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Switzerland: Selected Issues and Statistical Appendix

This Selected Issues and Statistical Appendix report on Switzerland was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with this member country. As such, the views expressed in this document are those of the staff team and do not necessarily reflect the views of the Government of Switzerland or the Executive Board of the IMF.

International Monetary Fund
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INTERNATIONAL MONETARY FUND

SWITZERLAND

Selected Issues and Statistical Appendix

Prepared by K. Hviding and K. Krajnyák (both EU1)

Approved by the European I Department

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Main Websites for Swiss Data

Data in the Statistical Appendix reflects information received by January 10, 2000. In most cases, more recent data can be obtained directly from the following internet sources:

Swiss Federal Statistical Office .... http://www.statistik.admin.ch

Swiss National Bank .... http://www.snb.ch

State Secretariat for Economic Affairs (SECO) .... http://www.seco-admin.ch

Federal Ministry of Finance .... http://www.efd.admin.ch

Federal Customs Administration .... http://www.zoll.admin.ch

Institute for Business Cycle Research at the
Federal Institute of Technology (KOF) .... http://www.kof.ethz.ch

Further information and documentation on Swiss
economic statistics can be found at the Special
Data Dissemination Standard website of the IMF .... http://dsbb.imf.org/country.htm

Switzerland: Basic Data

Area and population
  Total area   41,293 square kilometers
  Total population (end-1997)   7.1 million
  GNP per capita (1997) $38,301

	1997	1998	1999 1/
	(Percentage changes at 1990 prices)		
Demand and supply			
Private consumption	1.3	2.3	2.0
Public consumption	0.6	-0.2	0.3
Gross fixed investment	1.5	4.4	2.4
Construction	-1.5	0.4	1.3
Machinery and equipment	4.9	8.6	3.5
Final domestic demand	1.2	2.4	1.9
Inventory accumulation 2/	0.1	1.7	0.1
Total domestic demand	1.3	4.1	1.9
Exports of goods and nonfactor services	9.0	4.6	3.7
Imports of goods and nonfactor services	8.1	9.4	4.9
GDP	1.7	2.1	1.4
GNP	3.6	1.6	4.3
	(In billions of Sw F, at current prices)		
GDP	371.6	380.0	388.7
	(In millions, unless otherwise indicated)		
Employment and unemployment			
Employment	3,803	3,850	3,891
(Percent change)	-0.3	1.2	1.1
Unemployed (registered)	0.19	0.14	0.10
Unemployment rate (in percent)	5.2	3.9	2.7
	(Percentage changes, unless otherwise indicated)		
Prices and incomes			
GDP deflator	-0.1	0.2	0.9
Consumer price index	0.5	0.1	0.8
Nominal wage growth 3/	0.5	0.7	1.0
Unit labor costs (total economy)	-1.4	-0.1	0.7
Real disposable income	2.3	1.7	3.7
Personal savings ratio (in percent)	10.0	9.4	10.9
	(In percent of GDP)		
Public finances			
Central government financial balance 4/	-1.5	-0.7	-0.9
Gross debt	25.1	27.7	28.0
General government			
Financial balance 4/	-2.4	-1.1	-1.4
Structural balance	-1.3	-0.4	-1.1
Gross debt	51.5	53.8	54.0
Expenditure	39.4	39.3	39.1

1/ Staff estimates.
2/ Change as percent of previous year's GDP.
3/ Nominal wage growth per employee.
4/ Excluding cash surplus of civil service pension fund as revenue; from 1997 onward, including railway loans as expenditure.

Switzerland: Basic Data (concluded)

	1997	1998	1999 1/
	(In billions of Sw F, unless otherwise indicated)		
Balance of payments			
Trade balance	-0.5	-2.2	0.1
Service balance	18.9	19.0	20.5
Factor income balance	24.0	23.3	36.0
Net private transfers	-3.0	-3.0	-3.5
Net official transfers	-1.9	-2.4	-2.4
Current account	37.5	34.7	50.8
(In percent of GDP)	10.1	9.1	13.1
Foreign direct investment	-18.8	-13.7	-15.0
Outward	-26.1	-20.6	-25.0
Inward	7.3	6.9	10.0
Portfolio investment	-17.3	-6.6	-60.0
Outward	-30.4	-21.5	-70.0
Inward	13.1	14.9	10.0
Banking sector, net	0.5	-17.0	30.0
Memorandum items:			
Net investment income	30.5	29.8	42.5
(In percent of GDP)	8.2	7.8	10.9
Net external assets	449.1	486.6	533.2
(In percent of GDP)	120.9	128.0	137.2
Official reserves (billions of US$, end period) 2/	39.0	41.2	34.6
Reserve cover (months of imports of GNFS)	5.2	4.9	4.4
	(Percentage changes in annual averages)		
Monetary and credit data 3/			
Monetary base	4.8	3.0	1.9
Money (M1)	10.0	7.7	8.7
Broad money (M3)	4.8	1.0	1.6
Domestic credit	1.7	0.8	1.2
	(Period averages in percent)		
Interest rates			
Three-month euro rate	1.6	1.5	1.4
Yield on government bonds	3.5	2.9	2.9
	(Levels)		
Exchange rates			
Sw F per US$ (end of period)	1.44	1.36	1.54
Sw F per US$ (annual average)	1.45	1.45	1.50
Sw F per euro (annual average)	1.64	1.61	1.60
Nominal effective rate (1990=100)	104.3	107.0	105.3
Real effective rate (1990=100) 4/	100.9	102.1	100.4

Source: International Monetary Fund, World Economic Outlook database; Swiss National Bank; Swiss Institute for Business Cycle Research.
1/ Staff estimates.
2/ For 1999, end-November data.
3/ For 1999, first ten months compared with same period a year ago.
4/ Based on consumer prices.

I. SWISS BANKING AT THE START OF THE TWENTY-FIRST CENTURY: CHALLENGES AND OPPORTUNITIES[1]

A. Introduction

1.   Swiss banking has a long gilt-edged tradition. Benefiting from Switzerland's geographic position in the heart of Europe, Swiss bankers have, through the centuries, acquired a solid position in the areas of asset management, private banking, and merchant banking. Swiss banks are well known for their professionalism, discretion, and reliability, and have—through their acquisition of U.S. and U.K. banks—successfully entered onto the global stage in competition for major investment banking deals. The big banks are among the most solid in the world and a number of smaller "blue-blooded" banks have established a strong reputation as top-quality private bankers.

2.   Recent years, however, have not been without troubles for the Swiss banks. On the international front, much-publicized losses in derivative operations, a billion-dollar settlement in a class action suit concerning their conduct during World War II, and, recently, the withdrawal of a banking license for a subsidiary in Japan have somewhat tainted the Swiss banks' traditional image of conservatism and sobriety. On the domestic front, a collapse of the property market and a prolonged recession in the early 1990s necessitated the rescue of a number of smaller regional and cantonal banks and led to a weakening of the balance sheets of the larger banks.

3.   This chapter examines the challenges and opportunities facing Swiss banking at the start of the twenty-first century, and poses two key questions. First, how well are the Swiss banks prepared to deal with the international trends toward increased scale and cross-border integration, for example, in the context of the ongoing European integration? Second, to what extent are there internal and external pressures for the removal of the privileges of the cantonal banks, and what are their implications?

4.   It is argued that the two large international Swiss banks are quite well placed to deal with the international trends toward increased scale and cross-border integration: in particular, they compare favorably with their European counterparts as the Swiss banks have a stronger strategic foothold than their counterparts in the international investment banking arena. Rather, the main challenge to the Swiss banks is likely to arise in the domestic banking markets; public ownership and public guarantees of the cantonal banks have created a rigid structure that is likely to come under increased pressure from both international and domestic forces.

5.   The chapter is divided into three main sections. The main structure of the Swiss banking system is outlined in the first section. (See Box I-1 for an overview of the regulatory

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[1] Prepared by Ketil Hviding.

authority.) In the second section the international competitive position of Swiss banks is discussed, including an analysis of Swiss banks' future prospects in investment banking and asset management. The pressures for change in domestic banking sector are discussed in the final section.

