THE SWISS WATCH CLUSTER

Andrew Goodman | Fredrik Maro | Rasmus Molander

Jose Ojeda | Oliver Tompkins

Harvard Business School

The Microeconomics of Competitiveness

6 May 2010

Table of Contents

Executive Summary

Switzerland is one of the most wealthy, macroeconomically stable and highly competitive countries in the world. The country has achieved its competitiveness despite a landlocked location, lack of natural resources and a small domestic market. Stable political institutions, gradualist policy changes and economic integration with the EU27 are at the core of Swiss macroeconomic competitiveness. Swiss microeconomic competitiveness is driven by a very strong national business environment across the diamond, and 4 highly innovative, export-orientated, co-located clusters: Financial Services, Precision Engineering (including watchmaking), Biopharmaceuticals, and Medical Technology. These clusters have however developed despite an absence of intentional government cluster policies. To sustain and upgrade its national competitiveness, we recommend the Swiss government implement an integrated cluster strategy, coordinate its dispersed economic policymakers around a set of national economic objectives, reduce non-tariff barriers to trade, enact reforms to make starting up and winding down businesses easier, and harmonize business, tax and investor protection regulation with the EU.

Switzerland dominates the global watch market through a near monopoly on luxury watches. A long history, dedicated university and apprenticeship programs together with related and supporting industries, such as fashion and precision engineering, have created a rich environment of integrated and independent watchmakers in Switzerland's Jura region. The Swiss Made label, supported by the government and IFCs, has been of enormous benefit in marketing Swiss watches abroad, especially in Asia, which is the single biggest market. The cluster is strong across the diamond, but its formula for success comes with risks. Internally, the value of the Swiss Made brand motivates complacency and The Swatch Group holds a near monopoly on part of the value chain. Externally, high-value added services like design and marketing are moving abroad and the threat of Asian competition looms. To address this, the cluster, IFCs and government must incentivize firms to contribute to the Swiss Made brand to stave off complacency, foster entrepreneurship to increase competition, strengthen higher education in watch marketing and design and be more proactive in meeting Asian demand.

1.1 Overview of Switzerland

Switzerland is one of the most competitive countries in the world, ranking first in the 2009 Global Competitiveness Report. Despite its landlocked location, mountainous terrain, lack of natural resources and small domestic market, the country has been become wealthy, developed and highly competitive.

The Swiss Confederation consists of 26 relatively autonomous Cantons occupying just over 41,000km^2 of territory at the center of the European continent with a total population of 7.7m people (SFSO, 2010). The Cantons, which range in population from 15,000 to 1.3m people (SFSO, 2010), trace their political roots to the 13th century, significantly pre-dating the 1848 Constitution which established a Federal Switzerland (EIU, 2010). Despite a history of independence and armed neutrality, Switzerland is highly economically integrated with its three largest neighbors – Germany, France and Italy.

Historical Context - Switzerland emerged as one of the wealthiest economies in Europe by the start of the 20th Century, primarily as a result of the country's early industrialization. Swiss neutrality preserved this wealth and the country's industrial base during the two world wars which decimated the rest of Europe, and Switzerland's position of economic strength within Europe continued into the 1970s (SwissWorld, 2010). However, during the 1980s and 1990s as a result of oil shocks, protectionist domestic policy and economic isolation, growth of the Swiss economy slowed (OECD, 2006). Switzerland developed a reputation as a strong but 'sleepy' economy. Switzerland's re-assertion of its competitiveness from the late 1990s has been a story of domestic policy reforms and deeper integration of the country's economy into the European Union, creating export-led Swiss growth in a small number of highly innovative industries.

1.2 Economic & Social Performance of Switzerland

Since the late 1990s Switzerland has experienced real GDP growth rates of ~2% pa (IMF, 2009) while at the same time maintaining low inflation and low, stable unemployment despite business cycle

fluctuations. Switzerland in 2008/9 compares favorably to the comparable OECD and EU27 averages as well as to its immediate neighbors in both economic and social indicators (**Figure 1**).

		Switzerland	OECD	EU27	Germany	France	Italy
Population	m, 2008	7.7m	1191m	496.2m	82.7m	62.3m	59.6m
Real GDP	$bn at PPP, 2008	$291bn	$36,939bn	$14,049bn	$2,689bn	$1,964bn	$1,669bn
Real GDP/Capita	$ at PPP, 2008	$42,030	$33,710	$30,540	$34,670	$34,290	$30,100
Inflation	CPI, %, 2008	2.4%	N/A	3.6%	2.7%	2.8%	3.4%
Unemployment	% of GDP, 2008	2.6%	6.1%	7.3%	7.8%	7.4%	6.8%
Average Labor Cost	$ per Hour, 2008	$37.1	$23.9	$28.2	$41.3	$31.6	$31.3
UN HDI Score	Score, 2009	0.960	N/A	N/A	0.947	0.961	0.951

Source The Economist Intelligence Unit, CountryData; UN Human Development Index 2009
Figure 1 Key Performance Indicators for Switzerland and comparator countries

1.2.1 Economic Performance

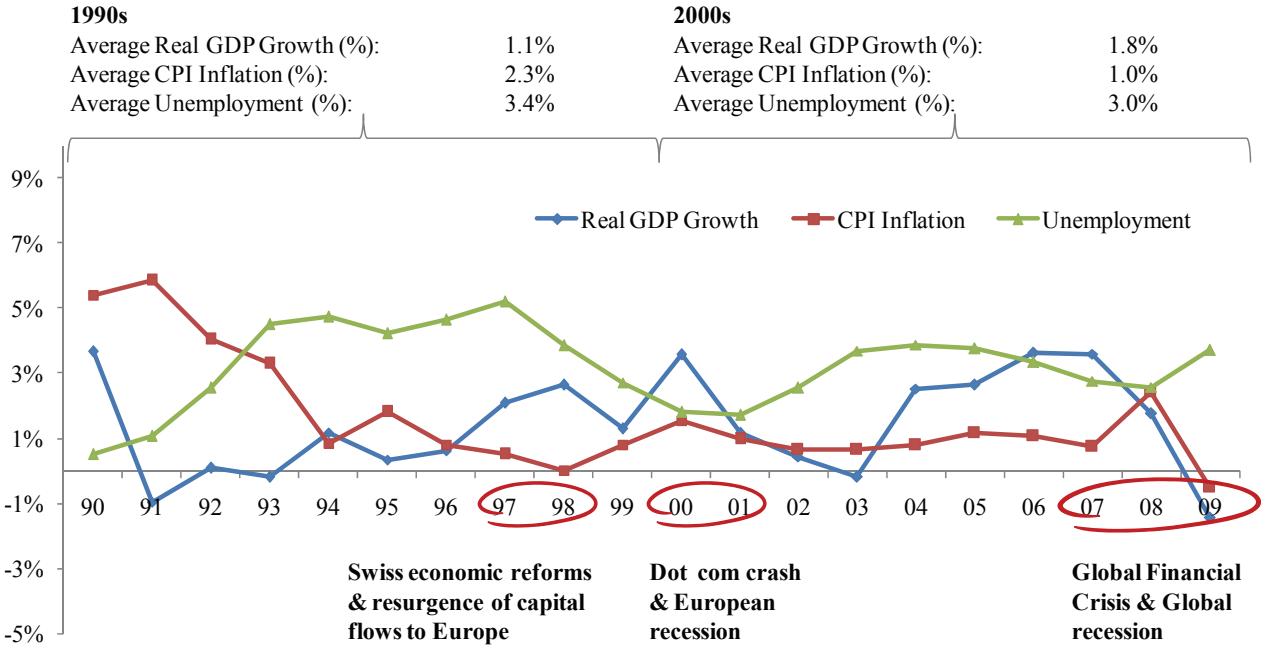


Figure 2 Swiss Real GDP Growth, CPI Inflation & Unemployment, 1990 – 2009

A) Headline Performance Measures - Switzerland has experienced low and stable real GDP growth, inflation and unemployment over the past decade. In the real economy, the Swiss economic experience differed markedly between the 1990s and 2000s (**Figure 2**). During the 1990s, Switzerland's economy averaged very low real GDP growth and unemployment rose above 5% at its peak in 1997 (EIU, 2010). As a result of an increase in developed market capital flows in the late 1990s following capital flight from Asia and Latin America, and domestic economic reforms including temporarily lower interest

rates, greater credit provision to stimulate private consumption and some labor market reforms around flexible working hours, the Swiss economy weathered the technology bubble crash in the US and began to recover in the 2000s. Since 1999 Switzerland has averaged real GDP growth of 1.9% pa and unemployment has remained below 4% (EIU, 2010). CPI inflation has remained below 2% for the ten years since 1999 (with the exception of 2008) as a result of the Swiss National Bank's (SNB) hawkish monetary policy and low domestic inflation expectations (EIU, 2010).

B) Economic Composition – Switzerland is predominantly a service economy with ~70% of GDP generated by the service sector, ~30% by manufacturing, and ~2% by a highly protected agricultural sector. The service sector's share of Swiss GDP has increased gradually from ~60% in the 1980s to ~70% today at the expense of manufacturing (EIU, 2010). The Swiss economy is 99% composed of SMEs (<250 employees), but a smaller number of very large mainly export-orientated companies – Financial services firms (~12%), metals and machinery manufacturers (~6%) and pharmaceutical manufacturers (~4%) – consistently make up a disproportionately large proportion of GDP.

