Monthly employers' sentiment indicators; Doing more with business survey data

09

Floris van Ruth and Roberto Wekker

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Explanation of symbols

.	= data not available
*	= provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
–	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
blank	= not applicable
2005-2006	= 2005 to 2006 inclusive
2005/2006	= average of 2005 up to and including 2006
2005/'06	= crop year, financial year, school year etc. beginning in 2005 and ending in 2006
2003/'04–2005/'06	= crop year, financial year, etc. 2003/'04 to 2005/'06 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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Monthly employers' sentiment indicators; Doing more with business survey data

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Summary: Labour market indicators are among the most important economic indicators, both from the business cycle analysis perspective and for the general public. Vacancies are very sensitive to changes in the economic climate and are a key to the situation on the labour market. Currently, Statistics Netherlands publishes data on vacancies on a quarterly frequency. Even the monthly labour market indicators possess a significant publication lag. More frequent and timely information on labour market developments would therefore be useful. This can be provided by sentiment indicators constructed from the various business surveys. These are available on a monthly basis and without publication lag. They contain employers' opinions and assessments directly and indirectly relevant for labour demand and thus vacancies.

The aim is to construct monthly indicators which can give a first indication of the direction of developments in the labour market, more specifically that of the growth rate of vacancies. Monthly composite sentiment indicators were constructed for total private vacancies, commercial services vacancies, business services vacancies, manufacturing industry vacancies construction vacancies. In general, the constructed labour sentiment indicators show a good coherence with the corresponding vacancy development.

Keywords: business cycle analysis, short-term economic indicators, labour market, vacancies, business surveys, sentiment indicators

1. Introduction

Of the set of short-term economic statistics, the most relevant for the average citizen are the labour market statistics. These reflect job security and prospects, and probable wage developments. These statistics are of course of great value for professional business cycle watchers as well. Even though developments in labour statistics tend to lag the economic cycle as a whole, they are of profound influence. Only when a business cycle movement is visible in the labour market indicators, one can be sure of its pervasiveness [Van Ruth et al. 2005]. Also, economic fluctuations which affect the labour market tend to be more persistent and profound. The motivation for this research was that more frequent and timely information on developments in the labour market, especially on vacancies, would be welcome. This was deemed possible as in the business surveys conducted by Statistics Netherlands there is much information on all kinds of economic developments which is not exploited fully.

Introducing a sentiment indicator for the labour market has several benefits. There is of course the already mentioned information lead. But almost as important is the fact that sentiment indicators consist inherently of employers' opinions and assessments on relevant topics. Therefore, it offers additional opportunities for analysis as it becomes possible to see in which parts of the economy or which aspects of the business climate observed developments in the labour market originate. It is also a further opportunity to exploit and show the information available in the business surveys of Statistics Netherlands. A final advantage is that a labour market sentiment indicator can serve as an independent reference for the labour market statistics, one which is not liable to revisions.

Sufficient reasons therefore for close monitoring of the labour market. Like other statistical agencies, Statistics Netherlands measures and publishes a wide array of labour market indicators. The most important are jobs (or hours worked), unemployment, job vacancies, temporary employment and labour costs. The problem, from the point of view of business cycle analysis anyway, is that these are all quarterly indicators, with the exception of unemployment. This is a monthly indicator, like most important business cycle statistics, but that still means a publication lag of almost a month and a half from the end of the reporting month. Also, as will be shown later, unemployment is one of the more lagging labour market indicators. Possibly the most relevant labour market indicator from the point of view of the general public and business cycle analysts are job vacancies. These are a good gauge of the health and outlook of the business sector, and of course of job prospects for the whole labour force. Also, as will be shown later, the development of job vacancies has a very strong link with the business cycle. An important quantity to track therefore. At present, Statistics Netherlands publishes data on job vacancies on a quarterly basis, again with a month and a half publication lag. This means that at the end of the first month of a given quarter, it still takes over three months before information on the development of vacancies at that time

becomes available. A quick indication of the direction of these developments, reducing uncertainty, would therefore certainly be welcome [Kroeze et all. 2006].

Increasing the frequency of a statistical survey such as the vacancies survey can be difficult, and is certainly costly. And there is also the burden on business to be considered. For monthly statistics there is the issue that reducing the publication lag, at least with conventional means, is very difficult or impossible. This is one of the main reasons why economic surveys into the opinions and expectations of producers and consumers have been instituted. Broadly speaking, these ask respondents a number of simple, qualitative questions concerning their assessment and expectations on a limited set of relevant economic issues. The difference between optimist and pessimists then gives an indication of the direction of developments. Indicators constructed from the consumer survey have been shown to closely track the development of household consumption [Stokman 2007], whilst the same goes for the manufacturing industry business survey and the development of industrial production [Van Ruth 2002]. Because these surveys consist of relatively few and qualitative questions, these can be conducted and processed quickly. Also, because they aim to chart attitudes and expectations, there is no real need to wait until the reporting month has ended before conducting the survey. Thus, these surveys are able to report their results at the end of the reporting month, gaining an important publication lead. For a quick indication of the direction of developments, these surveys are invaluable.

The link between survey outcomes and the development of consumption and industrial production has been mentioned. But these surveys were not solely constructed to track these realisations, but even more to get a quick and general impression of respondents' assessment of diverse aspects of economic and business conditions. Therefore next to questions on economic conditions and orders, they also contain questions on for example employment expectations, prices and competitiveness. Using these data it is possible to construct sentiment indicators which reflect the development of other important economic quantities, in this case job vacancies. There are no survey questions enquiring directly after the development of vacancies, but there are of course the questions concerning employment expectations. Vacancy development is also expected to be intimately linked with other survey questions, because of logical economic connections. For example, financial and economic conditions as experienced by consumers are intimately linked with developments in the labour market, especially job security and opportunities. On the employers' side, new hiring is for example affected by the (development of) the order portfolio and the general business outlook as reflected in other indicators. An extension of this is that favourable developments, such as increased orders, in a client industry will also increase the prospects and employment opportunities in servicing industries, indicating the possibility of exploiting the cross-links between the different business surveys.

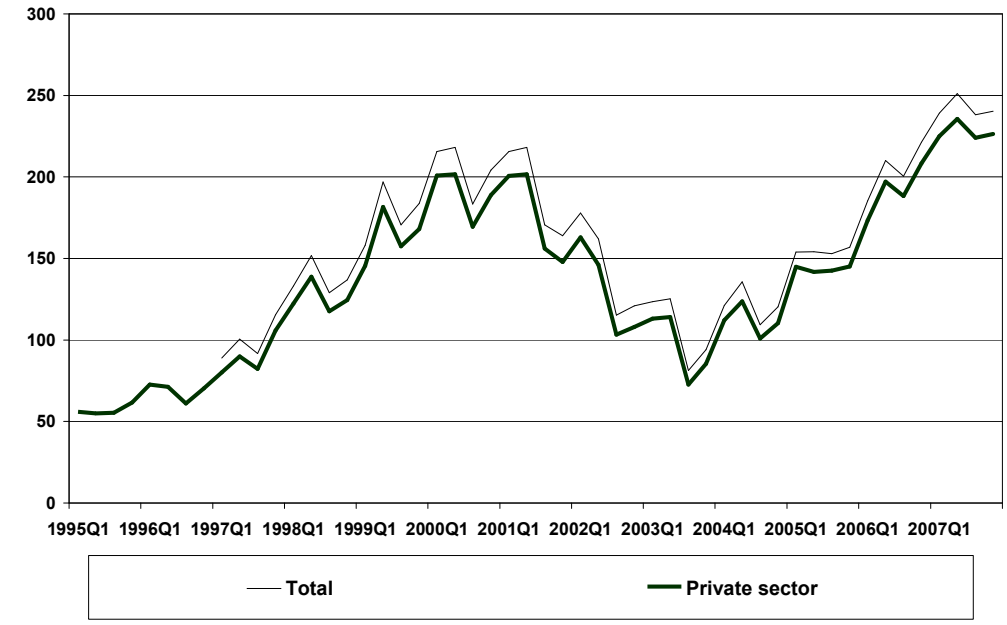
In this study it was tested whether these links are strong enough to derive from the survey data a sentiment indicator which reflects the development of vacancies and is thus able to give a quick, early indication of the developments in the labour market.

Via a quantitative process, the most relevant survey questions were selected, and combined into candidate labour market sentiment indicators. These were scored on several measures of similarity with the development of job vacancies, resulting in the most optimal formulation. Labour market sentiment indicators were constructed for Total Private job vacancies, Job vacancies in the building industry, in manufacturing industry, in services and in business services. First, some background information on job vacancy data is given in section 2, and on survey data in section 3. Section 4 describes the general methodology, whilst in the following sections the results are given for the different vacancy aggregates. Section 5 contains the actual results and indicator selections.