B. Main Structure of the Swiss Banking System

6.   The Swiss banking system is characterized by a two-tier structure. The first tier is composed of the two large banks and some smaller banks focused on private banking, all of which have a significant international presence. These banks represent, so to speak, the "international face" of the Swiss banks. They are mostly joint-stock companies or privately owned (unlimited personal liability). The second tier is composed of a varied group of banks, mostly focused on domestic, or even regional, business. The most important of these are the cantonal banks, which are majority-owned by the cantons[2] and have, in most cases, a special legal status.

Table I-1. Switzerland: Structure of Bank and Finance Company Assets, 1997 1/

	Domestic assets	Foreign assets	Total assets	Fiduciary assets
Large banks	39.4	71.4	55.8	23.6
Cantonal banks	25.9	1.5	13.4	2.4
Regional and savings banks	7.2	0.0	3.5	0.1
Raiffeisen	5.8	0.0	2.8	32.5
Foreign banks	4.2	10.0	7.2	48.9
Other banks	17.5	17.1	17.3	16.1
Of which:				
Handelsbanks	*4.7*	*1.7*	*3.2*	*6.2*
Private banks	*0.8*	*0.4*	*0.6*	*9.9*
Total	60.6	28.6	44.2	100.0

Source: Swiss National Bank (Les banques suisses, 1997).

1/ Includes branches of foreign banks.

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[2] The Swiss federation is composed of 26 cantons and half cantons. The cantons benefit from a high degree of autonomy; the federal government has no authority over cantonal affairs unless explicitly authorized in the Swiss constitution.

Box I-1. Regulation and Supervision

This box provides an overview of the legal framework and prudential regulation relevant for banks and other financial intermediaries providing banking services.

The legal framework for all Swiss banks is provided by the **Bank Act of 1934**, and its later revisions. This Act is supplemented by the Federal Council's ordinance on banks and saving banks, stipulating in detail the supervisory responsibilities of the Banking Commission and the prudential regulations. The banks are also subject to the civil code regarding, for example, contracts and property.

Swiss **capital adequacy rules** stipulate that total capital has to exceed 8 percent of risk-weighted assets; core capital should at least amount to 4 percent of risk-weighted assets. Off-balance sheet positions are incorporated by the use of credit equivalent values; additional capital to cover market risk is allocated according to risk classes or, in the case of the larger banks, estimated by the use of internal risk models. Although similar to the Basel Committee's standard, the Swiss capital requirements differs from this standard in several respects: (i) the Swiss capital requirements are based on unconsolidated balance sheets; and (ii) the risk-weights are generally higher than in the Basel Committee's guidelines. Only the two large banks are subject to the Basel Committee's capital standard on a consolidated basis (as modified to take account of market risk). The banks are also subject to liquidity requirements and concentration of risk limits.

Although formally a part of the Ministry of Finance, the **Federal Banking Commission** (FBC) enjoys significant operational autonomy. The president and the members of the Banking Commission are nominated by the Federal Council for a period of four years and it raises a significant share of its own funding through fees on the supervised financial institutions. The FBC has the power to initiate an administrative procedure and call witnesses; a banking license can, however, only be withdrawn in the case of material evidence of a breach of the conditions for banking licenses as stipulated in the Federal Council's ordinance. The FBC also licenses auditors and requests them to monitor the banks; it has the discretion to call interim audits at any time.

Within the framework of the Banking Act, the **Swiss Bankers Association** issues professional rules and guidelines. In addition, a number of self-regulatory agreements have been completed, of which a "Depositor Protection Agreement" (a deposit insurance scheme) and the "Due Diligence Convention" (complementing the Money Laundering Act) are the most important. The Depositor Protection Agreement guarantees the prompt withdrawal of up to Sw F 30,000 for saving, salary and pension accounts (excluding inter-bank deposits), investment accounts, and bank-issued medium term notes (the Banking Act provides for a privileged reimbursement of the same amount) in the event of a compulsory liquidation but is limited to Sw F 1 million in the case of each individual bank.

In the most recent amendment to the Banking Act—effective October 1, 1999—the obligation for the cantons to provide a guarantee to the **cantonal banks** was abolished. From October 1, 1999, the supervisory authority of the FBC was extended to cover the cantonal banks, and the capital adequacy will apply equally to all the banks, except for the cantonal banks with full cantonal guarantee. For these banks, a 12.5 percent discount (amounting to about one percentage point of risk-weighted assets) applies to the capital adequacy requirement.

Insurance and fund management companies, and securities dealers are supervised by separate supervisory authorities (**Insurance Supervision Act, Investment Fund Act, and Stock Exchange Act**). Other financial intermediaries, such as independent asset managers and trustees, are not covered, however, by these special laws and are only supervised by the Money Laundering Control Authority for the purpose of monitoring the observance of the **Money Laundering Act** (effective 1998). This law requires all financial intermediaries to report any suspicious transaction.

7.   For the purpose of official statistics, Swiss banks are often divided into six groups. Tier one, as defined above, is roughly equal to the first (two large banks) and the last of these groups (other banks):

- **Two large banks**, UBS AG and Credit Suisse AG, dominate the Swiss banking scene. Taken together, these two banks hold about 56 percent of total assets of the Swiss banking system, and 39 percent of domestic assets (Table I-1). The two large banks are joint stock companies and owned by a diversified group of domestic and international investors. Both banks are a part of a broader holding company structure, UBS Group and Credit Suisse Group, incorporating a broad range of financial services: retail banking (parent banks), investment banking (Warburg Dillon Read and Credit Suisse First Boston or, in short, "CSFB"), asset management (UBS Brinson and CSFB), private banking (parent banks), and, in the case of Credit Suisse, insurance (Winterthur). UBS Group was created in June 1998, as a result of a merger between Union Bank of Switzerland and Swiss Bank Corporation (SBC). At end-1998, UBS Group and Credit Suisse Group were ranked as the eight and fourteenth largest groups in the world (on the basis of capitalization).[3]

- **Cantonal banks** constitute a significant force in their "home canton." Although their share of total assets is only 13 percent, their share of domestic assets amounts to about 26 percent. Their importance is particularly large in the mortgage market with a share of some 36 percent of outstanding mortgages. Out of the 24 cantonal banks operating at the end of 1998, 19 were fully owned by the cantons and their liabilities were fully guaranteed by their respective cantons. The five remaining cantonal banks were organized as limited liability companies, with the cantons as majority owners and limited cantonal guarantees. In general, cantonal banks limit their business to their "home canton," although, recently, some cantonal banks have expanded their activity to other cantons or foreign markets.

- **Regional and saving banks** constitute a more heterogeneous group of banks. Although most of the banks are joint stock banks, a number of the smaller saving banks are foundations, cooperatives, or have a special legal status. These banks are generally small and operate independently, although their interests are collectively represented. Despite considerable consolidation that was due to heavy losses from a massive collapse in property prices in the early 1990s, 117 regional and saving banks were still operating in 1998 (down from 210 in 1989) with a median capital of only SwF 13 million (average: SwF 30 million). At end-1998, their combined share of total assets was 3½ percent (7 percent of domestic assets).

- *Raiffeisen* banks are credit cooperatives, located primarily in rural areas. These banks serve their local members, principally offering mortgages and small loans. By

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[3] The Banker, July 1999.

the end of 1998, all of the 722 *Raiffeisen* banks had been integrated into one umbrella organization. Large interbank transactions are performed by a special bank collectively owned by the Raiffeisen banks: *Zentralbank des Schweizer Verbandes der Raiffeisenbanks*. The share of the Raiffeisen banks in total domestic assets has increased gradually over the last 20 years, reaching about 7 percent in 1998.

