

## Locational Quality 2016

September 2016

Swiss Issues Regions

# Locational Quality: Basel-Stadt Set to Overtake Canton Zurich



LQI 2016  
**Zug at the top, Aargau in  
third place**

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LQI outlook for 2020  
**Basel-Stadt overtakes  
Zurich, Geneva makes  
the greatest advance**

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## Management Summary

**Quantitative analysis of the locational quality of Switzerland's cantons and regions, together with annual publication of the results, has been part of the Credit Suisse research offering since 1997. The methodology used for the Locational Quality Indicator was last comprehensively revised in 2013. In this study, we present the results for 2016 and an outlook for 2020.**

### Seven partial indicators

The long-term economic potential of a region is determined by the overall conditions for business. Firms tend to invest primarily in attractive locations, thus creating jobs and bringing added value and prosperity. Intense competition between different locations is forcing the Swiss cantons and regions to take steps to optimize their appeal to the greatest extent possible. The Credit Suisse Locational Quality Indicator measures the attractiveness of the Swiss cantons and regions to business, concentrating on seven “hard” location factors in the process. In this way, it serves on the one hand as a guide for companies that are in the process of weighing up various potential locations, and on the other as a benchmarking tool for the optimization of cantonal and regional location policy.

### Alpine cantons face challenging conditions

The highest locational quality is exhibited by the Canton of Zug, followed by Zurich and Aargau. The top rankings are not based on just one indicator, but are the result of an ideal combination of various locational advantages. The mountainous, peripheral cantons, such as Jura, Valais, and Graubünden, come in below the national average. The primary reason is their challenging topography, which by its nature limits their accessibility, and is not easily overcome.

### Enormous differences within the cantons

Within a canton, there are considerable differences at the regional level in attractiveness for business. The city of Bern, for example, is ranked 24th of the 110 economic regions, while Kandertal only reaches 107th place. In Graubünden, the Rheintal takes 54th place, while Surselva is ranked 100th. Similarly large discrepancies can be found in Vaud, such as that between Lausanne (40th place) and Pays d'Enhaut (108th). It can be difficult to formulate location policy in such heterogeneous cantons, since regulations and stimulus measures cannot necessarily be tailored to regional conditions.

### Major shifts from 2020 onward

The Corporate Tax Reform III (CTR III) will have a fundamental impact on the country's tax system, presumably as of 2019. Most cantons will reduce their corporate profit tax rates in order to offset the elimination of tax privileges for holding companies and management companies. The cantonal rankings will be affected heavily by these measures: Basel City is set to replace Zurich in second place, while Geneva and Vaud will climb significantly in the rankings. Cantons with little to offer besides a low tax rate will lose relative attractiveness. Moreover, the opening of the Gotthard base tunnel and Ceneri base tunnel increase the accessibility of Cantons Ticino and Uri, although this has only a minor impact on the locational quality indicator.

## The Credit Suisse Locational Quality Indicator

# Overall Conditions: Basis for the Economic Success of a Region

The Credit Suisse Locational Quality Indicator (LQI) measures the relative attractiveness of Swiss regions and cantons from a business perspective. Locational quality is assessed by means of a relative index based on the following seven quantitative partial indicators: tax burden on legal entities and private individuals, availability of specialist labor and highly-qualified personnel, population accessibility, employee accessibility, and access to airports.

**"It's the economy, stupid!"**

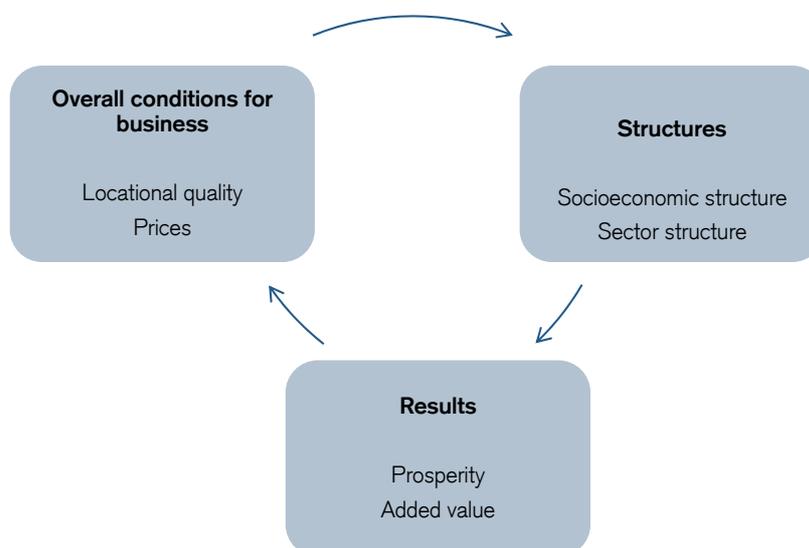
Governments promise their voters prosperity. This objective lies at the heart of all government programs in democracies, and Switzerland is no exception. For instance, the latest crisis period showed that, say, climate targets take a back seat as soon as prosperity can no longer be guaranteed. The question is, though: How can prosperity and added value be achieved or increased? The consensus view is that overall economic conditions play a vital role, because prosperity is always based on added value that was generated previously. Therefore, in order to increase their chances of re-election, governments – or the members of a consensus government – have every incentive to seek to optimize the overall economic conditions.

**High locational quality implies high economic potential**

Not all Swiss regions are equally successful in economic terms. Besides immutable natural conditions, locational quality constitutes the foundation for a region's economic potential. Depending on the overall conditions offered and the structures on which they are based, the regions achieve varied results (see figure). New businesses settle in attractive locations, while those already based there invest more heavily than in less attractive regions. Newly attracted businesses or investments increase a region's potential added value, thus creating jobs and income for the residents of the catchment area.

### Impact Model for a Region's Economy

Indicative illustration



Source: Credit Suisse

**Overall conditions:  
Starting point for economic  
policy**

The overall conditions for business include prevailing laws, market conditions, natural and geographical factors, prices, as well as other fundamentals for business activity. Whereas factors such as topography or geographical distances to other locations are immutable, politicians are able to shape (e.g. through tax policy) or at least influence (e.g. by investing in transport to increase accessibility) some of the overall conditions. On the other hand, past experience shows that political influence on economic structures rarely proves sustainable. Redistribution policy is geared toward economic results, but is unable to increase total prosperity or added value.

**The population and economic structure of a region...**

Based on the overall conditions offered, a population and economic structure has formed in each region over the years: Tax-sensitive companies and private individuals systematically seek out low-tax regions. Central locations, for instance, are particularly suited for service and retail businesses, while logistics-intensive firms prefer locations close to the main transport arteries. Regional cost levels may force businesses to relocate their activities to lower-cost areas or to other countries; this explains why manufacturing decided to move out of the cities. Workers choose where to live on the basis of their place of work, the resulting commute, the financial attractiveness of the location where they live, as well as other criteria that together form a region's sociodemographic structure.

**...constitute the basis for its economic results**

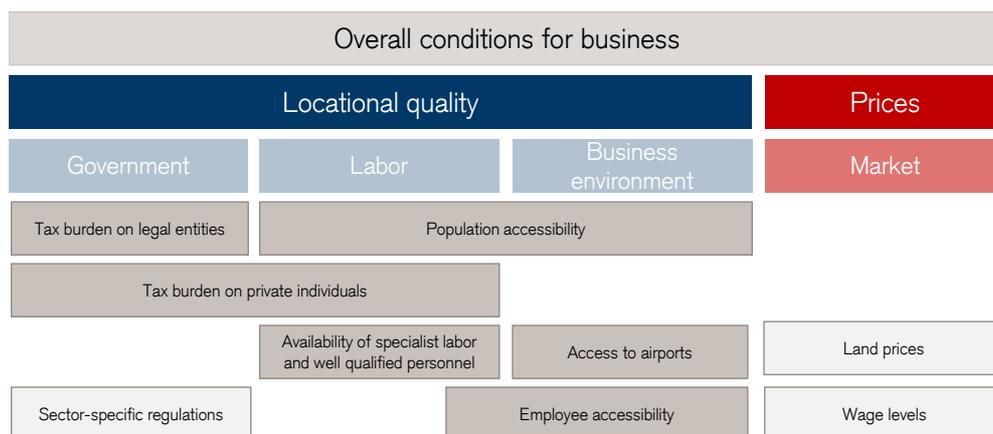
Depending on the structural parameters of a region, economic activity has varied implications for the economic results of a region. Thus a recession in structurally weak areas can have a more damaging effect on incomes and added value than a recession in structurally robust regions. The socioeconomic structure of the population is key to the level of regional incomes: Composition of age groups, job types, nationalities, etc. Besides added value and prosperity, economic activity also produces undesirable results such as waste and consumption of resources.