2. An introduction to vacancies

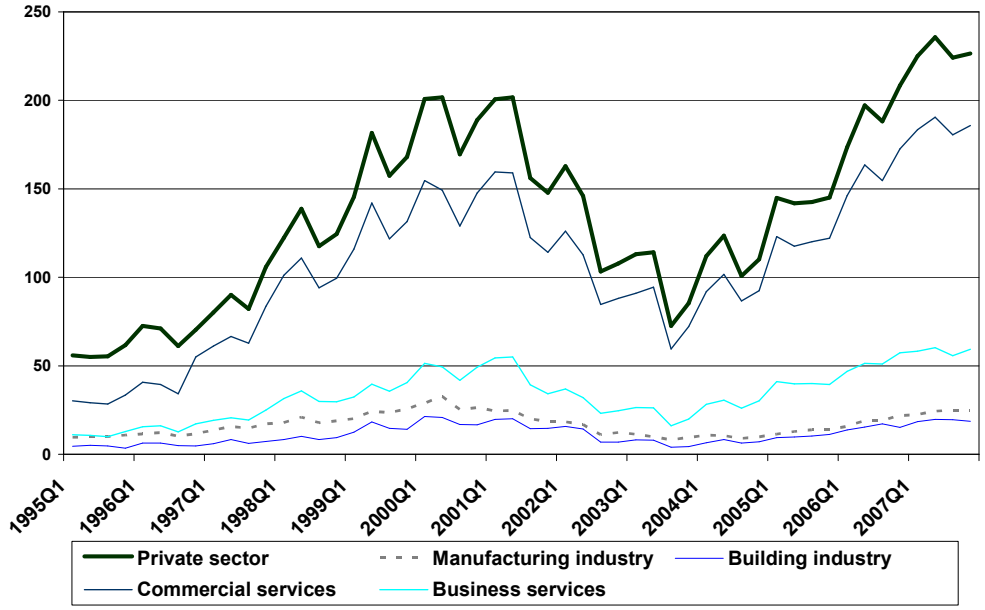
The vacancy statistics are based on a quarterly survey, where a sample of 21000 firms and institutions from the private sector is queried. Both existing and new vacancies are counted [Kroeze et all. 2006] . Quarterly realisations for the different branches are available from 1995 on. As said before, data are published 40 days after the end of the reporting quarter. The realisations of total vacancies range between about 50000 and 250000. As can be seen in graph 2.1, private sector vacancies make up the bulk of total vacancies, and more importantly cause virtually all the dynamics, while public sector vacancies are far more constant.

Graph 2.1; Total vacancies compared to private sector vacancies (number of unfilled and filled vacancies, 1000's of jobs)



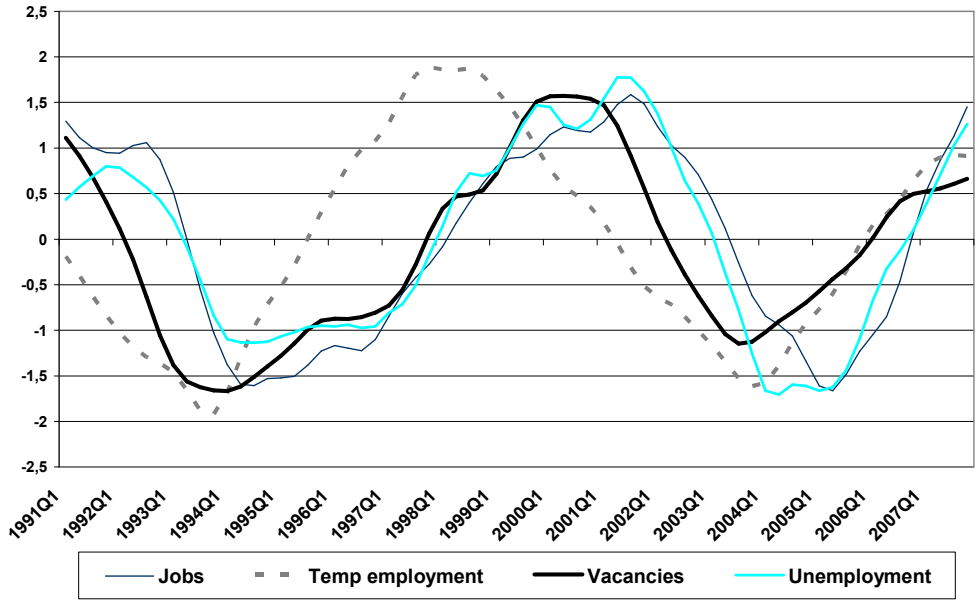
Of the vacancies in the private sector, the majority originates in the commercial services sector, with the number of vacancies in the manufacturing and building industries being much lower. This reflects the respective sectors' employment shares. But a cyclical development is visible in all vacancy aggregates. This development is of much interest, as it reflects the business cycle.

Graph 2.2; Breakdown of total private sector vacancies, 1000's of jobs.



The cyclical development in vacancies is of extra interest as analysis of the cyclical development of the labour market indicators from the Statistics Netherlands business cycle tracer shows that with the exception of temporary employment, the cyclical development of vacancies leads those of the other labour market indicators, see graph 2.3.

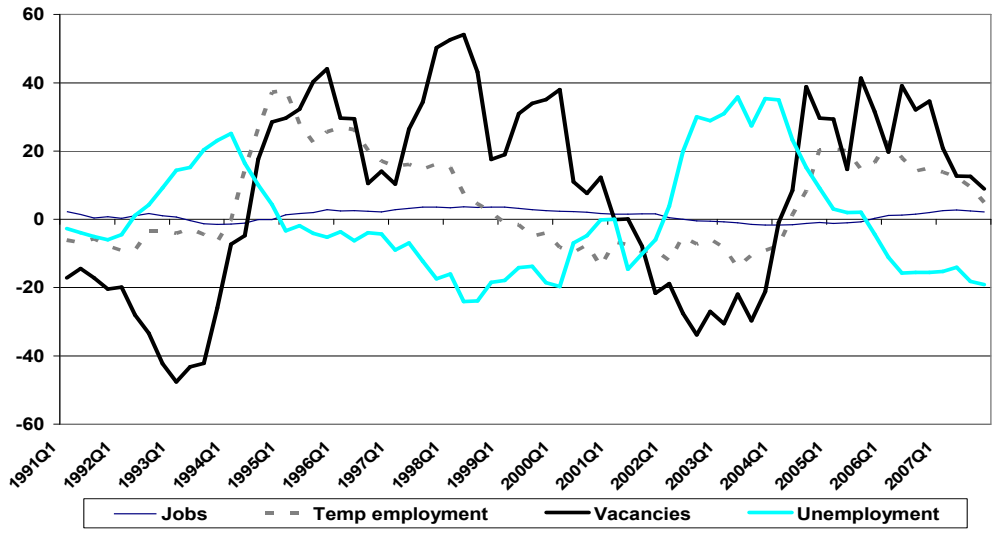
Graph 2.3; Cycles of private sector vacancies, unemployment, temp employment and jobs; from the Statistics Netherlands business cycle tracer.



Therefore business cycle developments will be visible earlier in the development of vacancies than in unemployment or jobs. This is one more reason why it is useful to construct a monthly indicator of vacancy development.

From a methodological point of view it is important to note that a gradual rising trend[1] is visible in graph 2-1, mostly in private sector and commercial services vacancies. Apart from the consequences for the Dutch labour market, the presence of this trend means that for methodological reasons, it is necessary to use the growth rate of vacancies as the object of study. Taking growth rates, absolute year on year in this case, means that the trend is purged from the data, allowing standard econometric techniques to be used. For reasons of consistency with other Statistics Netherlands reporting, we will be using the absolute growth rate in vacancies, and not relative growth rates. As a consequence, an indicator will be constructed for the growth rate of vacancies in stead of for the level. Using survey indicators it is not possible to directly construct an sentiment indicator for a rising (or decreasing) series. But there are several advantages to tracking the growth rate instead of the level of vacancies. For a start, in short-term economic analysis the focus tends to be on growth rates anyway, as this reflects the economic dynamics going on. The interest will be in whether vacancies have grown or not, and if so have grown more strongly than before. A second advantage in using growth rates is of course that developments in growth rates lead those in levels; meaning that peaks and troughs in the growth rate will lead those in the level. Studying the growth rates also shows that vacancies are the most important business cycle indicator among the labour market indicators. Graph 2.4 shows that cyclical variation in the relative growth rate is largest for vacancies, meaning that vacancies are more sensitive to the business cycle than the other indicators. For reasons of comparison, the growth rates in graph 2.4 are *relative* year on year growth rates. As mentioned before, our target in this study will be the *absolute* growth rate in vacancies, which exhibits a slightly different development.