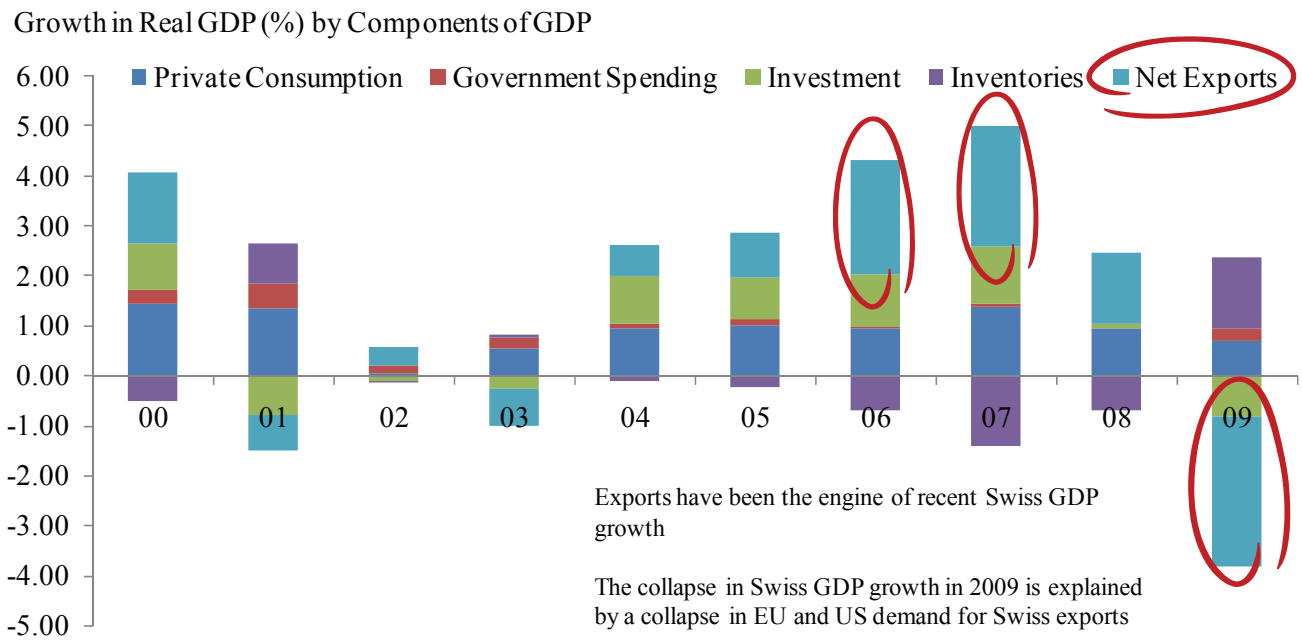


Figure 3 Components of Swiss Real GDP Growth, 2000 - 2009

C) Drivers of Economic Growth - Real GDP growth in the decade since 1999 has been driven by 3 factors - Trade, Foreign Direct Investment (FDI) and Innovation.

Trade - Swiss exports averaged 57% of GDP between 2004 and 2008, with over half of Swiss exports being sold to the country's four main trading partners – Germany, Italy, France and the United States (EU DG Trade, 2009). The Swiss Federal Statistics Office reported in 2010 that "*foreign trade has been the driving force of the Swiss Economy*", (**Figure 3**) resulting in a current account surplus which averaged 11.8% between 1999-2009 (IMF, 2009).

FDI - Investment has consistently been in excess of 20% of GDP over the last decade and much of this investment has been funded by foreign capital inflows. FDI inflows averaged 9.5% of Swiss GDP between 2004-2008, made up half of Swiss gross capital formation at their highpoint in 2007, and have grown 3x from their average level in the 1990s. The result is that Switzerland's foreign capital stock exceeded 100% of GDP for the first time in 2008 (SNB, 2009).

Innovation - Finally, Switzerland is one of the world's leading innovators. The country ranked #1 on the European Innovation Scoreboard in 2009, filed more *worldwide* patent applications than any other country except Japan in 2008 (BCG-AmCham, 2008), and saw US patent applications grow at a CAGR of 10% 2004-2008 (USPTO, 2010).

D) Productivity - Despite high levels of Swiss innovation, research by economists at the Swiss National Bank (Rudolf & Zurlinden, 2009) suggests that Swiss real GDP growth has mainly been driven by gains in *Labor Productivity* – resulting from Switzerland's increasingly flexible immigration policy for high-skilled EU workers - rather than *Total Factor Productivity* (TFP) that would result from innovation. TFP contributed only 6% of total (100%) Swiss real GDP growth between 2000-2005, but in contrast 58% of that GDP growth came from labor productivity, mainly as a result of importing higher quality labor from the EU since 2002. This low level of TFP growth has been consistent since the 1990s, with TFP adding on average only 0.25 points to real GDP each year (Rudolf & Zurlinden, 2009). It is also notable that labor productivity growth has differed significantly across different sectors of the Swiss economy – protected sectors such as agriculture have seen labor productivity actually decline since the 1990s while highly competitive sectors, as would be expected, have seen labor productivity increase.

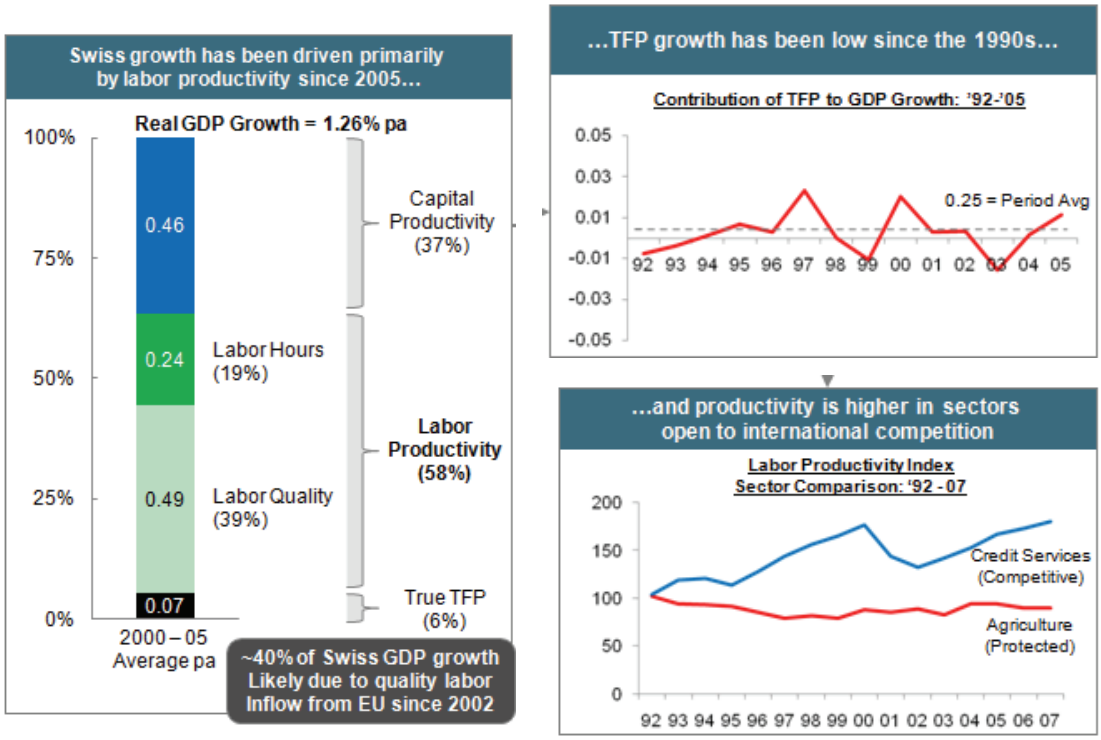


Figure 4 Analysis of Switzerland's Productivity Gains, 2000 – 2005
Source: Team Analysis based on (Rudolf & Zurlinden, 2009) and (SFSO, 2010)

1.2.2 Social Performance

While Switzerland is ahead of the OECD and EU27 averages in terms of its social development and has improved significantly over the last 2 decades, its 9th ranking in the UN's Human Development Index still lags the country's extremely high GDP per capita of $42,000. This HDI-GDP gap can be explained by a complex and often paradoxical gender disparity which still persists in Swiss society despite political reforms to give women formal equality. Swiss women, who were not allowed to vote in Federal elections until 1971, earn ~30% less than their male counterparts. Yet by 2009 Switzerland ranked 13th in the world in terms of gender empowerment in political and economic life (UNHDI – GEM). Outside of the area of gender disparity though, Swiss performance on social measures is very high. At the city level, 3 Swiss cities were ranked in the top 10 cities to world in which to live (Mercer, 2009) and quality of life is frequently cited by highly skilled EU national who migrate to Switzerland to live and work.

1.3 National Competitiveness Analysis

Consistency in both microeconomic and macroeconomic competitiveness explains Switzerland's ranking in the top 6 countries in the world in the ISC's New Global Competitiveness Index every year since 2001. However, Switzerland's improvement to rank 2nd in the world in the 2009 GCI is primarily the result of improvements in Switzerland's National Business Environment (8th in 2005 to 3rd in 2009) and in the country's Macroeconomic Policies (20th in 2006 to 4th in 2009).

A) Endowment – Switzerland's extremely high overall competitiveness is achieved without either a natural resource endowment or a large domestic market. Only 0.3% of Swiss exports are natural resources (ISC, 2010) – mainly timber, and the country consistently imports more than 45% of its GDP.

B) Location – Switzerland's location has been a mixed blessing. Historically the country's landlocked situation was a competitive disadvantage, but since the 1990s Switzerland's location at the center of the European Union – a wealthy and economically integrated neighborhood – has provided access to both required natural resources and a wealthy export market. Switzerland is not a member of the EU but has had zero tariffs on trade with the bloc since 1992 under EFTA and has been integrated into EU labor markets progressively during the 2000s, culminating in 2008 with membership of the Shengen zone. EFTA gives Swiss companies access to the mature, integrated European market of 500m people with a total GDP of ~$15trn. Around 60% of Swiss exports - mainly chemicals, manufactured goods, financial services and watches – are to the EU (EU, 2009), and 71% of Swiss inward FDI is from EU members (SNB, 2009). Foreign workers make up 27% of the Swiss labor force - 67% of these from the EU – (SFSO, 2010) and have increasingly filled vital skills gaps in the Swiss economy over the past decade.

1.3.1 Macroeconomic Competitiveness

A) Social Infrastructure & Political Institutions - Swiss macroeconomic competitiveness has its roots in a historical context of neutrality, stable democracy and federal compromise which has created strong Social Infrastructure and Political Institutions. In the present day, the neutrality which historically allowed Switzerland to avoid the devastation of two world wars has now made Switzerland the de

rigueur location for international organizations, with over 200 multinational HQs in the country. The combination of a Federal structure in which the 26 Swiss Cantons account for ¾ of Swiss government spending, and a constitutional system of Direct Democracy under which 50,000 citizens or 8 Cantons can call a referendum on any issue (EIU, 2010), have led to a system which is characterized by business leaders as 'reliable' where change is 'gradualist' – many increases in Federal tax would, for instance, require a referendum. The most pronounced example of this stability is the remarkable fact that the governing Swiss Executive has been a stable representative coalition of the 4 main parties since 1959.

Figure 5 Analysis of Switzerland's Social Infrastructure & Political Institutions

B) Fiscal Policy – Swiss tax policy has been highly competitive over the past decade. The lowest overall taxes in the OECD, including a flat Federal profits tax of 8.5%, a lump-sum tax option for wealth transfers from abroad, and banking secrecy, all explain the relocation of European Headquarters of companies including Google, Cisco, Kraft and Yahoo to Switzerland since 2005 and the fact that Swiss banks hold over CHF8.4trn in assets (SwissBanking, 2009). Government spending, the other side of fiscal policy, had been less competitive during the 1990s when the country consistently ran a structural budget deficit of up to 5% of GDP. However, in 2003 a 'debt brake' deficit limit was introduced, requiring the government to run a budget surplus over the economic cycle. This reform has also helped to reduced Switzerland's outstanding public debt which stood at 43.5% in 2009 (Dirk-Jan, 2005).

