# What lessons can be drawn from Switzerland's high standard of living?

- Switzerland, the world's 20th largest economy by gross domestic product (GDP), is characterized by long-term stable growth, one of the lowest unemployment rates among OECD countries, a structural current account surplus, an educational system that integrates young people into the labor market, and an efficient R&D ecosystem. This prosperity is evidenced in one of the world's highest living standards, with the third-highest GDP per capita at purchasing power parity (PPP) in the OECD (chart).

- The difference in GDP (PPP) per capita between Switzerland and France is explained mostly by a more intensive use of the labor factor. Three mechanisms are at work: Switzerland's very high employment rate, including for "seniors" aged 65 or over, cross-border commuters (frontier workers), and far higher annual hours worked by those in full-time employment. Levels of skills and qualifications, however, are equivalent in both countries.

- Measured at the aggregate level, hourly productivity in PPP is similar in both countries. A more detailed analysis by sector, however, shows that sectors exposed to international competition (manufacturing and financial services) make a greater contribution to value creation in Switzerland. This difference is explained by a composition effect, as employment is more concentrated in those sectors, and by higher productivity in those sectors than the national average. The financial services sector thus makes a substantial contribution to Switzerland's higher living standard. Overall, Switzerland's production base is characterized by stronger specialization, more export orientation, and higher pricing power (linked, among other factors, to the concentration of activities in the high range level).

- Furthermore, the stock of foreign direct investment per capita is ten times higher in Switzerland than in either France or Germany. Even if some FDI flows are attributable to companies that conduct only a small fraction of their commercial activity in Switzerland, they do stimulate production and employment.

- Between 1997 and 2017, the gap in living standards between France and Switzerland widened by roughly 9 points. Two trends contributed to the process. First, Switzerland benefited from the agreement with the European Union on the free movement of persons, which facilitated the entry of qualified personnel from EU countries and greater employment of non-residents. Second, for full-time employees, growth in productivity per job in France was moderated by the reduction in statutory working hours.

GDP per capita at purchasing power parity (2017)
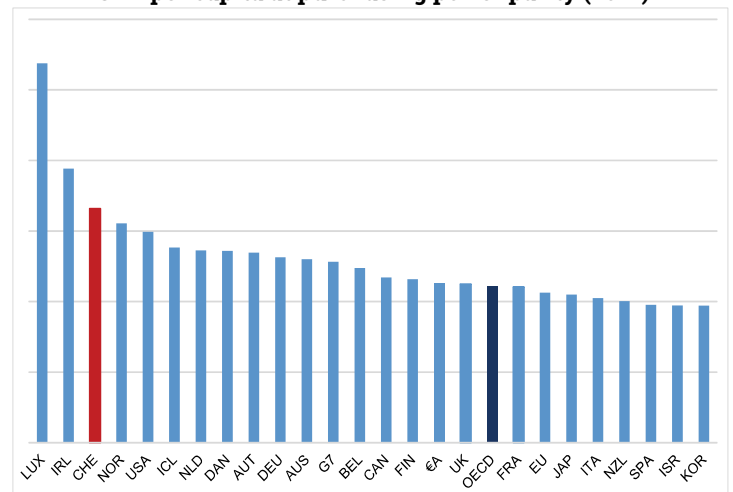
Source: DG Trésor, OECD data, USD PPP.

1. Most of the difference in living standards between Switzerland and France is explained by the labor market

1.1 The difference in GDP per capita between Switzerland and France is high in nominal terms but far smaller in PPP

In terms of the value of gross domestic output divided by population, Switzerland ranked second in the world (excluding principalities) in 2017, trailing only Luxembourg, with GDP per capita of €71,200.[1] This was twice as high as the €34,200 in France.

The gap between France and Switzerland in nominal GDP per capita, however, is not fully indicative of the difference in the purchasing power generated by annual production, because of price-level differences. After adjusting for the higher cost of living in Switzerland, the gap in living standards measured in GDP per capita at purchasing power parity (PPP, source Eurostat) was only 51% in 2017 (compared with 53% in 2016).

1.2 The very high employment rate and the number of annual hours worked are the main contributors to the difference in living standards

For the year 2016, the difference in living standards can be decomposed at the aggregate level into five factors (box 1):

a. A productivity factor, generally measured on a per hour basis.

b. Annual hours worked per full-time job equivalent, which is higher in Switzerland (1911 hours, compared with 1616 in France).

c. The intensity of the use of local labor, which has three components:

(i) The employment rate of working-age persons (15-64 years of age), which came to 79.6% in Switzerland in 2016 (the second highest in Europe, behind only Iceland), compared with 64.2% in France.