**How do we measure locational quality?**

The competition between locations constitutes a market just like any other. From a number of different locations, companies choose the one that suits them and pay the market price for it. Locational quality therefore represents the sum of all the advantages that a specific location has to offer compared with other locations (see figure). The aim of our indicator is to record locational quality in a generally representative form. The individual location factors are grouped together in the following categories: Labor, business environment, and government. As in other markets, the attractiveness of a location is a key determinant of prices. Besides land costs and rents, these include regional wage levels as well as other components of costs.

**Locational Quality and Prices from a Business Perspective**

Focus on "hard" locational factors; not an exhaustive illustration



Source: Credit Suisse

**Objective: To record the differences between the Swiss regions**

We focus solely on "hard" locational factors that constitute quantifiable, generally relevant criteria. Measurement of "soft" factors – such as the quality of the landscape and quality of services provided by the authorities – is more difficult, as they are not quantifiable or are subject to individual value judgments. In order to compare the locational quality of Switzerland's regions, we also omit national factors that are identical across the country. The availability of capital, for example, is an important criterion for investment; however, the differences between the Swiss regions are barely worth mentioning.

**Seven factors for measuring locational quality**

In days gone by, locational quality centered on criteria such as arable land, proximity to raw materials, and access to energy from watercourses. From the perspective of today's sector structure, however, other locational factors have moved center-stage: Knowledge-intensive industrial and service-sector firms are above all dependent on highly qualified labor, a low tax burden, and good transport connections. As competition between locations is geared first and foremost toward businesses that generate a high level of added value, we approach the issue primarily from their perspective. Our focal points are the availability of labor, the business environment, and government. All companies are dependent on these locational factors in one form or another, meaning the criteria are universal in nature:

<b>Tax burden on legal entities</b>	Taxes on profits and capital are directly relevant to the success of a business.
<b>Tax burden on private individuals</b>	Low taxes on income and wealth help to attract qualified labor.
<b>Availability of specialist personnel</b>	Manufacturing and commercial businesses are dependent on workers with professional training.
<b>Availability of highly-qualified personnel</b>	In knowledge-intensive areas of the economy, highly qualified employees are the key factor of production.
<b>Population accessibility</b>	The bigger the catchment area and more efficient the infrastructure, the greater the proximity to end-customers and human resources.
<b>Employee accessibility</b>	Proximity to other companies simplifies external cooperation and business-to-business trading.
<b>Access to airports</b>	A vital locational factor for firms with international operations.

### Prices: Flipside of the coin

The costs associated with setting up a business are a key locational factor. However, prices are essentially a reflection of quality: For example, real estate prices will likely be higher at especially sought-after locations. Therefore, prices are deliberately omitted from the calculation of locational quality.

### Locational quality: A quantitative assessment of economic potential

Individual partial indicators are assessed at municipality level and summarized to produce an overall indicator. Weighting of the partial indicators is based on their relative influence on economic development in the past. Values can then be aggregated across the various regional levels – cantons and economic regions. As locational quality is not measurable in absolute terms, the results are shown in standardized form, relative to the Swiss average and to the other regions. An individual improvement – such as a tax cut by a canton – therefore leads to a relative decline in the locational quality of the other regions. From an overall perspective, the economic potential and individual strengths and weaknesses of a region can therefore be measured in quantitative terms.

## Locational quality 2016

# Locational Quality of Switzerland's Cantons and Regions

**Zug and Zurich top the list of cantonal rankings, with Aargau following in third place. Tax measures have made Schwyz and Glarus less attractive to businesses.**

### Stability at the top, crowded mid-field

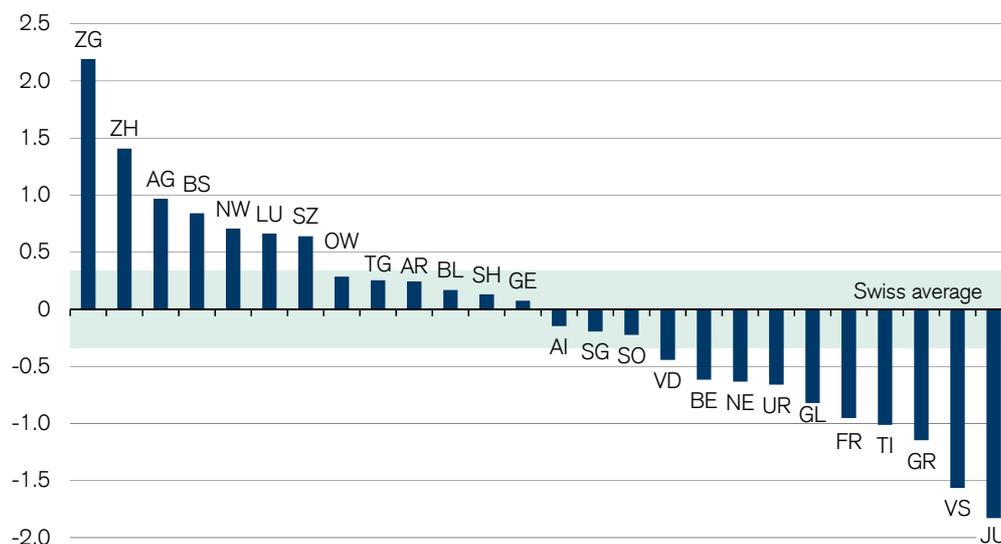
The Locational Quality Indicator (LQI) expresses the attractiveness of Switzerland's cantons and regions as a synthetic index compared with the Swiss average of zero. Values of between -0.3 and +0.3 can be described as average; higher values signal above-average attractiveness and lower values lower-than-average attractiveness. The highest locational quality, by a wide margin, is shown by the Canton of Zug, followed by Zurich (see figure). Next comes a group of five contenders: Aargau, Basel-Stadt, Nidwalden, Lucerne and Schwyz. A series of suburban cantons, plus the city canton of Geneva, make up the broad midfield.

### Not all metropolitan cantons rank high

Rural and mountainous cantons come in below the national average. Their natural overall conditions – such as topography and distance to larger economic centers – make location policy difficult, and are largely immutable. Positioning can be influenced, however, as illustrated by the example of the Canton of Uri, which is significantly better positioned than other mountain cantons. The metropolitan cantons of Bern and Vaud also come in below the Swiss average.

