

## Chapter 2

# Two Wealthy Economies and Their Development

As mentioned in the introduction both Denmark and Switzerland have managed to stay wealthier than most countries in Western Europe,<sup>1</sup> but the process of convergence in the West has reduced the gap. The West has experienced a strong economic integration in the twentieth century – notably in the second half. This process has led to convergence within the West – and as more countries have joined the process, it has become a true globalization.

The present chapter has four sections: Section 2.1 looks at the thorny problem of comparing the GDP per capita of Switzerland and Denmark. Section 2.2 concentrates on the convergence of the GDPs per capita within the West, notably Western Europe. Section 2.3 considers the perspective of globalization. Section 2.4 deals with the nominal and real exchange rates of the two countries.

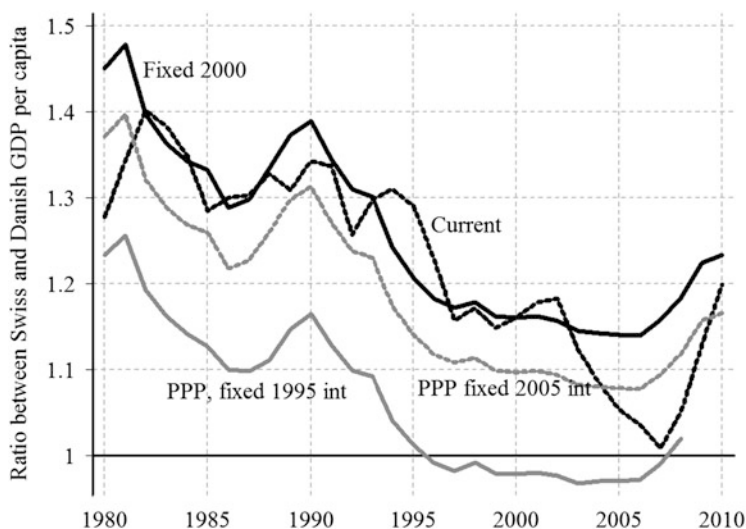
### 2.1 Comparing GDP per Capita

The countries included and the data used in this section are listed in the [Appendix](#). The GDP-data are in constant prices, reached by dividing by a price index. We prefer a PPP-index made to make countries as comparable as possible – this is done in the Maddison-data set, see [Appendix](#). However, the index uses PPP weights for 1995.

A price index measures the average price increases from period 0 to period 1. It uses the quantities consumed in either period 0 (Laspeyre's index) or period 1 (Paasche's index) as weights – in principle both formulas are equally 'right'. The difference between the two calculations is the index problem. It is due to the reaction of people to the change in the relative prices from period 0 to 1. Normally

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<sup>1</sup> During the last two decades the only European countries that are consistently richer than the two countries are Luxembourg and some micro-countries such as Liechtenstein, the Channel Islands and Monaco. However, Norway became richer in the last decade.

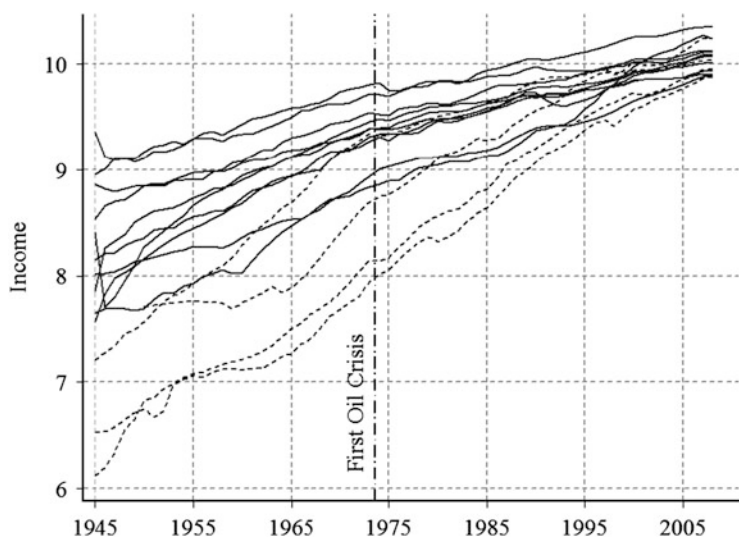


**Fig. 2.1** Four series comparing Swiss and Danish GDP per capita (Note: The four series are: (1) is in fixed 2000 US\$, source WDI, (2) current US\$, source WDI, (3) PPP, fixed 2005 international US \$, source WDI. (4) PPP, fixed 1995 US\$, source Maddison (2003))

the shifts in relative prices are small and barely noted by people, so the index problem is small. However, for visible systematic movements, such as the ones caused by exchange rate movements, the index problem becomes substantial.

Figure 2.1 shows four comparisons. WDI (the World Bank databank) gives few Swiss data before 1980, so the comparison is restricted to the period from 1980 to 2010. The comparison based on current US\$ and the index with the oldest weight (1995-weights) should differ most. The two middle indices are have newer weights. The four curves show three main features: (1) They have a range of about 18 %. This reflects the size of the index problem. (2) The three curves in fixed prices have almost the same path – just shifted by a fairly constant factor. (3) All four curves have a clear downward trend, so that over the 30 years the difference in GDP between the two countries falls by about 30 percentage points.