- **Foreign banks** focus mainly on a foreign client base. While the share of total assets totaled 7 percent in 1998, the share of domestic assets was only 4 percent. If foreign subsidiaries are included, the share was 6 percent of domestic assets.

- And finally, "**other banks**." This heterogeneous group includes prominent banks such as Julius Baer, Bank Leu, and Pictet & Co, mainly focused on private banking, smaller commercial banks, stockbrokers, and banks such as the Coop and Migros banks, which are owned by the cooperative retail chains with the same names.

8.   It should be noted that this is not an exhaustive list of institutions providing banking services. The dividing line between banks and insurance companies has become increasingly difficult to define. Not only are Swiss banks entering insurance markets, for example Credit Suisse's acquisition of Wintherhur, but Swiss insurance companies also are engaging in what traditionally has been called "banking." First and foremost, the value of assets under management by Swiss insurance companies equals about the size of banks' balance sheets. Second, the two large re-insurance companies have increasingly entered the project finance market, drawing on their expertise in insuring large risks.[4] The Swiss insurance companies are among the largest in the world and may challenge banks in high-risk markets such as large-scale project finance.

C. The Global Challenge: How Well are Swiss Banks Prepared?

9.   Since the early 1990s, a wave of banking mergers and acquisitions has been flowing across European and North America markets. Banking giants are being created: average core capital of the ten largest U.S. and European banks increased from US$ 14 billion in 1995 to US$ 25 billion in 1999. Many of the mergers has been driven by the desire to gain domestic share. But cross-border mergers are also on the rise, and are likely to spread in the coming years—particularly in Europe. Despite several mergers, the ranking of the two large Swiss banks among European and North American banks have fallen gradually, from among the seven largest in 1990 to among the 14 largest in 1999.

10.   Does this mean that only size will matter in the coming years and that banks from smaller countries, such as Switzerland, will have the "choice" only between being acquired or being closed? Probably not. First, the trend toward increased size is not in itself sufficient

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[4] *The Economist*, "The New Financiers," September 4, 1999, pp. 69-70.

evidence for the benefits of size. Both academic researchers and market analysts[5] agree that size alone is not the deciding factor in the success of financial institutions. The question of what is the optimal size of a bank is essentially unresolved. Also, the creation of "common infrastructure" (such as the Swiss Interbank Clearing and the Swiss Stock Exchange) has enabled the Swiss banks to reap some economies of scale without the need to merge (See Box I-2). Second, the merger wave may partly be a defensive move to counter narrowing margins by attempting to gain local market dominance. Given that the market for banking services is likely to become increasingly global, such a strategy is likely to falter, though: the advent of electronic banking and the Internet has reduced the natural barriers to entry in both retail banking (reduced need for branches) and investment banking (distribution channels can be created on the Internet).

11.   Finally, the large Swiss banks were among the earliest to enter the global arena, blending Swiss banking tradition with U.S./U.K. investment banking expertise. In this respect, the Swiss banks compare well with their European counterparts, which for the most part remain focused on their home markets. Although it is difficult to foretell the future, the survivors in the increasingly global banking markets are likely to be banks with: (i) a strong position in a broad range of financial services, including investment banking; (ii) an ability to take advantage of new technologies; and (iii) a sound risk management system. It is argued below that the two large Swiss banks score fairly well along these dimensions. In addition, smaller private banks have a strong franchise in private banking and are likely to be able to survive or even prosper far out in the future. Even a further erosion of the banking secrecy is unlikely to affect these institutions to any considerable degree.

Strategic position in international investment banking

12.   Although "economies of size" will probably play a small role in determining the winners of tomorrow's battles in the financial markets, the use of "economies of scope" is almost certainly to play an important role. Often called "synergies," economies of scope are important in investment banking because the success of one business segment to a large extent depends on the bank's capabilities in the other business segments. For example, an advisor on mergers and acquisitions needs the capability to raise large amounts of funds through the capital markets (bonds or equities) and to have a large distribution network for placing securities. In addition, clients often needs a broad set of investment banking services and would tend to use the same investment bank, even when there is no particular "synergy" between the different market segments.

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[5] See, for example, The Economist (1999), Berger (1991 and 1997), Molyneux, Altunabas, and Gardener (1996).

Box I-2. Common Financial Infrastructure

This box details the creation of various systems and institutions that provide clearing, settlement, and trading platforms mainly as a joint service to banks domiciled in Switzerland. This "common financial infrastructure" includes the creation of a highly efficient interbank clearing system, a unique system for real-time settlement of repurchase agreements (providing for short term collateralized lending), and an indirect link to TARGET, the euro real-time gross settlement system.

As one of the first in continental Europe, a continuous real-time gross settlement system, the **Swiss Interbank Clearing (SIC)**,[1] was introduced in 1987. Initiated by the Swiss National Bank (SNB), the system is managed under contract by a private company (Telekurs SIC AG) and collectively owned by the Swiss banks. The system is supervised by the SNB. At its start in 1987, the SIC resulted in a surprisingly sharp reduction in the demand for base money (cash and central bank liabilities),[2] and, with a daily average of some ½ million transaction,[3] is one of the most actively used gross settlement systems in the world.

In response to the introduction of the euro, the **euro-SIC**, essentially a parallel clearing and settlement system in euro, was created on January 4, 1999 to enable Swiss banks to supply competitive transactions services in euro. The euro-SIC, operating in Frankfurt, is indirectly connected to TARGET through the Swiss Euro Clearing Bank (SECB), a collectively owned subsidiary of the Swiss banks.

Repo SWX, an international on-line trading, clearing, and settlement system for repurchase agreements (repos) was introduced in November 1999. The system provides an efficient platform for collateralized short-term lending and is useful for the conduct of SNB's open market operations. Repo SWX is world's first electronic repo platform with integrated clearing and settlement.

In 1998, the Swiss Option and Financial Futures Exchange (SOFFEX) merged with the German Future and Option Exchange (DTB) to create **Eurex**, a fully integrated transnational electronic trading platform for financial derivatives.

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[1] The SIC was introduced one year ahead of the German gross interbank clearing system (EIL-ZB), but after the systems in the United States (1913), the United Kingdom (1984), and Sweden (1986).

[2] See, for example, Hviding (1999), p. 25.

[3] See Bank for International Settlements (1997).

13.   A ranking in key investment banking markets provides some clues to a bank's ability to benefit from economies of scope. As can be seen from Table I-2, the two Swiss-owned investment banks, Warburg Dillon Read (owned by UBS) and CSFB (owned by Credit Suisse), have an excellent position in most of the market segments (with the exception of loan syndication). Their average rank in these markets is clearly higher than for other European banks. In particular, CSFB ranks among the five largest in three market segments: mergers and acquisitions, bonds, and equities.

Table I-2. Switzerland: Investment Banking "League Tables," 1998 and 1999

(Ranked by market share)

| | M&A 1/ | | Bonds 2/ | Syndicated loans 3/ | | Equities 2/ |
	World	Europe		Europe	North America	
Swiss banks						
CSFB	4	5	5	26	12	4
Warburg Dillon Read	12	9	8	20	...	5
Other European banks						
Deutsche Bank	13	15	4	2	6	7
Paribas	14	11	12	11	...	...
BNP	15	12	...	6	...	19
ABN AMRO	...	...	10	15	13	12
US banks						
Goldman Sachs	1	1	6	25	9	2
J.P. Morgan	8	6	7	13	4	18
Morgan Stanley Dean Witter	2	2	3	...	...	1
Merrill Lynch	3	3	1	...	...	3
Salomon Smith Barney	9	8	2	...	...	6

Source: International Finance Review, Thomson Financial Securities Data.

1/ Merger and Acquisition advisors; January to September, 1999.
2/ Bookrunners; January 1 to September 18, 1999.
3/ Arrangers, 1998.