C) Monetary Policy - Swiss monetary policy, administered by the 'inflation hawkish' Swiss National Bank (SNB), has focused on price stability and as a result, inflation has been stable at below 2% pa since 2000. Resulting low inflation expectations have prevented rising wage demands in the manufacturing sector. However, consistently low relative inflation combined with portfolio inflows of wealth into Swiss banks and a lack of exchange rate management by the SNB have resulted in an extremely strong Swiss Franc. At between 1.7 and 2 in terms of PPP since 2000 (IMF, 2009), although gradually depreciating, the Swiss Franc is often cited as one of the most overvalued currencies. As a country reliant on exports for growth, the strong Swiss Franc has resulted in Swiss companies exporting goods at the highest end of the value chain, including pharmaceuticals, watches and medical devices.

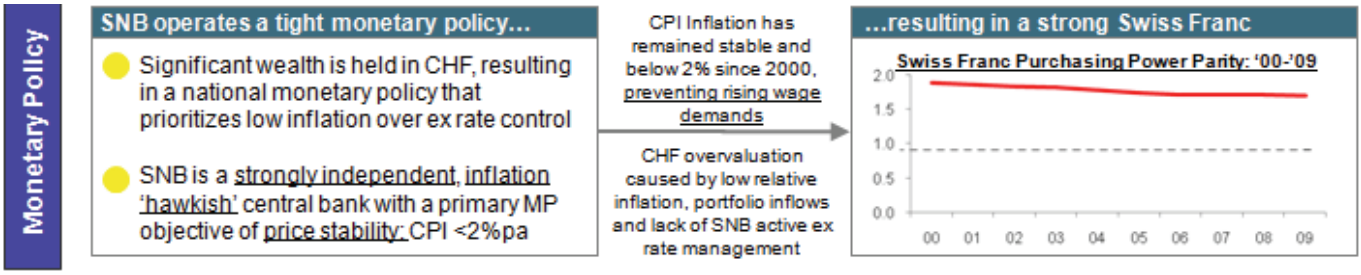
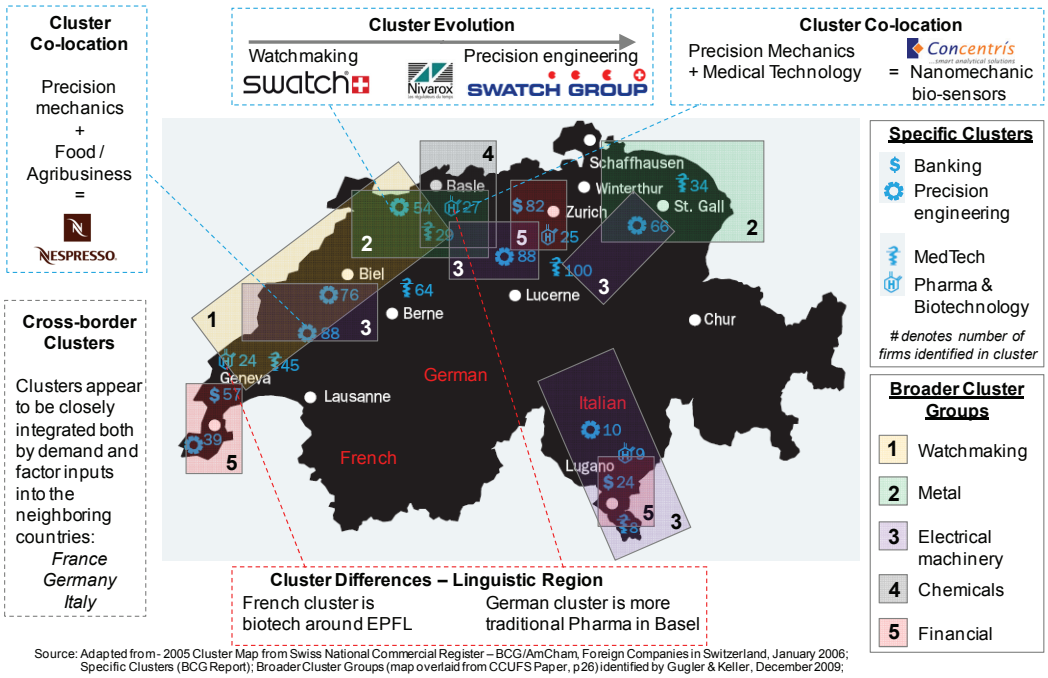


Figure 7 Analysis of Switzerland's Monetary Policy & Swiss Franc at PPP (IMF, 2009)

1.3.2 Microeconomic Competitiveness

A) State of Cluster Development – The majority of employment in the Swiss economy comes from local industries, but traded industries employ 29% of the Swiss workforce (Gugler & Keller, 2009). These traded industries, which are behind Switzerland's export-led growth, are dominated by 4 strong clusters: Banking (Financial Services), Biopharmaceuticals, Precision Engineering and Medical Technology (BCG-Amcham, 2006) and a set of broader cluster groups which additionally include metalwork and electrical engineering (Gugler & Keller, 2009)[1]. Swiss clusters exhibit a number of interesting characteristics. First, the 4 main sets of clusters are strong, deep, export-orientated and in highly innovative, high value-add industries (**Figure 9**).

[1] Location Quotient analysis based on the specialization of particular industries in certain locations in terms of employment (G&K, 2009) overlaid onto analysis of national commercial registry (BCG-Amcham, 2006) used to map Swiss clusters.



Source: Adapted from - 2005 Cluster Map from Swiss National Commercial Register – BCG/AmCham, Foreign Companies in Switzerland, January 2006; Specific Clusters (BCG Report); Broader Cluster Groups (map overlaid from CCUFS Paper, p26) identified by Gugler & Keller, December 2009;

Figure 8 Cluster Map of Switzerland

Second, Switzerland has significant evidence of cluster co-location creating innovation – one example is Concentris, which manufactures nanomechanic biological cantilever sensors and appears to have arisen from the co-location of a precision engineering cluster and a medical technology in the city of Basel (**Figure 8**). Third, many Swiss clusters are continuously evolving and upgrading – Swatch Group, which originated as a watch manufacturer, is now also a leader in the related field of precision engineering (**Figure 8**) and includes subsidiaries such as Lasag, a world leader in precision laser cutting instruments.

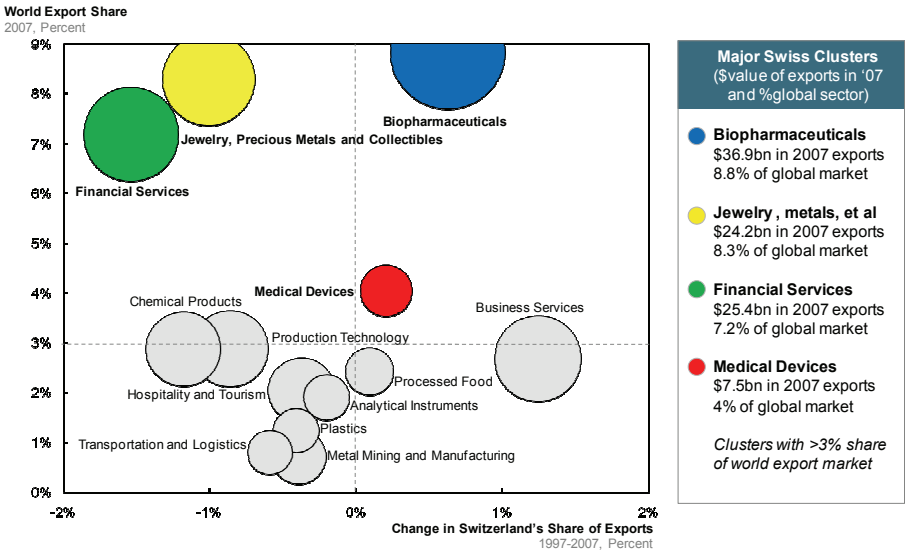


Figure 9 Switzerland's Export Portfolio, 1997 – 2007 (Clusters with export value >$5bn)

B) National Business Environment (NBE) – Overall, Switzerland's business environment ranks third in the world (GCI, 2009). This strong performance is achieved through strength in all four areas determining the quality of the business environment (**Figure 10**).

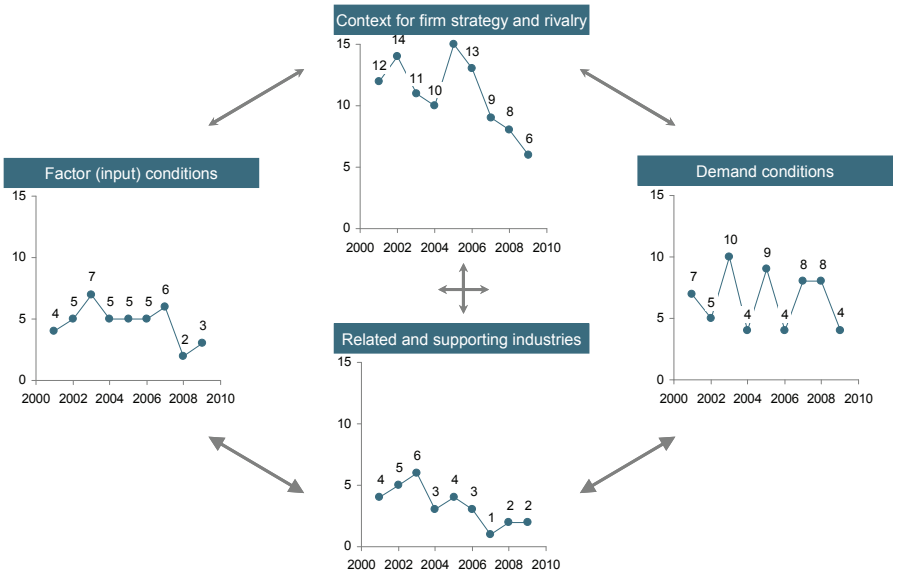


Figure 10 Switzerland's rankings in 4 areas determining the quality of the NBE (GCI, 2001-09)

The Swiss business environment is characterized by broad strengths coupled with specific but severe weaknesses (**Figure 11**). In particular, despite progress in improving the context for firm strategy and rivalry, clear weaknesses remain in this area.