### Locational Quality of Swiss Cantons, 2016

Synthetic index, CH = 0



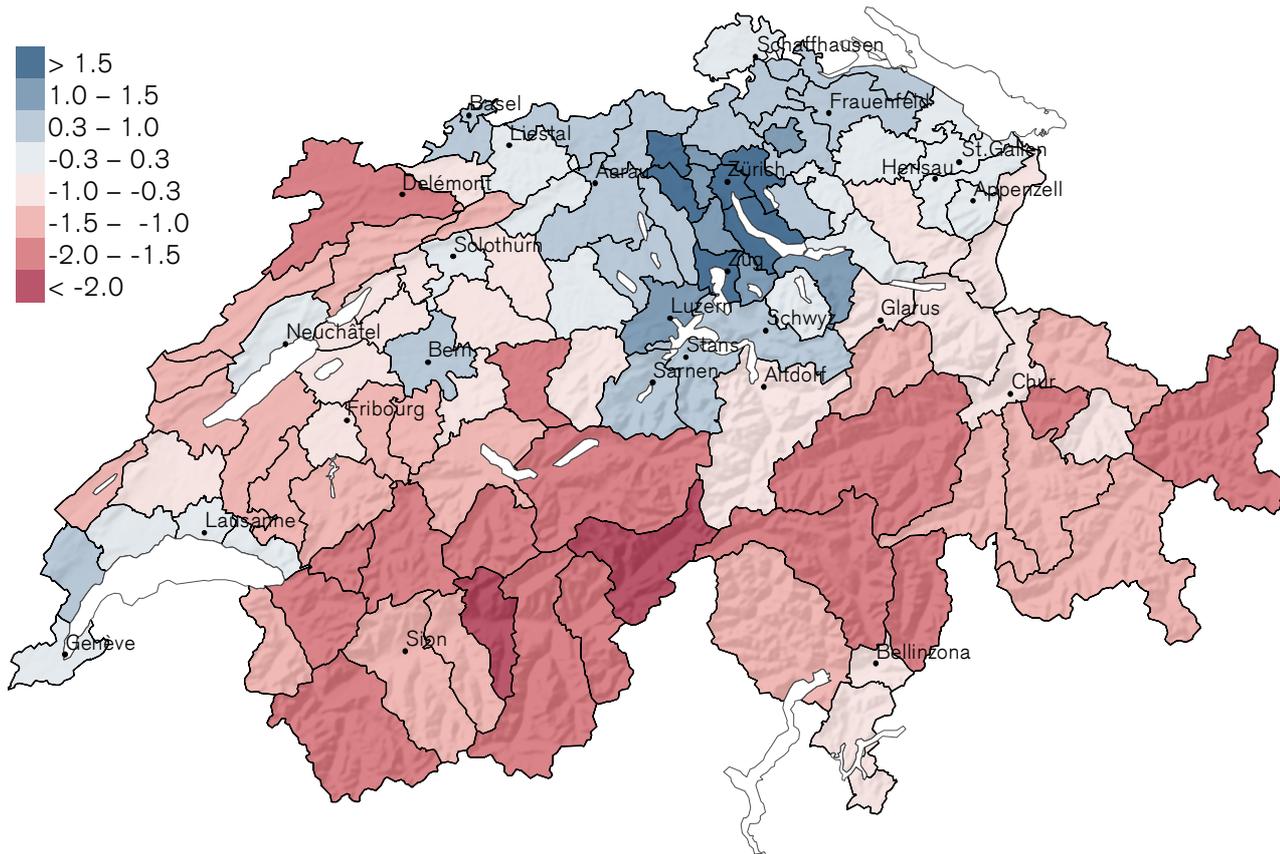
Source: Credit Suisse

### Regional view: Significant differences within the cantons

For the larger, heterogeneous cantons – such as Bern, Vaud, Ticino or Graubünden – an analysis merely at cantonal level is too superficial. Thus we also examine locational quality at the level of Switzerland's economic regions. The highest degree of attractiveness is exhibited by the centers Zurich, Zug, Baden, Lucerne, Basel, and Bern, as well as their agglomerations, thanks mainly to their accessibility. In the Suisse Romande, Nyon is positioned well above the neighboring regions, and in Ticino the same is true for Medrisio and Lugano. Alpine areas and the regions of the Jura arc are clearly less attractive to companies, due to their topographical features and, in some cases, the length of travel time into the urban centers. The varying conditions in different regions make it difficult for cantons to orient their location policy towards their individual strengths and weaknesses. For example, from a business viewpoint, an above-average tax burden is less of a disadvantage in urban centers than it is in peripheral regions. This is because, from a cost-benefit viewpoint, the generally larger offering of government services and infrastructure in urban areas compensates for the greater expense. An overview of the locational quality of economic regions and individual locational factors is located in the annex.

**Locational Quality Indicator for Swiss Economic Regions\***

2016, synthetic index, CH = 0



Source: Credit Suisse, Geostat

\* The 110 Swiss Economic Regions reflect the economic conditions in the best possible way and they do not always follow political borders. The economic regions, which comprise more than one canton, are labeled with an asterisk in the annex (see p.22).

## Outlook for locational quality in 2020

# Basel-Stadt overtakes Zurich, Geneva makes the greatest advance

Several factors of locational quality will change significantly in the years ahead. On the one hand, the Corporate Tax Reform III (CTR III) is set to have a fundamental impact on the corporate tax system. Furthermore, the completion of the NEAT rail link through the alps as of 2020 will boost the accessibility of central and southern Switzerland. In view of these upcoming changes, we have sketched out a forecast of locational quality in 2020.

### Tax on profits will be lower after CTR III

Based on the already announced changes to corporate taxation (see page 14), we recalculated the LQI factor measuring fiscal appeal for legal entities. For this hypothetical reshuffle of cantonal rankings, we took into consideration all publicly available information from cantonal authorities up until the editorial deadline. Some cantons have already announced their future tax rates, while others are reviewing but have not yet disclosed possible changes. The newly calculated cantonal ranking – based on the information available as of this writing – is intended to give an idea of the direction locational quality could take.

### NEAT: The new tunnels through the alps pull Switzerland closer together

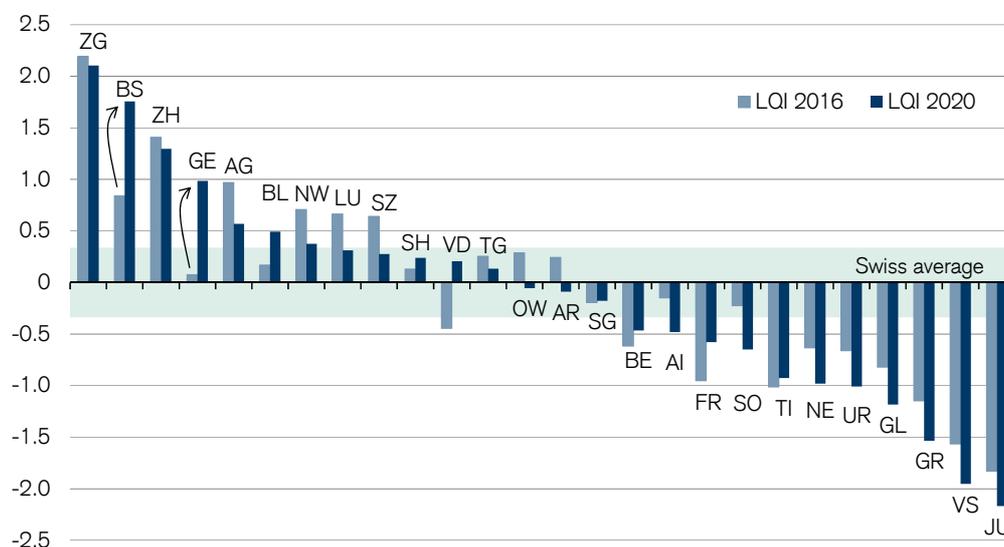
The NEAT rail link through the alps will considerably improve the accessibility of regions in Ticino and Uri. Their catchment areas will expand, and they will be “closer” to major cities. In order to quantify the effects of the project, we modeled the complete timetable of public transportation (PT) following the opening of the Gotthard base tunnel and Ceneri base tunnel. We recalculated the catchment areas of every Swiss town based on all 450 million connections between every square kilometer, as well as preferred travel times. We further included the impact of foreign urban areas. The improvements in PT accessibility will result in changes to the indicators of transport accessibility (see page 20), which in turn will affect the locational quality rankings.

### LQI 2020: Zug defends its place at the top

The greatest advances are likely to be made by Canton Geneva (+9 places), Vaud (+6) and Basel-Landschaft (+5). For these cantons, the current fiscal disadvantage of high corporate taxes will disappear, allowing them to gain ground in the locational quality indicator. While the Canton of Zurich has occupied second place since we began our survey of locational quality, it is set to be overtaken by Basel-Stadt and pushed to third place.

## Locational quality of the Swiss cantons: 2016 vs. 2020

Locational quality indicator (LQI), synthetic index, CH = 0, 2016 and after recalculation of partial indicators for accessibility and tax burden for legal entities



Source: Credit Suisse

**Will the founding cantons lose their cachet?**

Lowering standard rates of corporate income tax raises locational quality. However, given the relative assessment of locational quality, cantons may still lose rank in the LQI despite easing the tax burden. For example, the cantons that have long granted the greatest fiscal incentives are losing their relative advantage: The indicator ranking for every canton in Central Switzerland except Zug, as well as the two Appenzells, is set to fall. Cantons such as Lucerne and Neuchâtel, where profit tax was lowered early, will also drop back in the ranking as the other cantons catch up.

**NEAT has little influence on LQI**

Compared to the tax cuts, improvements in PT accessibility gained from the opening of the Gotthard base tunnel and Ceneri base tunnel have only a minor impact on the LQI. Despite the future second road tunnel through the Gotthard massif – which in any case is not scheduled to open before 2030 – road capacity will not increase nor will the travel time decrease. The new rail connection gives Ticino an additional 0.04 index points, Uri 0.01. Nonetheless, the NEAT should have a positive effect in Ticino and Uri on specific sectors, such as day tourism, logistics providers and commuters, and thus on the real estate market.<sup>1</sup>

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<sup>1</sup> See Credit Suisse Bulletin 02/2016: Gottardo.



### Few shifts in the case of private individuals

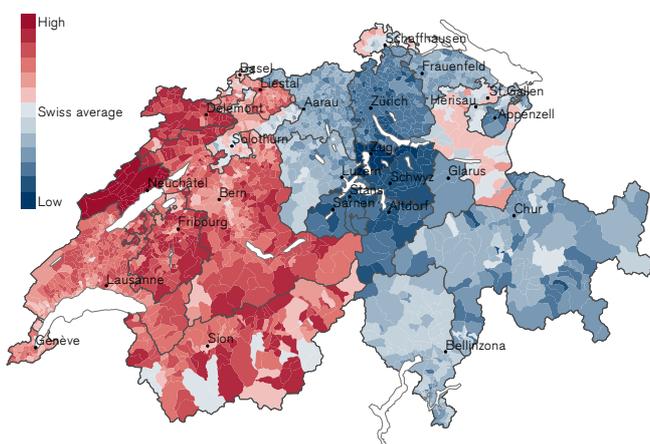
The cantons with the lowest tax rates for private individuals remained virtually unchanged in 2016<sup>2</sup> compared with a year earlier: Zug widened its lead on Schwyz, where a decision was made in 2015 to raise the tax rate for the first time in decades. Nidwalden comes next, followed by Uri, which overtook Obwalden in 2009 with the introduction of its flat rate tax. Big shifts such as Uri's were not repeated in recent years, however. Only Vaud advanced four places in the current ranking to reach 21st place, ahead of Valais, Bern, Fribourg, Jura and Neuchâtel, in last place. On balance, Switzerland is still split when it comes to tax policy: the Suisse Romande has significantly higher standard tax rates for private individuals (see figure).

