basis (from the retrospective labor

also included. The basic message is that a rise in unemployment and a decline in on-the-job search are associated with a rise in the relative number of temporary new hires.

Increased volatility in productivity or product demand conditions is another possible reason why firms may have become more prone to use fixed-term contracts. Hiring labour on a fixed-term contract can be seen as means to accommodate a more volatile market environment by shifting some of the increased risk to the worker. "Lean production", probably in part fuelled by the IT revolution, may carry with it a stronger desire to economize on inventories of both goods and labour. This possibility seems plausible, but it is difficult to find hard evidence on increased volatility. Data on job turnover in Sweden do not suggest marked changes during the first half of the 1990s, except for sharp increases in job destruction during the trough of the recession in 1992-93.[17]

All things considered, we argue that a compelling explanation of the rise in temporary work in Sweden should focus on how depressed product and labour market conditions impact on firms' incentives to offer temporary and permanent contracts as well as workers' incentives to accept these offers. Although this "business cycle explanation" may not be the whole story, it is most likely an important part of the story. Indeed, the evolutions of labour market conditions and temporary work in the other Nordic countries add further support for this claim.

During the 1990s, unemployment remained relatively stable in Denmark and Norway while it skyrocketed in Finland. The Finnish unemployment rate stood at around 3 percent in 1990 and had risen to 17 percent in 1994. During the second half of the decade it declined and had reached 10 percent by the end of the decade. (OECD, 2000.) What happened, then, to temporary work in these countries? The share of temporary work has been relatively stable in Denmark and Norway, hovering around 10-12 percent of total employment in Denmark and around 10 percent

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force surveys); we interpolated by means of a three-period moving average. The estimation period is 1989.2-1998.3. Adjusted R-sq.=0.93 and DW=2.1. The Breusch-Godfrey LM test for serial correlation has a *p*-value of 0.5.

of wage and salary employment in Norway. In Finland, by contrast, the share of temporary workers among employees increased sharply during the 1990s. The share stood at 12 percent in 1989 and peaked at 18.4 percent in 1997. The share fell slightly over the period 1997 – 2000 and had reached 16.4 percent in 2000.[18] Changes in labour law appear to have little to do with this Finnish development. We take the outcomes of these large-scale "natural experiments" as additional evidence supporting our argument that adverse labour market conditions can trigger a rise in temporary employment.

6. Concluding Remarks

The paper has documented and discussed the remarkable rise in temporary work that has taken place in Sweden during the 1990s. What has been driving this rise? As emphasized in the paper, there is little reason to expect legislative changes to be important. A more promising explanation focuses on the consequences of adverse macroeconomic conditions. We have found that a recession is associated with relatively more hirings on temporary contracts, presumably reflecting stronger incentives on part of firms to offer short-term jobs when workers are easier to find as well as an increased willingness on part of workers to accept temporary work when job offers in general are in short supply. The Swedish experience as well as the developments of temporary work in the other Nordic countries lends support to this hypothesis.

Further research on temporary work should preferably make use of more disaggregate data, including micro data. For example, micro data will be indispensable in one wants to understand the role of temporary jobs as an entry port to permanent employment. We have noticed that the probability of entering into a permanent job, conditional on being in a temporary one, is not markedly different today (2000) than it was a decade earlier. For the unemployed, however, the

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[17] Persson (1999) reports that the job reallocation rate, i.e., the sum of job creation and destruction rates, is of the same order of magnitude in 1995 as in the late 1980s. We are unaware of any study of job turnover that includes data for the second half of the 1990s.

probability of lining up a permanent job is substantially lower than it was a decade ago. This suggests that temporary jobs have become increasingly important as stepping-stones to permanent jobs.[19]

A rise in the share of temporary work has consequences for various labour market outcomes, including the level of unemployment.[20] The effects on flows into unemployment are obvious, at least in an accounting sense: the higher the share of fixed-term contracts, the larger the inflow to unemployment. There has been a marked rise in unemployment inflow over the decade.[21] In fact, most of the rise in Swedish unemployment can be attributed to a rise in the inflow rather than a rise in duration. Roughly 50 percent of the rise in inflow can be accounted for by higher inflow from temporary jobs. To the extent that there has been a trend rise in temporary work that will prevail also in favourable macroeconomic conditions, it is conceivable that it has contributed to some increase in equilibrium unemployment through higher worker separation rates. Of course, a complete analysis of this issue needs to consider a host of other factors, including effects on wage bargaining and firms' recruitment practices.