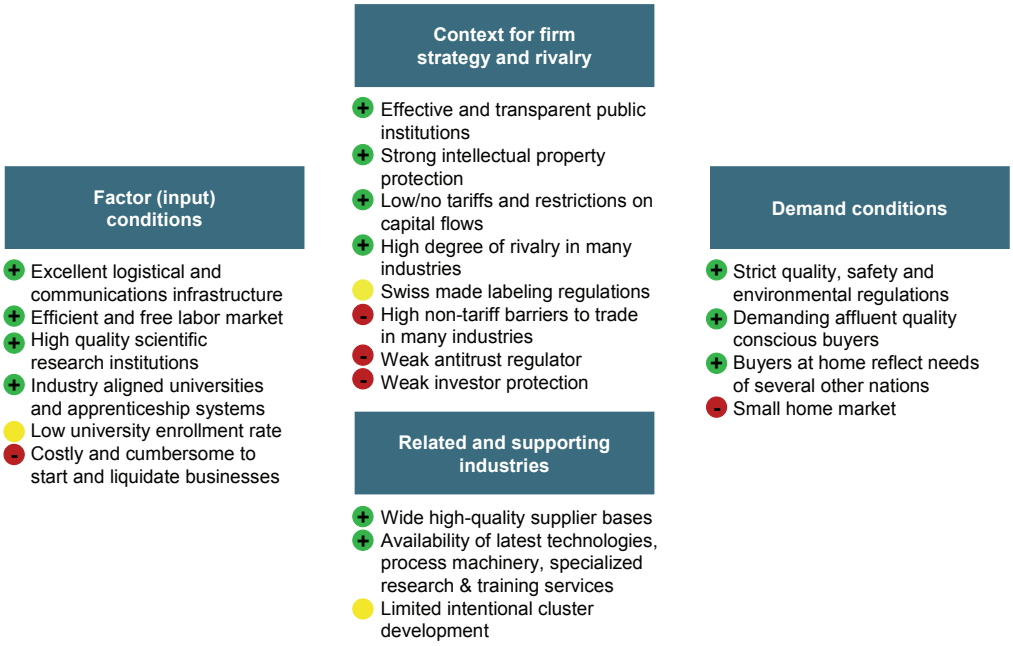


Figure 11 Switzerland's Country Diamond (Factors driving the quality of its NBE)

B.i) **Factor (input) conditions** – In contrast to most western European countries, Switzerland has a free and efficient labor market. Its rigidity of employment index (0 = no rigidity, 100 = maximum rigidity) score is 7, compared to 10 for the United Kingdom, 17 for Belgium, 38 for Italy and 42 for Germany (World Bank, 2010). Redundancy costs average 13 weeks salary in Switzerland compared to 69 weeks in for example Germany. In addition, Switzerland imposes no quotas on foreign workers from the EU.

Switzerland's openness to foreign labor is partly explained by the inadequate supply of scientists and technicians from the country's universities. Roughly 40% of Switzerland's youth enter tertiary education compared to almost 60% in the UK. Today, 35% of scientists and technicians working in Switzerland are foreigners (Credit Suisse, 2007). 60% of the immigrants to Switzerland have a tertiary degree (OECD, 2009).

70% of the youth in Switzerland receive their secondary education through the "dual bildung system" (StateUniversity.com, 2010). This schooling and apprenticeship system allows industry in Switzerland to educate its next generation workforce according to its needs. The system does however also contribute to Switzerland's relatively low tertiary education level.

Starting a business in Switzerland takes 20 days compared to 4 days in Belgium, 10 in Italy, 13 in the UK and 18 in Germany. Liquidating a business takes three years on average compared to 1.2 years in Germany (World Bank, 2010). The long liquidation time coupled with a CHF 25 thousand cash equity requirement mean that the cost of failure for new ventures is very high in Switzerland.

B.ii) **Context for firm strategy and rivalry** – Switzerland maintains a zero tariff policy but limits trade using non-tariff barriers such as quotas and standards, regulations and labeling. Industries protected by non-tariff barriers include agriculture, insurance, telecom, financial services, drug distribution, postal services and electricity (Heritage Foundation, 2010). While improved lately, the antitrust regulator in Switzerland, Comco, remains understaffed and fraught with conflicts of interest (OECD, 2006).

The most striking weakness in the Swiss business environment is the lack of investor protection. The World Bank ranks Switzerland 165 of 183 countries on investor protection (World Bank, 2010)

whereas the World Economic Forum ranks it 41 of 133 countries on protecting minority shareholders (WEF, 2010). While rankings are only a rough guide and sensitive to the methodology used[2] it is clear that Switzerland's policy of favoring majority shareholders and managers over minority shareholders is out-of-line with what is expected of developed countries.

B.iii) **Demand conditions** – Despite its small home market, Switzerland's demand conditions are favorable. The country benefits from affluent and quality conscious domestic customers, tourists and international meeting participants who reflect the needs of several other nations. In addition, the government is a leader in setting strict quality, safety and environmental regulations.

B. iv) **Related and supporting industries** – As discussed previously, Switzerland boasts several deep and interconnected clusters. This gives businesses access to wide high-quality supplier bases and allows them to share technology and coordinate marketing efforts.

C) Impact of Government on the NBE - The actions taken by the Swiss government have contributed to many of the current strengths in the business environment. However, the government is also responsible for *all* of the identified main weaknesses (**Figure 12**).

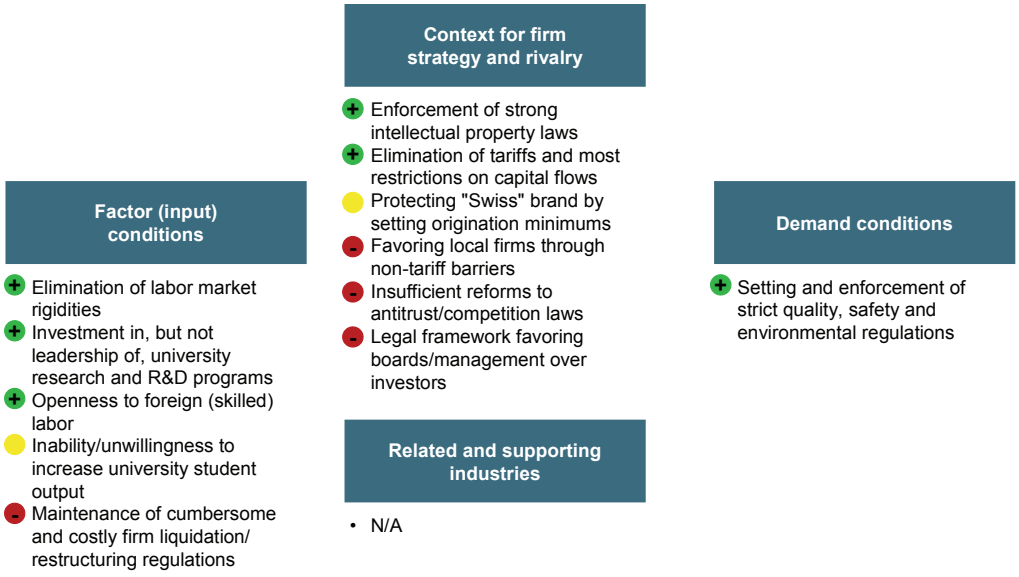


Figure 12 Government's impact on the Swiss business environment

[2] The World Bank strength of investor protection index on which Switzerland ranks 165/183 countries is derived by averaging three indices: (1) *Extent of disclosure*, (2) *Extent of director liability*, and (3) *Ease of shareholder suits*.

D) The Swiss Policy Process – Multiple dispersed actors make separate economic policies in Switzerland without reference to a coordinated national economic strategy and therefore with only limited coordination. These actors include the Swiss National Bank (monetary policy), OSEC (FDI attraction), OSEC (Federal spending), and the Cantons.

Switzerland also lacks any form of Cluster policy at the federal level – indeed in 2003 a report by SECO actively encouraged the government *not* to develop a cluster policy. There are, however, 4 regional cluster initiatives in Switzerland (The Ark, Bern Canton Cluster Policy, Biovalley Basel, Nanocluster Bodensee). These clusters are coordinated by and, in some cases, funded by the Cantons.

Therefore, despite Switzerland's number of deep, innovative clusters, the EU Cluster Mapping Project concluded in 2007 that "existing successful clusters in Switzerland originated *without* support from any specific cluster development program" (EU Cluster Mapping, 2007).

E) Institutions for Collaboration (IFCs) – Switzerland has a large number of research focused IFCs. The IFCs tend to be organized based on the underlying science or technology and hence often cross cluster lines. The two most important areas for IFCs in Switzerland are life and material sciences (**Figure 13**). More recently, increased focus has been given to IFCs that help Swiss entrepreneurs commercialize their inventions.

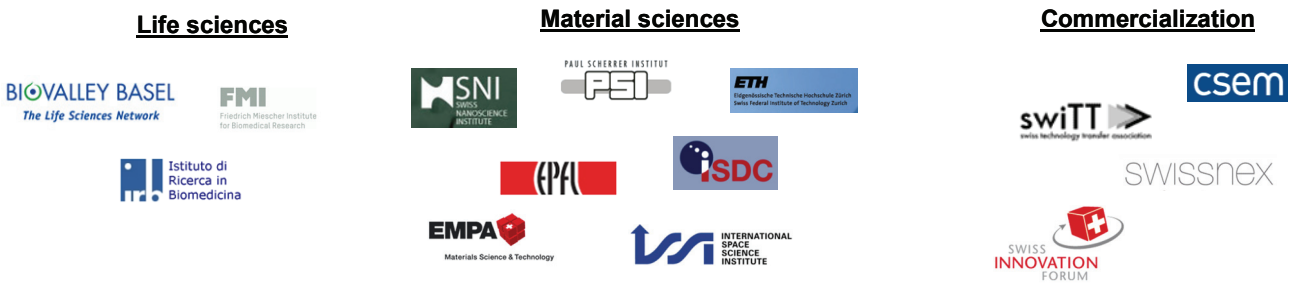


Figure 13 Examples of Swiss IFCs

1.4 Strategic Issues, Risks & Policy Recommendations for Switzerland

A) Macroeconomy & Clusters - The main macroeconomic issue facing Switzerland is insufficient policy and regulatory harmonization with the EU and the US. Going forward, Switzerland also needs to harmonize and intensify its cluster support activities on a federal and cantonal level. **Figure 14** summarizes the macro and cluster issues facing Switzerland and the associated recommendations.