The trend in the Swiss income relative to the Danish (and the West in general) is similar for all indices. It is due to the *downward* convergence of Switzerland as shown in the next section – notably Figure 2.2. From being about 35 % ( $\pm 10$  %) richer than Denmark only 30 years ago, the difference is now only 10 % ( $\pm 10$  %). The difference bottomed out at about 7 % ( $\pm 10$  %) about 7 years ago, but the financial crisis after 2008 has once again increased the difference.



**Fig. 2.2** The convergence of the OECD countries (Note: The 13 countries are chosen to be reasonably well spread out at the start. If all OECD-countries were included, the same pattern would appear, but it would be cluttered at the upper half. The countries with dashed lines are East Asiatic, see Table 2.3 of the Appendix)

## 2.2 The Convergence Within the Developed World

The main pattern is a *convergence upward*, where countries that are behind ‘catch up’. The following discussion refers to standard textbooks such as Jones (2002) and Barro and Sala-i-Martin (2004).

### 2.2.1 A First Look

The convergence among the developed countries is shown in Fig. 2.2. The horizontal axis is in years. The vertical axis is income defined as the natural logarithm to GDP per capita.

The figure shows that the countries differed by 3 lp (logarithmic points) at the start. This is no less than 20 times. If the East Asian countries are disregarded, the difference is about  $1\frac{1}{2}$  lp, which is only  $4\frac{1}{2}$  times. At the end the difference has fallen to less than  $\frac{1}{2}$  lp, which is about  $1\frac{1}{2}$  times, whether or not the East Asiatic countries are included. The fall in inequality within this country-group is thus substantial. Note that the speed of convergence slowed down a little after the first oil crisis in 1973, at least among the countries of the West.

### 2.2.2 *Sigma Convergence in the West*

The standard way to analyze convergence is to calculate the sigma-measure, where, as before, income is  $y_{it} = \ln gdp_{it}$  and  $gdp$  is GDP per capita:

$$\sigma_G(t) = STD_{i \in G}(y_{it}), \text{ where } STD_{i \in G}(y_{it}) \approx STD_{i \in G}(gdp_{it}) / AVR_{i \in G}(gdp_{it}) \quad (1)$$

The STD is the standard deviation and AVR is the average.  $G$  is a country group – at present it consists of the 20 countries of the West. The measure gives the cross-country income distribution so that the distribution becomes more skew when the measure rises. The long-run pattern thus shows a strong trend towards a more equal cross-country wealth distribution, precisely as convergence implies.<sup>2</sup>

Figure 2.3 shows the path of  $\sigma$  from 1921 to 2008 for the West. It shows the same pattern as Fig. 2.2, and it goes back to 1920. Therefore, a few additional observations can be made: The long-run trend was clearly interrupted by World War II. It made some countries – notably Germany and its allies – much poorer. But then the ‘Wirtschaftswunder’ caused Germany and its prewar allies to return to their long-run income path. The figure also shows that the Oil Crisis of 1973 caused the fast convergence to return to its long-run path.

The convergence will also be disturbed by the crisis of 2009–2011 as some of the countries that have been hit hardest are among the poorest in the group.

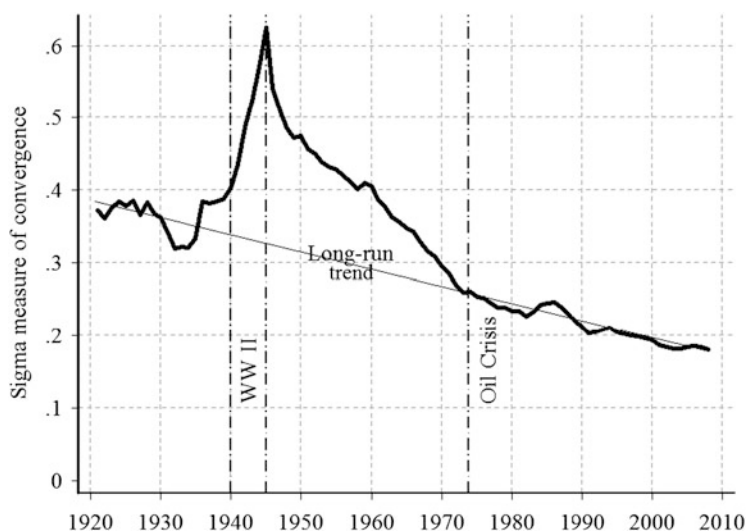
Economic theory considers long-run economic growth to be due to real factors – notably technology. The main theoretical insight of convergence rests on three conditions:

- (a) *Globalization*. The more countries are connected by trade, factor and information flows, the more similar will the economies become.
- (b) *Catch-up growth* where countries that produce at a low level of technology learn the technology of those ahead. It may be difficult if the technology gap is large, but at a certain moderate gap-level catch-up can be fast, as shown on Fig. 2.2.
- (c) *Steady state growth* at the ‘modern level’. It depends upon the development of new technologies at the margin. It is thus an international phenomenon.

The ‘modern level’ is determined by the international technological level and the state of the art techniques as regards management and economic policies. Obviously no country is doing everything right, so there is always some margin of inefficiency. Some inefficiencies are due to political constraints and some are due to business monopolies and lack of innovation. The ‘modern level’ is a zone where all countries are rich, but some differences remain. The poorest country is still 50 % below the richest.