Graph 2.4; Growth rates of Jobs, temp employment, private sector vacancies, and unemployment (all relative to same quarter one year ago).



[1] By contrast time-series with balance-outcomes used from business survey sentiment indicators have no trend.

3. Background; Business surveys and their methodology

Economic sentiments surveys have been explicitly instituted to obtain a quick insight into short-term economic developments. Their aim is to gauge producers' and consumers' assessment of current economic conditions or business climate, and their expectations of developments in the near future [De Goede and Wekker 1997]. The emphasis lies on finding the direction of developments, e.g. will production growth increase or not, and on identifying factors limiting this, for example labour shortage. Most questions focus on factors concerning the respondent or their business directly. Thus, by aggregating over a representative sample, a representative reflection of current conditions is obtained.

The essence of the surveys is their ability to give insight into current economic conditions. That is why the surveys generally are short and the questions kept simple. This makes them easy to complete and greatly simplifies processing. Moreover, as the interest is in expectations and assessments, there is no need to wait until the end of the reporting period before starting the survey. At Statistics Netherlands, survey are generally sent out in the first half of the reporting month, and results published on the 25th of that month. This means that immediately at the end of the month, a first and earliest impression of economic conditions is obtained. The first conventional indicators of economic development will only become available almost a month and a half later.

The aim here is to construct an survey-based indicator for total private vacancies. Therefore, we will use data from several different surveys, all but one conducted by Statistics Netherlands:

• Business survey of the manufacturing industry (monthly 1650 firms)

• Business survey of construction, conducted by the Economic Institute for Construction (EIB) (monthly 400 firms, distributed over civil engineering and building construction)

• Commercial services business survey by Statistics Netherlands (monthly 1600 firms)

This survey does not cover the whole commercial services sector; financial- and retail services are not included. Included are:

- Bars, restaurants and hotels
- Transport
- Tourism
- Renting of machinery and equipment without operator and of personal and household goods
- IT-services
- Other business services (e.g. Temporary employment agencies)

Other business services= Legal, accounting, book-keeping and auditing activities; tax consultancy; market research and public opinion polling; business and management consultancy; holdings; Architectural and engineering activities and related technical consultancy; Technical testing and analysis; Advertising; Labour recruitment and provision of personnel; Industrial cleaning.

Business services () = Renting of machinery and equipment without operator and of personal and household goods; IT; Other business services

For a more detailed description of the working of business surveys, we will use the manufacturing industry survey as an example. The construction of the other surveys is similar, and the corresponding lists of questions can be found in appendix A.

The monthly questions with corresponding answering categories are:

1. Production in the last month	increase/the same/decrease
2. Expected production in the coming 3 months	increase/the same/decrease
3. Expected development of sales prices	increase/the same/decrease
4. New orders	
-Domestic	increase/the same/decrease
-Foreign	increase/the same/decrease
-Total	increase/the same/decrease
5. Expected development of number of staff	increase/the same/decrease
6. Duration of production assured by current order-books	months of work
7. New Orders	Large/normal/small
8. Assessment of foreign order books-levels	Large/normal/small
9. Assessment of total order books-levels	Large/normal/small
10. Assessment of stocks of finished goods	Large/normal/small

The commercial services survey is broadly similar, though it rigorously asks after both realised and expected development for each subject. So there is for example also a question on the development of the number of staff in the past period. The Construction industry survey is somewhat different, due to the different nature of that sector. The main difference is that no questions on orders are included. Instead,

one question asks for an assessment of the operation time ensured by current backlogs (in months). But it also contain questions on trend of production activity in recent months and of expectations on staff development.

The calculation of the aggregate indicators is in all cases rather straightforward. For each firm, the answers are weighted according to turnover, giving the answers of the larger firms more influence. Subsequently the weighted percentage of firms answering increase (large) is determined, as is the percentage answering decrease (small). These two percentages are then subtracted, yielding the balance on the question. The link with actual realisations is now, that if a larger fraction of the firms expects an increase, a higher growth of production, or number of staff can be expected. The reverse is of course true if a majority expects a decrease. It is not the case that a negative balance automatically corresponds to a negative development in the corresponding realisation. The sentiment indicators are constructed to be roughly zero on average, and not to exactly mimic growth rates of realisations. The correct interpretation is that a higher balance on the sentiment indicators makes a higher development of the realisations more likely [De Goede and Wekker 1997].

An important distinction in types of survey questions is between questions inquiring after recent developments or the current situation and those inquiring after the respondent's expectations of certain developments in the near future. An example of the first category is whether production in the past month has increased, decreased or remained the same. The other category is for example whether the number of personnel is expected to increase, remain the same or decrease. This last type of question can of course be very useful as it contains a forward looking component. It is quite important to note that the respondent is asked about expected developments in their own firm in the near future, therefore the answers probably reflect more actual plans that forecasts. Though these questions focus on realisations, and not expected future developments, there is of course an intimate link between orders and future production and other business developments. Therefore, a realised increase in orders now, can probably be equated with an expected future rise of production or sales. In the same manner, an increasing inflow or stock of orders can lead to (plans for) future employment growth.

A second type of distinction in types of survey questions is between realised development questions and assessment questions. The first type is of course again rather straightforward; has something increased/remained the same/decreased. Assessment questions are subtly different. These inquire whether the respondent thinks whether certain realisations, for example orders, are large/normal/small. The aim is to confront these with observed realisations, and thus gain more insight into the opinions on current conditions of businesses themselves. The assessment questions tend to evolve more smoothly that the realisations as the former are less sensitive to random events.

4. Methodological background of sentiment indicator construction

The origin for attempting to construct an early indicator of vacancy development based on survey indicators can be found in several desirable properties of survey data.

- There is no publication lag, data on a certain month become available at the end of that month.
- The data are not subject to revisions, as no new information can become available at a later date.
- Business survey questions cover a wide range of topics.
- As business survey questions ask explicitly after orders, employment plans etc., one can find direct indicators for relevant phenomena.
- The forward-looking nature of some survey questions can help reduce information lags.

The methodology used here for constructing the labour market confidence indicators is based on the EU-methodology for constructing confidence indicators. These have been developed further by Statistics Netherlands, so as to arrive at a concrete set of guidelines for constructing confidence indicators [EU DG-ECFIN 1991, Wekker 2007]. The procedure is essentially a top-down approach, where starting from a chosen reference series, here vacancy development, individual business survey indicators are tested for their coherence with the reference series. This can be contrasted with a bottom-up procedure, where component-indicators are chosen on theoretical grounds, and comparison with a reference series is only performed at the end of the procedure. The process used here is largely statistical in nature, but not completely. Economic and theoretic considerations play a role as well. All selected indicators should have a direct link to labour demand and thus vacancy development. For questions enquiring after staffing levels, this is of course obvious. But also orders and production development will be very relevant for staffing needs. In the end, developments in the amount of work will affect the amount of labour needed. Therefore, survey questions concerning orders and production are deemed relevant potential indicators, but this is much less so for survey questions enquiring after for example competitiveness and price developments. Here, the link to staffing development is much more diffuse, and these indicators are deemed less relevant here.

The fundamental restriction is that the constructed confidence indicator should not be an inherently leading indicator, as Statistics Netherlands does not aim to produce forecasts. Instead, the indicator's main information lead should stem from its publication lead. This needs some explaining, as the definition of leading is somewhat subtle here. An indicator can be leading in two ways; its turning points (peaks and troughs) can lead those of the target, or reference, indicator. Or it can posses an average lead over the whole time span, usually determined by correlation analysis. An indicator which leads on both counts is fully leading. Ideally we would like to have an indicator which is coincident both in turning points and average correlation. A fully leading indicator will not be acceptable, but a fully lagging neither, as then we lose the information lead. In practice, a small average lead can be acceptable as long as the indicator is not leading at all turning points. Mirroring this, not timely identifying all the turning points is acceptable as long as the indicator is on average coincident or slightly leading.

Formally, the Statistics Netherlands criteria for a aggregate confidence indicator are:

- The aggregate indicator should not be leading. As it may be difficult to achieve fully, a small average lead is acceptable. Moreover, a lead or lag in (some) major turning points of at maximum six months is acceptable.
- The aggregate indicator should exhibit good average coherence with the target indicator, more concrete; average correlation should be 0.7 at least.
- All indicators used should be survey indicators in the form of balances, with the exception for number months of work.
- All component indicators should be seasonally corrected using Census-X12 RegArima
- If necessary, component indicators should be bias-adjusted, meaning that their average is set to 0 when this is substantially positive or negative measured over the full length of one or more business cycles.
- Minimum length of the available time series should be one business cycle, currently ten years in the Netherlands. Otherwise meaningful analysis will not be possible.