	Issue	Recommendation
Cluster Policies	Lack of specific cluster or collaboration policies at the Federal level	Develop a Federally funded cluster mapping project to accurately map Switzerland's industry cluster and create public databases of firms within clusters
		Create public-private partnerships to finance the creation and operation of institutes for collaboration to link well-develop Swiss research institutions with firms within clusters
	Lack of coordination between Federal and Regional actors	Develop a National Economic strategy which defines a coordinated set of objectives within which different Swiss government ministries and agencies should act
Monetary and Fiscal Policies	Strong / overvalued Swiss Franc makes it difficult for all but the highest-value Swiss exports to compete	SNB should engage in more active management of the Swiss Franc , taking advantage of the change in MP paradigm during the global financial crisis
	Tax policy risks bringing Switzerland into conflict with EU neighbors & US	Negotiate bilateral tax agreements with US and EU to identify foreign residents illegally evading tax and reduce pressure on Swiss government and Swiss executives travelling abroad
	Swiss national debt reduces competitiveness	Continue to apply 'debt brake' deficit containment rule and potentially mandate budget surpluses during positive GDP
EU Membership	Dual regulatory requirements discourage firms from re-locating to Switzerland	Maintain non-membership of EU but negotiate bilaterals which harmonize regulation (rather than using regulation as a non-tariff barrier as under the status quo) wherever possible

B) National Business Environment - To encourage entrepreneurship, Switzerland must make it easier and less costly for firms to fail. In addition, the rights of minority shareholders should be considerably improved to make it easier for small and medium sized companies to attract capital. Competitiveness can also be improved by discontinuing the protection of many domestic industries. **Figure 15** summarizes the issues Switzerland must address to improve its business environment and our recommendations.

	Issue	Recommendation
Factor (input) conditions	Low university enrollment rate	Encourage university studies • Reign in on apprenticeship system in non-handicraft vocations; expand upper secondary attendance[1] • Focus on engineering and science
	Costly and cumbersome to start and liquidate businesses	Make it easier to start and grow (innovative) businesses • "One-stop-shop" gov't entity for starting business • Use tax incentives to attract entrepreneurs[2] Reduce stock company book equity requirement • Eliminate cash requirement Reform insolvency/restructuring process • US chapter 11 potential role model
Context for firm strategy and rivalry	High non-tariff barriers to trade in many industries	Eliminate remaining restrictions to trade/competition • Swiss specific standards, regulations, labeling, etc
	"Swiss made" labeling regulations	Ensure "Swiss made" origination minimums are used to increase company competitiveness, not limit competition
	Weak antitrust regulator	Staff Comco with sufficient dedicated resources • Ban members from having conflicts of interest[3]
	Weak investor protection	Align disclosure, director liability, and shareholder suit rules and regulations with EU
Related and supporting industries	Limited intentional cluster development	Found marketing oriented institutions for collaboration • Include interdependent clusters in same organizations • Focus on maintaining and improving "Swiss made" quality brand image

1. Using PR campaign, financial support, etc 2. E.g. tax deductibility of R&D 3. E.g. positions on company boards

2.1 Swiss Watches in a Global Context

2.1.1 An Introduction to Watches

Wristwatches fall broadly into two categories: mechanical and quartz. Mechanical watches rely on an unwinding spring and mechanical "movements" (components) to pace hands accurately around a dial. Quartz watches rely on battery power and a quartz crystal oscillator to keep time accurately. Today quartz watches are more widespread because they are cheaper to produce and are more accurate. Mechanical watches mostly occupy the luxury segment, but many luxury quartz watches exist. Beyond the underlying technology of the watch however, the single greatest determinant of a watch's value is its country of origin.

IWC Big Pilot

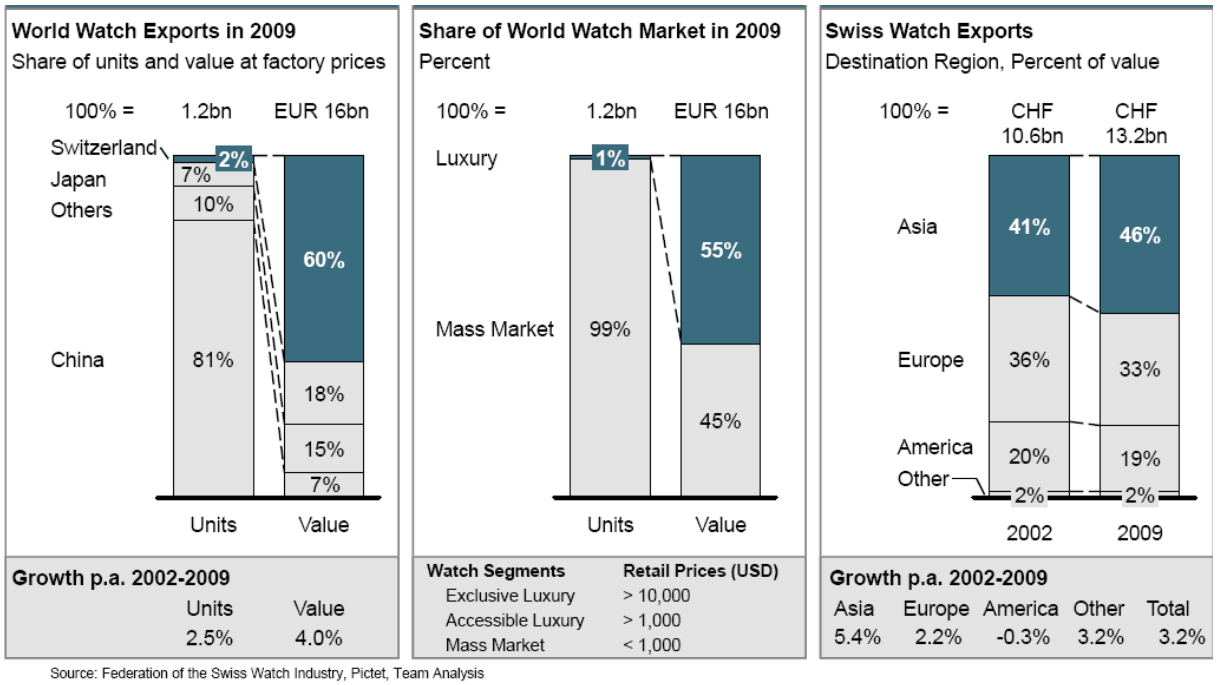
Casio CA53W

A comparison of the Swiss IWC Big Pilot mechanical watch and the Japanese Casio CA53W quartz digital watch illustrates this point. The Casio tells time accurately, has a battery that lasts for 10 years, requires no maintenance and even offers stopwatch, alarm and calculator functionality. The IWC offers no such added features, can gain or lose several seconds a day, has a maximum power reserve of 7 days and requires regular maintenance. It is also made of leather and steel and not adorned with any jewels or precious metals. Nevertheless, by virtue of being a "Swiss Made" watch and therefore a product of certified Swiss craftsmanship, the IWC can command a retail price of $20,000 whereas the Casio commands less than $20. We explore how the watchmaking cluster in the Jura region of Switzerland is able to create so much value. We also asses the risks that threaten this value creation along with actions the cluster can take to mitigate these risks.

2.1.2 The global market for watches

Switzerland produces only 2% of the roughly 1.2 billion wristwatches produced every year. In value terms however, Switzerland holds a 60% share of a EUR 16bn global market because of its dominant 95% market share (Pictet, 2003) in the EUR 9bn luxury watch market. Asia is the single

largest and fastest growing market for Swiss luxury watches. We see this as a potential threat for the Swiss watch cluster because Asian demand is much stronger and more sophisticated than what exists locally in Europe. It is questionable how long Swiss watch makers, with their European cultural affinities, can continue to satisfy increasingly refined Asian tastes without allowing for the rise of competing Asian luxury brands (figure 16).



Source: Federation of the Swiss Watch Industry, Pictet, Team Analysis

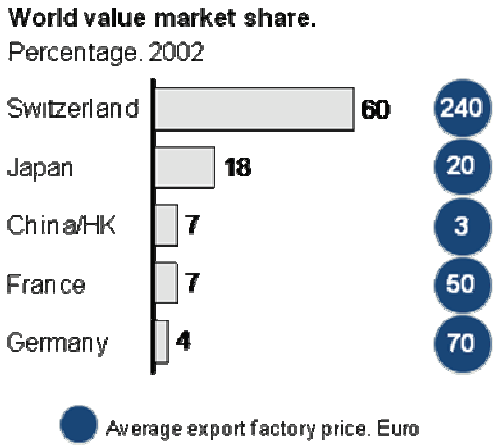
Figure 16 The global market for watches

2.1.3 Switzerland and competing watchmaking locations

Japan is the world's second largest watch producer in value terms. Its production system is vertically integrated and very efficient. Citizen, Seiko, and Casio are the main players with world value market shares of 8%, 6%, and 4% respectively (Pictet, 2003). By targeting the mid-price range with quartz watches, these Japanese players are in direct competition with Switzerland's main mass market brand Swatch, but of little threat to Swiss luxury watches.

China/Hong Kong is the world's largest producer of watches in terms of volume and focuses in the low-end of the market. Their system has low capital intensity but high labor intensity due to low labor costs. Chinese production is therefore quite flexible, with a product introduction cycle of 20-60 days vs.

2 years on average in Switzerland. Since Hong Kong's return to China in 1997, the regional epicenter for watch making has been migrating quickly from Hong Kong into the Chinese mainland, in terms of manufacturing capacity but also retail capability. There have been failed attempts to create branded watches in Hong Kong (Glasmeir, 2000). However, China is moving aggressively to the mid-price segment as its manufacturing capabilities improve. This constitutes a clear threat to the Swiss watch cluster because the depth and sophistication of the luxury markets in Hong Kong, Shanghai and Beijing create a strong incentive for Chinese watchmakers to enter the luxury watch segment. Moreover, these are markets whose tastes local Chinese producers are more apt to serve.



In the **US and other European countries** most watchmakers compete in the mid-price segment and we find few brands that compete with Swiss luxury watches. There are however two notable exceptions in the form of the East German brands Glashütte and A. Lange & Söhne, bought by Swiss companies The Swatch Group and Ricehmont respectively after the fall the Berlin Wall.

In **India**, Titan, owned by the Tata Group, is a rising high-end watch manufacturer worth noting. Titan has yet to achieve commercial success outside of India (Pasche, 2010), but like Chinese manufactures, Titan's proximity to the local market puts it at an advantaged position to compete with Swiss watches.

2.1.4 Competing companies in the global watch industry

Five conglomerates together control 53% of retail market for watches: Swatch Group (25%), Richemont (20%), LVMH (5%), Bulgari (2%) and Gucci (1%) (Cox, 2010). 38 out of the 41 brands in their combined portfolios are produced in Switzerland, making "Swiss Made" industry standard for luxury watches. Numerous independent Swiss watchmakers such as Rolex, Breitling and Patek Phillippe exist, but the dominance of conglomerates underscores the importance of related and supporting industries. Beyond watch production, the Swatch Group is involved in precision engineering and electronics. The

other four conglomerates are all major luxury goods and fashion houses. American brands such as Timex and Fossil and Japanese brands such as Casio, Citizen and Seiko all play major roles in the mass market, but the unique combination of luxury fashion and engineering help Swiss watchmakers dominate the luxury market and create most of the value in the global watch market.