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<sup>2</sup> The 50 states of the USA have converged rather much, but there are still differences between the states, and with the  $\sigma$ -measure used below it appears that the smallest value that can be reached is above 0.1, and the countries of the West are surely more different than the US states.



**Fig. 2.3** Sigma convergence for the 20 countries of the West since 1920

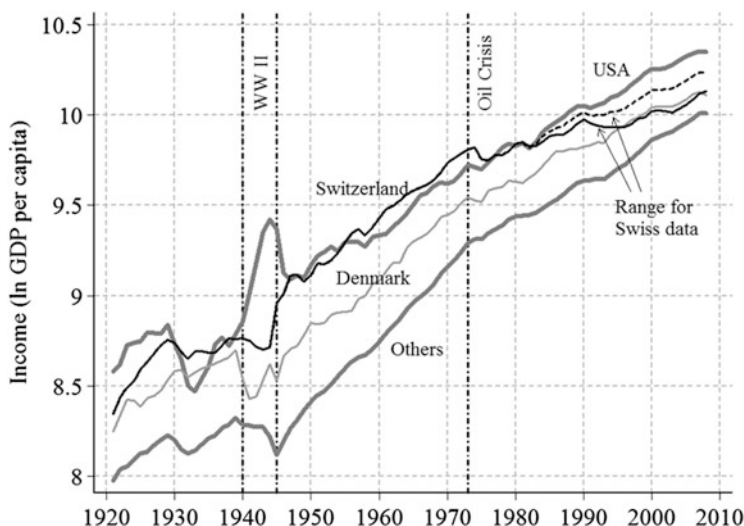
- (d) *Differences remaining*. The more institutions and policies differ and the more protected the economies are, the more different can they remain.
- (e) *Flexible and 'clever' policies*. The main condition for staying ahead of the other countries once you are at the modern level is fast adjustment to new technologies and changes in the world economy.
- (f) *Transfers* between countries, such as the ones to safe havens and to foreign debt and resource rents obtained from export, may shift income between countries.

Conditions (a)–(c) describe a process of convergence towards the zone that constitutes the modern level, much as seen in Figs. 2.2 and 2.3. Both Denmark and Switzerland are at the modern level and have institutions that differ considerable from the rest – and from each other. Both have also managed to do relatively well, though they have converged considerably towards the average.

The 50 states of the USA form a strong convergence area, where goods and factors are free to flow, and policies and institutions are almost the same. Still the  $\sigma$ -measure of convergence is not zero, but it seems to have stabilized a little below 0.1.

The countries of the West (where the USA is one country) have many regulations and historical barriers to trade and factor flows, and institutions and policies are likewise different in many ways. International organizations such as the EU and the WTO have been rather successful in curbing obvious barriers to trade, but there are many more subtle trade hindrances at play.

Thus, it appears the West will not converge as much as the US states, and the process shown at Fig. 2.3 may stop well before 0.1. However, the curve in the figure does not show a clear leveling off. While the convergence is rather strong at the top where the world technology frontier is the joint attractor, there is no other attractor



**Fig. 2.4** The position of Denmark and Switzerland in the convergence pattern in the West (Note: Data from Maddison (2003). The lowest of the two Swiss curves is the Maddison estimate. The highest (dotted) curve is probably exaggerated. Others are the remaining 16 countries of the West in Table 2.3)

in the world today. And indeed, when modern economic growth starts in an area, it will typically lead to divergence in the first few decades. This, e.g., is the case for the African countries, the Chinese provinces and the Indian states. They all experience rather strong divergence.

### 2.2.3 Denmark and Switzerland in the Pattern

Figure 2.4 shows the development of the USA, Denmark, Switzerland and the *other* western countries. The strong convergence before the Oil crisis is shown as a reduction in the gap between others and the USA. It is also clearly visible that the convergence has been slower after the Oil crisis.

From the difference observed we conclude that the other western countries still have a substantial productivity gap to the USA, which in average amounts to about 40 %. This suggests the size of the potential efficiency gap that can be reduced by further integration.

The second point to note is the position of the countries of interest: Denmark is close to the middle of the interval between the USA and others throughout. Switzerland has a much more interesting path: It did experience problems during the Second World War. However, as soon as the war was over Switzerland had a prolonged boom lasting until about 1980, during which the country was richer than the USA most of the time, but since then it has gone to the middle of the interval as

well. This implies that Switzerland has had relatively low growth in the period. This is normally ascribed to low productivity increases.

### 2.2.4 *The Relative Development Path*

The development shown in Fig. 2.4 is shown relatively on Fig. 2.5a, b. The figures indicate that Denmark did rather well during the big crisis in the 1930s, but has otherwise followed the general western development. Switzerland has had a radically different path. From the First World War and only interrupted by the Second World War, Switzerland has been extraordinarily successful in producing a high standard of living. From 1947 to the Oil crisis in 1973, Switzerland was on average about 40 % wealthier than the rest of the West.

When the two countries are compared with Western Europe in Fig. 2.5a the Swiss exceptionalism is even more striking. Switzerland was 2.4 times richer than other Western European countries just after the Second World War, but the excess standard of living has declined ever since.