(ii) Part-time employment (which is highly developed in Switzerland); employees work on average 83.2 percent of a full time equivalent in Switzerland, compared with 94.4 percent in France.

(iii) Employment of older workers, particularly those over the usual working age of 15-64, who account for 3.9% of total jobs in Switzerland, compared with 1.3% in France.

d. Cross-border mobility of labor: the percentage of non-permanent-resident workers[2] is far higher in Switzerland (where cross-border workers account for 6% of jobs).

e. An age structure effect: Switzerland has a lower dependency ratio (that is, the working age population makes up a greater percentage of the total population than in France).

Table 1: Macroeconomic factors explaining the living-standard difference between Switzerland and France (2016 data)

Factors contributing to the living-standard gap	Difference between Switzerland and France	Contribution to gap
Living standard (GDP per capita at PPP)	**+52.7%**	**100**
a) Hourly productivity (GDP per hour worked at PPP	**+2.3%**	**5.3**
b) Annual hours worked (full-time job equivalent))	**+18.3%**	**39.7**
c) Labor market participation by residents, of which:	**+12.3%**	**27.3**
(1) Employment rate, 15-64 years	+24%	50.8
(2) Part-time employment	−11.9%	−29.9
(3) Employment of "seniors" (65 and over)	+2.8%	6.9
d) Employment of non-residents	**+6.1%**	**13.9**
e) Working-age population as percentage of total	**+6%**	**13.8**

Source : Data from INSEE, Swiss Federal Statistics Office, and Eurostat, calculations by the Economics Department of the French Embassy in Switzerland.

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(1) Gross national product is considered a better indicator than gross national income for this kind of international comparison of living standards. In both Switzerland and France, the values of GDP and GNI (measuring the income of national economic agents) are close. For some specific countries, like Ireland, the indicators diverge; Ireland's GNI is 20% lower than its GDP.
(2) Incoming cross-border commuters (frontier workers) and persons resident less than one year.

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Box 1: Decomposition of GDP per capita

GDP per capita is the product of the following seven underlying factors: hourly productivity (term a), annual hours worked for a Full Time Equivalent job, FTE (b), the employment rate of permanent residents age 15-64 (c1), the ratio between the number of FTEs and the number of jobs, which captures the impact of part-time employment (c2), the increment of employment provided, on the one hand by those over 64 years of age (c3), and on the other hand by non-permanent residents (d), as well as the percentage of working-age persons in the permanent resident population (e).

More specifically, GDP per capita can be written:

$$\frac{Y}{Pop} = \frac{Y}{H} \times \frac{H}{ETP} \times \frac{E_{15-64}}{Pop_{15-64}} \times \frac{ETP}{E+E_{nr}} \times \frac{E}{E_{15-64}} \times \frac{E+E_{nr}}{E} \times \frac{Pop_{15-64}}{Pop} \qquad (1)$$

In table 1, these are linges: (a)...   (b)   (c1)   (c2)   (c3)   (d)   (e)

Where

- Y: denotes GDP;
- H: the total number of hours worked in the country;
- ETP: the number of jobs, in full-time equivalent units, in the country;
- $E_{(15-64)}$: jobs held by permanent residents aged 15 to 64;
- $Pop_{(15-64)}$: permanent resident population aged 15 to 64;
- $E+E_{nr}$: total jobs in the country;
- E: : jobs held by permanent residents;
- E_{nr}: : jobs held by persons who are not permanent residents in the country (i.e. incoming cross-border commuters, plus persons in employment residing less than twelve months in the country);
- Pop: permanent resident population;

Note that this decomposition is valid irrespective of the unit in which GDP is stated (whether in nominal euro terms or at purchasing power parity).

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This decomposition shows the limited difference in hourly productivity (in PPP terms) between France and Switzerland: most of the gap in living standards is explained by labor-market participation (the very high employment rate, including for "seniors") and annual hours worked for persons in full-time employment.

This decomposition, and the calculation of the various underlying aggregates, do not take into account potential heterogeneities in labor force skills and qualifications, or heterogeneities between sectors of the economy, which could also impact the relative performance of the Swiss and French economies (for instance, a person who is better trained will probably be both more productive and more likely to join the workforce[3]). The following sections aim to enrich the analysis with a more-detailed decomposition of the principal aggregates (human capital, and industry-level productivity).

1.3 France and Switzerland have broadly similar structures of labor force qualification

In the long run, a country's living standard is highly correlated with the level of accumulated human capital[4]. Two human capital indicators may be used to attempt a comparison between France and Switzerland:

- An input indicator: the level of education of the population in employment (which has the drawback of neither taking into account companies' requirements, nor human capital and skills developed during a person's career);
- An output indicator: the profile of jobs held by skills and occupational category.