### Legal entities: Advancing Neuchâtel ends its steady lowering of corporate taxes since 2010

As for taxation of legal entities, there were also only minor shifts from 2015 to 2016. The lowest corporate tax rates were in Central Switzerland (see figure): Nidwalden, Appenzell Ausserrhodens and Lucerne topped the rankings, followed closely by Obwalden, Appenzell Innerrhodens, Zug and Schwyz. Neuchâtel, which is concluding its 6-year profit tax reduction program in 2016, climbed another two notches to 8th place. This canton, which ranked 25th in 2010, is now the most attractive in Western Switzerland in terms of corporate tax rates. Aargau trimmed its profit tax rate somewhat and climbed four notches to 10th place. There were only slight changes in the lowest third of the ranking. Basel-Stadt and Geneva continue to occupy the lowest places with their comparably high standard tax rates. However, these two cantons are nonetheless attractive locations for companies with tax privileges – a factor that cannot be included in our ranking system.

#### Tax burden on private individuals

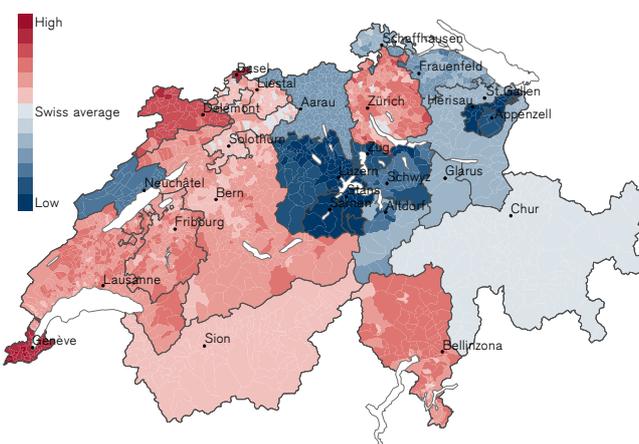
Taxes on income and wealth, synthetic index, 2016<sup>1</sup>



Source: TaxWare, cantons, Credit Suisse

#### Tax burden on legal entities

Taxes on profit and capital, synthetic index, 2016<sup>1</sup>



Source: TaxWare, cantons, Credit Suisse

### CTR III: A complete overhaul

The Swiss parliament approved the final bill on the third series of corporate tax reforms (CTR III) in June 2016. The reform aims to align corporate taxation in Switzerland with international standards.<sup>3</sup> Today, holding and management companies that generate most of their sales and costs outside Switzerland can profit from substantial tax privileges or even complete tax exemptions. This unequal taxation of profits generated in or outside Switzerland will no longer be permitted. Instead, new privileges will be introduced at cantonal level that are recognized abroad as well. Many companies will probably not be able to benefit from the planned new tax instruments (especially the patent box and R&D super deduction). As a result, cantons must design their fiscal appeal increasingly via their standard rates of corporate income tax. Accordingly, a majority of the cantons are planning to reduce profit taxes. The federal government will support these efforts by raising the share of the direct federal tax revenue, which the cantons receive.

### CTR III shakes up cantonal rankings

By now most of the cantons have announced at least an approximation of their future standard tax rates. Based on the adjustments to profit and capital tax rates already known as of September 2016, we recalculated the tax burden for legal entities (see figure). Different cantons are considering an adjustment to their tax rates, but have not yet published their conclusions. So the cantonal rankings are likely to shift further. In addition, tax cuts must be approved by the

<sup>2</sup> All tax data are drawn from 2016, wherever possible. In seven cantons, the most recent rates were not yet (AI, SG, TG, VS) or not yet completely (LU, FR, TI) available. In these cases, the tax data from 2015 were used.

<sup>3</sup> Further information can be found in the Lake Geneva Regional Study: "Corporate Taxes: Vaud and Geneva under Pressure", Credit Suisse, February 2016.

electorate in most of the cantons. The newly calculated hypothetical cantonal ranking – based on the information available as of the editorial deadline– is intended to give an idea of the direction locational quality could take. CTR III will intensify fiscal competition.

**Basel-Stadt, Vaud and Geneva shoot up the ranks, Zug takes first place for corporate taxes too**

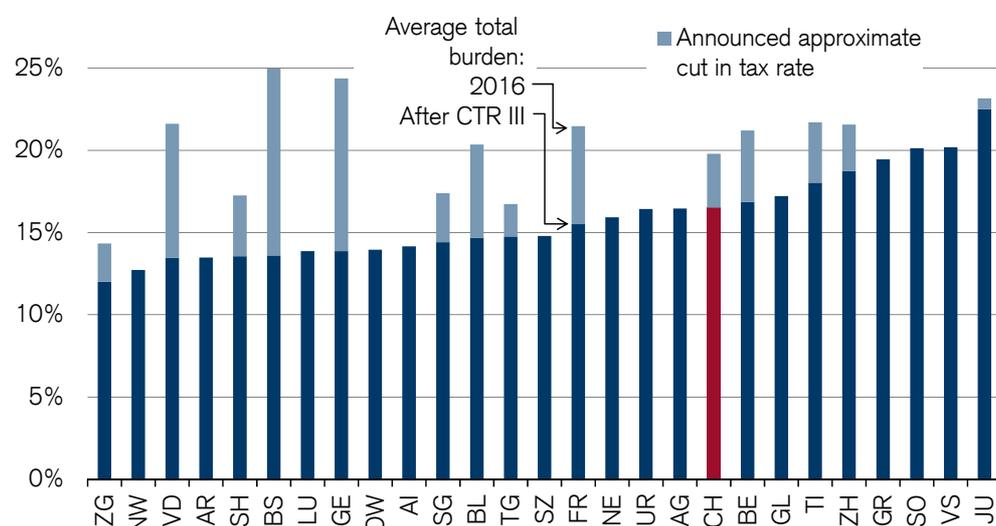
With a planned reduction in the corporate profit tax rate to 12%, Zug will now take first place in taxation of legal entities too, followed by the current leader, Nidwalden. In Suisse Romande and in Basel-Stadt, where many tax-privileged companies are domiciled, a particularly steep cut in corporate tax rates is expected. In March 2016, voters in Vaud overwhelmingly approved a reduction in the standard rate of corporate profit tax from today's 21.65% to 13.79%; in Geneva the rate is set to fall from around 24% to 13.49%. These two cantons would thus climb to third and eighth place. Basel-Stadt plans to reduce the profit tax rate from 22.18% today to 13%, and the relatively high capital tax rate from 5.25 per mills to 1 per mill. All factors considered, the current holder of last place, Basel-Stadt, would rise by 20 places to 6th.

**Tax burden in the mid-range between 15% and 16%**

In the future, the total burden of profit and capital taxes will amount to 15–16% for cantons in the mid-range. Some cantons, such as Appenzell Innerrhoden, Schwyz, Neuchâtel and Uri, already tax legal entities at this rate and have not proposed any further tax reductions to date. Given the fiscal measures under consideration, St. Gallen, Basel-Landschaft, Thurgau, and Fribourg would land in the mid-field.

**CTR III: Zug pushes to the front, Vaud, Basel-Stadt and Geneva make big advances**

Total burden\* of taxes on profit and capital taxes (federal, cantonal, municipal), as % of net profit, 2016 and taking into account the adjustments to corporate tax rates already announced by cantonal governments



Source: TaxWare, cantons, Credit Suisse

\* Average burden before taxes for a company with capital of CHF 2 million and net income between CHF 80,000 and CHF 1,040,000.

**Tax burden remains above-average for companies in Bern and Zurich**

Zurich and Bern are among the cantons where a large percentage of tax receipts stem from companies subject to standard tax rates. These cantons are in a difficult position, since a similar reduction in the standard tax rate causes a significantly greater receipts shortfall in the case of standard-rate tax payers. The preservation of tax competitiveness – for both special-status companies and normal companies based there – is a more costly affair in such cantons. The Canton of Zurich is only considering reducing its cantonal corporate tax rate from 8% to 6%. It would still rank among the less fiscally attractive cantons: In the city of Zurich, the actual corporate profit tax burden (federal, cantonal, municipal) would add up to around 18.2%. The Canton of Bern features in scenarios with corporate profit tax rates of 16.37% to 17.96%. Cantons, which have not yet published their tax strategies, are positioned at the end of this temporary ranking.