14.   Particularly striking is the strong position of the Swiss investment banking arms of the Swiss financial groups as advisors in mergers and acquisitions, a high-margin business segment. In the league of world advisors, CSFB is the only European bank among the six largest. Its share of the international merger and acquisition market (in terms of the value of

the deals) is about 20 percent, compared with 30-35 percent for each of three other world leaders: Goldman Sachs, Morgan Stanley Dean Witter, and Merrill Lynch.[6] The position of Warburg Dillon Read is apparently less solid, but its overall ranking in this market segment is comparable to European giants such as Deutsche Bank and Banque Nationale de Paris (BNP).

15.   Related to economies of scope are the benefits from the global presence. In investment banking, global presence is important because of the need to tap markets with surplus savings and supply these resources to markets with need for finance. In addition, a successful advisor in cross-border mergers must have local knowledge of different cultures and expertise in varying jurisdictions. In terms of global presence, the two large Swiss banks are also well positioned relative to the other European banks. For one, the share of revenue with a non-European origin is large (53 percent for CSFB and 34 percent for Warburg Dillion Read). In particular, CSFB has a strong position in the United States (44 percent of its 1998 revenue came for the Americas) and is consequently often referred to as a "U.S.-Swiss bank." In addition, Swiss banks have significant foreign assets: at end-1998, the outstanding amount of foreign assets amounted to 56 percent of total assets. This amount excludes fiduciary assets, which are off-balance sheet.

Ability to benefit from new technologies

16.   Advances in computer technology are changing the nature of banking quite dramatically. Most obviously, retail banking has been fundamentally changed as a result of the ATMs, which are rapidly replacing bank branches as distributors of cash and receivers of payments. Internet banking takes this development even further, rendering branches virtually obsolete for nearly all banking functions. Furthermore, extensions of loans are also becoming increasingly automated: information technologies are used increasingly to assess the creditworthiness of potential borrowers, and can form the basis for the issuance of asset-backed securities.

17.   To fully benefit from these new technologies, banks will probably have to undertake substantial restructuring. In the first round, the number of branches and bank clerks would need to be reduced (Table I-3). New bank employment may be achieved as a result of the increased demand for new banking services, but there is no guarantee that the previously employed could easily be reemployed in the new jobs. Formal or informal restrictions on the banks' ability to "hire and fire" would thus limit the cost-savings that could be achieved from investment in labor saving information technology.

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[6] Refers to the total value of deals (market capitalization of the merged company) during January to June 1999. Market shares add up to more than 100 percent since one deal may involve several advisors. See "Sharks on the Loose," *The Banker*, August 1999.

Table I-3. Switzerland: Number of Branches per 1000 Inhabitants

	1985	1990	1995	1996	1997	1998
Switzerland	0.82	0.62	0.53	0.51	0.48	0.44
Austria	0.54	0.58	0.58	0.58	0.58	0.57
France	0.47	0.45	0.44	0.44	0.44	0.43
Germany	0.61	0.49	0.54	0.53	0.52	...
Italy	0.23	0.31	0.41	0.43	0.44	...
Netherlands	0.59	0.67	0.59	0.54	0.44	...
United Kingdom	0.38	0.35	0.33	0.32	0.32	...
EU average	0.52	0.51	0.49	0.48	0.48	...

Source: OECD *(Bank Profitability)*.

18.   In this regard, the two large Swiss banks compare quite well to their continental European competitors. First, the Swiss labor market is considered among the more flexible in Europe.[7] Second, the relatively low level of unemployment makes layoffs more politically acceptable than, for example, in the neighboring countries which have double digit unemployment rates. Thus, mergers are less often subject to "no firing" conditions, as is often the case in other European countries. Third, as a result of the two large banks' global operations, a significant number of their staff members work abroad, often in financial centers with highly liberal labor laws.

19.   Comparing the UBS and SBC merger with similar mergers in other European countries is instructive. In the case of the merger between UBS and SBC—effective June 1998—the total Group headcount was reduced by 13 percent (from end-1997 to end-1998) and total personnel costs fell by 15 percent. Most of the staff reductions were abroad. This reduction of headcount appears to exceed those of other recent large European mergers. In two other large European mergers,[8] staffing changes in the year following the merger varied from a decrease of some 10 percent, in the case of the merger between Banco Central Hispano, and Banco Santander, to a four percent increase, in the merger between Bank Austria and Creditanstalt. In the cross-border merger between Fortis and Generale Bank, the average staffing level was up some two and a half percent (year-on-year) four months after the merger was completed.[9]

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[7] See, for example, *OECD Economic Survey on Switzerland,* 1996. The *OECD Job Study* identifies the Swiss employment protection legislation as among the most liberal in the OECD area.

[8] (1) Bank Austria and Creditanstalt, effective November 1997; and (2) Fortis (Netherlands) and Generale bank (Belgium), effective September 1998.

[9] Banco Central Hispano and Banco Santander (both Spain), effective January 1999.

20.   In the same vein, international data on banks' cost efficiency suggests that the Swiss banks' are relatively "cost conscious." A common measure of banks' cost-efficiency is provided by cost-income ratios, as measured by the banks' operational costs as a ratio of net interest income and net noninterest revenue. With an average cost-income ratio of about 50 percent, the two large Swiss banks—"parent banks," i.e., excluding investment banking—compare well with large commercial banks in other developed OECD countries (Figures I-1 and I-2). Consolidated group figures have much higher cost-income ratios, probably reflecting the inclusion of low margin investment banking and insurance services. Figure I-1 attempts to adjust the cost-income ratio for the share of non-interest revenue in total revenue by a simple cross-country regression on a selection of commercial banks; seen in this light, the consolidated group figures also compare relatively well with other banks.[10]

21.   All in all, this should suggest that the two large Swiss banks' earnings should be relatively comfortable. As can be seen from Figure I-1, Panel 2 showing net income before loan loss provisions, this does indeed seem to be the case. It also appears that the profitability of the two large Swiss banks has improved somewhat over the last decade. Return on equity (ROE)—measured as earning before taxes and extraordinary items as a percentage of book value of capital and reserves—averaged about 20 percent during the 1990s despite a prolonged recession. This is also an improvement relative to the late 1980s and are at par with the ROE reported for US commercial banks and higher than in the large German banks (Figures I-1 and I-3).

22.   It is, however, an open question whether the relatively high earnings comes at the cost of relatively high risk taking. The large losses in the early 1990s (Figure I-3, Panel 2) underlines the need to adjust the return on equity (excluding loan loss provisions) for risk. Unfortunately, there is no foolproof method of calculating such a risk-adjustment and it can be debated whether the volatility of earnings is an appropriate risk measure.

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[10] On the basis of production frontier estimates, Bikker (1999) finds that the Swiss banks are overall the third most efficient (in X-efficiency terms) among a group of nine European countries (Belgium, France, Germany, Italy, Luxembourg, Netherlands, Spain, the United Kingdom, and Switzerland), after Luxembourg banks (most efficient) and Belgian banks (second most efficient).