Appendix

The Firms' Choices Between Contracts[22]

Consider a large number of firms that operate in a labour market with frictions and costly recruiting. A firm can open two types of vacancies corresponding to two types of contracts that are referred to as temporary (v^T) and permanent (v^P). Time is continuous, the time horizon infinite and vacancies and unemployed job seekers (u) meet according to type-specific constant-returns matching functions of the form $H^j = (v^j)^{1-\eta}(u)^{\eta}$, $j=T, P$, where $\eta \in (0,1)$. A firm with a vacancy of type j meets a job searcher at the Poisson rate $q^j = H^j / v^j = (\theta^j)^{-\eta}$, where $\theta^j \equiv v^j / u$ is a measure of labour market tightness.

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[18] The figures for Denmark are taken from European Commission (2000) and the Finnish data from Kauhanen (2000). Erling Barth has kindly supplied data for Norway based on the labour force surveys.

[19] A recent paper by Håkansson (2001) looks at this issue in some detail by using longitudinal micro data.

[20] See Dolado *et al* (2001) for a comprehensive discussion of the effects.

[21] In 1989-1990, the annual inflow (from employment as well as nonparticipation) measured relative to the labour force amounted to 5 percent; in 1990-2000, the corresponding figure was 11 percent. These figures are based on labour force survey data on the number of unemployed with one week of elapsed unemployment and generally differ from flow figures obtained from the labour force panels.

[22] The model of this appendix draws on the analysis in Wasmer (1999).

   Consider price-taking firms and assume for simplicity that real wages and output per employed worker are constant and independent of the type of contract. The value functions pertaining to vacant and occupied jobs take the form:

$$rV^j = -ky + q^j\left(J^j - V^j\right), \qquad\qquad j = T, P$$

$$rJ^T = y - w + \lambda\left(V^T - J^T\right)$$

$$rJ^P = y - w + \phi\left(V^P - J^P - C\right)$$

where V^j is the expected present value of a type j vacancy and J^j the value of an occupied job of type j. Worker productivity (real revenue) is denoted y and w is the real wage. It is costly to hold a vacancy open so $k>0$. Temporary contracts expire at the exogenous rate λ and permanent contracts at the rate ϕ, where $\lambda > \phi$. Moreover, if a worker is separated from a permanent contract the firm has to pay a firing cost, C. This cost is of the "red tape" type and does not involve any transfer to the worker.

   There are thus two key differences between temporary and permanent contracts. First, permanent contracts carry firing costs whereas temporary contracts don't. Second, temporary contracts expire at a higher rate than permanent ones. These differences have implications for the firms' choices between the contract types. Operating firms need to maintain a positive surplus from employed workers, i.e., y-w>0, because of hiring and firing costs. The surplus needs to be higher the tighter the labour market is since it is more costly to recruit in a tight labour market when it takes a longer time to fill vacancies. The surplus must also be higher for jobs (contracts) that are destroyed at a faster rate, all else equal. The reason is that a high destruction (separation) rate forces firms to engage more frequently in costly hiring. Moreover, the surplus must be higher for permanent jobs since they carry separation costs. These claims are immediately confirmed by imposing the standard free entry conditions for vacancies, i.e., $V^j = 0$, in the value functions above. We then get two equations that describe how the firms' supplies of vacancies depend on profitability, y/w, and other factors:

(A1) $$w/y = 1 - (r + \phi)k\left(\theta^P\right)^\eta - \phi c$$

(A2) $$w/y = 1 - (r + \lambda)k\left(\theta^T\right)^\eta$$

where $c \equiv C/y$. These two "zero-profit conditions" can be thought of as labour demand equations and capture firms' supply of vacancies as functions of wages and productivity. The equations are illustrated in Figure 1. As θ^T goes to zero, w/y approaches unity since recruitment costs vanish. As θ^P goes to zero, w/y approaches $1 - \phi c < 1$ because of the need to maintain a surplus to cover firing costs. Moreover, the P-curve is flatter than the T-curve since $\phi < \lambda$; an increase in θ^T is more costly to the firms than an

increase in θ^P in the sense that it requires a bigger increase in profitability (decline in wages or increase in productivity) to maintain zero profits on new vacancies. The reason is that a rise in the expected duration of vacancies, $1/q(\cdot)^j = (\theta^j)^\eta$, is more costly the higher the separation rates are. Clearly, only temporary contracts will be offered for $w/y > 1 - \phi c$; as w/y falls below $1 - \phi c$, permanent contracts are also offered. As illustrated in the figure, the demand for permanent contracts may eventually exceed the demand for permanent contracts for sufficiently high rates of profitability.