Figure 2.5a shows that Switzerland gained great advantages at the end of the War in 1944 and till 1949 by being a safe and well organized island surrounded by countries in chaos: Germany-Austria and Italy lost the war, and France was torn between losers and winners. It was only after 1950 that Europe gradually ‘normalized’. This history certainly gave the Swiss safe haven policies a jump start.

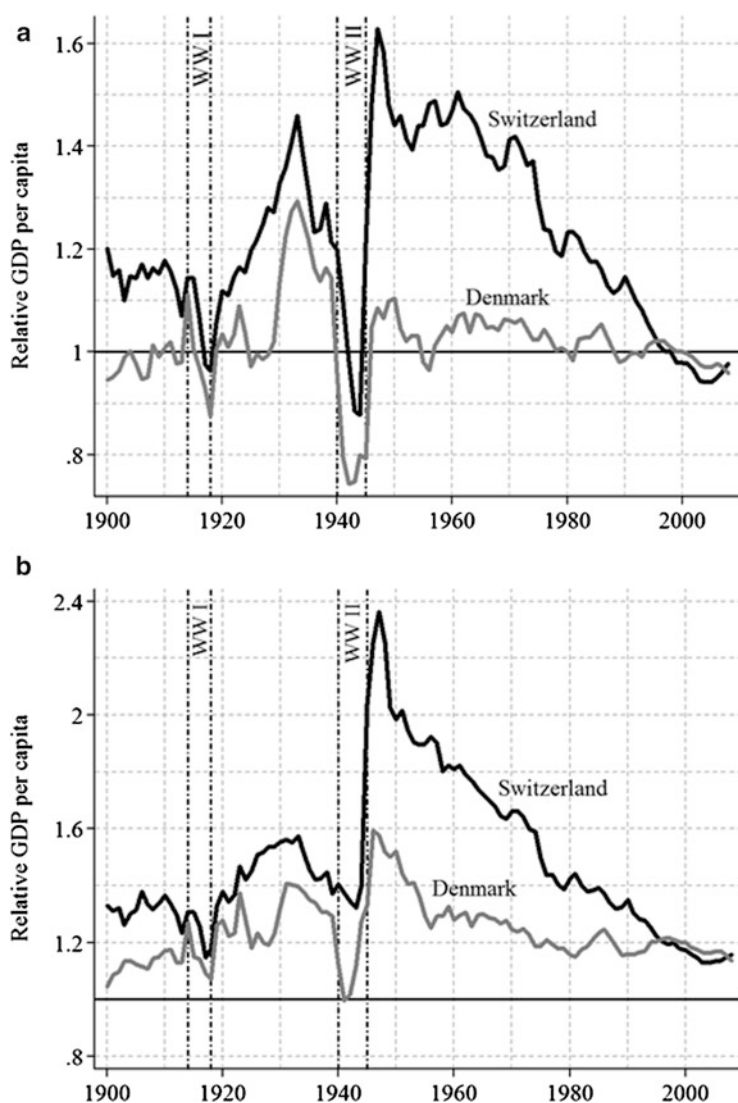
Switzerland differs from the other safe havens in two ways.<sup>3</sup> In the first place it is much larger and consequently a large part of the economy is ‘normal’. Secondly, in most of the period since World War II, it has operated a floating exchange rate that has steadily revalued. This implies that some of the funds floating into Switzerland have remained in the country, giving a combination of a low interest rate and a steadily revaluing real exchange rate. It has also given an unusual housing market. So the Swiss economy is highly unusual in a number of ways.

Table 2.1 compares the trends in GDP (calculated as explained in the note to the table) and deviations trend the average for the countries of the West. Table 2.1 shows that five countries have the same long-run growth rate as the average one: They are Germany, France, Denmark, Canada, and Switzerland.

However, countries may have periods where they *deviate* from the long-run growth rate. Switzerland certainly did by having a truly enormous jump in incomes in 1944–47 and a slow return to the trend since then. This is a very unusual path of income. In fact, the Swiss development deviates more from the trend than that of any other western country.

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<sup>3</sup>The OECD and IMF have had committees to study offshore banking centers. In Europe 11 countries are classified by both committees as financial safe havens. The other 10 countries are all micro-states see Paldam (2013).



**Fig. 2.5** (a) The path of GDP per capita relative to all West. (b) The path of GDP per capita relative to Western Europe (Notes: Calculated relative to the GDP per capita for the West (a) and Western Europe (b). The comparison is shown as horizontal lines at 1. In 1947 the average Swiss thus earned 1.6 times the average income in the West and 2.4 times the average income in Western Europe. Note that the data used are the Maddison data and that the Swiss performance is better using other indices)