From table 2 and chart 1, it appears that:

(i) France and Switzerland are not differentiated by the percentage of tertiary education graduates among the population in employment, with approximately 40% in both countries in 2016. However, the percentage of

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(3)   Further, the heterogeneity in skills and formal qualifications could be a source of bias in the productivity comparisons: for example, in Switzerland the vast majority of the working-age population participate in the labor market, including relatively lower-skilled people; this high participation can lead to lower average productivity at the aggregate level.

(4)   P. Romer (1986), "Increasing Returns and Long Run Growth", Journal of Political Economy; (1990) "Human capital and growth: Theory and evidence", *Carnegie-Rochester Conference Series*.

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higher-education graduates among the population as a whole, and among younger employees, is higher in Switzerland. This result is not entirely intuitive, because a greater percentage of Swiss students (57.5%) opt for a vocational apprenticeship curriculum following middle school – called "vocational education and training" – while 30% choose the general secondary education curriculum. These figures reflect:

- The high percentage of Swiss graduates of vocational education programs considered to be tertiary education (12% of those aged 25-34); their degrees are often earned in alternating work/study programs with fewer annual classroom hours than in the standard academic curriculum;

- A very high graduation rate for students in higher education: roughly 80 percent of first-year students in

non-vocational tertiary education go on to earn a bachelor's degree.

The distribution of jobs among socio-professional categories in Switzerland is characterized by a greater percentage of manager positions and intellectual professions. In particular, the percentage of specialists in science, engineering and ICT is 3 points higher (7.1% compared with 4.1% in France). The percentages are somewhat higher for those active in teaching (6% compared with 4.7%) and business administration, i.e., specialists in finance, administration, sales and public relations (5.2%, versus 4.2%). Of course, this difference between France and Switzerland reflects to some extent the difference in the sectoral composition of economic activity (discussed in section 2 below).

Table 2: Percentage of residents with tertiary education degrees (2016 data)

Reference population	Switzerland	France
a) All residents: age 25-64 age 30-34	**41.2%** 50.2% (55% in 2018)	**34.6%** 43.6% (46.2 in 2018)
b) Residents in employment: age 15-64 age 20-64	**39.2%** 41.2%	**39.6%** 40.1%

Source: Eurostat.

Chart 1 : Breakdown of persons in employment by socio-professional category (2016)
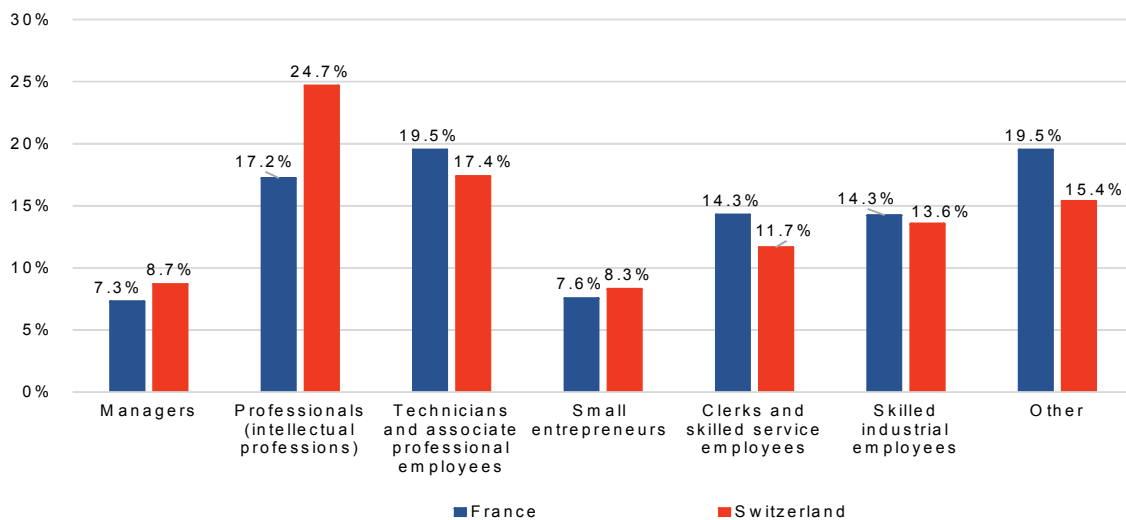
Source: : Eurostat, ESCO (European Skills, Competences, Qualifications and Occupations).

2. In Switzerland, the sectors exposed to international competition – excluding agriculture - make a greater contribution to value creation

2.1 The economic literature stresses the key role of the tradable goods sector for the standard of living

While aggregate hourly productivity in PPP terms is virtually identical in France and Switzerland, the situation is more nuanced, for three reasons at least:

(i) Productivity can differ considerably between sectors, and comparisons at a more disaggregated level could lead to different results for industries.

