



# KOF Bulletin

No. 98, July/August 2016

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# EDITORIAL

Dear readers,

One week after the unexpected Brexit vote, the longer-term economic effects remain unclear. The expected impact on the Swiss economy was outlined in the last KOF Bulletin. In the current issue of our Bulletin, you can read about the quality of the federal tax revenue estimates. KOF is giving the system a clean bill of health, although there is some room for improvement. On top of this, the Bulletin features articles on the core curriculum at Switzerland's Business Schools, the European construction sector and KOF's health care spending forecast.

Enjoy your read. We wish you a nice summer. The next Bulletin will be published in early September.

Anne Stücker and David Iselin

# ECONOMY AND RESEARCH

## Review of the Methods Applied to Estimate Direct Federal Tax Revenues



**How high is the quality of the direct federal tax estimates provided by the Federal Tax Administration (FTA) and the Federal Finance Administration (FFA)? Commissioned by the two administrations, KOF has carried out a detailed analysis of the respective revenue forecasts. The results of this analysis show that the personal income tax revenue forecasts can be improved.**

In the context of an expert appraisal commissioned by the Federal Tax Administration (FTA) and the Federal Finance Administration (FFA), Florian Chatagny and Marko Köthenbürger have reviewed the method applied to estimate direct federal tax revenue in the period from 1985 to 2015 and have formulated suggestions for possible adjustments. The forecast series consisted of a calendar year's revenues in the fields of personal and corporate income tax as well as the sum of the series plus lump-sum tax credits. The reference forecasts, which were utilised for comparative purposes, consisted of estimates of these series published in the fiscal plan.

As a first step, the two economists applied econometric tests to review the quality of the forecasts. In general, the quality of the FTA forecasts was shown to be good.

Statistical bias tests demonstrate that the FTA forecast estimates are generally unbiased and the forecast accuracy has hardly changed over time. This is not true for personal income tax revenue where the forecast quality has tended to deteriorate over time. The statistical evidence of this trend is, however, rather weak.

The authors furthermore applied so-called rationality tests to assess whether the information underlying the forecast was utilised efficiently. According to the test results, the assumption of rationality cannot be rejected with regard to the FTA forecasts in the fields of total revenue and personal income. However, as far as corporate tax revenue is concerned, the rationality hypothesis is (slightly) rejected. This result indicates that the largest scope for improvement exists in the case of corporate tax revenue.

**T 1: Forecasts Comparison**

2000–2015					
Natural Persons		Legal Entities		Total Revenue	
Forecast	MAPE	Forecast	MAPE	Forecast	MAPE
V+VAR (w5)	3.15%	<b>V</b>	7.82%	NJ	4.52%
VAR	3.74%	V+AR2 (w)	7.88%	<b>V</b>	4.83%
<b>V</b>	4.06%	AR2	9.89%	AR2	5.92%
AR2	4.08%	VAR	11.02%	RW	5.98%
RW	4.82%	RW	13.35%	VAR	8.00%

As a next step, the FTA forecasts were compared to real-time forecasts generated by a random walk model (RW) and other time series models (autoregressive [AR] and vector autoregressive [VAR] models). The database of the KOF macro model formed the (real time) basis for the explanatory variables and their forecasts. The forecast estimates were also compared to forecast combinations. Table T 1 specifies the accuracy of the various forecast models for the period from 2000 to 2015. Accuracy is measured by the mean absolute percentage error (MAPE).

The table T 1 shows that the accuracy of the budgetary forecast (V) compares favourably to other models and forecast combinations. Especially for corporate tax revenue, other models or forecast combinations cannot really compete with the budgetary forecast. In the case of personal income, however, a weighted combination of the budgetary forecast and the forecast from a VAR model is shown to be preferable. The weighting of both forecasts is based on the moving average of the forecast errors of the respective forecasts as observed in the last five years. The mean absolute percentage error (MAPE) of the combined V+VAR forecast (w5) is 0.91 percentage points lower than the error of the forecast estimate. This corresponds to a total of approximately 95 million Swiss francs in relation to revenue actually collected in year 2015.