Summarising, the aim is to construct an indicator which principally *tracks all major movements* in the target variable (vacancies), identifies its turning points and mainly possesses an information lead due to its publication lead. The construction process can be broadly characterised in the following manner. The first step is identification of candidate indicators which may contain useful information on the target variable, here vacancies. In this study, we restricted ourselves to survey data. The next step is considering in what form we will use the data: level, growth rates, trend-adjusted or cyclically adjusted. The first true selection stage is quantifying the relationship

between candidate indicators and target indicator. This is usually done by correlation analysis, classifying the candidate indicators as leading, coincident or lagging compared to the target indicator, along with a measure of the strength of the relationship. A turning point analysis can also be included, in which case the turning points of the candidate indicators are compared to those of the target. Next, the best individual indicators can be selected and taken through to the next stage. This is the most difficult one, where the indicators are combined into different groups in order to find the best aggregate representation of the target indicator. The grouping can be done based on several different principles. One can use theory as a guide, in which case all or the most important factors influencing the development of the target indicator should be represented by indicators in the set. Or in this case using only those indicators which are directly linked to the demand for labour in a specific branch, i.e. production expectations and personnel demand. Another, more statistical, approach is to use those indicators with the strongest links with the target indicator, this can be both in average correlation or in similarity of turning points. Creating a balanced set which optimally reflects the development of the target indicator always remains somewhat of an art. The aggregate indicators can be constructed by taking simple averages, or by some form of weighting process. This can be econometrically, such as via principal component analysis or dynamic factor analysis. Most common is to use a weighting scheme which somehow reflects the economic importance of the industries represented. This can be the value added share, or in this case the employment or vacancy share. All these approaches were tested, but as the presented indicators will show, simple averages usually worked best.

We conclude this section with some elaborations on the preceding. As explained in section 2, it is necessary and desirable to track the year-on-year growth rates of the different vacancy aggregates. This raises the question in what form the survey indicators should be entered; levels or also growth rates. Both have been used in the literature. A case can be made that as survey variables inquire after realised or expected developments, the level of a survey indicator corresponds with growth rates of the target indicator. On the other hand, it might be more consistent to use both types of data in the same form. Possibly survey data will just work better either in levels or growth rates; growth rates tend to lead levels, which can be useful, but are also more volatile which is not desirable in a short-term economic indicator. In the end we tested both approaches, and found that using survey data in the form of levels yielded somewhat better results, whilst also being easier to explain. Only the results for that approach will be reported here. The survey indicators were normalized before analysis and aggregate indicator construction. This was performed according to the following formula:

$$Y^{t}_{normalized} = \left(\frac{Y^{t}_{origonal} - Mean(Y)}{s\tan darddeviaton(Y)} \right)$$

This preserves the individual dynamics of the indicators, but puts them on the same scale. Some survey indicators have (much) larger typical or extreme realisations then others (e.g. 8 vs. 27). To prevent indicators with larger deflections to automatically dominate the aggregate, normalization is necessary.

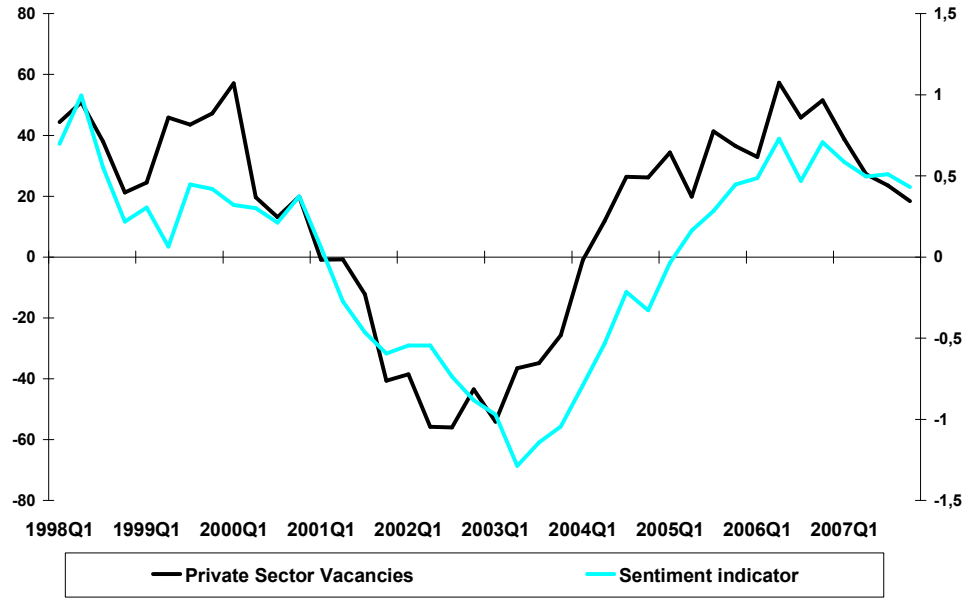
5. Results; the sentiment indicators

5.1 A monthly indicator for total private sector vacancies

There are two possible approaches to constructing a sentiment indicator for total private sector vacancies development; an indirect and a direct on. In the indirect case, the sentiment indicator for the private sector is constructed from the separate sentiment indicators developed to track vacancy development in the main sub-sectors; manufacturing industry, building industry and commercial services. In the direct approach, a separate sentiment indicator is constructed for total private sector vacancy development directly from relevant business survey indicators. Indicators from the different business surveys will then be combined. We report results from both approaches, as each has its advantages.

5.1.1 Indirect

Graph 5.1; Total private sector vacancy development (absolute year-on-year growth, 1000 jobs, left axis) vs. indirect composite sentiment indicator (standardized, right axis).



Correlation with vacancy development: 0.857 at lag 0, 0.884 at lag +1 (lagging)

Peak/trough identification:

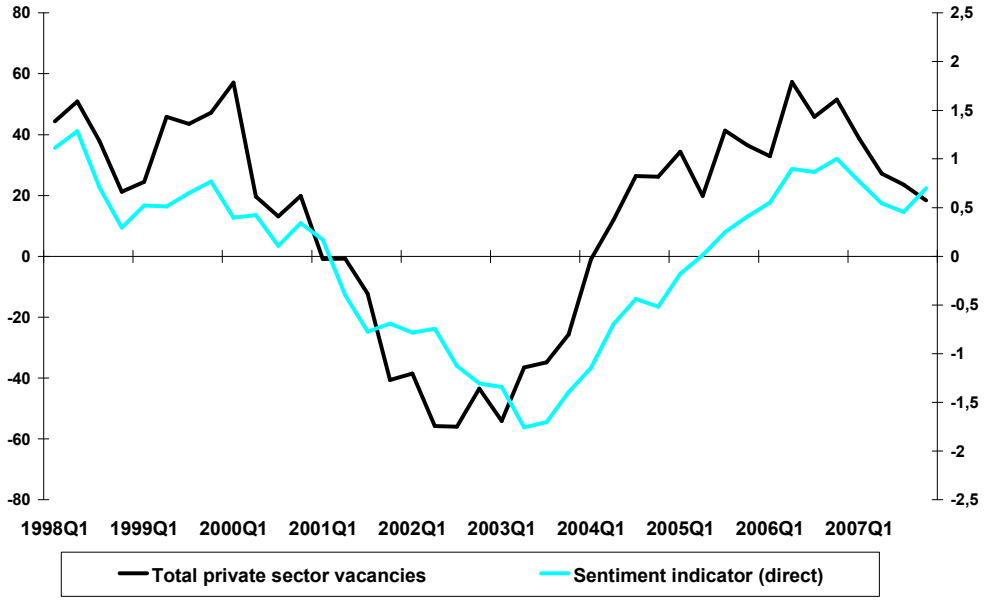
	Peak	*Trough*	*Peak*	*Trough*	*Peak*
Vacancy development	**1998Q2**	**1998Q4**	**2000Q1**	**2002Q**	**2006Q2**
indicator	**1998Q2**	**1999Q2**	**1999Q3**	**2003Q2**	**2006Q2**

The sentiment indicator is constructed by taking the vacancy-share weighted average of the labour market sentiment indicators developed for the manufacturing industry, the building industry, and commercial services. Job-weighted and non-weighted variants were tested as well, but performed slightly worse than this variant. Vacancy shares of the corresponding quarter one year earlier were used, to negate seasonal and availability issues. On the whole, the sentiment indicator gives a good indication of the longer-term development of vacancies. It is important to note here that the sentiment indicator is not, and cannot be, constructed to exactly mimic vacancy growth rates. *The most profound consequence is that a negative realisation of the sentiment indicator does not have to correspond to a negative realisation of the vacancy growth rate.* The most important information is in whether the sentiment indicator has improved compared to last period/last year, and what this means for the expected change in the vacancy growth rate.