Figure I-1. Switzerland: Cost Efficiency and Profitability, 1979-1998

Panel 1. Cost Efficiency and Revenue Structure: 1979-1998 1/
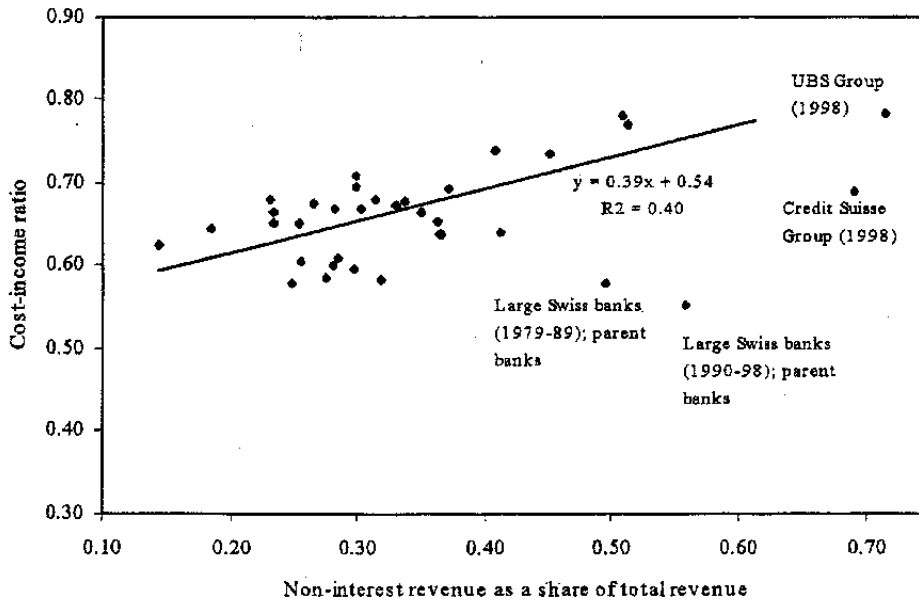
Panel 2. International Comparison of Return on Equity (ROE)
(Net income before loan loss provisions as a percentage of capital and reserves)
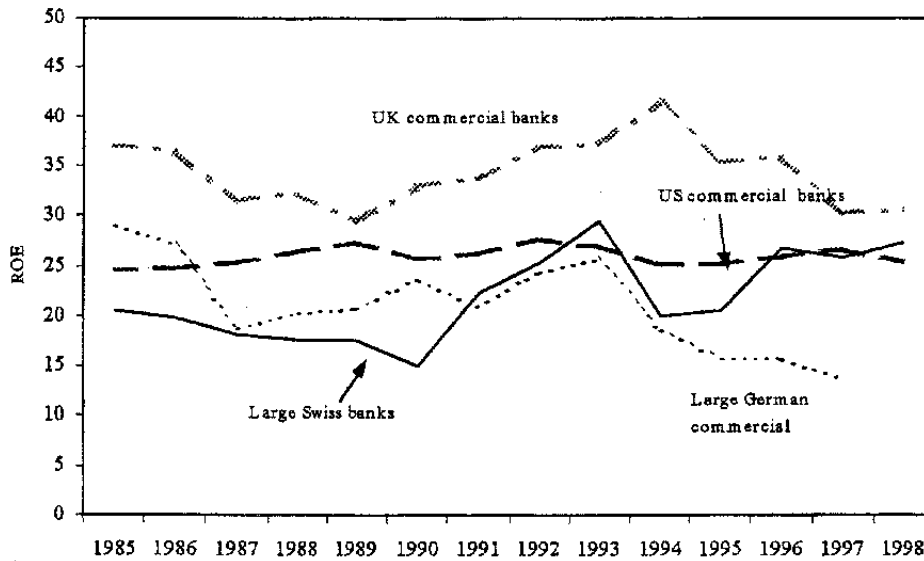
Source: OECD Bank Profitability.

1/ Regression line is based on a sample of aggregate data from OECD countries (as reported in OECD Bank Profitability) but excludes Swiss banks.

Figure I-2. Switzerland: Net Interest Margin and Cost-income Ratio, 1979-98

Panel 1. Net Interest Margin
(Percent of total assets)

Panel 2. Cost-income Ratio
(Operating costs as a share of total operating revenue)
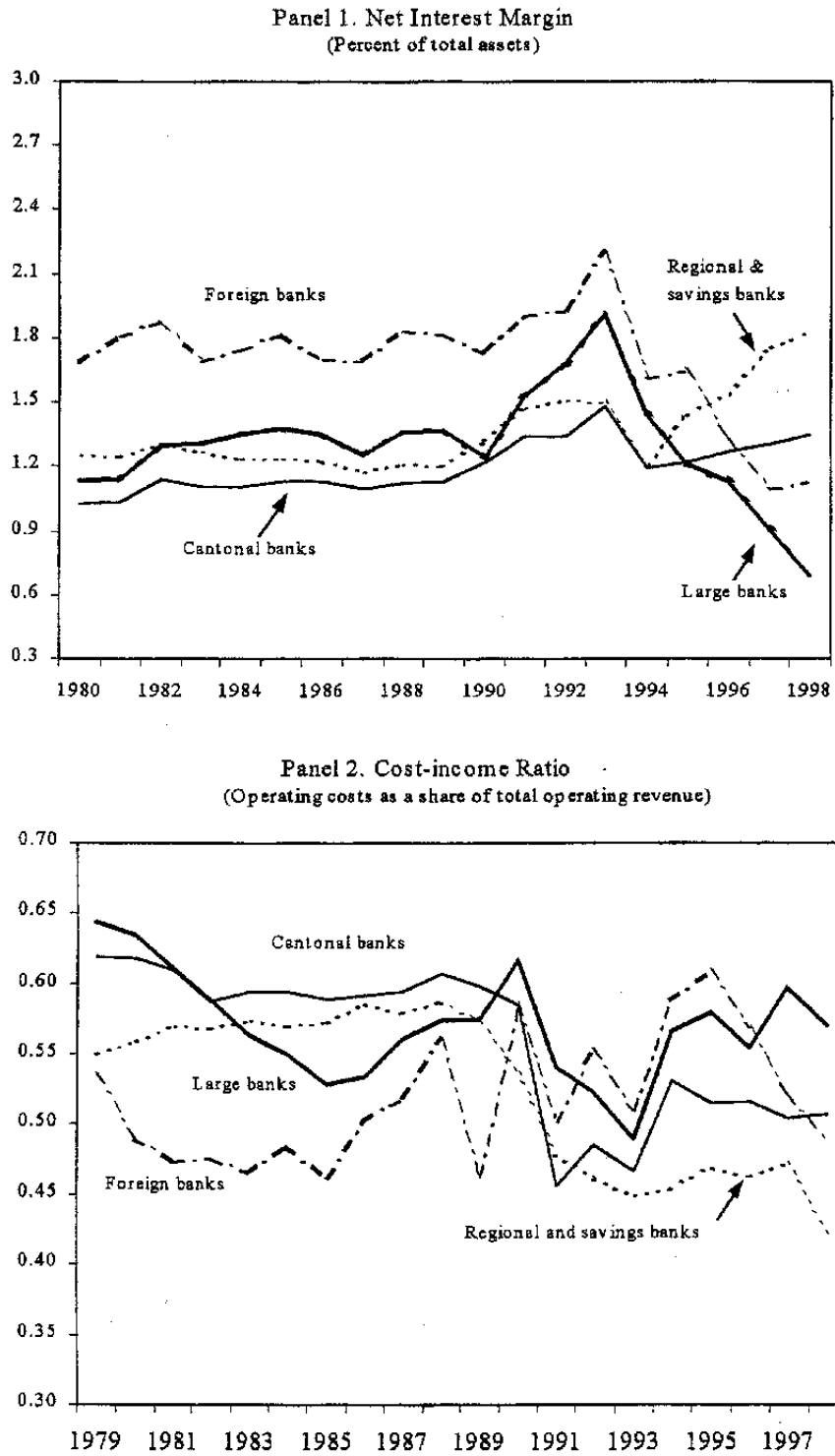
Source: Swiss National Bank.