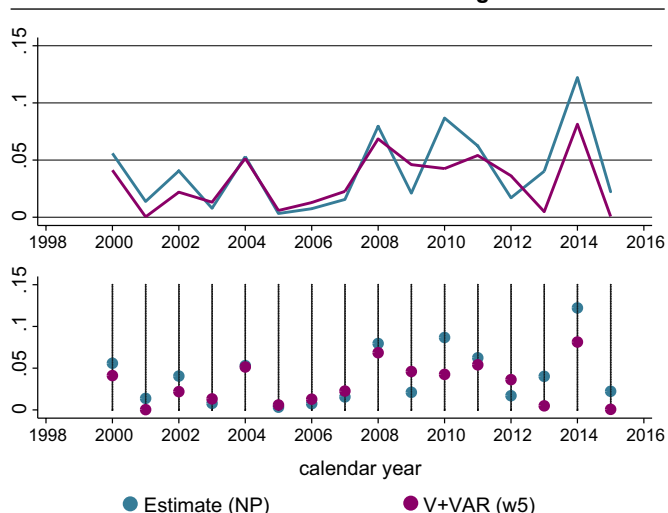
Graph G 1 presents the absolute error produced by the two forecasts as a percentage of revenue. If the combination forecast is utilised, the forecast error over the relevant time period is lower in ten years and not much higher than

the error produced by the budgetary forecast in other years. As regards total revenue, it can ultimately be stated that the sum of the best separate forecasts for personal and corporate tax revenue (NJ in table T 1) displays a lower forecast error than the budgetary forecast. A disaggregated approach (i.e. separate estimates for personal income and corporate income) is therefore preferable to an aggregated method.

**Conclusion**

KOF’s review of the method used to estimate direct federal tax revenue shows that the FTA budgetary forecasts are unbiased and mostly rational. According to the review, the forecast error also remains relatively stable over time.

**G 1: Absolute Forecast Error as a Percentage of Revenue**



However, comparison with forecasts generated by other models indicates that the forecast of personal income tax revenue could be improved via a weighted combination of the budgetary forecast and a VAR model. The largest scope for improvement regarding the tax revenue forecast is found in the field of corporate tax revenue.

#### Contacts

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The KOF Study No. 78 “Überprüfung der Methoden für die Einnamenschätzung der direkten Bundessteuer” by Florian Chatagny and Marko Köthenbürger (in German) can be found on our website:

[www.kof-studies/78/](http://www.kof-studies/78/) →

## Does the Framework Curriculum for the Higher Vocational Training Colleges for Economics Fulfil its Goals?

**In an annual survey of students and their employers, the KOF investigates whether the framework curriculum for the Höhere Fachschulen für Wirtschaft (HFW) [Higher Vocational Training Colleges for Economics] meets its requirements. Alongside an assessment of satisfaction with the study programme, this also assesses expectations of increased earning power as a result of the studies.**

#### Annual survey of students and employers

On behalf of the body responsible for the framework curriculum in Betriebswirtschaft HF [Vocational Qualification in Business Administration] (comprised of representatives of HFW.CH, the Interessengemeinschaft Kaufmännische Grundbildung Schweiz (IGKG) [Interest Group Basic Commercial Training Switzerland] and the Kaufmännischer Verband [Commercial Association]), KOF regularly evaluates the framework curriculum for the study programme Advanced Federal Diploma of Higher Education in Business Administration. This assessment identifies weak points, and points out scope for improvement during any review of the framework curriculum.

In order to obtain the assessments concerning the framework curriculum from students and employers, the KOF carries out a survey of both stakeholder groups each year. These surveys contain general questions concerning students, employers and the study programme. Secondly, they focus on the assessment of a broad spectrum of skills to be imparted through study according to the framework curriculum. The first survey round was carried out in the autumn/winter of 2014 and the second in the autumn/winter of 2015. Just under 1,200 prospective Business Administration graduates and 120 employers participated in these surveys.



#### Profile of prospective Business Administration graduates

The study programme is intended to educate “generalists with broad, networked, practical specialist and management skills”. Accordingly, evaluation surveys have shown that more than 40 per cent of HFW students in their final year of study have already taken up a management role at their place of work. They are on average 29 years old and come from a background characterised by vocational training. They have already accumulated almost five years out of their average of nine years of professional experience in



the area to which they currently dedicate most of their working hours. The most heavily represented areas of work amongst students are financing/investment, marketing/PR and procurement/logistics. However, more than a quarter of them plan to be working in corporate management within three years. Students are fully incorporated into professional life in parallel with their studies half of them working full time, the other half working at a rate of between 80 and 90 per cent. Their employers are, as a rule, major businesses operating in the services sector.