Correlation is high at 0.860 at lag 0. At lag +1, correlation is slightly higher, meaning that on average the sentiment indicator slightly lags vacancy development. This lag is not serious as it amounts to only one quarter, the difference between correlation at lag 0 and +1 is rather small, and it follows from average correlation analysis. This just measures in how far the *deviation from average* of the series is similar. It does not reflect in how far the overall direction of development in vacancies, worsening or improving conditions, is reflected in the sentiment indicator. Turning points identification is somewhat problematic, especially in 2002-2003. The trough in 2002 Q2 is only reliably identified in 2003 Q2, but with the mitigating circumstances that real recovery only starts in 2002 Q1, as can be seen in the graph. At the minor trough in 1998, the situation is not clear-cut either. A change is indicated, but a blip in 1999 Q2 results in a lower value of the sentiment indicator. So overall the sentiment indicator reflects the development of private sector vacancy quite well, but on details there are some discrepancies.

5.1.2 Direct

Graph 521; Total private sector vacancy development (absolute year-on-year growth, 1000 jobs, left axis) vs. direct composite sentiment indicator (standardized, right axis).



Correlation with vacancy development: 0.800 at lag 0, 0,821 at lag +1 (lagging)

Peak/trough identification:

	Peak	*Trough*	*Peak*	*Trough*	*Peak*
Vacancy development	**1998Q2**	**1998Q4**	**2000Q1**	**2002Q2**	**2006Q2**
indicator	**1998Q2**	**1998Q4**	**1999Q4**	**2003Q2**	**2006Q2/Q4**

This sentiment indicator is constructed by taking the simple average of standardized survey indicators from the manufacturing industry survey, the building industry survey, the IT-services survey, the temp-agencies survey and the business services survey. All important industries, and quite sensitive to the business cycle as well. This aggregate sentiment indicator tracks vacancy development satisfactorily as well. Correlation, 0.800 at lag 0, is more than sufficient and again the difference with the maximum correlation of 0.821 at lag +1 is small enough to consider the sentiment indicator to be coincident. A real weakness is, also again, the late identification of the trough in 2002 Q2. The identification of the peak in 2006 is also somewhat hesitant, with the sequence of the major and minor peak reversed

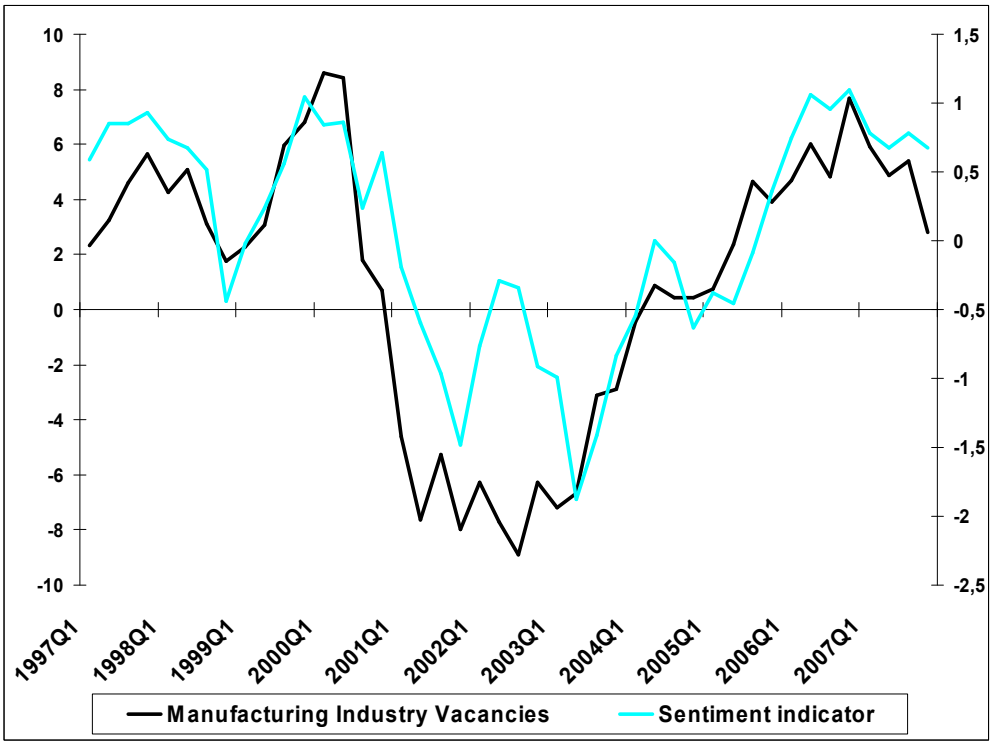
compared to vacancy development. This means that on the whole the direct indicator performs slightly worse than the indirect version. On the other hand, advantage of the direct approach is that developments in the labour market sentiment indicator can be directly traced to developments in the component indicators, facilitating analysis of the underlying developments. Apart from staffing-related indicators, survey indicators concerning orders and expected production contained information on vacancy development.. This pattern is also visible in the other sentiment indicators constructed for the sub-sectors. The relevance of these indicators is rather logical, as the development of labour demand labour will be closely linked to changes in the business climate, as represented by order development.

Indicators used:

Business services survey:	**Staffing level assessment**
Manufacturing industry survey:	**New foreign orders**
IT-services survey:	**Assessment of new orders**
IT-services survey:	**Staffing level assessment**
Other business services survey:	**Staffing level expectations**
Temp agencies survey:	**Staffing level assessment**
Building industry survey	**Production development**

5.2 A monthly indicator for Manufacturing Industry vacancies

Graph 5.3; Manufacturing industry vacancy development (absolute year-on-year growth, 1000 jobs, left axis) vs. composite sentiment indicator (standardized, right axis).



Correlation with vacancy development: 0.855 at lag 0, 0.860 at lag +1 (lagging)

Peak/trough identification:

	Peak	*Trough*	*Peak*	*Trough*	*Peak*
Vacancy development	**1997Q4**	**1998Q4**	**2000Q1**	**2002Q3**	**2006Q4**
indicator	**1997Q4**	**1998Q4**	**1999Q4**	**2003Q2**	**2006Q4**

The sentiment indicator tracks the development of vacancies in the manufacturing industry very well. This is confirmed by the high correlation of 0.855 at lag 0. Average correlation at is maximal with vacancy development one quarter lagged, but at 0.860 the difference with correlation at lag 0 is so small that the sentiment indicator can be classified as coincident without difficulty. This is confirmed by the fact that almost all turning points in manufacturing industry vacancy development

are timely identified. Overall, the sentiment indicator is very able to mimic the pattern of vacancy development. Except for the problematic trough in 2002, all peaks and troughs are correctly and timely identified. Even when the development of the series diverges, such as in 2001-2003, there is information to be gained from the sentiment indicator. At the end of 2001, the sentiment indicator shows improvement, whilst the vacancy development remains consistently negative, and when the trough in vacancy development arrives in 2002, the sentiment indicator is late in identifying it. But when considering the situation in somewhat more detail, in 2001 the long slide in vacancy growth is starting to slow, leading up to the trough in 2002. So even though the sentiment indicator is too optimistic in that period, some ground for its development can be found in actual vacancy development. And on the other hand, real improvement only sets in from the beginning of 2003, when the trough in the sentiment indicator occurs.