(ii) The PPP index used for international comparisons can be sensitive to exchange-rate adjustments. (In the case of Switzerland, high current-account surpluses may suggest the currency is undervalued.)

(iii) An economy's performance is closely linked to the performance of the sectors most exposed to international competition (the tradable goods sector, and primarily manufactured goods). According to the Balassa-Samuelson model, a country's productivity gains in the exposed sectors have an impact on value creation and eventually on prices in the sheltered

sectors, and therefore on the general level of prices and wages (box 2).

In Switzerland, the level of prices in sheltered sectors (e.g., retail distribution, telecommunications, and construction) is far higher than in France and in the European Union (as is the PPP index); the model suggests that this difference could be largely attributable to high productivity in Swiss industry.

Box 2: The Balassa-Samuelson effect

The Balassa-Samuelson model (Balassa, 1964 and Samuelson, 1964) provides an analytical framework to explain changes in an economy's real long-term exchange rate, which in the model is determined by the productivity of the tradable (exposed) national sector relative to foreign productivity.

The model divides the economy into two sectors, the tradable sector exposed to international trade and therefore international competition, and the sheltered (nontradable) sector that is not exposed to international trade. The underlying assumption is that the prices of a given good are identical in the exposed sectors (because essentially determined by international markets), in which productivity increases far faster than in the nontradable sector.

1. The level of productivity in the exposed sector determines the level of wages throughout the economy, because labor mobility tends to lead to more uniform wages.

2. The only way the protected sector, where productivity gains are lower, can absorb the impact of the wage increases is by raising prices.

3. The resulting inflation - known as the Balassa-Samuelson effect - is thus generated by productivity gains in the exposed sector and, in this simplified model, is not detrimental to productivity.

In the developed economies, the cumulative Balassa-Samuelson effect over many years is observed in the general level of prices, and particularly the level of prices in the services sector: services are more expensive in countries where industry productivity is higher.

2.2 The productivity differential between exposed and sheltered sectors of the business economy is greater in Switzerland

There are empirical limitations to any direct comparison of sectoral productivity between the two countries, primarily due to the absence of sectoral deflators. Starting from data on value-added per hour worked[5] per industry (available for both countries, for 47 sectors of the General Classification of Economic Activities, NOGA, which cover the entire economy exclusive of activities of households), two indirect measures make it possible to identify the contribution of the sectors exposed to international competition to the Swiss economy:

i. The "industry" sectors, including financial services, account for a far higher proportion of the total value added of the business economy in Switzerland, at 31%, compared with 18% in France. (The contribution by the

structure of employment is further discussed in section 2.3).

ii. The productivity differential between the exposed and sheltered sectors is greater in Switzerland than in France (bearing in mind that in both countries, the exposed market sectors create more value per hour worked).

This analysis of the dispersion of sectoral productivities is carried out in each country taking average value added per hour worked for the overall economy as base 100. Table 3 shows that the productivity differential between the manufacturing and financial sectors, on the one hand, and non-financial market services, on the other hand, is 41% in Switzerland and 21% in France. Excluding the financial services sector, the difference is smaller. The relative size of the financial services sector in Switzerland reflects in particular the importance of cross-border activities in wealth management (one-fourth of the global market), asset management, and reinsurance. Note that among

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(5) Because GDP data are not available by industry, productivity is measured by value added per hour worked:

$$GDP = \sum GVA + \text{taxes on products} - \text{subsidies on products}$$

tradable goods, the primary sector exhibits far lower productivity than average. In Switzerland, agricultural production is protected by relatively high customs duties (which average 30%, according to WTO figures)[6].

Table 3: Gross value added (GVA) per hour worked, by sector, base 100 = business economy average (2016)

Sector	France GVA / H	Switzerland GVA / H
Grand total (exclusive of activities of households)	97	101
Total business economy (excl. general government and education) - base 100 for each country	**100**	**100**
Agriculture, forestry and fishing	51	27
Manufacturing, of which: *Pharmaceuticals (Swiss industrial specialization)* *Manufacture of machinery and equipment (Swiss industrial specialization)* *Manufacture of motor vehicles (French industrial specialization)* *Other transport equipment (French industrial specialization)*	**115** *348* *107* *163* *267*	**119** *451* *100* *102* *111*
Mining and quarrying	147	126
Production and distribution of energy	365	188
Water supply, sewerage, waste management and remediation	116	81
Construction	**78**	**69**
Financial services (FS)	**132**	**172**
Market services excl. financial services	**99**	**94**
Difference between 'Manufacturing' and 'market services excl. FS'	*+17%*	*+27%*
Difference between 'FS' and 'market services excl. FS'	*+34%*	*+82%*
Difference between 'Manufacturing + FS' and 'market services excl. FS'	*+21%*	*+41%*

Source: Data from INSEE and Swiss Federal Statistics Office (gross value added as per European System of Accounts ESA 2010 and Swiss General Classification of Economic Activities NOGA 2008 sectors), calculations by the Economics Department of the French Embassy in Switzerland.