**Satisfaction with the HFW study programme**

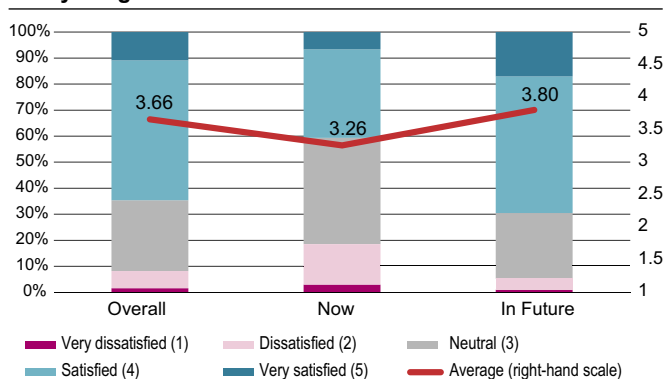
HFW students are overall satisfied with the study programme (see G 2). There is hardly any dissatisfaction. In addition, a breakdown of students according to area of activity shows that this is the case for all areas of activity. Students are somewhat more satisfied regarding their future career prospects than their current activities. This is significant since the improvement in career opportunities is frequently an important reason for embarking upon studies.

The general satisfaction with the study programme is also reflected by the fact that more than one half of students expect to earn a higher salary as a result of their studies. They expect to receive a salary increase of around 7.9 per cent over the medium term, corresponding to a salary increase of 7,600 Swiss francs per year. This expectation is also confirmed by employers. The expected salary increase is greatest for students working in the project management and accounting sectors, whilst the lowest salary increase is expected by those in HR, IT and organisational management and development.

**The framework curriculum meets the requirements**

These results indicate that the HFW study programme satisfies the requirements of students and employers. This

**G 2: Satisfaction of Students with the HFW Study Programme**



Data: HFW framework curriculum evaluation survey 2014 and 2015; N=1,122/1,171/1,174

conclusion is also confirmed by the results of previous surveys. In summary, the assessment reaches the conclusion that the framework curriculum is, considered overall, relevant. This survey and future surveys may also provide valuable information in identifying potential scope for improvement.

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The KOF Study No. 75 "Evaluation des Rahmenlehrplans für den Bildungsgang 'dipl. Betriebswirtschafter/in HF', Bericht zur zweiten Befragungswelle 2015" by Thomas Bolli, Maria Esther Egg, Ladina Rageth and Ursula Renold (in German) can be found on our website: [www.kof-studies/75/](http://www.kof-studies/75/) →

## Construction in Europe: Good Economic Prospects

The European construction sector has recovered from the crisis years and can hope for a continuation of the economic upswing. The Euroconstruct network, within which the KOF is the Swiss representative, forecasts an overall real increase of investment in construction for its 19 European member countries of 2.6 per cent per year for the years 2016 to 2018. Based on stable overall economic development and low interest rates, development in new residential construction and civil engineering is particularly dynamic.

The economic environment in the 19 Euroconstruct countries, which are represented by the national research institutes, is stable. In 2015, real gross domestic product (GDP) increased by 1.9 per cent (see G 3). For the first time in eight years, all countries posted an increase in economic activity. For the 2016-2018 period, the Euroconstruct institutes are forecasting this development to continue with average real annual growth of 1.9 per cent. This will be fuelled by private consumer spending as well as the labour market. Growth in public spending is projected to grow at a more modest rate of 0.8 per cent in 2017 and 2018. As before, inflation will remain low. The Euroconstruct institutes have however revised the inflation forecast upwards due to the increase in the price of oil compared to the last forecast (December 2015).

The recovery of the European construction industry continued into 2015 with a 1.4 per cent increase in investment in construction. The construction sector benefits from low interest rates, an increase in real disposable household income and stabilised residential construction. Euroconstruct



is forecasting an increase in aggregate construction activity by 2.6 per cent in 2016, 2.7 per cent in 2017 and 2.4 per cent in 2018.

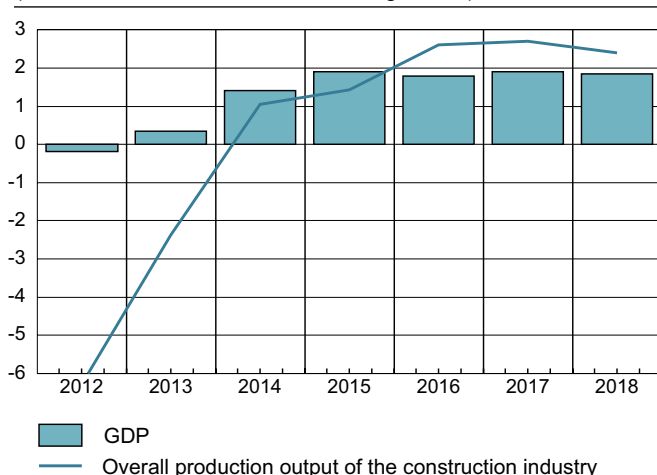
However, development is not uniform throughout the member countries. Particularly the Eastern European and Scandinavian countries along with Ireland are expecting dynamic development over the forecasting period. The largest contribution to economic growth over the coming years will be provided by France, which after years of recession is expecting an upswing in construction activity.

