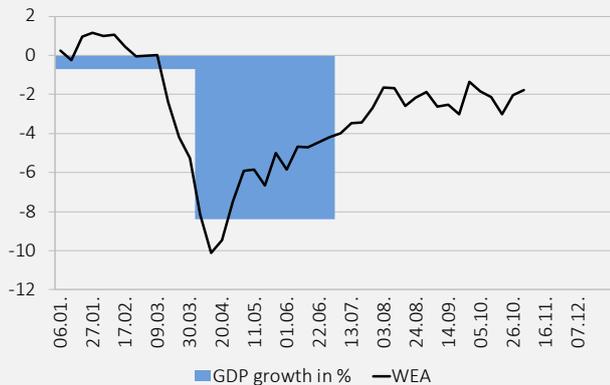


## Excursus: New index of weekly economic activity (WEA)<sup>1</sup>

In March, the Covid-19 crisis spread at an unprecedented speed when compared with other crises in previous decades.<sup>2</sup> This presented economic analysts with new challenges, because traditional economic indicators are available only monthly or quarterly and are published after a delay. As a result, it was not until May or June that they were able to provide information about the severity of the slump during the most restrictive phase of the lockdown from mid-March to the end of April.

**Figure 1: Weekly economic activity**

WEA: scaled, GDP: real, seasonally, calendar and sport event adjusted, growth compared with previous year's quarter



Source: SECO

In order to be able to track economic activity in real time, SECO is therefore publishing a new index of weekly economic activity (WEA) in Switzerland. A variety of daily and weekly data – for example, concerning mobility or card payments – gives an early indication of changes in the economy. However, considered individually these data do not show how the economy as a whole is developing.

For this reason, the WEA index brings together information relating to different high-frequency data into one index. The index supplements the existing data, can be calculated from 2005 onwards and has a strong correlation with the real GDP growth of Switzerland. The WEA is based on comparable indices in the USA, Germany and Austria and has been developed in consultation with the relevant institutions.<sup>3</sup> It should be seen as an immediate, experimental<sup>4</sup> economic indicator and not as a weekly GDP figure, because the calculation of the WEA differs significantly from

that of GDP in terms of its methodology and definitions and it does not accurately cover all sectors of the economy.<sup>5</sup>

The benefit of the index is its rapid availability. In the weeks from mid-March 2020 onwards, the WEA fell significantly below its 2008/09 level and therefore quickly indicated the sudden and severe contraction in the economy (Figure 1). The index reached its low point in week 15 (6 to 12 April). After the relaxation of the public health restrictions, it gradually began to recover.

The WEA is scaled in such a way that its average over 13 weeks – which corresponds roughly to one quarter – gives an indication of the real, seasonally, calendar and sport event adjusted GDP growth during the period, compared with the same period in the previous year. For example, the average of the index over the second quarter showed a contraction compared with the same period in the previous year of 6,2 % (effective figure -8,4 %). In the third quarter, the index indicates a fall of 2,8 % compared with the third quarter of 2019. This means that the economy remains well below its pre-crisis level, although this result implies a growth in GDP of 6,9 % compared with the second quarter of 2020.

### Data with wide-ranging economic coverage

Since the outbreak of the pandemic, composite indicators with a daily and weekly frequency have been processed for Switzerland and these represent at least some parts of the country's economic activity. For example, the indicators on [www.trendecon.org](http://www.trendecon.org) reflect consumer behavior based on Google searches. The so-called *fever curve* measures the condition of the Swiss economy using financial market data and newspaper articles, while the Swiss Economic Institute (KOF) publishes a measure of mobility and sales activity.<sup>6</sup>

The WEA is calculated using nine daily and weekly indicators that correlate closely with GDP or its components. The data is available for at least three years, which means that an appropriate seasonal adjustment can be made (Table 1). During the selection process, other high-frequency

<sup>1</sup> Data are available from <https://www.seco.admin.ch/wea>. The present excursus is an extract of SECO's *Konjunkturtendenzen*, winter edition 2020/2021, available in German and French on [www.seco.admin.ch/konjunkturtendenzen](http://www.seco.admin.ch/konjunkturtendenzen). It was first published on November 20, 2020.

<sup>2</sup> See <https://dievolkswirtschaft.ch/de/2020/04/konjunkturprognosen-in-zeiten-von-corona-ein-werkstattbericht/>.