Figure A1. The Demand for Temporary and Permanent Contracts.
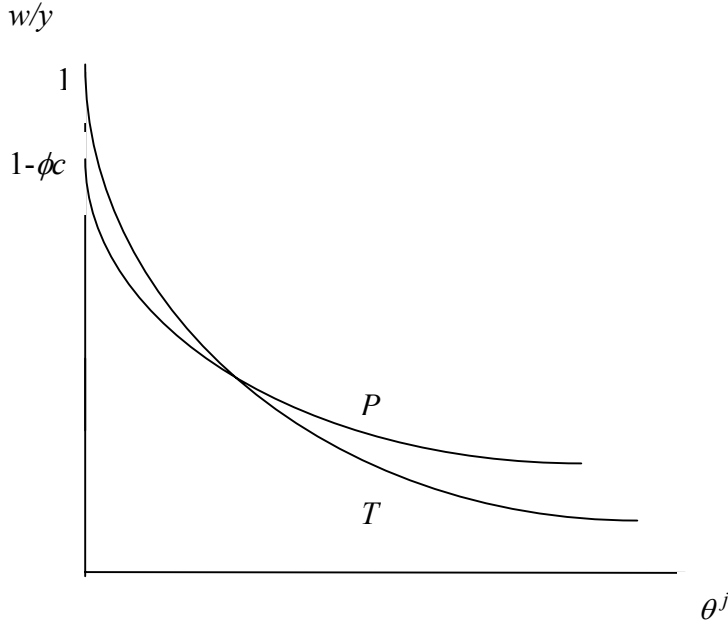
By using (A1) and (A2) we can express the ratio between vacancies pertaining to temporary and permanent contracts as follows:

(A3)
$$\frac{v^T}{v^P} = \left[\left(\frac{(r+\phi)k}{r+\lambda}\right)\left(1 + \frac{\phi c}{1 - \phi c - (w/y)}\right)\right]^{1/\eta}$$

where we have used the fact that $\theta^T / \theta^P = v^T / v^P$. Note that this relative vacancy ratio is increasing in w/y, i.e., decreasing in profitability. To obtain an expression involving the number of employed workers we use the flow equilibrium relationships. For temporary jobs we have: $q^T v^T = \lambda T$, where T is the number of workers on temporary contracts. For workers on permanent contracts the analogous expression is: $q^P v^P = \lambda P$. We thus obtain: $T / P = (\phi/\lambda)(v^T / v^P)^{1-\eta}$. It is clear that the ratio T/P (as well as v^T / v^P) is declining in profitability.

In summary, we have sketched a simple model that predicts that a general decline in the profitability of hiring labour causes a rise in the share of temporary workers. A decline in profitability can have many causes, including a fall in productivity or the relative price of output as well as a rise in real wages. The model is highly simplified but the basic forces at work are likely to survive in more elaborate models. For example, if wages are made endogenous the results hold so long as wages do not fully adjust to changes in productivity. Although such adjustments are plausible outcomes in the long run, they are unlikely to hold in the short run.

References

Abowd, J and A Zellner (1985), Estimating Gross Labor-Force Flows, *Journal of Business and Economic Statistics* 3, 254-283.

Aghion, P and P Howitt (1994), Growth and Unemployment, *Review of Economic Studies* 61, 477-494.

Aronsson G and S Göransson (1999), Permanent Employment not in a Preferred Occupation: Psychological and Medical Aspects, Research Implications. *Journal of Occupational Health Psychology* 4, 152-163

Aronsson, G, K Gustafsson and M Dallner (2000), Anställningsformer, arbetsmiljö och hälsa i ett centrum-periferiperspektiv, *Arbete och hälsa* 2000:9.

Bentolila, S and G Saint Paul (1992), The Macroeconomic Impact of Flexible Labor Contracts with an Application to Spain, *European Economic Review* 36, 1013-1047.

Berlin, E (1995), Massiv majoritet för fast jobb, *Arbetsmiljö* 4, 7-8.