**Methodology:****Private individuals:**

To assess taxation for private individuals, we look at taxes on income and wealth as a percentage of gross income and accordingly net wealth at federal, cantonal, and municipal level. This is done on the basis of effective tax rates, i.e. applicable deductions are subtracted. Individual deductions (e.g. for commuting, childcare, education and training, healthcare) are not included, since they vary widely from one household to another. Another new feature in the LQI 2016 is a deduction for two-income households. To calculate the income tax burden, we include the level as well as the progression over an income range from CHF 50,000 to CHF 300,000. From the corresponding income levels, an index is obtained of the income tax rate for each municipality. As for the wealth tax burden, we calculate the tax rate as a percentage of taxable assets over an asset range from CHF 100,000 to CHF 1,000,000; this enables us to create an index at municipal level. The process is repeated for the four types of household: singles, couples with children, couples with no children, and pensioners. We use a different level of income and wealth depending on the type of household. To aggregate the results across the four types of household, we take their respective share of Switzerland's total population. From the indices for income and wealth tax, we then generate a total index for the tax burden on individuals. Our index does not take account of special tax systems such as the lump-sum taxation for foreigners resident in Switzerland or the deduction of tax at source for foreigners and cross-border commuters working in Switzerland.

**Legal entities:**

To measure taxation for legal entities, we calculate taxes on profit and capital at federal, cantonal, and municipal level as well as the applicable church tax for a corporation with capital of CHF 2 million and net profit between CHF 80,000 and CHF 1,040,000. The resulting tax index measures the overall tax burden as a percentage of net profit for all municipalities. The index is then aggregated across the various regional levels using appropriate weightings. Only standard tax rates based on cantonal tax law are applied; tax privileges for holding companies and management companies or selectively granted tax breaks for newly founded or newly located companies are not included. Tax privileges in various cantons allow for a lower average tax burden. However, these privileges are difficult to quantify since the tax burden is company-specific and no detailed statistics are available due to tax secrecy. The new privileges foreseen in CTR III (patent box, R&D super deduction, etc.) are likewise not included.

## Availability of skilled labor

# Rising Qualification Levels

Manufacturing and commercial businesses are dependent on workers with professional training. In knowledge-intensive areas of the economy, highly qualified employees are a key factor of production. While the level of education in Switzerland has increased steadily over recent decades, there are still considerable differences between regions.

### Skilled workers are a key resource of Switzerland

Aside from water and wood, Switzerland has no significant supply of natural resources. Its countryside can be exploited for touristic and agricultural purposes, but its economic success depends heavily on innovation. Much of Switzerland's prosperity is the product of intellectual work or knowledge-intensive products, be it in industrial research and development or in the service sector. A suitably qualified workforce is a key prerequisite for innovation. Moreover, high factor costs force Swiss enterprises to generate a high value added per employee. The availability of suitably skilled workers is therefore of central importance to the quality of a given location from the perspective of businesses.

### Continuous rise in level of education

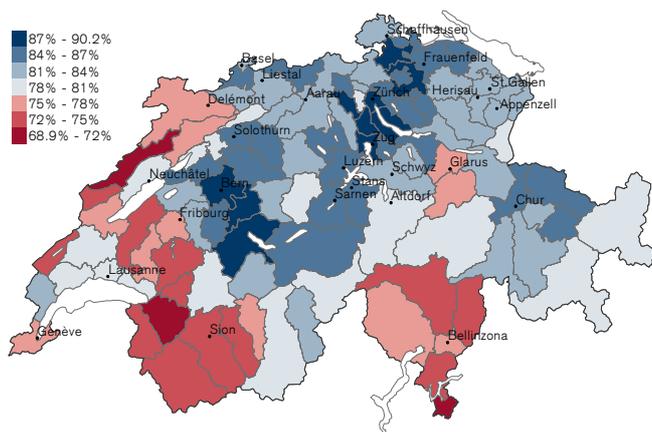
The education system increases employees' potential for added value, and thus their opportunities in the modern labor market. On-the-job training programs and a vibrant market for continuing education offer additional options. However, career paths often cause people to relocate if an education or training site in a different region of Switzerland or outside the country is chosen. The level of education of the Swiss population has increased dramatically in recent decades. In 1980, just 11% of the population had completed a program of tertiary education; by 1990 this figure had risen above 15%, by 2000 to 22% and for the period from 2010 to 2014 it had already climbed to nearly 35%. Two factors contribute to this trend: The working population has changed as a cohort with a lower average level of education reached retirement age and was replaced by comparatively highly educated young workers. Besides these demographic factors, the concept of "life-long learning" has taken hold.

### Many highly qualified immigrants

Finally, immigration also plays a role in the rising level of education. Nearly 56% of the persons entering Switzerland from the European Union under the terms of the free movement of people have completed a program of tertiary education, a figure above the average. The skill level of the available labor in the various Swiss regions is thus the combined product of the local education system, national and international migration, and the job offerings in the respective regions.

### Availability of specialist personnel

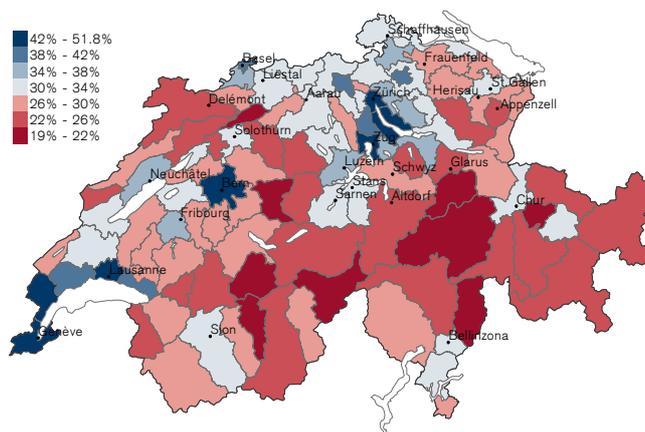
Percentage of working-age population with vocational training, 2010–2014



Source: Swiss Federal Statistical Office, Credit Suisse

### Availability of highly-qualified personnel

Percentage of working-age population with tertiary education, 2010–2014



Source: Swiss Federal Statistical Office, Credit Suisse

### **In the spotlight: Residents, inbound commuters and cross-border commuters**

The availability of specialist personnel and highly qualified human resources in a given location encompasses not only those people who reside in a specific region, but also inbound commuters and cross-border commuters, depending on their skill level. Highly qualified personnel, by our definition, are university graduates or people who have completed advanced technical or vocational training. The specialist personnel category additionally includes people who have completed basic vocational training, i.e. a professional apprenticeship or comparable training.

### **Highly qualified workers concentrated in urban regions**

The city of Zurich tops the list of 110 economic regions in Switzerland with 51.8% of its population having completed a program of tertiary education ([see figure](#)). The other urban regions (Geneva, Lausanne, Bern, Basel) as well as the immediate suburban areas on the lakes of Zurich and Geneva have a similarly large pool of workers with a tertiary degree. The local structure of industry, which in the urban regions is strongly biased toward skill-intensive occupations, plays a major role here. Universities exert an additional impact. It is harder to find university graduates in rural and mountainous regions.

### **Specialist personnel rarer in the Romandie and Ticino**

The picture with regard to specialist personnel is more complex: an array of urban centers and suburban agglomerations, such as Geneva and Fribourg, are positioned below the Swiss mean with regard to the education level of their local populations ([see figure](#)). The linguistic divide between the three language areas of Switzerland appears to play a role here: among the regions of Western Switzerland, Nyon is the only one with a score above the national average. Specialist personnel are also comparatively rare in Ticino. At the same time, the populations in some rural areas in the Cantons of Bern, Graubünden and central Switzerland have a strikingly high percentage of specialist personnel.

#### **Methodology:**

The availability of specialist and highly qualified personnel focuses on the level of education of the workers in a specific region, and includes not only local residents but also inbound commuters and cross-border commuters working in the region. Only persons of working age are considered. We define specialist personnel as workers who have completed training at secondary level II, such as a professional apprenticeship, upper secondary school or upper secondary specialized school. Highly qualified personnel are graduates of a tertiary education program, such as a university of applied sciences, university, or college of professional education and training. The level of education of residents and inbound commuters is gleaned from structural surveys conducted by the Swiss census, that of cross-border commuters from the wage structure survey.

## Indicators of transport accessibility

# NEAT Boosts Accessibility in Uri and Ticino

The quality of a location is strongly dependent on the economic potential of its catchment area. Urban areas enjoy greater accessibility than more remote regions. Improvements in transport routes increase the accessibility of those destinations.