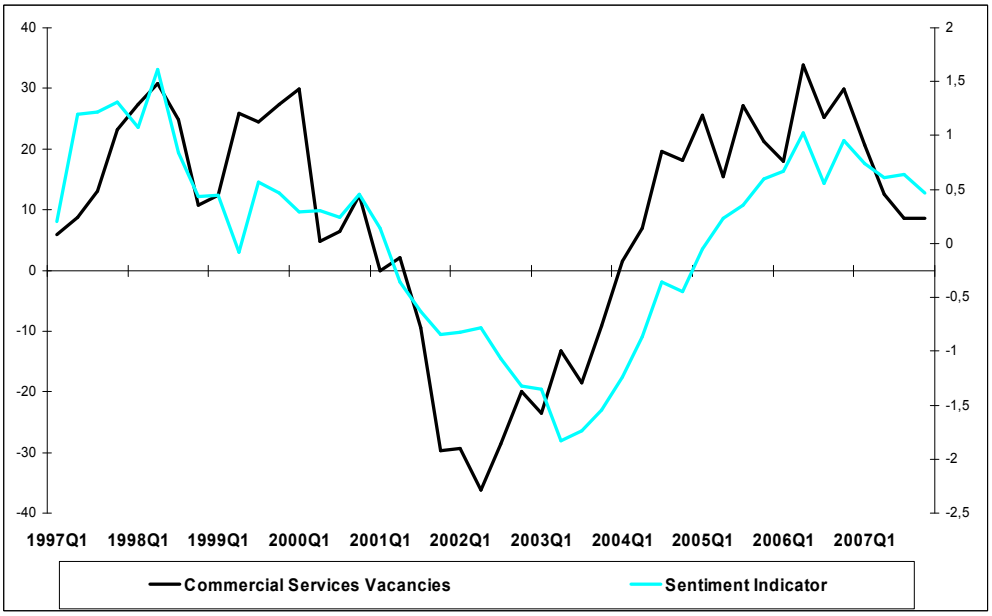
In constructing this sentiment indicator, we have not only just data from the manufacturing industry survey, but also on indicator from the temporary employment agencies survey, i.e. its staffing expectations . This is justified as a significant portion of the labour force in Dutch manufacturing industry is nowadays supplied by temp agencies. And inclusion of the indicator does enhance performance of the aggregate indicator. The indicator set highlights another important point; it is not enough to just track employers' staffing expectations. The order book and production expectations are important as well. This makes sense, as the development of these quantities determines the staffing requirements.

Indicators used:

Manufacturing industry survey:	**Staffing level expectations**
Manufacturing industry survey:	**New international orders**
Manufacturing industry survey:	**New orders total**
Manufacturing industry survey:	**Production expectations**
Business services Temp agencies survey:	**Staffing level expectations**

5.3 A monthly indicator for commercial services vacancies

Graph 5.4; Commercial services vacancy development (absolute year-on-year growth, 1000 jobs, left axis) vs. composite sentiment indicator (standardized, right axis).



Correlation with vacancy development: 0.751 at lag 0, 0.796 at lag +2 (lagging)

Peak/trough identification:

	Peak	*Trough*	*Peak*	*Trough*	*Peak*
Vacancy development	**1998Q2**	**1998Q4**	**2000Q1**	**2002Q2**	**2006Q2**
indicator	**1998Q2**	**1999Q2**	**1999Q3**	**2003Q2**	**2006Q2**

Constructing a sentiment indicator for vacancy development in the commercial services sector is more difficult than for the manufacturing industry. Commercial services are a vast and very heterogeneous sector, ranging from bars to IT-consultancy, and constituting the lion's share of employment in the Dutch economy. This difficulty is reflected in the constructed sentiment indicator. On average it is coincident with vacancy development, and the correlation between them meets the requirements, but at 0.751 it is somewhat low, and maximum correlation is at lag 2, classifying the sentiment indicator as lagging. But as explained before, this is partly due to the mechanics of correlation analysis. Looking at the graph, except for the

period 2002-2003 correspondence is quite good. If it might seem that the sentiment indicator somewhat lags vacancy development, on closer inspection it can be seen that periods of favourable vacancy development are matched with an on average increasing sentiment indicator, and vice versa for periods of weakening vacancy development. Also, turning point identification is quite good, with again the exception of the 2002 trough. But also again, the period 2002-2003 is characterized by strongly negative vacancy development in commercial services, so dating the trough in 2003 is perhaps even a better reflection of real developments, as the situation only starts really improving in the beginning of 2004.

Significantly, the indicators which make up the sentiment indicator represent developments in major, and business cycle sensitive, branches of the commercial services sector. An indicator from the manufacturing industry survey is included as well. Manufacturing is an important source of work for commercial services, which explains why the fortunes of these two sectors of the economy are entwined. Crucial for developments in manufacturing is of course order inflow, explaining the significance of the new orders indicator. On the whole therefore, the sentiment indicator gives an acceptably realistic description of the development of vacancies in commercial services..

Indicators used:

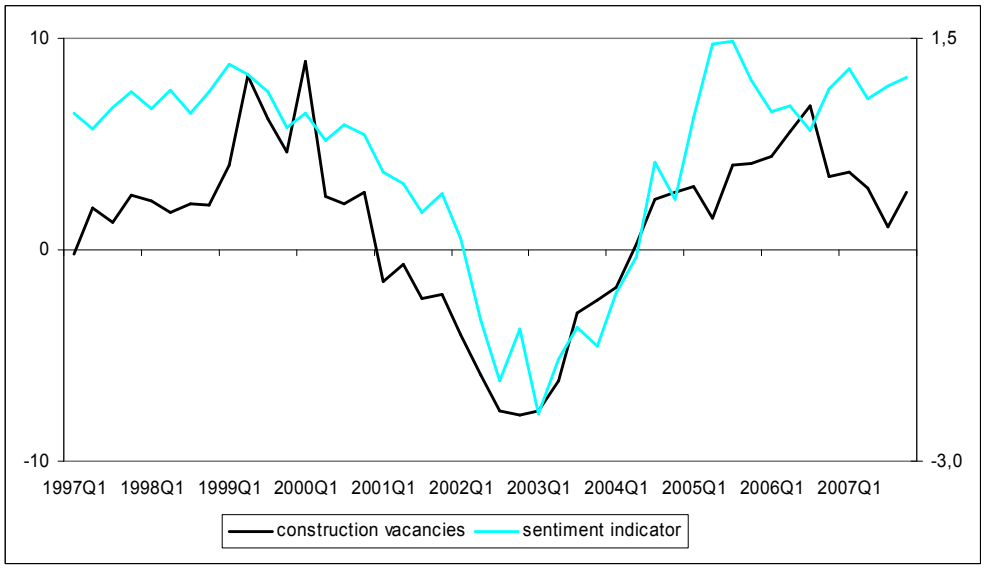
Other services survey:	**Staffing level assessment**
Other services survey:	**Staffing level expectations**
IT-services survey:	**Staffing level expectations**
IT-services survey:	**New orders**
Temp agencies survey:	**Staffing level assessment**
Temp agencies survey:	**Staffing level expectations**
Business services survey:	**Staffing level expectations**
Manufacturing industry survey	**New orders**

5.4 A monthly indicator for construction vacancies

The construction of the sentiment indicator is based on monthly tendency surveys in two major construction industries, building construction and civil engineering. These two business tendency surveys are held by the "Economische Instituut van Bouwnijverheid" and are from a cyclical viewpoint representative for the construction as a whole. According to their value added in construction as a whole building industry is weighted for four fifth while civil engineering is weighted for one fifth in the sentiment indicator of construction.

With a maximum of 0.844 at lag 0 the correlation between the sentiment indicator and growth of vacancies is high. Thus the two periods of growth increases in the vacancies are more or less paralleled by strong positive sentiment indicator (see Graph 5.5). The same holds for the period with negative decreases in vacancies which is corresponded by a pessimistic mood of employment prospect on the side of entrepreneurs.

Graph 5.5;Construction vacancy development (absolute year-on-year growth, 1000 jobs, left axis) vs. composite sentiment indicator (standardized, right axis).



Correlation with vacancy development: 0. 844at lag 0

Peak/trough identification:

	Peak	*Trough*	*Peak*	*Trough*	*Peak*
Vacancy development	**n.o.**	**n.o.**	**2000Q1**	**2002Q4**	**2006Q4**
indicator	**n.o.**	**n.o.**	**1999Q1**	**2003Q1**	**2005Q3**

With regard to the two downturns in 2000 and 2006 in vacancy growth rates, the sentiment indicator down turns lead for one year. At the upturn in 2002 the timing is far more better, the sentiment indicator lags with one quarter.

Indicators used:

Building construction survey	**Production in the last month (weight 0,40)**
Building construction survey	**Number months of work (weight 0,40)**
Civil engineering survey	**Employment expectations (weight 0,10)**
Civil engineering survey	**Number months of work (weight 0,10)**

5.5 A monthly indicator for Business Services vacancies

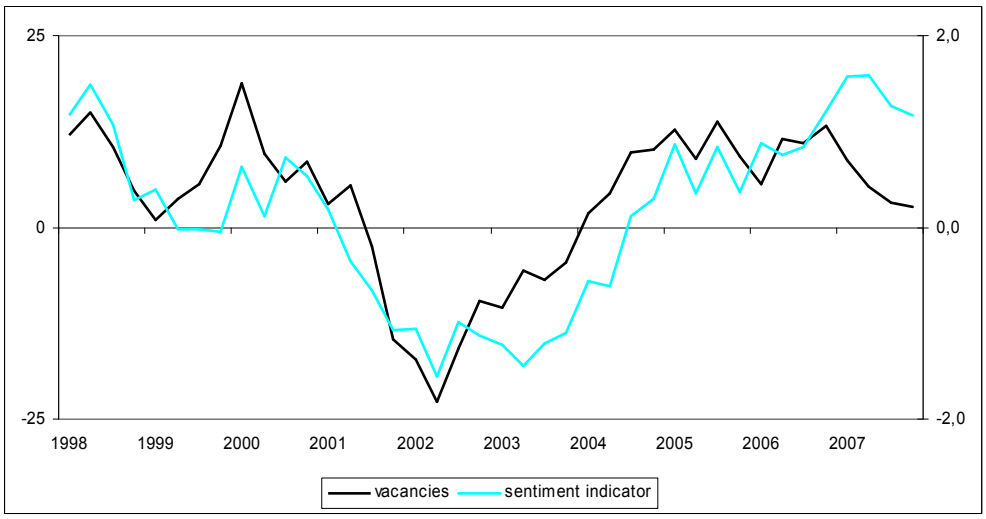
The vacancies of business services covers real estate (sbi70); renting of machinery and equipment without operator and of personal and household goods (sbi71); computer and related activities (sbi72); research and development (sbi73); and other business services (sbi74). The tendency survey is monthly held in sbi71, sbi72 and sbi74 as these are considered to be representative for the whole range of business services.