### Upswing supported by new residential construction and civil engineering

This year, residential construction is supporting the European construction sector with projected growth of 3.1 per cent (see G 4). There is positive development in particular in the area of new residential construction. In 2016, a total of 1.54 million new homes are expected to be completed, which represents an increase of 9.1 per cent compared to the low-point in 2013. An important driver for this has been the influx of refugees, particularly in Norway and Germany.

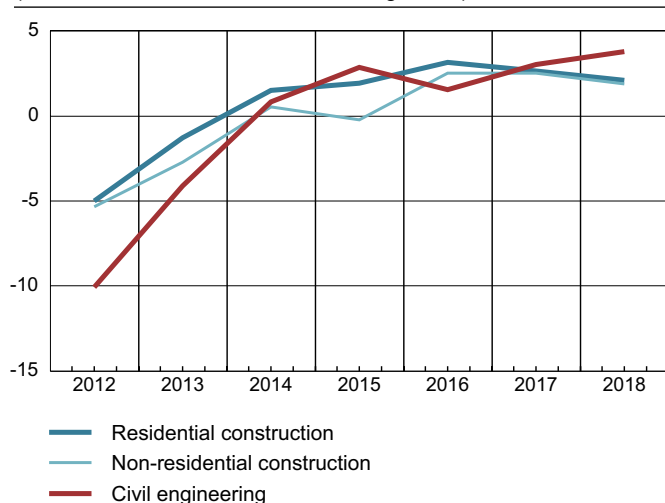
**G 3: GDP and Construction Sector Output 2012 to 2018**

(Source: Euroconstruct: annual change, in %)



**G 4: Development of Construction and Civil Engineering Between 2012 and 2018**

(Source: Euroconstruct: annual change in %)



Refurbishment activity accounts for around 60 per cent of residential construction and is developing stably, albeit with less dynamism than new-build construction.

Non-residential construction, which varies strongly in line with the overall economic situation, is forecast to grow by an average of 2.3 per cent per year over the period from 2016 to 2018. Ireland is expecting extraordinarily high construction activity in this segment in order to make up for the investment shortfall over the last few years. In Hungary, EU funds will support investment in the non-residential sector from 2014 until 2020. In particular the construction of offices and storage facilities is contributing to the upswing, whilst educational building is posting the weakest growth.

Public sector austerity measures as a result of the European debt crisis have kept a lid on civil engineering projects for a long time. In 2014, this segment recovered with growth of 0.8 per cent, and has been expanding further since 2015 (2.9%). Growth is expected to slow in 2016, although Euroconstruct is expecting an economic upswing in 2017 (3%) and 2018 (3.8%). This development is broadly supported throughout the European countries, with the exception of Finland, Portugal and Spain. Despite the financial restrictions on public spending, investment requirements associated with the influx of refugees (for example in Germany), the current inadequate state of infrastructure and positive economic growth prospects have contributed to dynamic development. Norway and Switzerland occupy the top positions in terms of civil engineering investment per capita.

**Contact**

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The 81st Euroconstruct Conference held in Dublin mid-June 2016. Euroconstruct is an association of European economic research institutes within the construction sector. Forecasts are presented twice each year concerning developments in the construction sector within the individual member countries. The KOF is the Swiss representative. Euroconstruct provides information, analyses and forecasts.

Further information is available at:  
[www.kof-euroconstruct](http://www.kof-euroconstruct) →



## KOF Forecast of Health Care Expenditure, Spring 2016: Moderate Trend Followed by Growing Dynamics



**Health care spending is set to rise further in the coming years. In 2016, KOF expects total health care expenditure to go up by 3.6 per cent. In the following year, the increase in spending will be more pronounced at 3.9 per cent. The share of health care expenditure in GDP will rise to 12.1 per cent in 2017. These are the results of the biannual KOF Forecast of Health Care Expenditures, which is carried thanks to a research contribution from the TopPharm AG.**

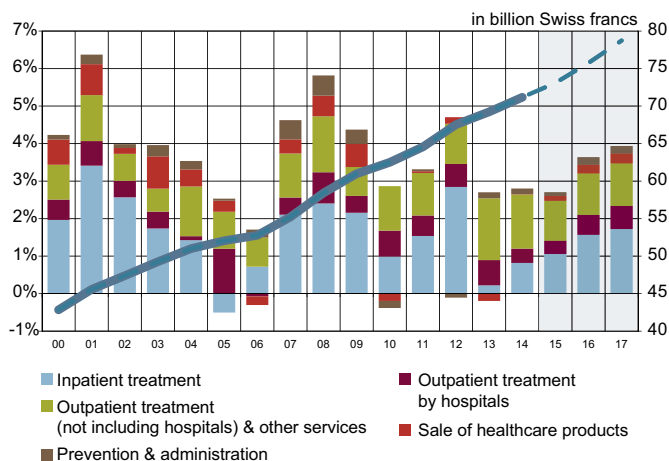
Since Switzerland's health care expenditure data are published with a time lag, KOF is also forecasting the increase in health care spending in 2015. The Swiss Federal Statistical Office published the 2014 data in May 2016.