Berlin, E (1997), Stor majoritet för fast jobb, *Arbetsmiljö* 5, 3-5.

Bertola, G, T Boeri and S Cazes (2000), Employment Protection in Industrialized Countries. The Case for New Indicators, *International Labour Review* 139, 57-72.

Blanchard, O J and P Diamond (1990), The Cyclical Behavior of the Gross Flows of U.S. Workers, *Brookings Papers of Economic Activity* 1990:2, 85-155.

Blanchard, O J and Landier, A (2000), The Perverse Effects of Partial Labor Market Reform: Fixed Duration Contracts in France, manuscript, Department of Economics, MIT.

Booth, A (1997), An Analysis of Firing Costs and their Implications for Unemployment Policy, in D Snower and G de la Dehesa (eds), *Unemployment Policy: Government Options for the Labour Market*, Cambridge University Press.

Booth, A L, M Francesconi and J Frank (2000), Temporary Jobs: Stepping Stones or Dead Ends?, manuscript, Department of Economics, University of Essex.

Burda, M and C Wyplosz (1994), Gross Worker and Job Flows in Europe, *European Economic Review* 38, 1287-1315.

Cabrales, A and H Hopenhayn (1997), Labor Market Flexibility and Aggregate Employment Volatility, *Carnegie-Rochester Conference Series on Public Policy* 46, 189-228.

Dolado, J J, C Garcia-Serrano and J F Jimeno-Serrano (2001), Drawing Lessons from the Boom of Temporary Jobs in Spain, CEPR Discussion Paper No. 2884.

Edlund, J and S Svallfors (1997), *ISSP 1997 – Work Orientation II. Codebook for machine-readable datafile,* Department of Sociology, University of Umeå.

European Commission (2000), *Employment in Europe*, Brussels.

Furåker, B and T Berglund (2001). Employment in Relation to Work and Organizational Commitment, forthcoming in B Furåker (ed) *Employment, Unemployment, and Marginalization. Studies on Contemporary Labour Markets*, Department of Sociology, Göteborg University and Almqvist och Wiksell International.

Guell, M (2000), Fixed-Term Contracts and Unemployment: An Efficiency Wage Analysis, Discussion Paper 461, Centre for Economic Performance, London School of Economics.

Holmlund, B and A Vejsiu (2001), Labour Market Flows in Boom and Slump: Sweden 1987 – 2000, in *Essays on Labor Market Dynamics*, Economic Studies 56, Department of Economics, Uppsala University.

Håkansson, K (2001), Språngbräda eller segmentering? En longitudinell studie av tidsbegränsat anställda, Research Paper 2000:1, Office of Labour Market Policy Evaluation, Uppsala.

Kauhanen, M (2000), *Määräaikaiset työsuhteet ja, sosiaaliturvajärjestelmän kestävyys*, Ministry of Social Affairs, Helsinki.

OECD (1999), *Employment Outlook*, OECD, Paris.

OECD (2000), *Employment Outlook*, OECD, Paris.

Persson, H (1999), *Essays on Labour Demand and Career Mobility*, PhD Dissertation, Swedish Institute for Social Research, Stockholm University.

Pissarides, C (1990/2000), *Equilibrium Unemployment Theory*, Basil Blackwell/MIT Press.

Storrie, D (1995), Reglering av visstidsanställningar i kollektivavtal: Konsekvenser av 1994 års lagstiftning (The Regulation of Limited Duration Contracts in Collective Agreements: The Consequences of the 1994 Reform), EFA, Ministry of Labour, Stockholm.

Storrie, D (2002), *Temporary Agency Work in the European Union*, Consolidated Report European Foundation for the Improvement of Working Life and Living Conditions, January 2002.

SKr (1999/2000), Regeringens skrivelse 1999/2000:146, Anställningsformen överenskommen visstidsanställning.

SOU 1997:27, DELTA – Utredningen om deltidsarbete, tillfälliga jobb och arbetslöshets-ersättningen.

Statistics Sweden (1997), *Välfärd och ojämlikhet i ett 20 årsperspektiv*. Levnadsförhållanden 1975-95. Rapport nr 91. Statistics Sweden, Stockholm.

Wasmer, E (1999), Competition for Jobs in a Growing Economy and the Emergence of Dualism, *Economic Journal* 109, 349-371.