2.1.5 Innovation in the watch making industry

Watchmakers no longer strive to make wristwatches more accurate, but innovation in the industry persists through avenues such as marketing, production, movements and materials. The main thrust of innovation lies within marketing and facing challenges such as targeting new consumers in distant markets (e.g., China) through new channels (e.g., internet sales). Within production, watchmakers continuously seek to produce more efficiently and lower unit costs. Within movements, watch makers are continuously looking to add functionality, such as chronographs or moon phases that set their watches apart from the rest. Similarly in materials, watch makers are experimenting with new materials such as ceramics to differentiate themselves.

2.2 The Swiss Watchmaking Cluster

2.2.1 Recent history and competitive strategy of the cluster

The Asian/Quartz crisis: 1970-1983. Switzerland became the dominant watch manufacturer over a century ago. However the emergence of quartz technology in the early 1970s sparked a revolution that sent the Swiss watchmaking cluster into a severe crisis. Although Quartz wristwatches were first developed in Switzerland by the Centre Electronique Horloger (CEH) in Neuchâtel in 1967, Swiss watchmakers were unable, and perhaps unwilling, to depart from their traditional production methods to produce cheap quartz watches on a mass scale. It would take the electronics and operations expertise of the Japanese to commercialize quartz watches successfully (Federation of the Swiss Watch Industry FH, 1997). Quartz technology led to a rapid drop in the price for watches, as Seiko and later other Japanese companies were able to exploit production improvements and economies of scale. By 1980, Switzerland

had lost most of its share in the mass market to Seiko and Citizen. Employment in the Swiss watch industry was cut in half over the period of the Quartz crisis.

Marketing-led Swiss strategy: 1983 – 2007. The one big manufacturer in Switzerland, SMH decided to differentiate and innovate to fight the Asian crisis. Their introduction of Swatch (1983) marked a change in the value proposition of the watch, which now was positioned as a fashion accessory vs. an utilitarian item. In addition, SMH eliminated some superfluous products and brands and repositioned others with the help of aggressive worldwide promotional campaigns. A worldwide network of distribution subsidiaries was created to increase the company's profit margins and to react to market trends quickly. The effect of this change of strategy can be seen in the dramatic increase of the unitary price per watch and a rebound in the employment levels.

2.2.2 Performance of the cluster

With 10% of the total exports in 2007, jewelry, precious metals and collectibles is the third largest export category in Switzerland after Biopharmaceuticals and Financial Services. Watches alone are 5.2% of the total exports and 1.2% of the total employment of the country in 2007, showing the relative high value-added. The cluster's sales have grown by a remarkable 11% CAGR from 2003 to 2007.

2.2.3 The Swiss watch making value chain

Broadly, there are five links in the watch making value chain (**Figure 17**): component manufacturing, movement assembly, manufacturing (including design and marketing), wholesaling and retailing. There are integrated players like Rolex who are present along the whole value chain and there are independent players serving each link of the value chain. For a watch to bear the "Swiss Made" label, Swiss law requires that at least 60% of the components are Swiss, that the movement is cased up in Switzerland and that the final inspection of the watch happens in Switzerland (Federation of the Swiss Watch Industry FH, 1997).

Figure 17 The Swiss watchmaking value chain

The "Swiss Made" label is effectively a gatekeeper to the luxury watch market, but in some ways, the Swatch Group is a gatekeeper to the "Swiss Made" label. Through its subsidiary ETA, the Swatch Group is integrated from manufacturing to component production. ETA has a near monopoly on high-end movements and key components. According to the investment bank Pictet, "there is no Swiss watch brand that does not contain a movement or component supplied by the Swatch Group" (Pictet, 2003).

The requirements of the Swiss Made brand protect traditional Swiss component and movement manufacturers and ensure that foreign fashion brands come to Switzerland in order to produce credible luxury watches. However, the share of value creation preserved in Switzerland as a result of the Swiss Made rule is remarkably low. The cost of components and movement assembly for a typical Swiss luxury watch is only 6% of its retail price (Pictet, 2003). The bulk of the value creation happens in the consumer's mind through branding and functions such as design and marketing. Swiss based Swatch Group and Richemont conduct most of their design and marketing in Switzerland, but the Swiss Made label does not require them to do so. Most foreign firms such as LVMH, Bulgari and Gucci conduct their design and marketing abroad (Pasche, 2010).

For Switzerland there are clear risks inherent in the watch making value chain. Firstly, there is the risk that an increasing amount of the skills and expertise that make Swiss watches valuable will come from abroad if critical design and marketing skills do not exist domestically. Secondly, there is the risk that the Swatch Group's monopoly in components and movements will motivate Swiss watchmakers to source from abroad and thereby break with the Swiss Made label requirements.

2.2.4 Swiss Watchmaking Cluster Map

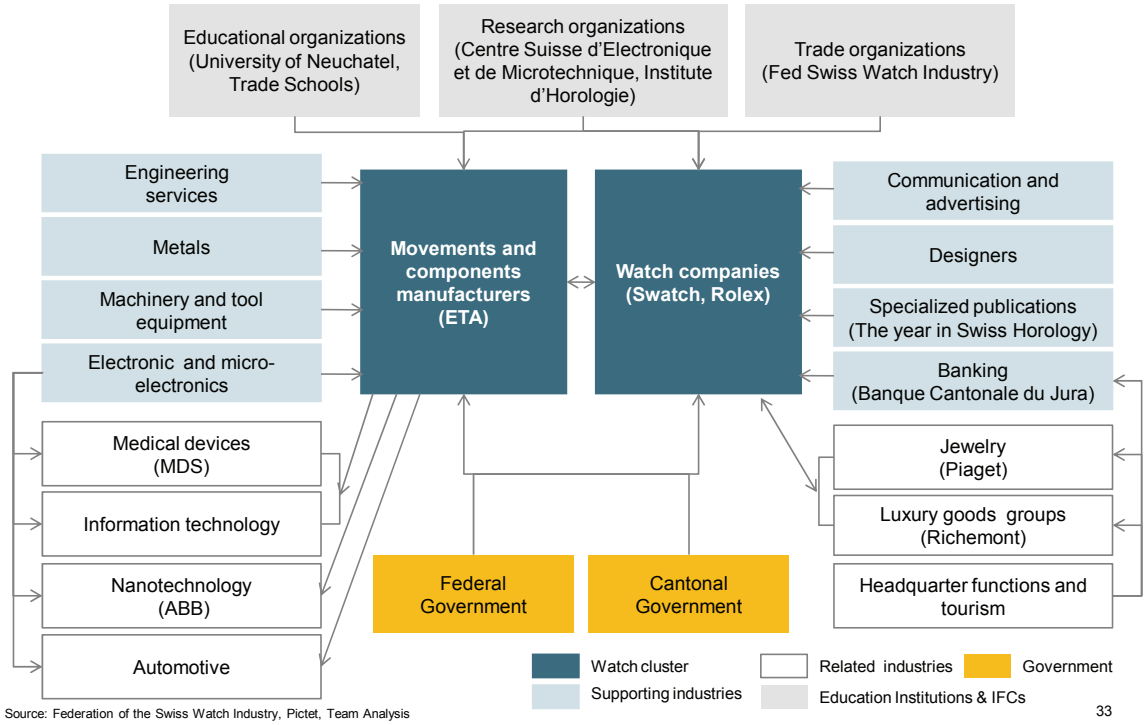


Figure 18 Swiss watchmaking cluster map

The cluster map shown in **Figure 18** can be described as very deep and wide; the movement/component manufacturers and the watch companies form the core of the cluster. The local suppliers of the movement manufacturers are situated to their left, including engineering services, metal, machinery and tool equipment and electronics. The competitiveness of these suppliers is very high and is similar to the related industries linked to the parts manufacturing, that appeared as a spillover of the highly skilled workforce and include medical devices, information technology, nanotechnology and automotive among others. On the right side of the map, one can find the suppliers of the watch companies, including some local communication and advertising agencies, designers and specialized banks. This part of the cluster is qualitatively less competitive if we take into consideration that some of the foreign brands (LVHM) carry these activities out of the country while they keep the production in Switzerland. The related industries are Jewelry and some Swiss Luxury goods groups. On the top of the map, we find the educational organizations which play a key role in bringing skilled labor to the cluster and the

Institutions for Collaboration, which played a key role especially in the past. For example, the Centre Suisse d'Electronique et de Microtechnique (CSEM) was the source of multiple innovations for the watch industry, but is now more focused on other fields. At the bottom of the map, we can find the Federal Government and the Cantonal Government, which deal with regulation (Swiss Made rules) and funding some of the educational institutions respectively.

2.3 The Swiss Watch Cluster Diamond

The Swiss watch cluster is incredibly strong, showing depth across all four aspects of the diamond (Figure 19). This is not surprising given the long history, the recent success, and also the overall strength of the Swiss national economy. Overall we found that the factor (input) conditions and related and supported industries were both well develop and highly complimentary to the cluster, but that it was the unique interplay between the way firms compete and the demand conditions that face that gives the Swiss watch cluster its incredible strength. Interestingly though, this area of strength also represents the biggest potential threat to the continued strength of the cluster.

2.3.1 Factor (Input) Conditions

Large and highly skilled labor pool supported by specific watch making schools - The Swiss watch cluster is characterized by a large labor pool that is highly skilled and very specialized in the unique needs of precision watch making. This large labor pool can be traced to the historical roots of the cluster and also to the Swiss focus on vocational training. Watches have been manufactured in the Jura region of Switzerland since the 1700s and has been the dominate industry in the region for most of this time. Because of this, state and industry sponsored trade schools developed to train the specific needs of the cluster, the first of which appeared as far back as 1865 (Bumbacher, 1995). Today there are seven specialized watch making and micro technology schools (Bumbacher, 1995) all of which have very close relationships to the firms within the industry through both apprenticeship programs and school financing. This close relationship to industry also ensures that the schools are more responsive to the

changing skill requirements of the industry. More recently, as the industry focus has moved more towards fashion and design, the Swiss cluster has been very well supported by the greater European fashion industry and the large pools of people trained in fashion in France and Italy in particular.