In the forecast period 2015 to 2017, the rise in health care expenditure will remain moderate at the beginning and will subsequently gain momentum. KOF assumes a modest 2.7 per cent increase in spending in 2015 due, in particular, to the weaker economic environment and the cuts in drug prices, which entered into force in June 2013. According to the Swiss Federal Office for Public Health (FOPH), the cuts had resulted in savings of 720 million Swiss francs by 2015. The shift in expenditure from inpatient to outpatient

treatment persisted. Outpatient treatment continued to follow a dynamic trend (see G 5), especially in the "Spitex" and "Physiotherapy" categories.

The economic environment will remain subdued for the remainder of 2016. Nevertheless, health care spending is likely to pick up momentum (2016: 3.6%). Growing numbers of senior citizens are contributing to a steady increase in health care expenditure due to the growing need for health care at older age. In the following year, the macro-economic environment will brighten up, leading to a slightly stronger wage trend which, in turn, will result in a more pronounced increase in health care spending of 3.9 per cent.

**G 5: Contributions to Growth Broken Down by Service**



Within the framework of its “Health 2020” agenda, the Federal Council is pursuing substantial additional savings in the medium to long term. The cost impact of the measures planned in the context of the agenda has, however, not been included in the forecast since, with the exception of the drugs category, these measures are as yet too undefined to be incorporated into the projection.

The health care sector is playing an increasingly important role in the Swiss economy. In 2015, over 266,000 people (in full-time equivalents) were working in the health care industry. This figure translates into just under seven per cent of total employees in Switzerland. The sector’s share in added value is five per cent and the share of health care expenditure in GDP (health care expenditure ratio) is 11 per cent. In the years 2004 to 2014, the health care expenditure ratio increased from 10.4 per cent to 11.1 per cent and is expected to rise to 12.1 per cent by 2017.

**About the study**

The KOF Swiss Economic Institute at ETH Zurich publishes its forecast of Swiss health care expenditure on a biannual basis. The spring forecast is supported by the company TopPharm, while the autumn forecast is supported by the internet comparison service comparis.ch.

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You can find the detailed KOF Study “Frühjahrsprognose der schweizerischen Gesundheitsausgaben 2015–2017” by Marko Köthenbürger and Pauliina Sandqvist in German on our website: [www.kof-studies/79/](http://www.kof-studies/79/) →



# KOF INDICATORS

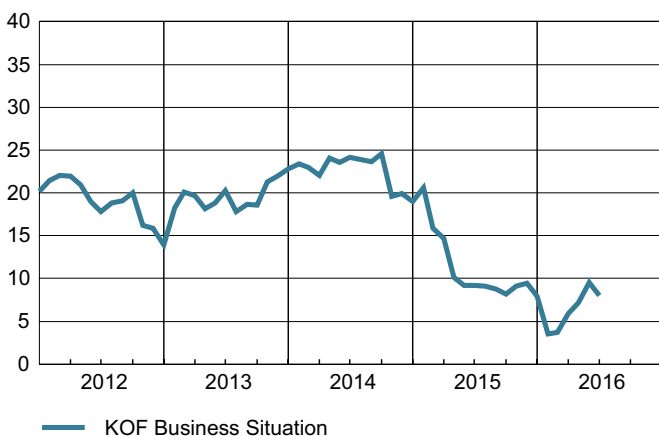
## KOF Business Situation: Business Situation Slips Back – Financial Services Face Headwind

In June, the KOF Business Situation Indicator for the Swiss private economy fell for the first time in four months. The decline in June is predominantly due to the financial and insurance service providers. However, the recent drop in the indicator is less pronounced than its rise in May. All in all, in mid-2016 Swiss companies are in slightly better shape than they were at the beginning of the year. Nevertheless, the strain caused by the strong Swiss franc remains noticeable.

The latest slow-down in the business situation is predominantly due to the financial and insurance service providers (see G 6). Similarly, the situation in the project engineering sector is no longer quite as favourable as in the preceding month. The construction industry has remained stable while the manufacturing industry and the retail trade have picked up to some degree. This represents a continuation of the recovery in the manufacturing industry where export-oriented companies in particular have been reporting a gradual easing of the business situation for a few months now. The wholesale trade, hotel and catering sector and other services were last surveyed in April. At the time, the wholesale trade and the hotel and catering sector considered their business situation to be less unfavourable than three months previously. The other service providers were affected by slight downward pressure.