2.3 In Switzerland, jobs are concentrated in the most productive sectors

The sectors exposed to international trade make a larger contribution to value creation in Switzerland; this reflects, in particular, a size effect that is also evident in the structure of employment (table 4)[7]. Manufacturing accounts for 15.6% of employment in Switzerland, compared with 9.7% in France. The financial services sector also employs a much higher percentage of the workforce – nearly twice as high as in France.

Table 4: Employment (full time equivalent jobs) and gross value added (GVA) per hour worked (2016)

Sector	France		Switzerland	
	FTE portion	GVA / H	FTE portion	GVA / H
Grand total (exclusive of activities of households and general government)	100%	97	100%	101
Total business economy (excl. education and general government) – base 100	**83.7%**	**100**	**89.3%**	**100**
Agriculture, forestry and fishing	3.1%	51	2.6%	27
Manufacturing, of which: *Pharmaceuticals (Swiss industrial specialization)* *Manufacture of machinery and equipment (Swiss industrial specialization)* *Manufacture of motor vehicles (French industrial specialization)* *Other transport equipment (French industrial specialization)*	**9.7%** *0.2%* *0.6%* *0.4%* *0.3%*	**115** *348* *107* *163* *267*	**15.6%** *1.1%* *1.8%* *0.1%* *0.3%*	**119** *451* *100* *102* *111*
Construction	6.8%	78	7.9%	69
Financial services (FS)	**3%**	**132**	**5.5%**	**172**
Market services excl. financial services	**60%**	**99**	**56.5%**	**94**

Source: Data from INSEE and Swiss Federal Statistics Office, calculations by the Economics Department of the French Embassy in Switzerland.

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(6) Note that energy production and distribution activities have relatively high productivity per hour worked, in line with their high capital intensity, particularly in France where nuclear power accounts for a high portion – close to 75% – of electricity production.

(7) Roughly 80 percent of the greater contribution by exposed sectors is explained by the size effect.

To illustrate the magnitude of the impact of the sectorial composition of employment on the aggregate living standard, two static simulations are carried out:

i. The first simulation estimates the impact of an increase in the size of the French manufacturing sector. If the percentage of jobs in the manufacturing sector were the same in France as in Switzerland (with sectorial productivity held constant in France), and if the percentage of jobs in other sectors were to be reduced proportionately, then GDP per capita in France would be 1.3% higher than the current level[8];

ii. This second simulation resizes Switzerland's financial services sector (in the broad sense, that is, including commodities trading, see box 3) to match the employment share and productivity level observed in France. More specifically, this simulation is based on the following three assumptions:

● The share of employment in the Swiss financial services sector is reduced to the same level as in France (and increased proportionately in the other sectors);

● The productivity of the financial services sector in PPP terms is assumed to be identical to the level observed in France;

● Commodities trading activities are excluded (in order to neutralize the contribution of international trading, the productivity of the Swiss wholesale trade sector is reduced to the level that would prevail in the absence of commodities trading).

The second simulation estimates that Switzerland's high degree of specialization in financial services has a positive 7-point impact on the difference in living standards between France and Switzerland; this is broken down into 3 points for financial services (1 point due to its greater share of Swiss jobs in financial services and 2 points due its greater productivity), and 4 points for commodities trading[9].

Box 3: The contribution of financial services and commodities trading in Switzerland

To analyze the difference in living standards between Switzerland and France, it is legitimate to investigate the contribution of two industries with high-value-added per hour worked that are particularly strong in Switzerland and have historically benefited from the country's legal stability, attractive tax system, and diplomatic neutrality:

● Switzerland's net international receipts from commodities trading, included in the national accounts under "wholesale trade" in the current account balance, represent an average 4% of GDP. The Swiss Trading & Shipping Association (STSA) claims that the industry provides some 35,000 jobs in Switzerland, meaning that it generates over CHF 700,000 in gross value added per job.

● The Swiss financial services sector generates international trade surpluses equivalent to 3.7% of GDP, on the strength of cross-border wealth management (where the country ranks number one worldwide, with one-fourth of the corresponding assets under management, having historically benefited from bank secrecy laws that have been rescinded since 2013) and insurance (with a surplus of 1% of GDP arising from Switzerland's strong position in reinsurance).[a]

a. Note also that Switzerland has five of the world's top ten gold refiners; the country's gold trade flows are equivalent to 20 to 25 percent of GDP on average, with a balance between imports and exports.