Figure I-3. Switzerland: Bank Profitability, 1979-98

Panel 1. Return on Equity
(Net income before provisions in percent of capital)
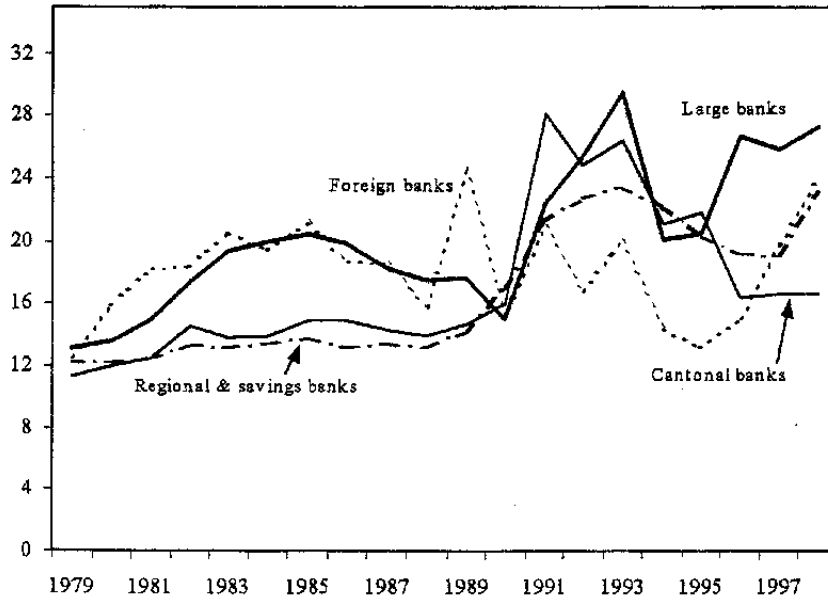
Panel 2. Loan loss Provision, Revaluation, and Capital Depreciation.
(In percent of capital)
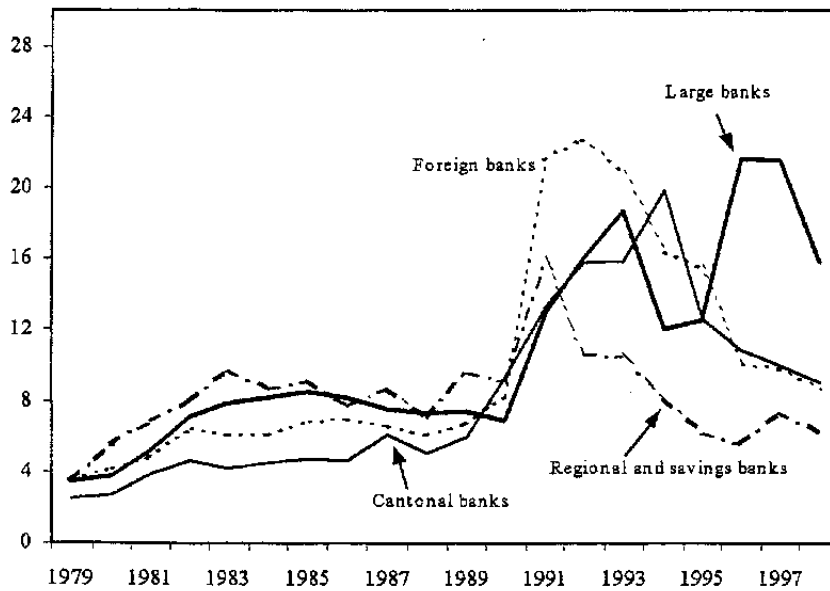
Source: Swiss National Bank.

Quality of risk management

23.   The large losses in emerging markets and on derivative positions highlight the need for strong risk management in Swiss banking. Owing to their increased focus on investment banking and related financial services, the earnings of the two large Swiss banks have become increasingly volatile over the last few years, despite the use of sophisticated risk management models. Notably, both UBS Group and Credit Suisse Group experienced significant losses as a result of the emerging market crisis: in 1998, combined losses in the wake of the Russian crisis amounted to $2.5 billion, or about 6 percent of combined shareholder equity (of which 28 percent relate to Long Term Capital Management, a U.S.-based hedge fund).

24.   The importance of risk management is also highlighted by the banks' earlier experience with large losses in the domestic market. Following a boom in the late 1980s, interest rates were increased sharply in late 1988 and 1989, triggering a prolonged recession and a sharp fall in housing prices. The combined effect of (i) a sharply inverted yield curve, (ii) collapsing real estate prices, and (iii) increasing insolvencies resulted in sharply worsening loan portfolios.[11] Even though the losses affected virtually all Swiss banks, smaller regional banks and the cantonal banks were particularly hard hit, as they had mainly domestic loans.[12]

25.   Although most Swiss banks are well capitalized[13] (Figure I-4), maintaining a high level of risk management is of key importance. The two large Swiss banks are clearly aware of the importance of risk management and have implemented sophisticated internal risk-management systems (described in some detail in the annual reports). Clearly, no risk management system is foolproof; cracks can emerge in an apparently perfect system, arising typically from the lack of central control or a sharp breakdown of established price relationships. Owing to the multicultural identity of the two large Swiss banks, they may be particularly exposed to coordination problems. Nevertheless, the highly diversified business portfolio and the resources spent on risk management suggest that the two large Swiss banks should be able to strengthen their reputation as prudent bankers.

26.   Smaller banks are also well advised to focus on risk management. The regionally specialized banks (cantonal banks, regional banks, and savings banks) are heavily exposed to regional or domestic shocks. Thus, some wider diversification of their portfolio appears

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[11] See, for example, Staub (1998).

[12] See IMF (1997).

[13] The consolidated capital adequacy ratio of the internationally active large banking groups was 14.8 percent in June 1999 (excluding international subsidiaries, the capital ratio of the Swiss banking system as a whole was 11.3 percent in December 1998).

Figure I-4. Switzerland: Structure of Lending and Capital Reserves, 1979-98

Panel A. Share of bank lending to non-banks (excluding mortgages) in
Total Lending
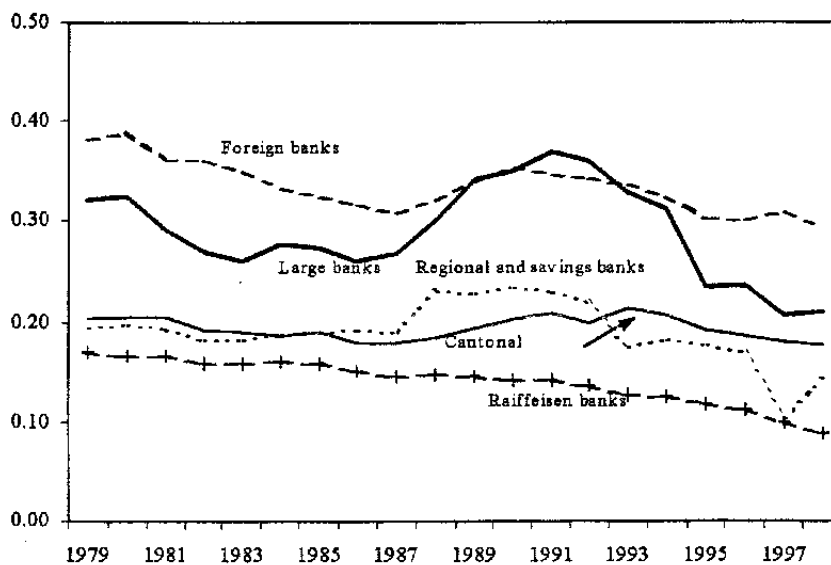
Panel B. Capital and Reserves 1/
(Percent of total assets)
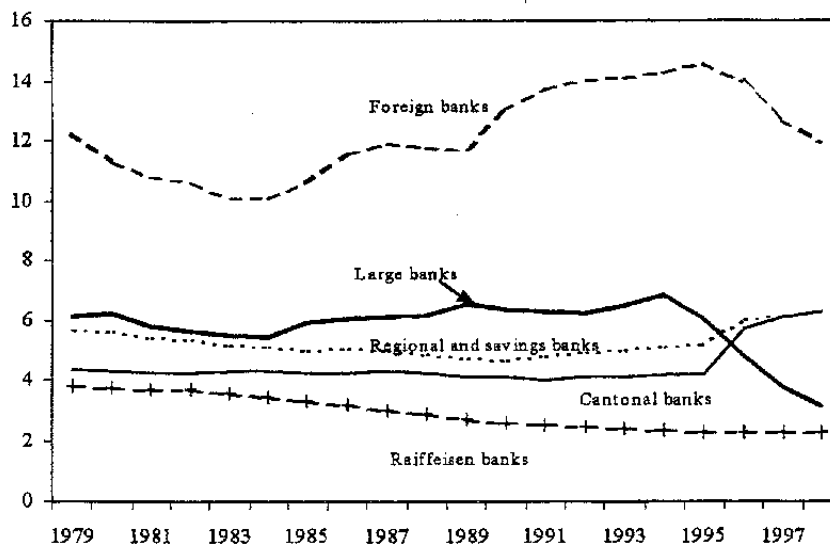
Source: Swiss National Bank.