It was not easy to construct a labour sentiment indicator without information from other business tendence surveys, i.e. manufacturing industry (sbi15-37) and construction (sbi45). The reason why is that these two industries have a substantial stronger impact on the economics of business service industries as a whole (sbi70-74) than visa versa. Nor did any other single service industry had a stronger economic relation with business services than manufacturing industry. Besides this, in most other commercial services manufacturing industry has a second best economic influence as measured from an input-output table.

Thus it was necessary to weigh the underlying indicators in order to construct a abour sentiment indicator. Of course indicators from business services were weighted stronger although manufacturing industry was weighted relative high, given its economic relation with business services.

The correlation between the growth rate of vacancies and the labour sentiment indicator is 0,798 at lag 0 and reaches an optimal value of 0,815 at lag 2, but this is only slightly higher. Visual inspection revealed that the lead of vacancy growth rates began in 2003 but ended in 2005. So periods of high and low growth rates in vacancies are more or less reflected in the labour sentiment indicator.

Gr*aph 5.6; Business services vacancy development (absolute year-on-year growth, 1000 jobs, left axis) vs. composite sentiment indicator (standardized, right axis)*



Correlation with vacancy development: 0. 798 at lag 0; 0.815 at lag 2.

Peak/trough identification:

	Peak	*Trough*	*Peak*	*Trough*	*Peak*
Vacancy development	**1998Q1**	**1999Q1**	**2000Q1**	**2002Q2**	**2006Q4**
indicator	**19981Q1**	**1999Q4**	**2000Q3**	**2002Q2**	**2007Q1/Q2**

Looking at turning points between sentiment and vacancies there is a one to one correspondence for the upturn in 2002 and also for the first downturn in 1998. Compared with the first trough or upturn in 1999 in the growth rates the sentiment indicator lags for two quarters. On the second peak in 2000 and the third one in 2006 of growth rates the sentiment indicator lags for one up two quarters.

Indicators used:

Manuf. industry survey	**number months of works (weight 0,30)**
Construction survey	**number months of works (weight 0,15)**
Business services survey	**trend of turnover in recent month (weight 0,30)**
Business services	**trend of new orders in recent month (weight 0,15)**
Business services	**staffing level expectations (weight 0,10)**

6. Discussion and conclusions

Timely and frequent information on labour market developments is vital for economic analysts, but certainly also of interest for the general public. Even monthly conventional statistics tend to possess a significant publication lag, first estimates are typically available a month and a half after the end of the reporting month. Sentiment indicators from business survey are in general free of publication lags, meaning that survey data on a certain month are available as soon as the month has ended, giving a first valuable insight into current economic developments. Most developed countries now publish composite indicators of consumer and business confidence, which generally have been constructed to track respectively consumption and output development.

We propose to add to this set by constructing a number of composite sentiment indicators reflecting labour market developments. They show the sentiments of firms relevant for the labour market. Thus, the proposed indicators will both be able to give information on expectations of employers relevant for their need for labour, and also give a first indication of whether the development of labour demand will become stronger or weaker. In this study, labour market developments were represented by the growth rate of vacancies, as this aggregate is most sensitive to business cycle developments and is the most relevant for employment prospects. The proposed sentiment indicators closely track vacancy development, and because of their publication lead they will be very useful for real-time economic analysis. At the end of each month these composite indicators will be able to give a first indication of the direction of current developments on the labour market.

Business and consumer surveys derive their usefulness from the fact that they contain the opinions and expectations of producers and consumers on current and future economic developments, both macro and micro. The surveys tend to contain questions on a wide range of topics, not only on the relatively well-known production and consumption expectations. Most relevant here is the presence of several questions inquiring directly after employment/staffing expectations. But information on order development and production expectations is of course relevant as well, as they represent drivers of labour demand. This actually is one of the strengths of composite survey indicators; generally their composition allows an analysis of the drivers of the observed developments, for example diminishing order inflow vs. a reduction of employment expectations.

Composite sentiment indicators were developed for the growth rates of total private sector vacancies, manufacturing industry vacancies, construction industry vacancies, commercial services vacancies and finally business services vacancies. This covers the most important sectors of the economy, and their construction was possible

because of the existence of separate business surveys for each of these sectors. The composite indicators were as much as possible constructed solely from the business survey covering the relevant sector. However, in a few cases it was sensible to include one or more indicators from other surveys as these markedly improved performance. Generally, these indicators originated in surveys of sectors which are important suppliers or customers of the target sector. The private sector indicator was constructed as a weighted average of the manufacturing, construction and commercial services labour market sentiment indicators. This was the most elegant option, though a composite indicator constructed directly from individual survey indicators performed almost as good. On the whole, it was somewhat surprising how well the constructed labour market sentiment indicators were able to track vacancy development. Correlations were high, generally around 0.8, and most turning points were timely and accurately identified. Most, because occasionally the sentiment indicators exhibited a development deviating from that of vacancies. Development of the composite labour market indicators is generally smooth, with no wild swings and few additional cycles. On the whole the sentiment indicators will be able to add important and timely information to the reporting on short-term economic developments, and also to the existing set of labour market indicators.

Composite sentiment indicators posses a few secondary advantages worth mentioning here. They are not subject to revisions, giving at the moment of publication an accurate reflection of employers' opinions and expectations of economic conditions at that time. This is a not unimportant property. Finally, they are easy and fast to compute, and based on existing statistics. Implementation should be painless.

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Appendix A; Wordings of the different Survey Questions

Construction industry:

1) Development of production	increase/same/decrease
2) Assessment of the number of months of work in portfolio	large/normal/small
3) Number of months of work in portfolio	no. of months
4) Work in progress	
a) has not been hindered	yes/no
b) has been hindered by:	yes/no
b1) insufficient orders	%
b2) weather conditions	%
b3) Staffing shortages	%
b4) supply shortages	%
b5) subcontractors	%
b6) other	%
5) Expected level of staff in the coming three months	increase/same/decrease
6) Expected development of prices in the coming three months	increase/same/decrease

Commercial services/business services

1) Development of new orders compared to last month	increase/same/decrease
2) Assessment new orders	large/normal/small
3) Expected development of new orders in the coming three months	increase/same/decrease
4) Development of sales compared to last month	increase/same/decrease
5) Expected development of sales in the coming three months	increase/same/decrease
6) Development of sales prices compared to last month	increase/same/decrease
7) Expected development of sales prices in the coming three months	increase/same/decrease
8) Development in staffing levels compared to last month	increase/same/decrease
9) Expected development of staffing levels in the coming three months	increase/same/decrease
10) Assessment of economic climate	favourable/neutral/ unfavourable

Appendix B; Results correlation analysis

Correlations with absolute year-on-year growth in vacancies in the manufacturing industry

Survey	Indicator	Correlation at lag 0	Maximum correlation	Lag
Manufacturing Industry	Production expectations	**0.745**		**c**
Manufacturing Industry	Assessment of production development	**0.507**	**0.805**	**+3**
Manufacturing Industry	New orders; total	**0.797**		**c**
Manufacturing Industry	New orders; foreign	**0.693**		**c**
Manufacturing Industry	Assessment of total new orders	**0.765**	**0.904**	**+2**
Manufacturing Industry	Assessment of foreign new orders	**0.711**	**0.834**	**+1**
Manufacturing Industry	Assessment EU competitiveness	**0.549**	**0.677**	**+2**
Manufacturing Industry	Assessment foreign sales	**0.67**	**0.753**	**+1**
Manufacturing Industry	Staffing level expectation	**0.650**	**0.902**	**+3**
Business services	New orders	**0.720**	**0.786**	**+2**
Business services	Assessment new orders	**0.685**	**0.802**	**+2**
Business services	Expected development new orders	**0.713**	**0.774**	**+1**
Business services	Assessment of staffing level	**0.670**	**0.724**	**+4**
Business services	Staffing level expectation	**0.711**	**0.790**	**+3**

Survey indicators in levels; lags in quarters, + means survey indicator lags vacancy development, c=coincident.