**Table 2.1** Deviations of western countries from the common trend 1900–2008

Above average growth					Below average growth			
Country	Trend %	R <sup>2</sup> -adj	Deviation		Country	Trend %	R <sup>2</sup> -adj	Deviation
Germany	2 (0.6)	-0.006	1.22		Denmark	-1 (-0.2)	-0.009	0.82
France	9 (2.8)	0.058	1.34		Canada	-3 (-1.1)	0.002	0.73
					Switzerland	-8 (-1.5)	0.012	3.22
Austria	15 (3.9)	0.113	1.71		Netherlands	-13 (-3.7)	0.104	1.55
Spain	16 (5.2)	0.193	1.09		USA	-17 (-5.0)	0.183	1.37
Sweden	21 (6.4)	0.271	1.27		Belgium	-19 (-6.1)	0.248	1.17
Italy	25 (9.0)	0.426	0.91		Australia	-38 (-20.2)	0.790	0.40
Finland	44 (27.6)	0.876	0.29		UK	-51 (-22.5)	0.824	0.60
Norway	52 (27.5)	0.876	0.42		New Zealand	-68 (-23.4)	0.835	0.96

Note: The ‘trend’ scores are in pp (percentage points). They are calculated by a linear regression through the ratio  $r_t$ . The section *shaded in gray* contains the countries with an insignificant trend. The trend of 2 for Germany means that the distance of the trend from the average is 2 pp higher in 2008 than it was in 1900. This is negligible. Deviations are the average squared sum of the residuals from the linear regressions

## 2.3 Globalization: Two Measures

Globalization is a phenomenon in a handful of dimensions. Several attempts have been made to measure all dimensions and combine them into an index.

The most ambitious is the KOF-globalization index, see Dreher (2006). Figure 2.6 shows the path of the index since 1971 for the western world, which is the West in Table 2.3 (Appendix).

The KOF-index is in percentage points and shows a very strong increase till about 2000 where the index levels off. It also shows that both Denmark and Switzerland are more globalized than the average, though the globalization of Switzerland has fallen since year 2000.

The economic component of the index taken alone shows almost the same picture but even more marked – especially with respect to the decline in Swiss globalization that ends up below average. This is due to the regulation component of the index, cf. Fig. 2.7. The regulations included are the ones dealing with international trade and capital movements.

Figure 2.7 shows the regulation component of the KOF-index. Here Denmark is clearly a free-trade nation also relative to the West. However, since 2000 Switzerland has introduced a good deal of restrictions. Next section explains why Switzerland had to do something.

A very similar result is reached in the openness to trade components of the Economic Freedom Index, see Gwartney et al (2010).

The alternative index is from the World Economic Forum that issues the *Global Competitiveness Report* where countries are ranked based on their competitiveness according to a Global Competitiveness Index. The index is calculated from publicly available data and it is also based on a survey of executives’ opinions, covering more than 13,500 business leaders in 2010. According to the Global

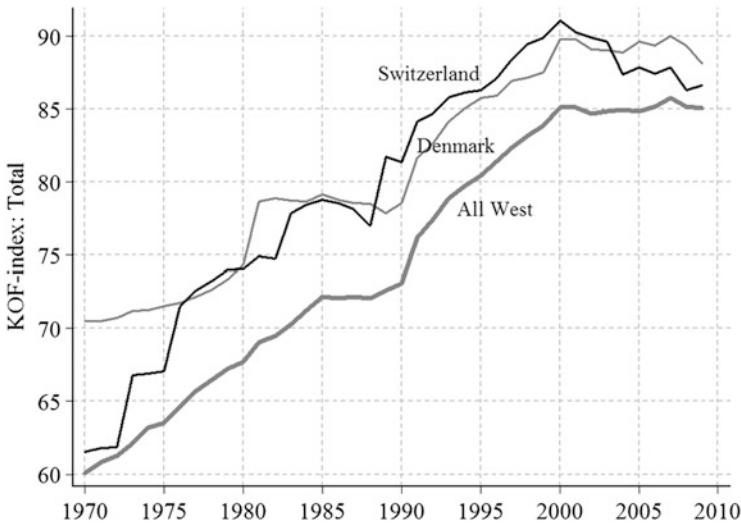


Fig. 2.6 The KOF-index of globalization, aggregate scores

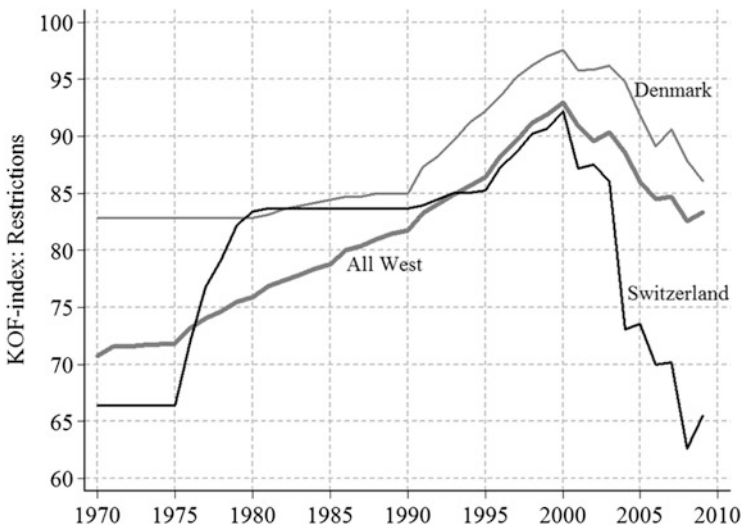


Fig. 2.7 The KOF-index of globalization, regulations of trade and capital movements

Competitiveness Report the index is based on 12 major factors which reflect institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation.