<sup>3</sup> US WEI: [https://www.newyorkfed.org/medialibrary/media/research/staff\\_reports/sr920.pdf](https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr920.pdf); German WAI: <https://www.bundesbank.de/de/statistiken/konjunktur-und-preise/woechentlicher-aktivitaetsindex/woechentlicher-aktivitaetsindex-fuer-die-deutsche-wirtschaft-833774>; Austria: <https://www.oenb.at/Presse/thema-im-fokus/echtzeitschaetzungen-der-wirtschaftsentwicklung-in-oesterreich.html>.

<sup>4</sup> See <https://www.experimental.bfs.admin.ch/expstat/de/home/experimentelle-statistiken-bfs/index.html>.

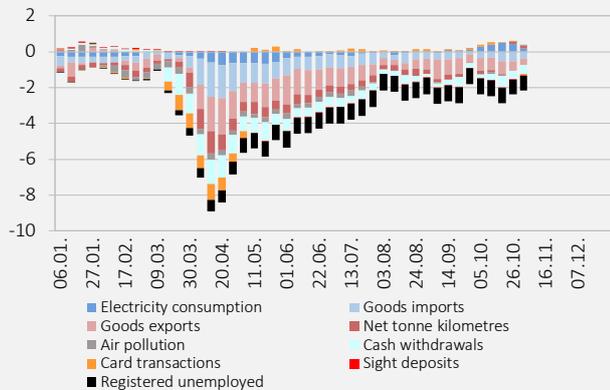
<sup>5</sup> See [https://www.seco.admin.ch/dam/seco/de/dokumente/Publikationen\\_Dienstleistungen/Publikationen\\_Formulare/Wirtschaftslage/Konjunkturtendenzen/Spezialthema/kt\\_2020\\_02\\_exkurs\\_nowcast.pdf.download.pdf/KT\\_2020\\_02\\_Exkurs\\_Nowcast.pdf](https://www.seco.admin.ch/dam/seco/de/dokumente/Publikationen_Dienstleistungen/Publikationen_Formulare/Wirtschaftslage/Konjunkturtendenzen/Spezialthema/kt_2020_02_exkurs_nowcast.pdf.download.pdf/KT_2020_02_Exkurs_Nowcast.pdf).

<sup>6</sup> <https://www.trendecon.org/>; Fever curve: <https://sjes.springeropen.com/articles/10.1186/s41937-020-00051-z>; KOF business activity: <https://sjes.springeropen.com/articles/10.1186/s41937-020-00055-9>.

indicators were evaluated, but they did not improve the correlation between the WEA and GDP.<sup>7</sup>

**Figure 2: Indicators' contribution to growth**

In percentage points, referred to the unscaled WEA-index



Source: SECO

The trade in goods covers the foreign and domestic demand for goods. The net tonne kilometres on the Swiss Federal Railways (SBB) give an indication of levels of foreign and domestic trade. Cash withdrawals and debit and credit card transactions are reliable indicators of changes in individual consumer behavior. Air pollution and electricity consumption provide an index of overall industrial production. The number of people registered as unemployed describes the status of the labor market and the change in sight deposits at the Swiss National Bank gives an indication of the upward pressure on the Swiss franc.

### Domestic economy recovered more quickly than exports

Figure 2 shows the contributions to growth made by the individual indicators of the WEA. In mid-March, at the start of the lockdown, there was a significant fall in card transactions and cash withdrawals. This was followed by a collapse in the trade in goods as measures were taken in other countries to contain the virus. While the volume of card transactions increased again relatively quickly, by October there had still by no means been a full recovery in exports and cash withdrawals.

### Calculation method

The first stage in calculating the WEA is to convert the daily data to a weekly frequency.<sup>8</sup> In the second stage, the data

is seasonally adjusted. As well as the seasonal patterns within years, there may also be patterns within each month. For example, cash withdrawals increase at the end of the month when salaries are paid, while the number of people registered as unemployed also rises at this time because employees are given notice to the end of the month. During this second stage, the data is also adjusted for the effects of public holidays, such as Easter, Ascension Day, Christmas and the Swiss National Day. Subsequently, the adjusted indicators are used to show the growth rates compared with the same week in the previous year. The growth rates are adjusted for outliers, in other words, major upward or downward spikes. For example, if an airliner is imported, this results in a huge increase in imports in the week in question, which has little significance for the business cycle and should not be included in the model. Finally, an unobservable component – the so-called cyclical factor – is extracted from the nine weekly indicators to calculate the WEA from January 2005 onwards.<sup>9</sup> The resulting index is standardized on the growth rate in the previous year of the seasonally, calendar and sport event-adjusted real GDP. This means that it gives a direct indication of the changes in GDP.