Survey	*Indicator*	*Correlation at lag 0*	*Maximum correlation*	*Lag*
IT-services	New orders	**0.673**	**0.767**	**+2**
IT-services	Assessment new orders	**0.718**	**0.840**	**+2**
IT-services	Expected development new orders	**0.639**		**c**
IT-services	Assessment of staffing level	**0.672**	**0.744**	**+2**
IT-services	Staffing level expectation	**0.762**	**0.850**	**+2**
Other business services	New orders	**0.651**	**0.703**	**+2**
Other business services	Assessment new orders	**0.650**	**0.754**	**+2**
Other business services	Expected development new orders	**0.632**	**0.675**	**+2**
Other business services	Assessment of staffing level	**0.654**	**0.704**	**+1**
Other business services	Staffing level expectation	**0.679**	**0.757**	**+3**
Temp agencies	New orders	**0.521**		**c**
Temp agencies	Assessment new orders	**0.526**	**0.602**	**+2**
Temp agencies	Expected development new orders	**0.524**	**0.551**	**+1**
Temp agencies	Assessment of staffing level	**0.694**	**0.719**	**+1**
Temp agencies	Staffing level expectation	**0.668**	**0.702**	**+2**
Construction; civil engineering	Production development	**0.592**	**0.644**	**+1**
Construction; civil engineering	Assessment months of work in portfolio	**0.460**	**0.821**	**+4**
Construction; civil engineering	Staffing level expectations	**0.487**	**0.817**	**+5**
Construction; civil engineering	Months of work in portfolio	**-0.065**		**c**
Construction; building industry	Production development	**0.792**	**0.820**	**+1**
Construction; building industry	Assessment months of work in portfolio	**0.538**	**0.873**	**+4**
Construction; building industry	Staffing level expectations	**0.654**	**0.878**	**+3**
Construction; building industry	Months of work in portfolio	**0.320**	**0.816**	**+5**

Correlations with absolute year-on-year growth in Commercial services vacancies

Survey	Indicator	Correlation at lag 0	Maximum correlation	Lag
Manufacturing Industry	Production expectations	**0.574**	**0.672**	**+4**
Manufacturing Industry	Assessment of production development	**0.543**	**0.670**	**+2**
Manufacturing Industry	New orders; total	**0.649**		**c**
Manufacturing Industry	New orders; foreign	**0.552**	**0.593**	**-1**
Manufacturing Industry	Assessment of total new orders	**0.704**	**0.751**	**+3**
Manufacturing Industry	Assessment of foreign new orders	**0.621**	**0.650**	**+3**
Manufacturing Industry	Assessment EU competitiveness	**0.571**		**c**
Manufacturing Industry	Assessment foreign sales	**0.529**	**0.591**	**+4**
Manufacturing Industry	Staffing level expectation	**0.585**	**0.810**	**+4**
Business services	New orders	**0.749**		**c**
Business services	Assessment new orders	**0.639**	**0.775**	**+3**
Business services	Expected development new orders	**0.524**		**c**
Business services	Assessment of staffing level	**0.692**	**0.768**	**+2**
Business services	Staffing level expectation	**0.683**	**0.708**	**+1**

Survey indicators in levels; lags in quarters, + means survey indicator lags vacancy development, c=coincident.

Survey	*Indicator*	*Correlation at lag 0*	*Maximum correlation*	*Lag*
IT-services	New orders	**0.763**		**c**
IT-services	Assessment new orders	**0.712**	**0.755**	**+3**
IT-services	Expected development new orders	**0.581**	**0.638**	**-1**
IT-services	Assessment of staffing level	**0.661**	**0.738**	**+2**
IT-services	Staffing level expectation	**0.72**	**0.836**	**+2**
Other business services	New orders	**0.686**		**c**
Other business services	Assessment new orders	**0.601**	**0.742**	**+3**
Other business services	Expected development new orders	**0.566**	**0.633**	**+2**
Other business services	Assessment of staffing level	**0.633**	**0.752**	**+2**
Other business services	Staffing level expectation	**0.648**	**0.730**	**+2**
Temp agencies	New orders	**0.573**		**c**
Temp agencies	Assessment new orders	**0.505**	**0.606**	**+3**
Temp agencies	Expected development new orders	**0.524**		**c**
Temp agencies	Assessment of staffing level	**0.692**	**0.768**	**+2**
Temp agencies	Staffing level expectation	**0.683**	**0.708**	**+1**

Correlations with absolute year-on-year growth in private sector vacancies

Survey	Indicator	Correlation at lag 0	Maximum correlation	Lag
Manufacturing Industry	Production expectations	**0.645**	**0.677**	**+1**
Manufacturing Industry	Assessment of production development	**0.583**	**0.732**	**+2**
Manufacturing Industry	New orders; total	**0.690**		**c**
Manufacturing Industry	New orders; foreign	**0.581**	**0.601**	**-1**
Manufacturing Industry	Assessment of total new orders	**0.766**	**0.808**	**+1**
Manufacturing Industry	Assessment of foreign new orders	**0.679**	**0.719**	**+1**
Manufacturing Industry	Assessment EU competitiveness	**0.604**		**c**
Manufacturing Industry	Assessment foreign sales	**0.590**	**0.598**	**+2**
Manufacturing Industry	Staffing level expectation	**0.659**	**0.833**	**+3**
Business services	New orders	**0.775**		**c**
Business services	Assessment new orders	**0.695**	**0.785**	**+3**
Business services	Expected development new orders	**0.688**	**0.758**	**+2**
Business services	Assessment of staffing level	**0.703**	**0.788**	**+2**
Business services	Staffing level expectation	**0.729**	**0.807**	**+2**

Survey indicators in levels; lags in quarters, + means survey indicator lags vacancy development, c=coincident.

Survey	*Indicator*	*Correlation at lag 0*	*Maximum correlation*	*Lag*
IT-services	New orders	**0.771**		
IT-services	Assessment new orders	**0.754**	**0.779**	**+1**
IT-services	Expected development new orders	**0.626**	**0.665**	**-1**
IT-services	Assessment of staffing level	**0.713**	**0.762**	**+1**
IT-services	Staffing level expectation	**0.776**	**0.862**	**+2**
Other business services	New orders	**0.705**		**c**
Other business services	Assessment new orders	**0.655**	**0.750**	**+3**
Other business services	Expected development new orders	**0.602**	**0.663**	**+2**
Other business services	Assessment of staffing level	**0.682**	**0.776**	**+2**
Other business services	Staffing level expectation	**0.697**	**0.773**	**+2**
Temp agencies	New orders	**0.573**		**c**
Temp agencies	Assessment new orders	**0.539**	**0.599**	**+2**
Temp agencies	Expected development new orders	**0.531**		**c**
Temp agencies	Assessment of staffing level	**0.732**	**0.774**	**+1**
Temp agencies	Staffing level expectation	**0.711**	**0.739**	**+1**
Construction; civil engineering	Production development	**0.664**	**0.694**	**+1**
Construction; civil engineering	Assessment months of work in portfolio	**0.462**	**0.903**	**+4**
Construction; civil engineering	Staffing level expectations	**0.510**	**0.931**	**+4**
Construction; civil engineering	Months of work in portfolio	**-0.123**		**c**
Construction; building industry	Production development	**0.840**		**c**
Construction; building industry	Assessment months of work in portfolio	**0.568**	**0.920**	**+4**
Construction; building industry	Staffing level expectations	**0.687**	**0.915**	**+3**
Construction; building industry	Months of work in portfolio	**0.352**	**0.839**	**+5**

Correlations with absolute year-on-year growth in construction vacancies				
Survey	Indicator	Correlation at lag 0	Maximum correlation	Lag
B&U	Number months of work			
B&U	Assessment of production			
GWW	Assesment of production			
GWW	Employment expectations			
Correlations with absolute year-on-year growth in business services vacancies				
Survey	Indicator	Correlation at lag 0	Maximum correlation	Lag
Business services	Assessment new orders	**0.705**	**0.720**	**+1**
Business services	Assesment of turnover	**0.612**	**0.752**	**+2**
Business services	Assessment of staffing level	**0.641**	**0.742**	**+1**
Manufacturing industry	months of work, index	**0.726**	**0.740**	**-1**
Construction	Months of work, number	**0.774**	**0.831**	**+1**