As seen throughout this chapter Denmark and Switzerland are very similar with respect to many factors of importance for competitiveness. Focusing on the report of 2010, we find that both countries are indeed highly competitive. Looking at the overall score, Switzerland achieves the highest rank for its global competitiveness ahead of Sweden (rank 2), Singapore (rank 3), the United States (rank 4) and Germany (rank 5). Denmark finds itself ranked ninth behind Japan (rank 6), Finland (rank 7) and the Netherlands (rank 8). However, we have to remark that the differences in the ranking score between Denmark and Switzerland are fairly small. Denmark obtains a competitiveness score of 5.319 while Switzerland has a competitiveness score of 5.630. Thus, in a global comparison both countries can be regarded as highly competitive. However, in the 2012 report Denmark has dropped some places while Switzerland is still ahead.

## 2.4 Exchange Rates: The Exceptional Swiss Case

The Danish exchange rate has been tied to the Euro (ECU) since 1980, so the story of the nominal Danish exchange rate is dull.<sup>4</sup> As will be shown the same applies to the real rate.

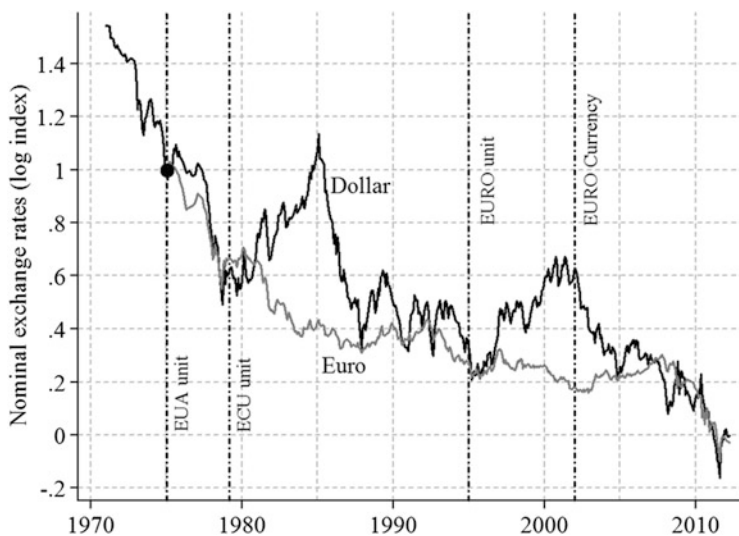
However, the Swiss case is unique: The data considered start in 1971 where the exchange rate of the Swiss Franc was fixed to the US \$ at 4.375 by the Bretton Woods agreement. In early 2012 the exchange rate fluctuated around 0.91, so we are dealing with a nominal revaluation of no less than 4.8 times.

### 2.4.1 *The Nominal Exchange Rate of the Swiss Franc*

During the spring of 1971 the international monetary system was under pressure, and in August 1971 the US \$ left the fixed rate policy of the Bretton Woods agreement. This also caused the Swiss Franc to float. In the early 1970s the EC (later to become EU) countries started to build a common European currency through a gradual process introducing a common unit of account. First the EUA was introduced, then came the ECU that led to the Euro unit of account in 1999 and finally to the Euro currency in 2002. Below we just use the term Euro for this sequence of EU ‘money’.

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<sup>4</sup> The exchange rate terminology is confusing: The nominal exchange rate is the price in domestic currency of one unit of foreign currency. A revaluation thus means that the exchange rate goes down, so that the price of foreign goods falls in the country, while the price of domestic goods rises abroad. The real exchange rate is reached from the nominal rate by multiplying with a foreign price index and dividing with the corresponding domestic price index. Below the consumer price index is used to calculate the real rate.



**Fig. 2.8** The nominal exchange rate of the Swiss Franc to the Euro and the US \$ (Note: Monthly data from the [Bloomberg data set](#). The indices are set at 1 in January 1975.)

Switzerland has continued to float the Franc independently of both the \$ and the Euro, as shown on Fig. 2.8. To allow the reader to see if there is an underlying ‘constant’ rate of revaluation, the rate is a log-index where a constant rate of revaluation shows up as a straight line. The large Swiss revaluation in the period 1971–1975 represents an adjustment to the realignment of the disequilibrium in the previous years, so the period since 1975 is the most interesting one.

Consequently the comparison fixes both the \$/franc and the €/Franc indices at 1 in January 1975 as indicated by the black dot, and they are close together in 2012. In March both indices are precisely 1 logarithmic point lower than in 1975. Between 1975 and 2012 the indices fluctuated substantially around the trend – especially due to the large cycles in the price of the US \$.

Thus, the Swiss Franc has fallen by 1 logarithmic point relative to both the US\$ and the Euro in the 37 years from 1975 to 2012. This corresponds to an **annual nominal revaluation of 2.7 %**. The exchange rate of the Franc to the Euro has a more stable fall, indicating that Switzerland is an ‘island’ in Euroland. Between 1983 and 2010 the revaluation to the Euro is just below 1 % per year. It is also notable that the steepest revaluation slopes for the Swiss Franc occur during financial crises where funds are desperate for a safe haven.