2.4 Swiss industry is specialized in very high productivity and/or high-end range products

As indicated above, the absence of producer-price data at the sectorial level severely restricts the ability to compare real productivity between industries in France and Switzerland. In the case of fully homogeneous tradable goods (the prices of which should not vary substantially between markets in the absence of barriers to trade), a comparison of nominal productivity levels should theoretically be considered to yield equivalent results.

It would however be a strong assumption to suppose that goods produced are homogeneous – especially in light of the high degree of aggregation of the sectors considered in this study – and it would be more realistic to assume imperfect substitutability, which is better able to describe a difference in value chain positioning or in pricing power (e.g., relating to a trademark or a monopoly resulting from patent protection).

Under these conditions, a difference in nominal productivity – between the same industry in Switzerland and in France – could just as well reflect a difference in real productivity, as

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(8) On the assumption that the PPP index is constant (whereas an increase in aggregate productivity should lead to some real appreciation of the exchange rate).

(9) As indicated in note (8), this is a static simulation and does not take into account the impact on the PPP index.

a difference in prices arising from different product ranges or market power. Both cases illustrate different forms of competitive advantage in exposed sectors.

Table 5 shows that the average difference in hourly productivity between the two countries is relatively high in manufacturing (measured in euros), indeed over 50%. Four sectors make a major contribution to the differences:

i. The biggest difference in favor of Switzerland is in the pharmaceutical industry, which accounts for 6 times a greater share of employment than in France (and 29% of exports).

ii. A second key Swiss area of specialization is the manufacture of machinery and equipment, particularly industrial machines (which generates a trade surplus of over 1% of GDP); the sector is noteworthy both for high productivity and for a high share of total employment.

iii. The Swiss food products industry benefits from a relatively protected domestic market and strong export performance in segments like coffee in capsules (primarily by Nestle, which accounts for one-fourth of the country's food exports).

iv. Finally, for computer, electronic and optical products (a sector that includes watchmaking), the level of productivity in euros is comparable, but the sector's relatively large share of total employment means that it also contributes to the strong overall performance of Swiss manufacturing.

Among the leading French manufacturing sectors exposed to international competition, transport equipment (motor vehicles, and other transport equipment) generates higher nominal value added per hour worked than the equivalent sectors in Switzerland.

Table 5: Comparison of nominal value added per hour worked in manufacturing (2016)[a]

Sector	France GVA / H (€)	Switzerland GVA / H (€)
Manufacturing, of which:	**56.9**	**89.0**
Manufacture of food products and tobacco products	**46.6**	**66.9**
Manufacture of textiles / manufacture of wearing apparel	33.5	43.5
Manufacture of wood and of products of wood and cork, except furniture	32.7	39.3
Manufacture of paper and paper products	49.8	52.1
Printing and reproduction of recorded media	26.8	46.1
Manufacture of coke and refined petroleum products; and chemicals and chemical products	113.7	126.4
Pharmaceuticals	**171.2**	**336.3**
Manufacture of rubber and plastic products	48.6	58.7
Manufacture of other non-metallic mineral products	51.6	68.2
Manufacture of basic metals	50.5	63.4
Manufacture of fabricated metal products	42.1	51.4
Manufacture of computer, electronic and optical products (includes watchmaking)	88.3	92.5
Manufacture of electrical equipment	52.8	78.7
Manufacture of machinery and equipment	**52.9**	**74.7**
Manufacture of motor vehicles, trailers and semi-trailers (automobiles)	**80.4**	**76.3**
Manufacture of other transport equipment t	**131.5**	**82.4**
Manufacture of furniture	33.7	55.2
Other manufacturing	45.4	73.8
Repair and installation of machinery and equipment	54.0	55.2

a. The potential impact of transfer prices on the international distribution of value added is a complicated issue that lies outside the scope of this study.

Source: Data from INSEE and OECD, calculations by the Economics Department of the French Embassy in Switzerland.

The high share of manufacturing in both value-added and employment in Switzerland is also attributable to very strong performance by manufacturing SMEs, which (including micro-enterprises) accounted for 45.4% of Swiss goods exports in 2016, compared with 14.5% in France.

Many Swiss SMEs are among the world leaders in niche markets.

Watchmaking is primarily composed of SMEs (with under 100 employees on average); it accounts for over 8% of full-time job equivalent in manufacturing and generates exports equivalent to 3% of GDP.

3. High FDI flows contribute to Switzerland's living standard

3.1 Switzerland's per capita stock of inward FDI is seven times higher than the European Union average

Switzerland also stands out in international comparisons by its extremely high level of inward foreign direct investment (FDI) flows and stock; its per capita stock of FDI[10] is over ten times higher than in France (and 5 times higher per unit of GDP, see table 6) and in Germany.