At the regional level, the business situation in the Zurich region suffered a setback in June (see G 7). This is consistent

**G 6: KOF Business Situation Indicator**  
(balance, seasonally adjusted)



**G 7: KOF Business Situation: Change in Different Sectors**



with the general industry pattern since financial and insurance service providers, whose overall business situation has weakened, are well-represented in the Zurich region. In Ticino, the Lake Geneva region and Eastern Switzerland, the situation has hardly changed. In contrast, the comparably favourable situation in Espace Mittelland, in North-West Switzerland and especially Central Switzerland has improved further.

**G 8: KOF Business Situation in the Private Sector**



The angle of the arrows reflects the change in the business situation compared to the previous month

Source: KOF

**Net balances**

■ 55 to 100	■ 30 to under 55	■ 16.5 to under 30
■ 9 to under 16.5	■ 5 to under 9	■ -5 to under 5
■ -9 to under -5	■ -16.5 to under -9	■ -30 to under -16.5
■ -55 to under -30	■ -100 to under -55	

**Explanation of Graphs**

Graph G 6 presents the KOF business situation across all sectors covered by the survey. The business situation in sectors which are surveyed on a quarterly basis is kept constant during the intervening months.

Graph G 7 presents the business situation and the current changes. In the case of the monthly surveys, the changes over the previous month are highlighted. In the case of the quarterly surveys, the changes between the latest quarterly

value and the previous quarter are marked. The quarterly values are updated in the first month of every quarter and are not adjusted during the intervening months.

Graph G 8 presents the business situation in the main regions according to the Federal Statistics Office. The regions are coloured according to business situation. The arrows in the regions indicate the change in the business situation compared to the previous month. An upward-pointing arrow, for instance, indicates that the situation has improved over the previous month.

The KOF business situation is based on more than 4,500 reports from businesses in Switzerland. Each month businesses are surveyed in the economic sectors of industry, retail trade, construction, project engineering and financial and insurance services. Businesses in the hotel and catering sector, wholesalers and other service providers are surveyed quarterly in the first month of each quarter. Businesses are requested, amongst other things, to assess their current business situation. They may class their situation as “good”, “satisfactory” or “bad”. The balance of the current business situation is the percentage difference between the answers “good” and “bad”.

**Contact**

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You can find more information about the KOF Business Tendency Surveys on our website: [www.business-tendency-surveys.ch](http://www.business-tendency-surveys.ch) →



## KOF Economic Barometer: Stable Development

**In June, the indicator value of the KOF Economic Barometer continued to be above its historical average. It reached a value of 102.4 compared to 101.8 in May (see G 9). Overall, the KOF Economic Barometer indicates a stable condition of the Swiss economy.\***

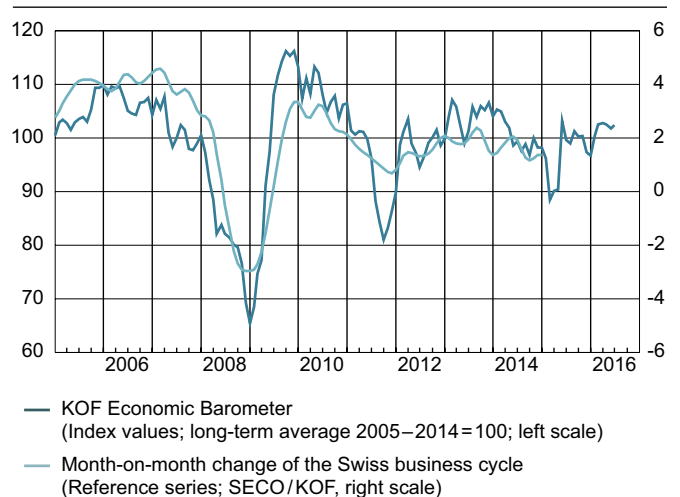
Positive impetus for the development of the Barometer in June came from the indicators related to export opportunities for Swiss companies and from the indicators of construction activity, the positive development here being mainly driven by the project engineering bureaus. In the actual construction industry, the situation is unchanged. Within the manufacturing sector in particular the prospects for mechanical engineering brightened. For chemistry and food manufacturers the outlook, however, is not as good as before. The perspectives for private consumption as well as for the banking industry worsened.

In the manufacturing sector, in particular the stock and the business situation had a negative effect. Positive signals came, however, from production and to a lesser extent from the order books and the intermediary products.