**Table 2.2** Average inflation rates, 1975–2011

Country	Average rate	Relative to Euroland	Country Euroland	Average rate	Relative to Euroland
Switzerland	2.19	−2.78	Germany	2.56	−2.41
Denmark	4.48	−0.49	Netherlands	3.07	−1.90
			Austria	3.14	−1.84
Sweden	4.86	−0.11	Luxembourg	3.61	−1.36
UK	4.63	−0.35	Belgium	3.66	−1.32
USA	4.22	−0.75	France	4.44	−0.53
			Finland	4.78	−0.19
			Ireland	6.03	1.06
Average for Euroland	4.97	–	Italy	6.97	2.00
			Spain	7.40	2.43
			Portugal	10.24	5.27
			Greece	11.25	6.27

Source: Consumer price indices from the WDI filled up from national statistics for the UK and (West) Germany

Note: The Euroland rate is calculated as a weighted sum of the 12 countries in the right hand panel using GDP in 2005

### 2.4.2 Inflation and Real Exchange Rates

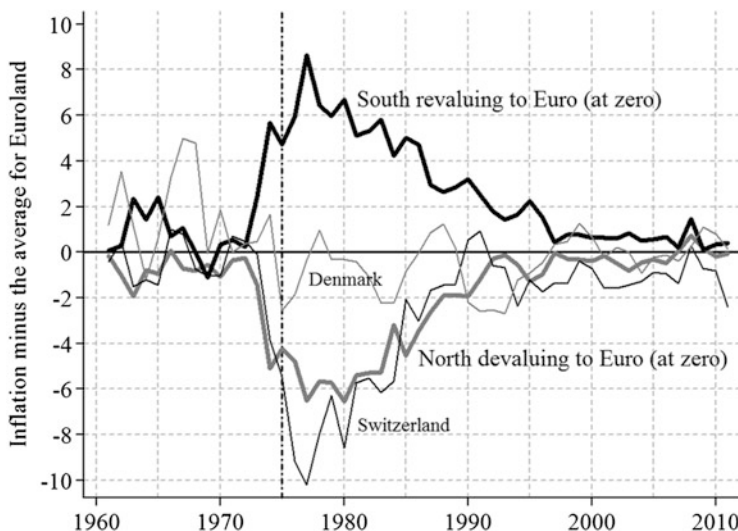
The inflation rates using the consumer price index are reported in Table 2.2. The average inflation rate in Euroland is calculated as the weighted sum of the 12 inflation rates given in the right hand panel, with the GDP in 2005 used as weights. Obviously this is a debatable choice, but the results are much the same for other weight years.

The US inflation rate is about 2 % higher than the Swiss, so crudely Switzerland has revalued in real terms relative to the US\$ with an average rate of 0.7 % per year or about 30 % over the full period. In the same way the data show that the Swiss rate of revaluation relative to the Danish crown is 0.5 % per year or 20 % over the full period.

However, the Euroland inflation rate minus the Swiss inflation rate is precisely equal to the Swiss rate of nominal revaluation: Switzerland seems to have had a constant real exchange rate relative to Euro land. At a closer look this turns out to be misleading, however.

### 2.4.3 The Northern and the Southern Inflation Regime

The right hand panel of Table 2.2 tells a story of the 12 old western members of the European monetary fixed rate system. Essentially it shows why the Euro is in trouble. The same story can be told about budget deficits and debt.



**Fig. 2.9** Relative inflation rates of Euroland North and South, Denmark and Switzerland (Note: North Euroland is Austria, Belgium (Luxembourg), Finland, Germany and the Netherlands. South Euroland is Greece, Italy, Portugal and Spain. The price indices of the groups are the weighted average using the same weights as before. France and Ireland are not included, so the two lines are to the same side of the Euroland average in 2 years)

We define Euroland North as Austria, Belgium (+Luxembourg), Finland, Germany and the Netherlands. Euroland South is Greece, Italy, Portugal and Spain. France is closer to the North and Ireland closer to the South, but the Irish story is different when it is considered over time. It should be mentioned that the KOF-index for globalization shows that although the South was well behind the North till 1990, the difference has closed rapidly after that. The two bold curves in Fig. 2.9 show the path over time of inflation in the two country groups. It has also converged after 1990. A look at the two curves leads to four simple observations:

- (i) The Northern group has devalued relatively to the Euro in real terms by having less inflation. The Southern group has revalued relative to the Euro in real terms by having more inflation. The South-curve is always above the North-curve (except in 1969).
- (ii) From 1975 to 1985 the annual inflation differed by no less than 11 percentage points.
- (iii) However, after the establishment of the Euro in 1999 (in fact from 1997) the big gap in inflation rates decreased considerably. In connection with the establishment the South devalued to wipe out some of the big accumulated inflation gap.
- (iv) Clearly a serious attempt to reach monetary discipline was made. But a difference in inflation rates of about 0.8 percentage points has remained.

So for the last 15 years the North has devalued by about 14 % relative to the South. It does not seem much, but there probably was some disequilibrium already before 1997, and it grew.

This is an important part of the difference between the economic developments of the two areas, and it certainly is one of the main explanations of why many observers fear that the Euro may not remain. In the fixed exchange system of Bretton Woods it was possible for countries with a substantial disequilibrium in its exchange rate to devalue (or revalue).<sup>5</sup>

The figure and many like it have demonstrated that while it is easy to have more inflation than the average one in Euroland (or any other monetary unions) it is a slow and painful process to offset that inflation with less inflation later on.