### What constitutes a location's catchment area?

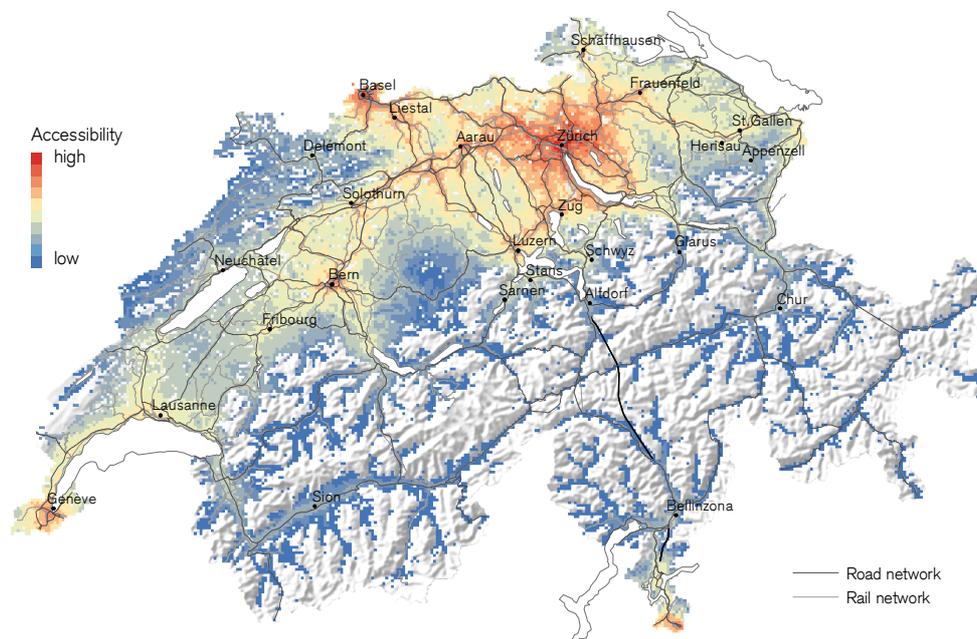
The quality of a given location is determined by the local underlying conditions specific to it, but is also shaped considerably by its interaction with neighboring locations. The location with the lowest taxes and the highest educational level might actually be unsuitable for an enterprise if a corresponding business environment does not exist there. Most businesses' production operations depend on suppliers, business partners and subsidiary service providers. Moreover, close geographical proximity to other enterprises, especially to ones active in the same industry or related sectors, facilitates the exchange and accumulation of knowledge. The "accessibility of the workforce" score incorporates these elements into the locational quality indicator. On the sales side, companies need corresponding customer markets for their products. The "population accessibility" score takes this point into account.

### Traffic corridors are an advantage

Not surprisingly, the highest accessibility scores are found in the major Swiss cities, followed by their suburbs. Regions along key traffic corridors are similarly attractive. Accessibility is more limited in rural and mountainous areas due to lower population density and employment levels as well as longer commutes into the urban centers due to their topography. Border regions such as Mendrisio, Geneva, Basel and the Rhein valley near St. Gallen profit additionally from potential beyond the Swiss borders.

### Accessibility of the population

Result per inhabited square kilometer, PMT and PT combined



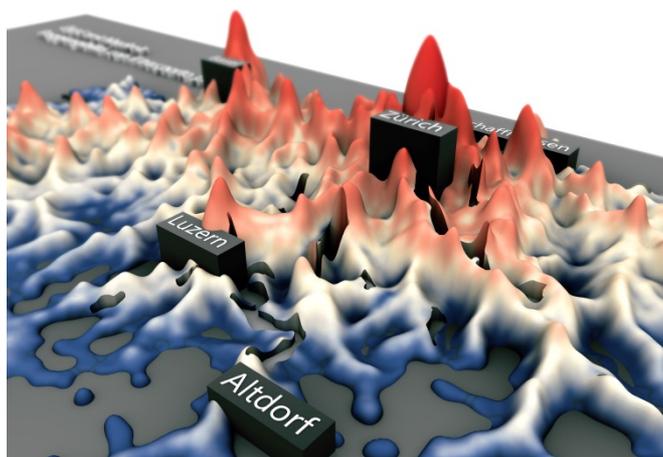
Source: Credit Suisse

### Roads have the benefit of "the last mile"

The public transportation (PT) network is a significant factor in locational quality, particularly in metropolitan areas. High PT accessibility scores are more concentrated compared to private motorized transportation (PMT). Railway stations served by express trains are a key feature here. In contrast, high accessibility scores for PMT are spread across wide areas. The biggest differences between the two modes of transport are evident in suburban regions that are near, but not on major traffic arteries, such as the Freiamt area, Murten, and Gros de Vaud.

### Accessibility by PT in Central Switzerland and Zurich

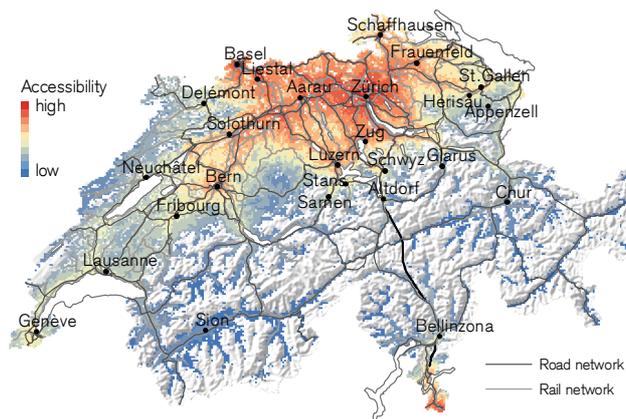
Extract, 3D representation



Visualization: 3d-model.ch. Source: Credit Suisse

### Accessibility of the workforce

Result per inhabited square kilometer, PMT and PT combined



Source: Credit Suisse

### Airports: Central plateau at a disadvantage

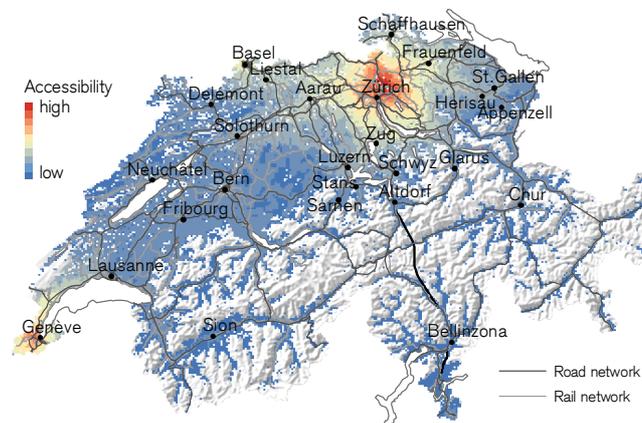
For internationally oriented companies in particular, the accessibility of airports is of key importance. Proximity to an airport allows for efficient travel to customers and facilitates logistics. In terms of accessibility, the regions around the airports in Zurich, Geneva and Basel are most advantageously positioned. Bern-Belp and Lugano-Agno airports cannot keep up with the larger hubs due to their small number of flight routes offered and the subsequent low volume of passengers. In international comparison, the travel time from, say, Bern to the airports in Basel or Zurich is certainly competitive at just over an hour. At the same time, regions in Aargau or Vaud have a clear advantage over the central plateau in access to airports. Ticino suffers from inefficient public transportation connections to the Milano-Malpensa airport. The planned S30 rapid transit railway should improve this situation, but the project has been plagued with building delays and it is unclear when the line will be opened.

### Topography plays a decisive role

The accessibility of transport can only be improved with costly, long-term investments in road and rail lines. Accelerated connections in other parts of the country increase accessibility, and greater catchment areas can be covered in a specific time. The distances involved and population density, however, remain unchanged. New highways, road and rail tunnels, and new rail lines have a greater effect on accessibility when they are located near densely populated areas. In this sense, accessibility scores are largely predefined and not easily adjusted.

### Access to airports

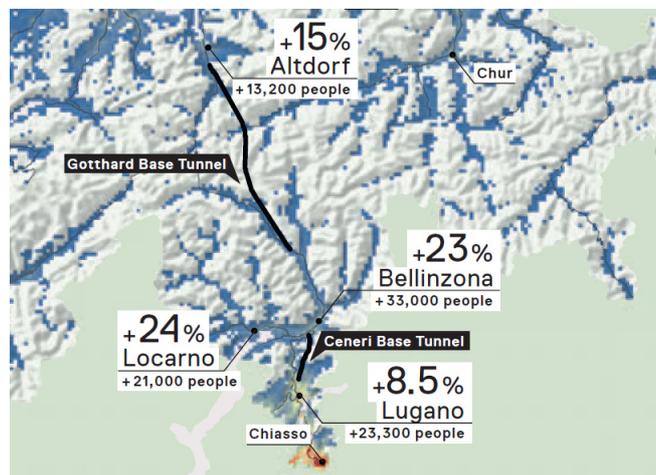
Based on PT and PMT travel times to the airports Zurich-Kloten, Basel-Mulhouse, Bern-Belp, Geneva Cointrin, Lugano-Agno and Mailand-Malpensa.



Source: Credit Suisse

### Greater catchment areas thanks to NEAT

PT accessibility, changes due to opening of the Gotthard base tunnel and Ceneri base tunnel



Source: Credit Suisse

## NEAT speeds up the North-South artery

In June 2016, Switzerland celebrated the opening of the Gotthard base tunnel, and in 2020 it will be the turn of the Ceneri base tunnel. In addition to significantly increasing the goods capacity, the new train line shortens the travel time between German-speaking Switzerland and Lugano by up to 52 minutes. The catchment area from Altdorf for PT commuters is 15% larger, that for Bellinzona or Locarno 24%. The Ceneri base tunnel reduced the travel time between the centers of Lugano and Bellinzona by 10 minutes, and between Locarno and Lugano by up to 29 minutes. For Ticino, this means that the two sections of the canton north and south of Monte Ceneri can be brought closer together in terms of the labor and real estate markets. Condominiums in the Lugano region are around 41% more expensive than those in Bellinzona, and rents 17% higher. The new railway connection should narrow these differences.<sup>4</sup>

### Methodology:

The accessibility of a given location is the sum of the employment and demographic potential in its commuter belt in and outside Switzerland plus the passenger volume at its nearest airport. The three partial indicators have been calculated on the basis of travel times via private motorized transport (PMT) and via public transportation (PT). PMT travel times have been calculated for the first time using effective travel times that factor in delays caused by traffic congestion. For PT, the timetables of the Swiss Federal Railways and all other transport providers at around 20,000 PT stops are applied.