### KOF Economic Barometer and reference time series: annual update

This annual update concerns the following stages: redefinition of the pool of indicators that enter the selection procedure, update of the reference time series, a new execution of the variable selection procedure and a technical adjustment of how to cope with missing monthly values of quarterly variables. Compared to 479 indicators that entered the variable selection procedure in October 2014, the current pool comprises 420 indicators due to elimination of KOF surveys related to prices and monthly changes in inventories. The updated reference series is the smoothed continuous growth rate of Swiss GDP according to the new System of National Accounts ESVG 2010, released at the end of August 2015, which takes into account the release of the previous year's annual Gross Domestic Product (GDP) data by the Swiss Federal Statistical Office. As a result of the indicator variable selection procedure, the updated KOF Economic Barometer is now

**G 9: Economic Barometer and Reference Series**



based on 238 indicators (instead of 217 as in the previous vintage) that are combined using statistically determined weights. Last but not least, with this annual update we introduce a slight modification of how the variables observed at only the quarterly frequency are treated when computing the Barometer. Instead of freezing those values until the next quarterly release is available, we now implement a statistical procedure to interpolate data values for these variables using the information contained in all other variables that are available at monthly frequency.

### Contact

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For detailed information on the KOF Economic Barometer, visit our website:  
[www.economic-barometer.ch](http://www.economic-barometer.ch) →

\* Note: The data included in the Barometer reflect the situation before the publication of voting results in the United Kingdom. The above-average revision of the value of the previous month is mainly due to late survey responses from companies for May, which at that time could not be included in the publication of the Barometer.



# AGENDA

## KOF Events

### **KOF Prognosetagung Herbst 2016**

Die schweizerische Wirtschaftsentwicklung bis 2018  
Gastreferent: Prof. Clemens Fuest,  
Präsident ifo Institut, München  
ETH Zürich, Donnerstag, 6. Oktober 2016, 17.15 Uhr

### **KOF Research Seminar:**

#### **Optimal Energy Taxation in Cities**

Jan Brueckner – University of California, Irvine  
ETH Zurich, 11 July 2016

#### **Fiscal Transfers and Ricardian Equivalence**

Markus Brueckner – The University of  
Queensland, Australia  
ETH Zurich, 25 July 2016

#### **Toward Robust Early-Warning Models:**

##### **A Horse Race, Ensembles and Model Uncertainty**

Peter Sarlin – Hanken School of Economics, Finland  
ETH Zurich, 3 August 2016

#### **A Descriptive Model of Banking and Aggregate Demand**

Mark Mink – De Nederlandsche Bank  
ETH Zurich, 1 September 2016

#### **Can Regional Trade Integration Lead to Spatial Deconcentration?**

Alexander Himbert – Université de Lausanne  
ETH Zurich, 21 September 2016

#### **Did the Swiss Exchange Rate Shock Shock the Market?**

Gregor von Schweinitz –  
Halle Institute for Economic Research (IWH)  
ETH Zurich, 5 October 2016

#### **tba**

Eric Verhoogen – Columbia University  
ETH Zurich, 19 December 2016

Jean-Robert Tyran – University of Vienna  
ETH Zurich, 18 January 2017

Alfonso Flores-Lagunes – Syracuse University  
ETH Zurich, 15 March 2017

[www.kof.ethz.ch/kof-research-seminar](http://www.kof.ethz.ch/kof-research-seminar) →

### **KOF-ETH-UZH International Economic Policy Seminar:**

#### **tba**

Samuel Kortum – Yale University  
ETH Zurich, 22 September 2016

Alex Whalley – University of California  
ETH Zurich, 15 December 2016

[www.kof.ethz.ch/kof-eth-uzh-seminar](http://www.kof.ethz.ch/kof-eth-uzh-seminar) →

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## KOF Publications

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Analyses, KOF Working Papers and KOF Studies) on our  
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# TABLE KOF SUMMER FORECAST 2016