1/ Paid in capital and accumulated reserves as defined in SNB's "Les banques
suisses". Excludes hybrid capital instruments accepted in the Basle Committee's
(BC) capital ratio. In addition, the denominator includes all assets while the BC's
capital ratios are based on risk-weighted assets.

warranted. This could result from encouraging cross-regional or, even better, cross-border mergers. Moreover, some cantonal banks have increasingly been entering into new business lines, such as investment banking. Thus, the type of risk may have become more complex, requiring increasingly sophisticated risk management techniques.

27.   The quality of banking supervision is in many respects a "common good" for Swiss banks.[14] Vigilant banking supervisors not only protect taxpayers against large losses, but also provide a service for the private bankers. In particular, the supervisors gain insight into a number of different institutions and can determine common problems, that could potentially arise from unsustainable macroeconomic developments. Thus, an outside assessment should be helpful in maintaining the quality of risk management in smaller Swiss banks, with insufficient resources to build up sophisticated risk management units.

28.   Although formally a part of the Federal Finance Administrations, the Federal Banking Commission (FBC) has been given considerable operationally independent from the political authorities (Box I-1) and the Implementing Directive provides clear guidelines on minimum prudential standards. The operational independence of the has been recently enhanced by the introduction of increased budgetary flexibility enabling the FBC to offer more competitive salaries to financial market specialists. Furthermore, the recent amendment to the Banking Act (Box I-1) has improved international cooperation by facilitating on-site inspection by foreign supervisors in branches or subsidiaries of foreign banks located in Switzerland.

29.   Experience with the insolvency of one small bank has, however, revealed that roles played by the courts and the FBC during a financial crisis in an individual bank are not sufficiently clear; thus, the option of merging technically insolvent institutions with larger and more solid institutions has been used instead of liquidation in most cases.[15] The use of consolidation as the only effective "exit" for insolvent institutions, may potentially delay the resolution of a crisis or could give rise to an undesirable increase in concentration (to the extent that the large banks may see a positive value in taking over the insolvent bank as it could enhance the large banks' market dominance).

The future of Swiss asset management

30.   Swiss banks and asset managers occupy one of the leading positions in the world market for asset management services. UBS Group Economic Research estimates that, at

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[14] Such "common good" has also been called a "club good" (see, e.g., Sandler and Tschirhart, 1997). In contrast to pure public goods, exclusion in consumption is possible; the "club goods" differs also from private goods, however, as their joint production is beneficial.

[15] As in most other European countries, bank failures are virtually nonexistent in Switzerland. See, for example, Staub (1998).

end-1997, the total amount of assets under management was approximately $2.3 trillion (about 10 times Switzerland's GDP), of which a majority was for private clients (Table I-4).

Table I-4. Switzerland: Assets Managed
by Swiss Banks, End-1997

(In billions of dollars)

	Onshore	Offshore	Total
Institutional	540	330	870
Private	530	910	1,440
Total	1,070	1,240	2,310

Source: Blattner, Gratzl, and Kaufmann (1996).

31.   Although there is no doubt that the strong position in asset management is partly a result of the high Swiss savings rate,[16] the Swiss position is particularly strong in the market for "offshore" private asset management—the market for the management of private portfolios owned by foreign residents. It has been estimated[17] that about $1,600 billion, or about 30 percent of "offshore" private wealth, is deposited in Swiss banks, making Switzerland the world's leading location for the management of private wealth owned by foreign residents (exceeding by far the United Kingdom with about 15 percent, the second largest destination for "off-shore "wealth).[18]

32.   Despite the Swiss private banks traditionally strong position in the management of wealth of established families, the Swiss private banks can be expected to benefit from the prospective increase in the transfer of wealth created during the post-war period. Particularly in neighboring Germany and Austria, a large number of post-war business founders will retire in the coming 5-10 years.[19] As a result of its geographic location, its local knowledge

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[16] In addition, a beneficial tax regime favors debt financed investment in insurance products (collateralized with real estate) thus making it relatively beneficial to roll over outstanding mortgage debt and to invest savings in insurance products or other financial assets. See OECD (1999).

[17] *The Banker* (1998).

[18] This comes in addition to assets held for institutional investors (e.g., pension funds) and Swiss nationals.

[19] See Pictet & Co (1999).

(including languages), and its outstanding reputation, Swiss banks should be well placed to participate in the management of this wealth.

33. Their relatively small scale may, however, not allow the Swiss private banks to offer highly sophisticate information technology, most likely to be most demanded by young wealthy entrepreneurs. As the average costs of large scale investment in some information technology is likely to be negatively related to size, the relative burden of such investment would be larger for smaller banks. Thus, the smaller private banks may respond by merging or cooperating in the creation of common information technology infrastructures.

34. What role does Switzerland's strict banking secrecy laws[20] play in explaining its strong position in the private banking market? The answer is probably: "Some, but not as much as is often believed." Particularly in the case of the private banks, the main attraction is the development of long-standing relationships with high-wealth individuals and the acquired reputation for professionalism, discretion, and reliability. Whether this relationship is protected by a strict banking secrecy law is probably of less importance than the banks' acquired reputation, as long as a fundamental protection against arbitrary expropriation is maintained. The rapid growth in assets managed by Swiss private banks in recent years[21] suggests that the recent measures to clamp down on "money laundering" have not slowed down the inflow of foreign funds into Swiss private banks, although these measures clearly modify the strictest interpretation of "banking secrecy." Rather, the introduction of clear legal procedures against money laundering may have helped to maintain or even improve the international reputation of the Swiss private banks.

35. Similar arguments may apply to the case of tax evasion. Although Swiss banks undoubtedly benefit from some tax motivated investments, the core motivation for having the money managed in Switzerland is probably still related to the professional reputation of Swiss private banks. Thus, the effects on Swiss private banks earnings from an introduction of, for example, a wider application of the withholding tax (to include, for example, returns on fiduciary assets) may only be limited.

36. A couple of additional points may shed some light on the role of banking secrecy in the Swiss private banking. First, the Swiss banks built up their strong position in private

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[20] "Banking secrecy is defined as the discretion which the representatives and employees of a bank must guarantee in regard to information about the business affairs of their clients or third parties which comes to their knowledge during their profession. Authorized agents, auditors mandated by the supervisory authority and other persons involved in business with the bank are also obliged to maintain banking secrecy." Banking secrecy is enshrined in the banking law (and the civil law). See Swiss Federal Administration (1998) and KPMG (1999).

[21] On average, the assets of the three largest incorporated private banks (Julius Baer, Sarasin, and Vontobel) grew by an annual rate of close to 20 percent in 1998 and 1999.

banking before the introduction of the strict banking secrecy laws in 1934, motivated by the need to protect deposits flowing in from Germany. Second, some other European countries have similar banking secrecy laws, notably Luxembourg and Austria, but a far smaller share of the market for "offshore" private wealth. Thus, the strict banking secrecy law is probably only a secondary factor behind the success of the Swiss private banks.

D. Pressures for Change in the Domestic Banking Sector

37.   The previous sections reviewed the extent to which Swiss banks are likely to face increased international competition. This review has mainly focused on the more internationally oriented banks, in particular the two large Swiss banks and the smaller banks specializing in private banking. The domestic banking sector is, however, more important for the efficiency of the domestic economic system. Although the two large banks are also large players in the domestic markets, the domestic banking sector is also heavily influenced by state-controlled banks (the cantonal banks) and, to a lesser extent, mutual or cooperative banks (saving and *Raiffeisen* banks).[22]

Table I-5. Switzerland: International Comparison of
Ownership Structures in Banking, 1998

(Percent of total assets)

	Public/ State (A)	Mutual/Coop. (B)	Total (A+B)	Foreign 1/
Switzerland	13	4	17	8
Domestic Assets	*29*	*8*	*37*	*6*
Austria 2/	14	30	44	3
France 3/	0	19	19	12
Germany 4/	38	14	52	3
Netherlands	6	16	22	8
United Kingdom	0	6	6	52

Sources: National central banks, European Commission, Building Societies Association, and staff estimates.