Since traveling a certain distance involves time and other costs, the achievable potentials are assigned a decreasing weighting as travel time increases. The weighting functions employed are derived from empirical data on commuter and commercial traffic, and are differentiated by mode of transport and the achievable potential. If, for example, it takes 30 minutes to travel to a given location via public transportation, the population and aggregate level of employment there are assigned weightings of 22% and 38%, respectively.

All results have been calculated down to the geographical granularity of one square kilometer for both PMT and PT. This yields a precise measurement of the accessibility of the populace and workers for each of the approximately 20,000 inhabited square kilometers of Switzerland.

<sup>4</sup> For further information: See Credit Suisse Bulletin 02/2016: Gottardo.

## Appendix

## LQI 2016 results in detail

## Factors of locational quality at cantonal level

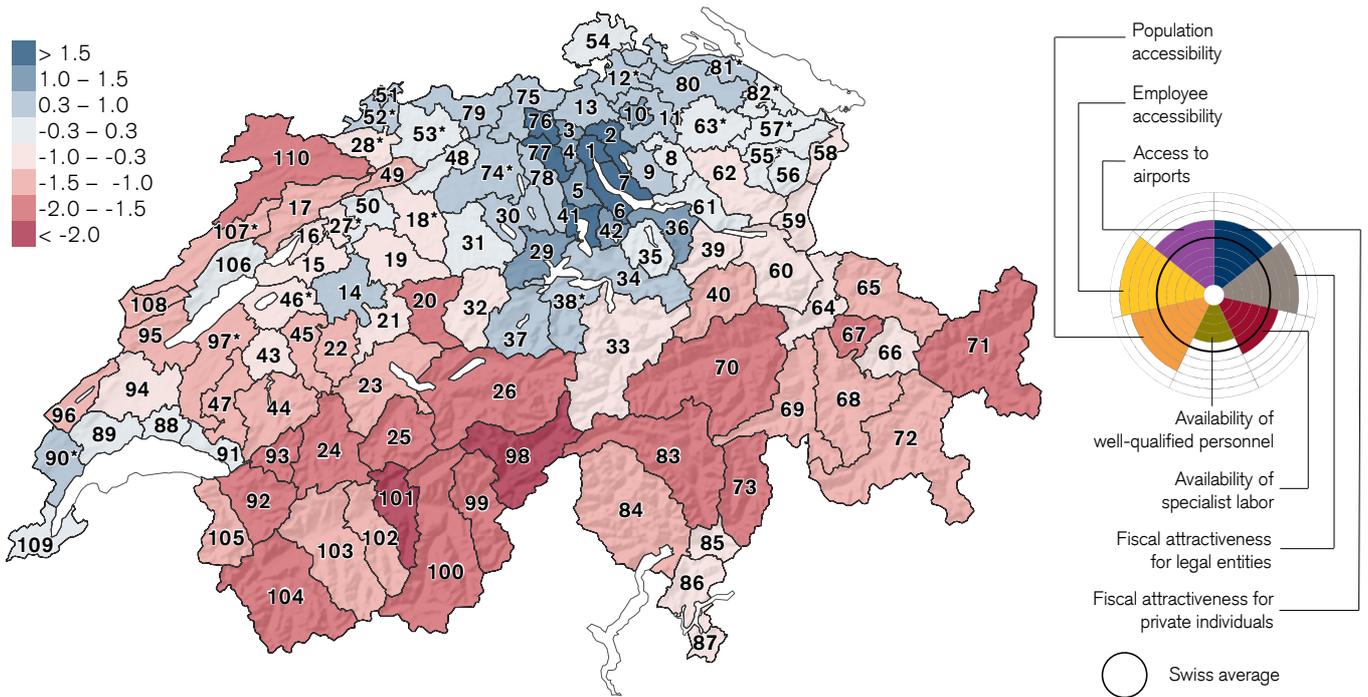
Ordered by rank, + / ++ more attractive than the Swiss mean; - / -- less attractive than the Swiss mean; = Swiss mean

Canton	Fiscal attractiveness		Availability of		Accessibility			Locational quality 2016		
	Private individuals	Legal entities	Specialist labor	Highly qualified personnel	Population	Employees	Airports	LQI 2016	Rank	
ZG	++	++	++	++	+	+	+	++	2.19	1
ZH	++	-	+	+	++	++	++	++	1.41	2
AG	+	++	+	-	+	++	+	+	0.97	3
BS	=	--	=	+	++	++	+	+	0.84	4
NW	++	++	+	-	-	=	-	+	0.71	5
LU	+	++	+	-	=	=	=	+	0.66	6
SZ	++	++	=	-	=	=	=	+	0.64	7
OW	++	++	+	-	-	-	-	=	0.29	8
TG	+	+	=	-	=	+	=	=	0.25	9
AR	+	++	+	-	-	=	-	=	0.24	10
BL	-	-	+	-	+	++	=	=	0.17	11
SH	=	+	=	-	=	=	=	=	0.13	12
GE	-	--	--	++	+	=	++	=	0.08	13
AI	++	++	=	--	-	-	-	=	-0.15	14
SG	=	+	=	-	=	=	=	=	-0.19	15
SO	=	=	=	-	+	+	=	=	-0.22	16
VD	-	-	-	+	=	-	=	-	-0.44	17
BE	-	-	+	-	=	=	-	-	-0.62	18
NE	--	++	--	-	-	-	-	-	-0.63	19
UR	++	++	-	--	-	-	-	-	-0.66	20
GL	+	+	-	--	-	-	-	-	-0.82	21
FR	-	-	--	-	=	=	-	-	-0.95	22
TI	+	-	--	-	-	-	-	--	-1.01	23
GR	+	=	=	--	--	--	-	--	-1.15	24
VS	-	-	--	--	-	--	-	--	-1.56	25
JU	-	--	--	--	-	-	-	--	-1.83	26

Source: Credit Suisse

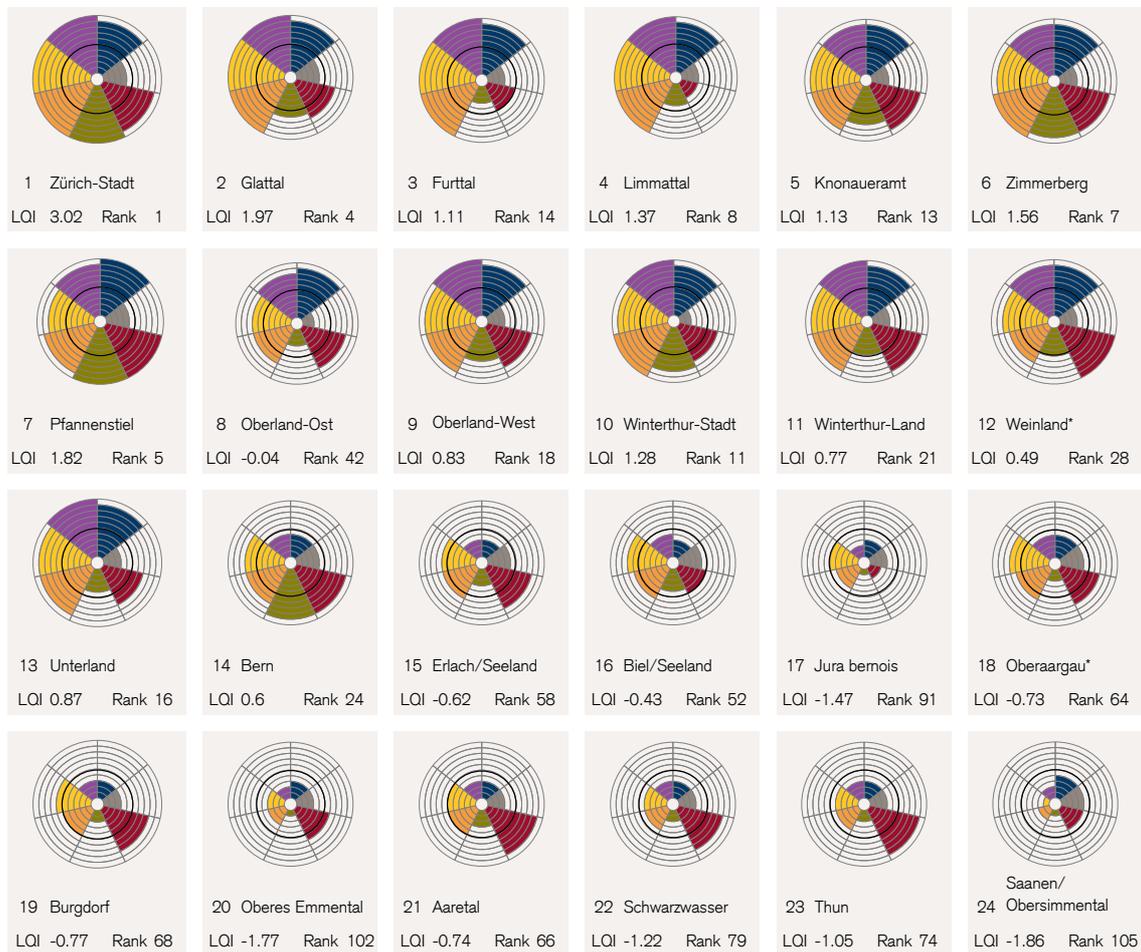
### Locational Quality Indicator for Swiss Economic Regions\*