FDI is considered a major contributor to a host country's economic performance and growth[11]. In Switzerland for instance, companies in which foreign investors hold over 50% of the share capital account for more than one third of the country's exports (source: Swiss Federal Statistics Office).

Table 6: Stock of inward foreign direct investment (per capita and as % of GDP)

Country	Unit	Dec. 2000	Dec. 2017
Switzeland	USD per capita	77,750	136,630
	% GDP	105%	170%
France	USD per capita	9,700	13,080
	% GDP	24%	34%
Germany	USD per capita	11,950	11,550
	% GDP	28%	26%

Source: OECD.

A very large percentage of FDI stocks in Switzerland, however, concerns holding companies, financial services companies or intermediary companies that carry out most of their operations outside the country. According to data published by the Swiss National Bank, the category of "financial and holding companies" (which includes holding companies, corporate head offices, trusts and similar entities, and other financial activities, exclusive of banking, insurance and pension funds) accounted for 55% of the stock of inward FDI (held by foreign investors) at end-2016. Further, 38% of the stock of Swiss FDI abroad was held by financial and holding companies. Finally, special purpose entities established to hold equity investments account for 14% of the FDI stock.

3.2 Favorable corporate tax regimes for multinationals have helped attract FDIs

Favorable tax regimes provided a zero percent effective tax rate for income derived from qualified holdings (i.e., at least 10%), and particularly three cantonal regimes, for holding companies, domiciliary companies, and mixed companies. The mixed company regime concerns companies whose business activities in Switzerland account for less than 20% of their global turnover. This classification helped to attract multinationals, because of its impact on taxation of total global profits[12].

The Swiss corporate tax reform adopted by referendum in May 2019 and that comes into force on January 1, 2020, will eliminate these three tax regimes that were considered harmful by the OECD.

While holding companies or companies that conduct only a small fraction of their operations in Switzerland typically do not generate the same level of positive externalities as greenfield investments for a host economy, they nevertheless have positive effects on the country's economic environment, e.g., the creation of specialized jobs in law or finance, and potential spillover to the national economy.

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(10) In accordance with the methodology followed by the IMF, the FDI stock includes equity investment (initial investment plus reinvested earnings), intra-group loans and real estate investments. Stocks of FDI for Switzerland are published at book value, and data for France are measured at "mixed value" (i.e., equity investment in listed companies is reported at market value, and in unlisted companies at book value).

(11) The economic literature predicts that FDI has a positive impact on growth, all the more when certain positive factors occur, including human capital development (Jyun-Yi, Wu & Hsu Chin-Chiang, 2008), financial sector development (Chee & Nair, 2010), or safeguards to protect intellectual property. Further, because the corporate groups undertaking FDI are expected to exhibit higher than average productivity (L. Fontagné and F. Toubal (2010), "Foreign Direct Investment and Business Performance", *Analyses économiques, Report of the French Council of Economic Analysis*), their contribution to value added and to exports is likely to be more than proportionate to their share in total employment.

(12) Bearing in mind that Switzerland's effective tax rate on income from productive activities is low by international standards.

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4. In the recent past, the living standards have failed to converge between France and Switzerland

4.1 Switzerland has benefited from resorting increasingly to skilled labor from the European Union

The foregoing analysis has identified the main factors contributing to the current difference in living standards between Switzerland and France. A longitudinal analysis shows not only that the difference has failed to narrow over the past two decades, but that the gap in GDP per capita, based on purchasing power parity at current prices, actually widened by 8.8 points between 1997 and 2017, from 42% in 1997 to 51% in 2017.

GDP (PPP) per capita at current prices is a nominal value, and its growth is not a relevant proxy for growth in a country's standard of living[13].

This comparison therefore focuses on real GDP per capita growth (in which nominal GDP is divided by the GDP deflator), which was 2 points stronger in Switzerland between 1997 and 2017 (table 7). The switch to the real GDP measure thus identifies a further contribution to the widening of the gap in living standards between France and Switzerland, namely the relationship between the GDP deflator and the PPP index. This contribution comes to 6.9 points in favor of Switzerland and explains most of the difference in the change in living standards. It reflects a more favorable change in the ratio of producer prices to consumer prices in Switzerland, which may include a positive impact of the terms of trade[14] (possibly linked to the Swiss economy's move upmarket).