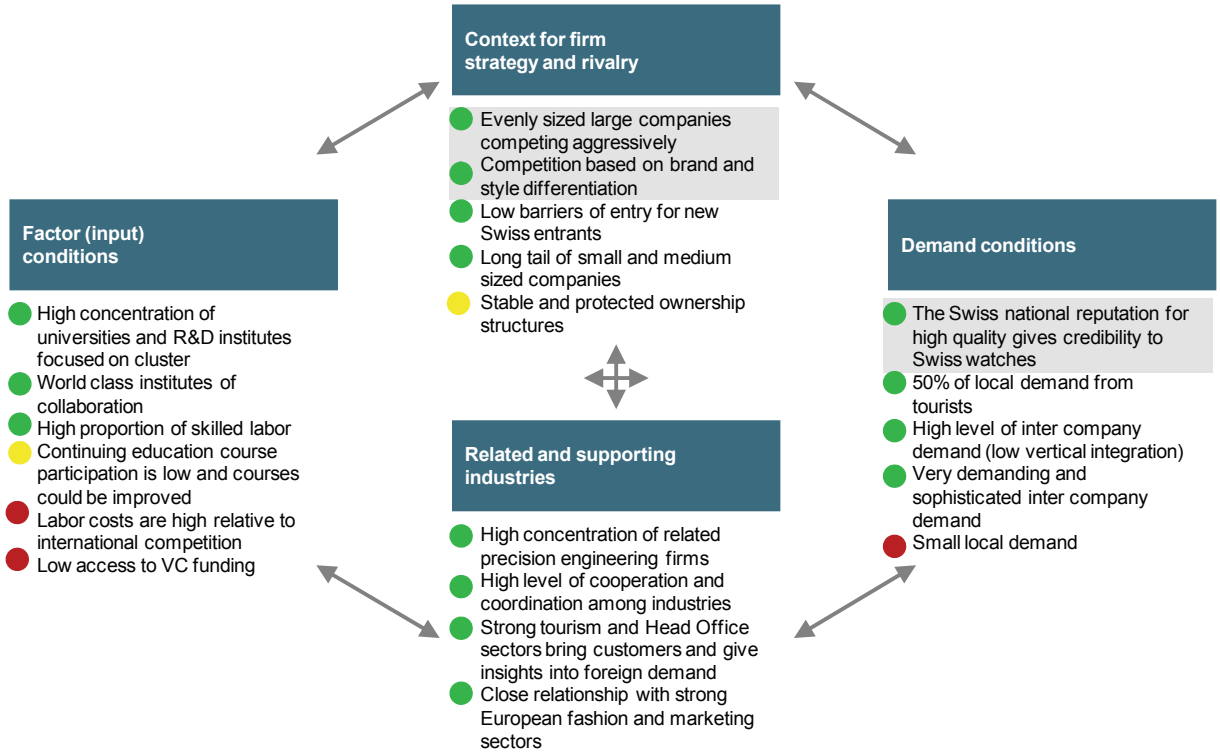


Figure 19 Swiss watchmaking cluster diamond

Strong IFCs – The cluster is also supported by a very strong group of IFCs and scientific research organizations covering both general micro technology as well as watch making specific ones. The Jura Canton sits at the centre not only of the watch making cluster, but also the growing Swiss micro technology and precision engineering cluster. One defining aspect of innovation in all of these clusters is it is typically has long time frames, is capital intensive and is not always easy to patent. Hence the incentive to innovate is low for specific companies and IFCs and other research bodies thus are vitally important. To meet this need a number of scientific instructions have developed around this broader cluster focusing in particular on R&D projects. The Swiss Federal Institute of Technology in Lausanne (EPFL), The Institute of Micro-technology at the University of Neuchâtel (IMT) and Swiss Centre for Electronics and Micro-technology (CSEM) are the three main organisations, with the first two focusing

primarily on early stage R&D while CSEM focuses more on the interface between research and industry, performing both research functions, but also cluster co-ordination functions (Stempak, 2010). More recently, as the cluster has reorintated towards a marketing focus other IFCs which deal with things such as market research, government lobbying and other general cluster coordination issues have grown in importance. Today the most important IFC is The Federation of the Swiss Watch Industry (FH) which was founded in the 1930s in response to the downturn caused by the great depression (Federation of the Swiss Watch Industry FH, 1997). FH plays a critical role today in coordinating information sharing and in promoting the Swiss watch industry and brand globally, prehaps its most important role recently has been as a lobiest to the government to protect regulation around the Swiss made brand. Finally in addition to these IFCs a large number of industry trade journals and magazines exist which both facilitae information sharing around the cluster and also serve as publication material for the firms. Today in Switzerland alone there exists 20 unique journals and magazines (Federation of the Swiss Watch Industry FH, 1997)

Low access to VC funding – As with Switzerland overall, the watch cluster is hurt by the low access to early stage funding. Despite the well developed and internationally competitive banking system, Switzerland has a poorly developed VC community with just 5 venture companies being active in the micro technology space (Stempak, 2010). This low activity results in a very slow rate of new company formations and means that the cluster relies almost entirely on the large companies for innovation. While this represents a concern, it has not been a major issue for the cluster to date.

2.3.2 Related and supporting industries

The Swiss Watch cluster is supported by a very strong network of related and supporting industries which help it through knowledge and skill transfer, demand generation and also through the enhancement of the Swiss brand.

The precision engineering cluster and fashion clusters support the watch cluster though skill transfers – Switzerland is home to a very strong micro technology and precision engineering cluster, of

which the watch making cluster is in essence a sub part. This cluster shares many similar needs in terms of skills, R&D and infrastructure and so the location of this broader cluster, surrounding the watch cluster helps tremendously in terms of generating scale. Additionally, with the move towards a greater importance on marketing and product design the watch cluster has benefited tremendously from the close proximity of the strong French and Italian fashion clusters. This interdependence can be seen by the fact that two of the largest watch companies today, LMVH and Bvlgari, are fashion houses who have chosen to expand into the watch industry. The watch industry benefits from this through skill transfer in terms of product marketing as well as access to the clients and markets served by this fashion houses.

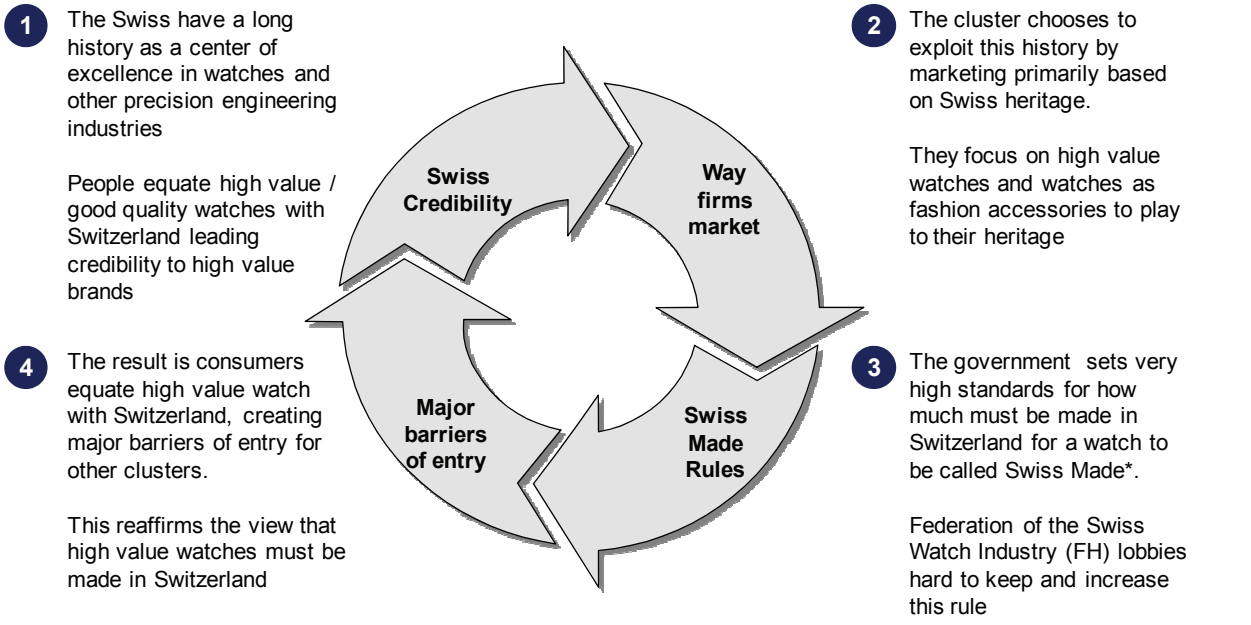
The other Swiss industries support the high quality image of the "Swiss Brand" – Perhaps most importantly, however, is the intrinsic advantage that the cluster gets through the consistent image of the other strong Swiss clusters also focusing on high quality, high value products. As we will discuss later, the cluster benefits from a unique demand through the heritage of the watch cluster and the perception of exceptional quality. The related industries in which Switzerland excels, micro engineering, biotechnology and banking all also help enhance this image by exclusively focusing on the high quality, high value, and very personalized parts of the market.

2.3.3 Demand conditions

While the factor input conditions and related industries support the cluster, it is the unique demand conditions that the cluster faces and the way the firms act to capitalize on this that is at the heart of the success of the Swiss watch cluster today. Looking at the Swiss watch cluster today it is clear that due to its long history and storied heritage, it faces very different demand characteristics to watch clusters in other countries. This has the effect of creating major barriers of entry at the exclusive end of the market for non Swiss brands and enabling the Swiss to extract a significant margin premium. To see how this works, **Figure 20** outlines a schematic of the virtuous cycle in which the cluster operates.

Due to the long history and heritage, all Swiss watch makers start with a degree of credibility in the market place, the firms then exploit this by marketing and reviving traditional brands and focusing on

the high quality segment of the market, the government and IFCs support the industry by creating rules around the use of the Swiss Made label, and together these actions ultimately results in all high end watches being manufactured in Switzerland, even if they are a non Swiss brand. This then creates a virtuous circle where in the consumer's mind the Swiss Made brand is even more credible and valuable, ultimately meaning that Swiss Made watches face very different demand characteristics in the market and are able to charge a significant premium over rivals. This is perhaps best illustrated by the fact that LVMH and Bvlgari have chosen to manufacture in Switzerland not in their home countries.



* A watch is considered Swiss whose movement is Swiss, whose movement is encased in Switzerland and whose final control by the manufacturer takes place in Switzerland and if at least 60% is made in Switzerland
Source: Federation of the Swiss Watch Industry, "*Strengthening Of Swiss Made Step One Accomplished*"

Figure 20 Swiss watchmaking unique demand conditions

2.3.4 Context for firm strategy and rivalry

The second key element that enables the Swiss cluster to be so successful is the structure of the industry and the way in which the Swiss firms compete with each other. Firstly, the industry is highly consolidated with 5 conglomerates making up 53% of total retail value of watches. But this disguises both the long tail of super premium brands and also the fact that the four large firms are all equally sized

and compete very aggressively with each other. Secondly, and most importantly, the firms have chosen to compete almost exclusively on the basis of brand proliferation and through innovation in product design and marketing. This has enabled them both to successfully capitalize on the unique demand conditions they face, and also to maintain prices. Today there is a very large number of Swiss watch brands and, while they concentrate on the high end mechanical watches, they do in fact cover the full range of the spectrum. This shows how they have chosen to compete through the continual re-launch of brands rather than through price competition. This point is further reinforced through steady unit price increases since the 1980s.