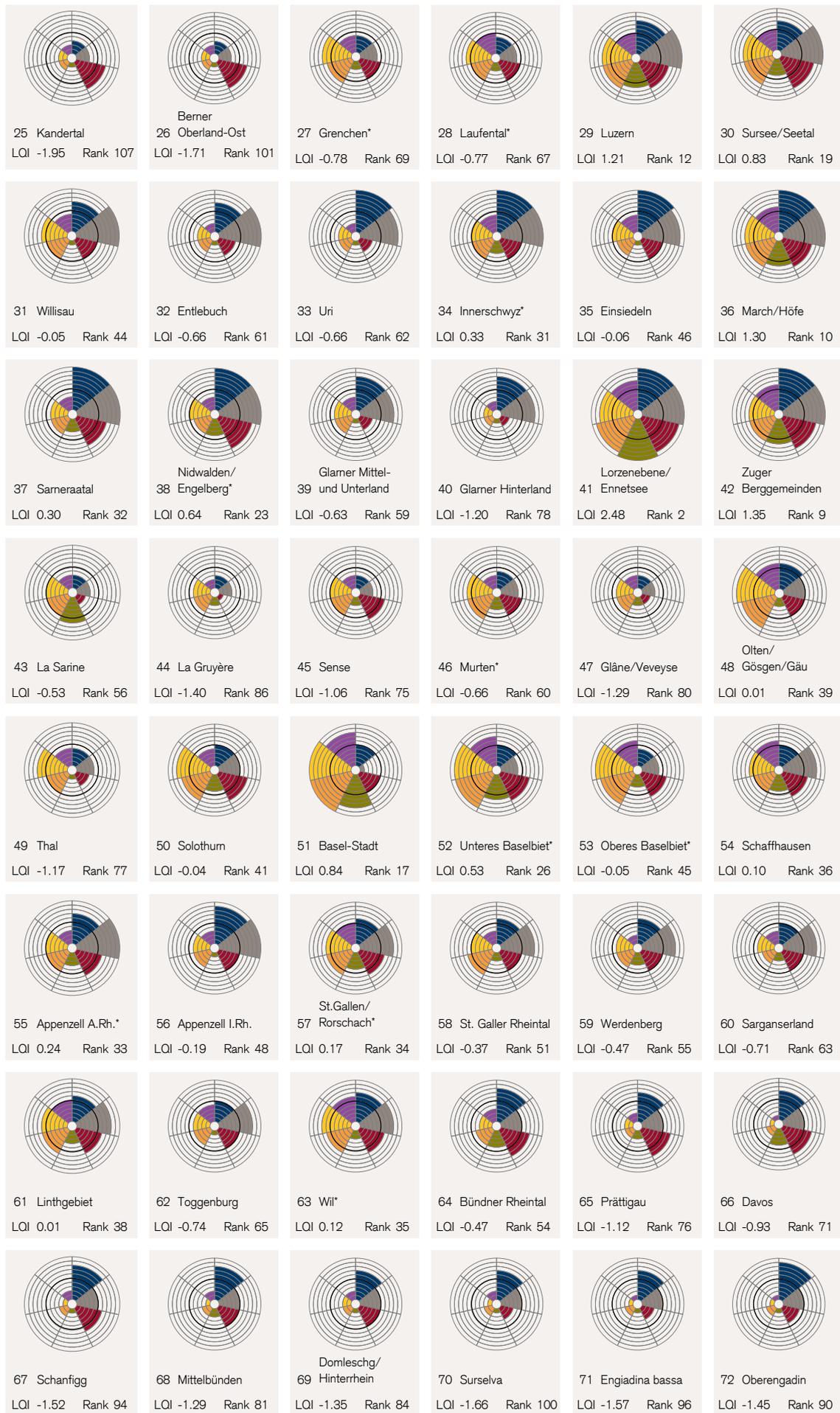
2016, synthetic index, CH = 0

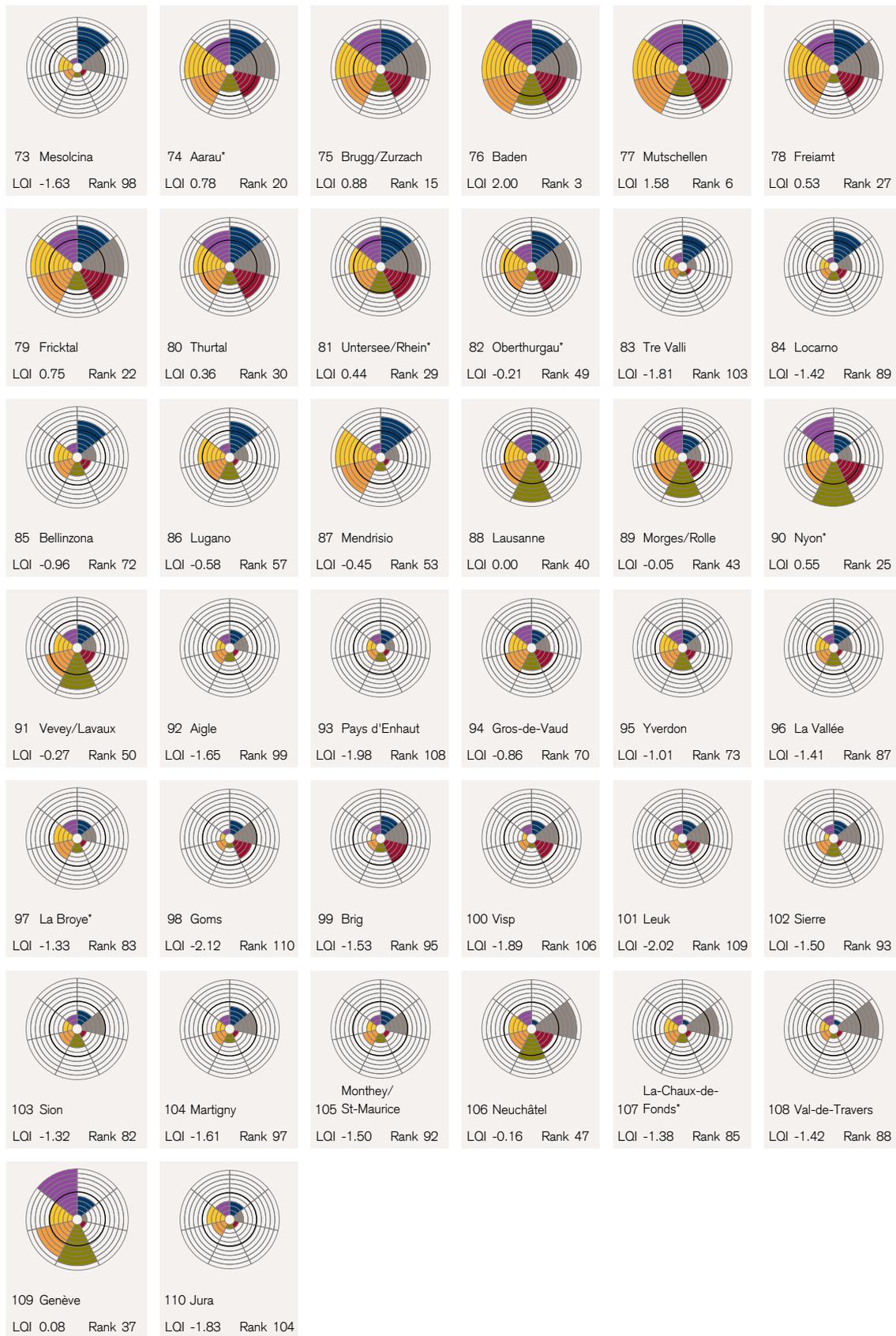


Source: Credit Suisse, Geostat

\* The 110 Swiss Economic Regions reflect the economic conditions in the best possible way and they do not always follow political borders. The economic regions, which comprise more than one canton, are labeled with an asterisk.







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