#### ***2.4.4 The Position of Denmark and Switzerland in the Pattern***

The path of inflation of Denmark and Switzerland is included on Fig. 2.9.

The Danish inflation path was between the two bold curves till the early 1980s, and then it moved to follow the North curve rather neatly. From 1975 to 1982 Denmark did devalue enough to keep the Danish crown reasonably stable in real terms. As most of Denmark's foreign trade is with the Euroland North group, this meant keeping the inflation at the German level. After 1989 this has worked rather well.

As we are accustomed to, by now the Swiss story is the interesting one. Switzerland has followed the North inflation curve throughout, but in most years it has had less inflation. Before 1972 Switzerland had a little higher inflation than the North, but after 1975 Switzerland has had 0.7 percentage points less inflation annually. To reach the real rate of revaluation relative to Euroland North, the 0.7 % less inflation should be deducted from the 2.7 % nominal revaluation. That is, compared to Euroland North Switzerland has revaluated in real terms with about 2 % annually. Over the 37 years this amounts to about 100 percentage points. Also, the German revaluation in 1987 should be included – it decreases the size of the Swiss revaluation a little. These calculations can be endlessly refined – and this has surely been done by the many economists who study exchange rates in banks and economic ministries, etc.

However, with all refinements the Swiss Franc has revalued substantially to Euroland North. Obviously this corresponds to a similar devaluation of the Swiss Franc relative to Euroland South, but most of the four countries did devalue

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<sup>5</sup> Madsen and Paldam (1983) analyze the 12 devaluations and 3 revaluations that took place in the OECD area during the Bretton Woods period. All of these were due to previous differences in the rate of inflation. They typically helped substantially to restore the equilibrium.

substantially in connection with the entry into the Euro. The devaluation to Euroland South is consequently substantially less than shown.

## 2.5 Summing Up

In 1945 Western Europe was in a sorry state. Most of Central Europe had been intensely bombed and then the last battles were fought there. Germany and its allies including Italy and Vichy France were defeated, and production was reduced. But the two countries we are comparing had been relatively lucky.

Denmark had been occupied 1940–45, but it had been treated relatively leniently by Nazi-German standards, while Switzerland had managed to stay neutral as the only ‘safe’ island in Central Europe. This had required a great balancing effort and had forced the Swiss to deal with all sides in the war in a very discrete way.<sup>6</sup> Thus, both countries had a fairly intact production structure, and Switzerland had already embarked upon its role as a safe haven when the war ended.

In the 1950s and 1960s Switzerland was very successful, while also Denmark did fairly well.<sup>7</sup> Since then both countries have been caught up in the general process of western convergence. However, they have managed to stay ahead. We conclude that Denmark is about 10–15 % poorer than the USA and about 15–20 % above the West European average. Switzerland is about 10 % above Denmark, and thus very near the USA.

While Denmark is one of the most globalized countries, Switzerland has introduced some trade restriction. The main reason is that the strong Swiss Franc has steadily revalued, threatening Swiss competitiveness, which would otherwise be great.

## Appendix: Data Definitions and Sources

Angus Maddison (1926–2010) constructed his data for the OECD millennium perspective report, see Maddison (2002, 2003). They build on Penn world tables (see Kravis et al. 1982), but they have been greatly extended in time. They were updated till 1 month before Maddison passed away.

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<sup>6</sup> Switzerland has stayed neutral since 1815, so Switzerland was also neutral under World War I, but so was Denmark.

<sup>7</sup> However, the most intact production sector in Denmark was agriculture, and the agric sector was subjected to a great deal of import regulation on the traditional Danish markets.



**Table 2.3** Countries

The West is: Australia, Austria, Belgium, Canada, Denmark (s), Finland (s), France (s), Germany (s), Greece, Ireland, Italy (s), Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland (s), UK (s), USA (s). In Fig. 2 the countries with (s) are depicted with *solid lines*, while Japan (d), South Korea (d), Singapore (d) and Taiwan (d) are showed with *dashed lines*

Note: The Maddison data set covers all countries with more than ½ million inh. in year 1990.

**Table 2.4** Data and abbreviations used

Data	Definition	Source
Index $i$	Country	Maddison (2003, and later)
Index $t$	Time	
$P_{it}$	Population	Maddison (2003, and later)
$Y_{it}$	GDP, Gross Domestic Product in real PPP prices	Maddison (2003, and later)
$gdp_{it} = Y_{it}/P_{it}$	GDP per capita	Maddison (2003, and later)
$y_{it} = \ln gdp_{it}$	<i>Income</i> , where $\ln$ is the natural logarithm	
$E_{it}$	Exchange rate as price of the foreign currency	Bloomberg data
$CPI_i$	Consumer price index	WDI, World Bank data
$Rel_{ij}$	$CPI_j/CPI_i$ relative prices	Own calculations
$R_{ijt} = E_{it}$	Real exchange rate relative to country $j$	Own calculations

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The Good Society

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2014, XII, 327 p. 67 illus., Hardcover

ISBN: 978-3-642-37237-7