## SWITZERLAND

Real Gross Domestic Product by Type of Expenditure																
Percentage change against																
	2006-2014	previous quarter (annualized, trend cycle component)												previous year		
		2015				2016				2017				2015	2016	2017
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Private consumption	1.7	0.8	1.0	1.2	1.5	1.9	1.8	1.5	1.4	1.4	1.5	1.4	1.4	1.1	1.6	1.4
Public consumption	1.0	3.4	1.7	1.5	1.5	2.2	2.2	1.0	0.1	0.6	0.7	0.2	0.5	2.4	1.5	0.8
Gross fixed capital formation	1.9	2.1	2.3	0.0	-0.2	2.6	3.5	0.7	-1.5	-0.9	0.3	0.7	4.0	1.5	1.4	0.3
– Construction	1.6	-1.3	-2.8	-3.7	-0.3	4.2	3.9	1.8	0.3	-0.3	0.2	1.4	1.9	-1.2	1.4	0.7
– Machinery and equipment	2.0	3.8	4.8	2.1	-0.5	1.7	2.7	-1.9	-2.7	0.5	1.6	0.5	5.3	3.4	1.4	0.0
Exports of goods (1) and services	3.6	1.3	4.8	5.8	5.1	3.5	1.4	0.7	2.4	3.3	3.7	2.9	3.1	2.0	3.5	2.7
– Goods	3.3	-4.3	-0.4	6.6	11.4	7.9	0.3	0.3	3.2	4.2	4.4	4.0	3.8	0.6	5.4	3.2
– Services	3.0	-1.0	0.6	-0.6	-3.6	1.2	3.8	0.9	1.8	2.3	1.8	1.7	1.9	0.2	0.9	1.8
Imports of goods (1) and services	3.3	-1.1	-2.0	2.9	8.6	7.6	4.7	2.5	2.0	4.1	3.8	2.0	2.8	1.6	4.9	3.2
– Goods (1)	2.6	-5.1	-6.3	1.6	11.7	8.3	4.2	3.6	2.7	5.2	4.7	2.2	3.3	-1.3	4.9	4.0
– Services	5.1	6.7	5.1	5.2	3.5	6.6	5.4	1.0	0.9	1.6	1.8	1.9	1.9	7.4	4.8	1.6
Change in stocks (2)	0.2	-1.6	-4.5	-2.5	-0.2	-0.8	-0.5	1.3	1.1	1.4	0.7	0.1	-0.3	-0.8	-0.9	0.9
Gross Domestic Product (GDP)	2.0	0.6	-0.1	0.3	0.8	1.2	1.3	1.6	1.9	2.0	2.1	1.9	2.0	0.9	1.0	1.9

(1) Without valuables (i.e. precious metals including non-monetary gold, precious stones and gems as well as objects of art and antiquities)

(2) Percentage contribution to GDP-growth

Other Macroeconomic Indicators																
Percentage change against																
	2006-2014	previous quarter												previous year		
		2015				2016				2017				2015	2016	2017
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Real effective exchange rate of CHF (1)	1.5	38.3	7.4	-11.4	-6.3	-2.3	-2.0	-5.7	0.0	0.1	-2.1	-3.5	0.4	7.0	-3.9	-1.7
Short term interest rate (3-month Libor CHF) (2)	0.8	-0.7	-0.8	-0.7	-0.8	-0.8	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.7	-0.8	-0.7	-0.7
Yield of 10 years federal bonds (2)	1.8	0.0	0.0	-0.1	-0.2	-0.4	-0.3	-0.2	-0.1	-0.1	0.0	0.1	0.2	-0.1	-0.3	0.1
Consumer prices (3)	0.4	-0.7	-1.1	-1.4	-1.4	-1.0	-0.4	-0.2	0.0	0.2	0.1	0.2	0.3	-1.1	-0.4	0.2
Full-time equivalent employment (4)	1.5	1.4	0.5	-0.2	-0.6	-0.2	0.4	0.7	0.5	0.5	0.5	0.7	0.9	0.8	0.0	0.6
Unemployment rate (2,5)	3.0	3.2	3.3	3.3	3.4	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.3	3.5	3.6

(1) Annualized

(2) Level

(3) Same quarter of previous year

(4) Smooth components annualized

(5) Unemployed as percentage of labour force according to census of 2010

## GLOBAL ECONOMY

Percentage change against																
	2006-2014	previous quarter (annualized, seasonal adjusted)												previous year		
		2015				2016				2017				2015	2016	2017
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4			
Real Gross Domestic Product (GDP)																
– OECD total	1.3	2.0	2.4	2.0	0.9	1.7	1.8	1.7	1.8	1.8	1.8	1.7	1.8	2.0	1.7	1.8
– European Union (EU-28)	0.8	2.4	1.8	1.5	1.6	2.5	1.2	1.4	1.7	1.6	1.7	1.6	1.6	1.9	1.7	1.6
– USA	1.3	0.6	3.9	2.0	1.4	0.8	2.8	2.4	2.2	2.4	2.3	2.2	2.2	2.4	1.9	2.3
– Japan	0.5	5.2	-1.7	1.7	-1.8	1.9	1.0	0.9	1.0	0.9	1.0	1.1	1.2	0.5	0.6	1.0
Oil price (\$ per barrel) (1)	89.8	54.0	62.1	50.0	43.4	34.5	47.0	50.1	50.3	50.5	50.8	51.1	51.3	52.4	45.5	50.9

(1) Level

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