2.4 Risks and Recommendations for the Swiss Watch Cluster

2.4.1 Risks

While the Swiss watch cluster is incredibly strong today, it must work to maintain its stature. We see four main risks to the cluster. The first two are internal factors that are incentivizing Swiss watchmakers to alter the way they compete and thereby devaluing the Swiss Made brand. The second two risks are external. One relates to the high value-added activities like design and marketing migrating to other locations. The other arises from the strength and sophistication of Asian demand and the resulting risks of rising foreign luxury watch makers.

The first internal risk comes from a **moral hazard created by the shared resource of the Swiss Made brand**. While big watch conglomerates spend millions annually marketing the value of Swiss watches globally, many smaller Swiss watch makers are essentially free riders, spending no money on marketing and relying on the strength of the Swiss Made brand to sell their watches (Pasche, 2010).

There is also the risk that firms overall begin to reduce spending on innovation or even try to 'milk' the Swiss Made brand by selling lower quality watches. The **second internal risk arises from the structure of the industry**. ETA currently has a near monopoly in the manufacture of high-end movements and key components and has been agitating for a greater share of the value created. If ETA

raises prices considerably or stops supplying its key components (as it has threatened), competing brands would be forced to source components from abroad and thereby potentially break with the Swiss Made label en masse. Moreover, competing watch companies face the constant allure of sourcing cheaper components from abroad. The case study of the East German brands Glashütte and A. Lange & Söhne proves that watches can still command a high price without the Swiss Made label. These brands are perhaps the most expensive brands in Swatch and Richemont's portfolios (Pictet, 2003). Importantly however, they do not bear the Swiss Made label. Although consumers may consider these brands Swiss for all intents and purposes (Pasche, 2010), these brands prove that the Swiss Made label is not the be-all and end-all of value creation in the mind of the consumer. These brands indicate the willingness of the two dominant Swiss watch conglomerates to sidestep and potentially marginalize the value of the Swiss Made label. The effect of several watchmaking firms abandoning the Swiss Made label could well trigger a domino effect that ends up rendering the Swiss Made label completely defunct.

Regarding external risks, we have seen that most of the value from Swiss watches comes from branding. When watchmakers such as LVMH, Gucci and Bulgari conduct design and marketing functions abroad, **Switzerland risks losing control of its main source of value creation**. While this is a risk, it is also an opportunity for the cluster to move up the value chain and expand design and marketing functions domestically. The second external risk comes from **increasingly strong and sophisticated demand from Asia.** Local watchmakers are better positioned to cater to local tastes. As watchmakers in India and China grow in sophistication, their ability to match the quality of Swiss high-end watches will be brought to bear. Indian and Chinese watchmakers are playing catch-up, but they may soon come to be innovation leaders in production techniques, watch functionality and materials. The real test however will be marketing and the ability of Chinese and Indian producers to make watches that local consumers prefer over Swiss ones. This may not just be a question of adapting to local tastes, but of shaping them.

2.4.2 Recommendations

To address the issue of free riding on the value of the Swiss Made brand, firms must be better incentivized to invest in innovation, marketing and design. Individual firms could be made to invest more in marketing and design through tax breaks, up to a limit, on this type of spending. Moreover the FH should be able to play a larger role in marketing the Swiss Made brand centrally. Recognizing that the basis of competition in the cluster has moved from technology to marketing, the government should transition some of its current funding of technology IFCs, such as the CSEM, towards marketing IFCs, such as the FH.

In order to address the risk that a monopoly in movements brings to the current industry structure, the Swiss antitrust bodies should monitor ETA more closely and take action on any type of exploitative behavior. Additionally, the government should lower barriers to entrepreneurship and attract more venture capital and private equity to the country. This would make easier for existing players and potential entrants to establish competing component and movements factories.

With a potential migration of high value-added activities away from Switzerland, the Cantonal governments should work together with Swiss watchmakers to open world-class educational programs in watch design and marketing. The University of Neuchâtel has established a degree for existing Swiss engineers to learn watch design and become "design-engineers" (Pasche, 2010), but the cluster's overall aim should be to attract the best design and markeing talent from all over the world.

Finally, the cluster must strengthen its efforts in Asia in anticipation of rising Asian competition. The FH should expand its marketing office presence to India and mainland China. Cluster companies should increasingly complement their lines with products targeted at Asian markets, avoiding a narrow European style/design focus. They should also shorten new product development cycles, which currently do not allow them to respond to changes in demand quickly enough. In addition, the educational programs mentioned above should pay explicit attention to the Asian tastes and changes in the market.

Required Disclosures

No member of the team is a national or long-term resident of Switzerland.

No non-public information has been used in the preparation of this report.

No member of the team has travelled to Switzerland during the project period.

Bibliography

Baltensperger, E., Hildebrand, P., & Jordan, T. (2007). The Swiss National Bank's Monetary Policy Concept - an example of a 'principles-based' policy framework. *Swiss National Bank Economic Studies* .

Berne Economic Development Agency. (2009). *Berne Capital Area: Information and Communication Technology Cluster.* Berne.

Bumbacher, U. (1995). *The Swiss Watch Industry. Case 9-792-046.* Boston: The Harvard Business School.

Cox, J. (2010). *Swiss Watches.* Geneva: Kepler Research.

Credit Suisse. (2007). *Ls Suisse est-elle innovante avec la recherche - Economic Briefing No 44.*

Dirk-Jan, K., & Ruffner, M. (2005 (5:1)). Budgeting in Switzerland. *OECD Journal on Budgeting* , 37-78.

Dummler, P., & Thierstein, A. (2003). Identifying and Managing Clusters - Evidence from Switzerland. *Entrepreneurship, Spatial Industrial Clusters and Inter-Firm Networks - Uddevalla Symposium 2003.*

Economist Intelligence Unit. (2010). *Switzerland Country Report: April 2010.* London: EIU.

Economist Intelligence Unit. (2010). *Country Data Dataset: April 2010*. EIU.

Ernst & Young. (2006). *Swiss Attractiveness Survey: What Foreign Companies Say.* Ernst & Young.

EU DG Trade. (2009). *EU Bilateral Trade and Trade with the World: Switzerland.*

Europe INNOVACluster Mapping Project. (2007). *Country Report: Switzerland.* Kristiansand.

Federation of the Swiss Watch Industry FH. (2010, April). Retrieved from www.fhs.ch

Federation of the Swiss Watch Industry FH. (1997). *From the roots until today's achievements...* Retrieved March 1, 2010, from Federation of the Swiss Watch Industry Web Site: http://www.fhs.ch/en/history.php

Feld, L., Kirchgassner, G., & Schaltegger, C. (2004). *Fiscal Federalism and Economic Performance: Evidence from Swiss Cantons.* University of St. Gallen.

Glasmeir, A. K. (2000). *Manufacturing Time: Global Competition in the Watch Industry. 1975-2000.* New York: The Guildford Press.

Gugler, P., & Keller, M. (2009). *The Economic Performance of Swiss Regions.* Fribourg: The University of Fribourg.

Harvard Business School - Institute for Strategy & Competitiveness. (2010). New Global Competitiveness Index 2001 - 2009.

Institute of Strategy and Competitiveness - Harvard Business School. (2010, April). Retrieved from www.isc.hbs.edu

International Monetary Fund. (2009). *World Economic Outlook - October 2009 - Sustaining the Recovery.*

Marnier, P. (2010, March). Swiss Consul in Cambridge, MA.

Mercer. (2009). *Mercer's 2009 Quality of Living Survey.*

Milham, W. I. (1945). *Time and Timekeepers.* New York: MacMillan.

Morvan, L. (2010). *Luxury and Consumer Goods: Full speed ahead to Asia!* Paris: BGC-Aurel Equity REsearch.

OECD. (2009). *OECD Factbook 2009.*

OECD. (2006). *OECD Policy Brief: Competition Law and Policy in Switzerland.*

OECD. (2006). *Economic Survey of Switzerland 2006.*

Pasche, J.-D. (2010, March 29). Interview with the President of the Swiss Watch Federation FH. (F. Maro, Interviewer)

Pictet. (2003). *The Watch Industry: What makes it tick?* Geneva: Pictet & Cie.

Porter, M. E. (1998). *On Competition.* Boston: Harvard Business School.

Pro Inno Europe. (2010). *European Innovation Scoreboard (EIS) 2009.* European Commission: Enterprise & Industry.

Rudolf & Zurlinden. (2009). Productivity and Economic Growth in Switzerland 2001 - 2005. *Swiss National Bank Working Papers* .

StateUniversity.com. (n.d.). *Switzerland Educational System Overview*. Retrieved February 2010, from StateUniversity.com.

Swiss Federal Statistics Office (SFSO). (2010). *SLFS 2009 in Brief: Key Findings of the Swiss Labour Force Survey.* Neuchatel: SFSO.

Swiss Federal Statistics Office (SFSO). (2010). *Statistical Data on Switzerland 2010.* SFSO.

Swiss National Bank. (2009). *Direct Investment 2008.* Zurich: Swiss National Bank.

SwissBanking.org. (2009). *The Economic Significance of the Swiss Financial Center*.

SwissWorld.com. (2010). Retrieved 01 May 2010.

Switzerland Trade & Investment Promotion (OSEC). (2009). *Switzerland: Your Business Location in Europe.* OSEC.

The Boston Consulting Group & The Swiss-American Chamber of Commerce (BCG-AmCham). (2008). *Creative Switzerland? Fostering an Innovation Powerhouse.* Zurich.

The Boston Consulting Group & The Swiss-American Chamber of Commerce (BCG-AmCham). (2006). *Foreign Companies in Switzerland: The Forgotten Sector.* Zurich.

The Boston Consulting Group & The Swiss-American Chamber of Commerce (BCG-AmCham). (2007). *Multinational Companies on the Move: How Switzerland Will Win the Battle.* Zurich.

The Heritage Foundation. (2010). *The Heritage Foundation 2010 Index of Economic Freedom.*

The World Bank. (2010). *Doing Business in Switzerland.*

The World Economic Forum. (2010). *The Global Competitiveness Report 2009 - 2010.*

UBS. (1010). *Swiss Economy - Status 5 February 2010.* UBS.

United States Patent and Trademark Office Website. (2010). *General Statistics*

Van der Linde, C. (2003). The Demography of Clusters - Findings from the Cluster Meta-study. In J. Brocker, D. Dohse, & R. Soltwedel, *Innovation Clusters and Interregional Competition* (pp. 130-149). Berlin: Heidelberg.