Of the indicators that make up the WEA, only the figures for imports, exports and electricity consumption are revised to the latest level. Apart from this, the revisions in the WEA are limited to seasonal adjustments. However, the WEA is constantly checked and amended where necessary.

### High correlation with GDP real growth

Figure 3 shows the resulting WEA since 2005. Despite a relatively high level of volatility at a weekly frequency, the index has a close correlation of 0.85 with the GDP growth rate at a quarterly level. For the period between the major crises in 2009 and 2020, the correlation is almost 0.6 and is therefore comparable with that of widely used monthly economic indicators in Switzerland.

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<sup>7</sup> Several other indicators were evaluated for the model (construction permits, cars and commercial vehicles on the roads, volumes of freight at Swiss airports and the Rhine port, air passengers, parcels and other post, applications for bankruptcy). However, they were not included in the calculation of the index because of their special characteristics (no correlation with GDP or its components, too much volatility, too short, available too late). In addition, a robustness analysis using these variables, trendEcon or financial market data (exchange rates, term spread, and share prices) has shown that the characteristics of the WEA will not be further improved by adding alternative data.

<sup>8</sup> The international ISO 8601 standard applies in this case. This specifies that a year has either 52 or 53 weeks. To ensure that there is an even number of weeks, in a year with 53 weeks, the values for week 53 are evenly divided across the remaining 52 weeks.

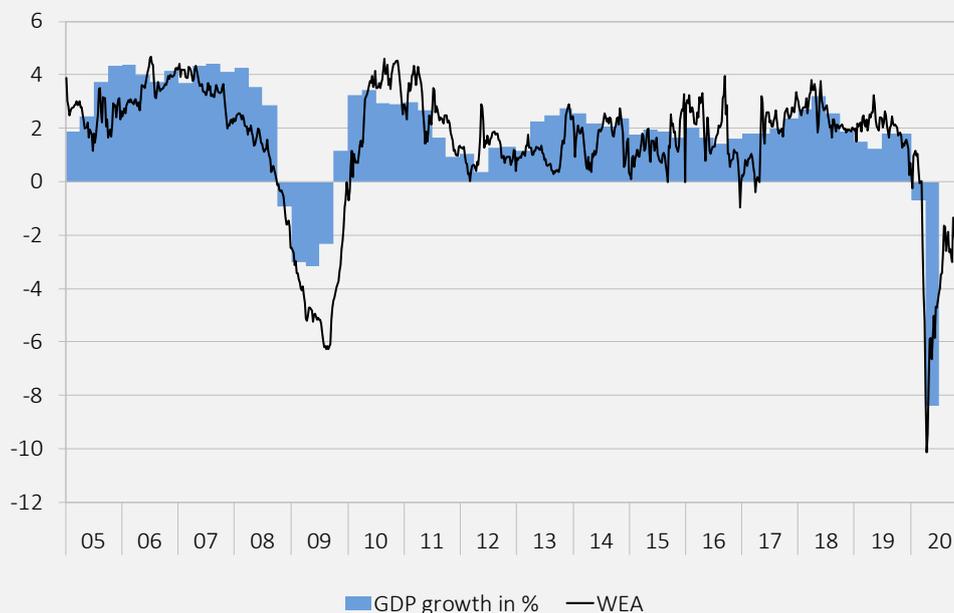
<sup>9</sup> See Stock and Watson, 1988 : <http://www.princeton.edu/~mwatson/papers/w2772.pdf>.

Table 1: Indicators in the WEA

Input data	Source	Start	Frequency	Details
Cash withdrawals	SIX	Aug 2016	Daily	Debit cards, total volume
Electricity consumption	Swissgrid, ENTSOE	Jan 2009	Daily	Excluding internal consumption in power stations and grid losses
Air pollution	European Environment Agency	Jan 2015	Daily	Average concentration of nitrogen dioxide NO <sub>2</sub> (in mg/m <sup>3</sup> ) in 9 cities
Net tonne kilometres	SBB Infrastruktur	Jan 2001	Daily	Total daily volume of rail freight in Switzerland
Card transactions	Worldline	Aug 2011	Daily	Debit and credit cards, total volume, card-present transactions
Registered unemployed	SECO	Jan 2004	Daily	Number
Sight deposits	SNB	Aug 2011	Weekly	Weekly average of the sight deposits held by SNB
Goods exports	SECO, FCA	Jan 2013	Weekly	Real, excluding items of value
Goods imports	SECO, FCA	Jan 2002	Weekly	Real, excluding items of value

Figure 3: Weekly economic activity since 2005

WEA: scaled, GDP: real, seasonally, calendar and sport event adjusted, growth compared with previous year's quarter



Source: SECO