Table 7: Change in living standard over the period 1997-2017 and contributions of macroeconomic factors

Factors underlying the change in living standard	Switzerland		France		Contributions to widening difference (points)
	Change (%)	Change (percentage points)	Change (%)	Change (percentage points)	
Change in GDP per capita (in PPP at current prices)	72%		62%		**8.8**
Price effect, of which: terms of trade (PPP GDP deflator)	39%		32%		**6.9**
Change in real GDP per capita:	24.1%		22.5%		**1.9**
• Real productivity per job	14%		18%		**−4.8**
- of which: hourly productivity (in real terms)	*nd*		*25%*		***nd***
- of which: annual hours worked per FTE	*nd*		*−6%*		***nd***
- of which: impact of part-time employment	*nd*		*0%*		***nd***
Labor market participation by residents:					
• Employment rate, 15-64 years	*4%*	*2,9*	*7%*	*4.2*	***−4.4***
• Employment of "seniors" (65 and over)	*1.4%*	*1,4*	*0.8%*	*0.8*	***0.9***
Employment of non-residents	4.3%	4,5	1%	1	**4.7**
Working-age population as percentage of total population	−1%	−0,7	−4.3	−2.8	**4.9**

Source: Data from INSEE and Swiss Federal Statistics Office, calculations by the Economics Department of the French Embassy in Switzerland.

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(13) The purchasing power parity (PPP) index is constructed as the ratio between domestic prices (in this case, Swiss and French domestic prices) and the price of a basket of representative goods on a reference market, in this case the European Union.

(14)) More specifically, the change for each country in the ratio of GDP prices to the PPP index reflects, on the one hand, a trend in price-level changes in the EU market (the basis for the PPP index), and on the other hand, the difference between GDP prices and a consumer-price index. The first effect does not come into play when comparing two countries' GDP per capita growth in PPP.

Despite the unavailability of full-time job equivalent employment data for Switzerland in the period examined, it is possible to decompose, in a manner similar to that in box 1, the contribution of the factors underlying the change in real GDP per capita for France and Switzerland.

Table 7 accordingly shows the following:

(i) Real GDP per capita growth was similar in both countries, that is, barely two points higher in Switzerland. By contrast, France experienced greater growth in productivity per job.

(ii) The employment rate increased in both countries, but more strongly in France (where the 4.2-point increase was mainly among those in the 55-64 age group, whose employment rate rose by 20 points following an extension of the contribution period required for full pension eligibility). The 2.9-point increase in Switzerland is attributable to female employment. France's advantage in this area reduced the differential in living standards by 4 points.

(iii) Employment of non-residents contributed 4.7 points to the widening of the gap in standard of living, as the number of cross-border workers more than doubled, from under 150,000 to over 300,000.

(iv) While demographic aging reduced the working-age population as a percentage of the total by 2.8 points in France, Switzerland managed to nearly stabilize the percentage (which declined by 0.7 points). This stabilization is very closely linked to the inflow of highly skilled new residents from the EU.

The coming into force of the EU-Switzerland Agreement on the Free Movement of Persons (Free Movement of Persons Agreement, FMPA) in June 2002 thus appears to have been greatly beneficial to Switzerland, which continued to report stronger growth in its living standard through the third and fourth channels mentioned above, which combined contribute 9.6 points to the widening of the gap in standard of living over the period 1997-2017.

4.2 Gains in productivity per worker were hindered in France by the reduction in working time

For France, a more detailed analysis of the determinants of the change in growth in productivity growth per worker is possible because data for the entire period are available for annual hours worked, employment per full-time equivalent jobs, and part-time employment.

For the entire period, France achieved gains in hourly productivity in real terms of 25% (or 1.1% a year). Growth in productivity per job was significantly lower (0.8% a year on average), primarily due to the reduction in annual hours worked, which fell by 5.5% per FTE after implementation of the 35-hour working week. Assuming that hourly productivity exhibits low sensitivity to variations in annual hours worked[15] (i.e., assuming the impact of the decrease in annual hours worked is fully passed on to productivity per FTE), the shift to the 35-hour working week is estimated to have a negative 7-point impact on both the living standard, and on the widening of the gap with Switzerland. Part-time employment, by contrast, was stable over the period.

In Switzerland, on the other hand, part-time employment grew substantially, rising from 28% of the economically active population in 1997 to 37% in 2017. Based on the partial data available, this change was responsible for the reduction in the number of hours worked per job, which is estimated to be on the order of 7%.

As in France, the reduction in annual hours worked restricted growth in productivity per job. However, growth in female part-time employment also made a positive contribution to growth of GDP per capita, through its positive effect on the total employment rate, which recorded a massive 7-point increase, from 68% to 75%.

The situation was somewhat different for men, as male part-time employment rose while the male employment rate fell slightly. This restricted growth in the total employment rate to 4% during the period (table 7).

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(15) This assumption is consistent with the results published in Gianella and Lagarde (1999), "Productivity of hours in the aggregate production function", *Working Paper* G9918, INSEE.

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