1/ 1997; includes branches of foreign banks (source: European Commission).

2/ The assets of Bank Austria are included proportionally to the public sector share of the votes.

3/ The specialist Caisse des Dépôts et des Consignations is not included (assets of about 3 percent of all banks). Similarly, the 10 percent public stake in Crédit Lyonnais is excluded.

4/ Landesbanken (owned by the Länder), saving banks (owned by the municipalities), and state-owned mortgage companies (estimated asset share: 2 percent).

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[22] See Table I-5 for an international comparison of ownership structures.

38.   The present section focuses on the challenges facing the Swiss banks on their "home turf." It is argued that rigidities created in particular by the significant influence of state-owned and state-guaranteed banks are likely to be challenged in a more or less orderly process. Compared with privately-owned banks, the state-owned cantonal banks (i.e., owned by the cantons) benefit from a double advantage: first, the cantonal banks have access to "cheap equity" from the canton; second, cantonal liability guarantees have the effect of reducing the their funding costs. Thanks to these advantages the cantonal banks can underbid the joint-stock banks unless the latter have a special expertise in the business segment, or are sufficiently large to compensate for the special advantage given to the cantonal banks. Although the cantonal banks are generally required to provide for "local needs" (in rather vague terms), the effect of the privileges enjoyed by the cantonal banks is likely to raise the barriers to entry, thereby bolstering the market power of the incumbents. In effect, the regional market is highly concentrated: most cantons are dominated by the two large banks and one or, at most, two cantonal banks.[23] While the two large private banks dominate the market for small and medium-size business credit, the market share of the cantonal banks is particularly high in mortgage lending and in lending to government institutions (Table I-6).[24]

39.   There are also additional barriers to entry affecting foreign banks. According to the Banking Act, the establishment of a foreign subsidiary or a branch of a foreign banks is restricted; and a majority of the management has to be Swiss.[25] As a joint result of this provision and the entry barriers mentioned above, foreign banks (foreign-owned subsidiaries and branches) play a relatively minor, albeit growing, role in Switzerland. Despite the substantial international activity of Swiss banks, the proportion of total assets of foreign banks in Switzerland is much smaller than, for example, in France and the United Kingdom. The foreign banks concentrate mainly on asset management, investment banking, and

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[23] In the market for small and medium size business loans (above Sw F 100,000), Neven and Ungern-Sternberg (1998) reports that the two large banks and one cantonal bank have a combined marked share of 90 percent in almost all cantons. Furthermore, the Federal Competition Commission (FCC) judged the potential threat from new entrants to be small, reflecting the combined dominance of the two big banks and the cantonal banks. Subsequently, the FCC ordered the new UBS AG to sell 25 branch offices and to freeze the outstanding volume of smaller business loans until 2004, motivated by a concern to prevent the creation of an oligopolistic market structure. See *Commission de la concurrence, "Rapport annuel 1998,"* p. 9.

[24] Rime and Egli (1999) finds a positive relationship between market concentration and saving deposits rates in the large cantons; in the small cantons, by contrast, this relationship is negative suggesting that economies scale effects from increased concentration dominate the negative effect on competition.

[25] "The Swiss Banking System," *Fitch IBCA Country Report,* May 1994.

Table I-6. Switzerland: Developments in Domestic Market Shares 1/

	1979-85	1986-90	1991-95	1996	1997	1998
	(Percent of total domestic assets)					
Large banks	40.7	41.8	42.0	44.4	45.6	46.0
Cantonal banks	31.2	30.0	32.5	31.3	29.9	29.8
Regional and savings banks	14.4	13.4	10.6	8.3	7.8	7.8
Raiffeisen	4.4	4.9	5.9	6.7	6.8	7.1
Foreign banks	4.3	4.4	4.6	4.5	4.6	5.7
Other	5.1	5.6	4.4	4.8	5.3	3.5
Total	100	100	100	100	100	100
	(Percent of domestic mortgage loans)					
Large banks	33.7	37.5	38.8	39.7	38.7	37.8
Cantonal banks	38.6	35.3	35.9	35.1	35.2	35.7
Regional and savings banks	18.9	16.8	12.8	10.7	10.6	10.9
Raiffeisen	5.9	6.4	7.4	8.8	9.4	10.0
Foreign banks	2.6	3.4	4.6	5.2	5.6	5.0
Other	0.4	0.5	0.6	0.5	0.5	0.6
Total	100	100	100	100	100	100
	1988-90 1/	1991-95	1996	1997	1998	
	(Percent of other domestic non-bank credit)					
Large banks	...	48.6	47.4	48.2	47.0	45.4
Cantonal banks	...	23.3	28.3	28.8	29.4	30.6
Regional and savings banks	...	10.3	7.3	5.4	5.1	5.0
Foreign banks	...	3.6	4.6	5.2	5.6	5.0
Other	...	14.2	12.5	12.3	12.9	14.0
Total	...	100	100	100	100	100

Source: Swiss National Bank.

1/ Excludes private banks, finance companies, and branches of foreign banks.

wholesale banking, all highly international market segments; their market share in the domestic market is only around 6 percent.

40.   Pressure for change may arise from several sources. The first and foremost source arises from the distortions created by state-ownership and state-guarantee, which are likely to meet political opposition from groups that would benefit from a change. As noted in the statement by the Competition Commission on the amendment of the Banking Act,[26] taxpayers in general have suffered in several instances from the state-guarantee of the cantonal banks.[27] The combination of state-guarantee and lower capital requirements is a particularly "explosive" constellation; the value of taxpayers' implicit liability increases if the amount of capital is reduced.[28] Also, state-ownership risks being used for the purpose of directed lending, a practice accentuated by the special legal status of the banks and the lack of clear profit targets. This lack of a clear commercial objective is bound to favor certain groups at the expense of others, in ways which may be not conform to accepted "social justice."

41.   The second source is the lack of incentives for innovation arising from state-ownership, potentially creating over time a "technology gap." In particular, in such a highly complex sector such as banking, private ownership has proven superior to state-ownership, unless the objective is a "public good" (e.g., development aid). Lower profit aspirations arising from the state-ownership combined with a lack of competitive pressures, makes it less urgent for the managers to take advantage of new technologies than in the case of joint-stock banks (where, e.g., the owners can align the incentives of the managers with the owners interest through the award of stock options). Moreover, state-ownership is apt to impose stronger constraints on the ability to reduce staff in order to benefit from technological progress. In effect, staffing levels in the cantonal banks and the number of branches have hardly changed over the last four years while, at the same time, the two large banks have been significantly reducing their staff levels and pruned their branch networks (Figure I-5).

42.   A third related source of change comes from the relentless progress of technology which can be expected to nibble away on the artificially high barriers to entry. The advent of internet and direct banking is likely to reduce the obstacles facing foreign banks when they

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[26] *Stellungnahme der Wettbewerbskommission vom 5. Mai 1997 zum Bericht der Expertenkommission im Vernehmlassunsverfahren: Staatsgarantie as konstitutives Merkmal.* Available at: www.wettbewerbskommission.ch.

[27] The Competition Commission mentions four cantons: Appenzell, Ausserhoden, Bern, and Solothurn.

[28] Merton (1977) shows that the value of a deposit guarantee increases with the amount of risk and decreases with the value of bank capital.

Figure I-5. Switzerland: Resource Use in Banking, 1986-98

Panel A. Employment in the Large Banks

Panel B. Employment in Other Banks

Panel C. Bank Branches
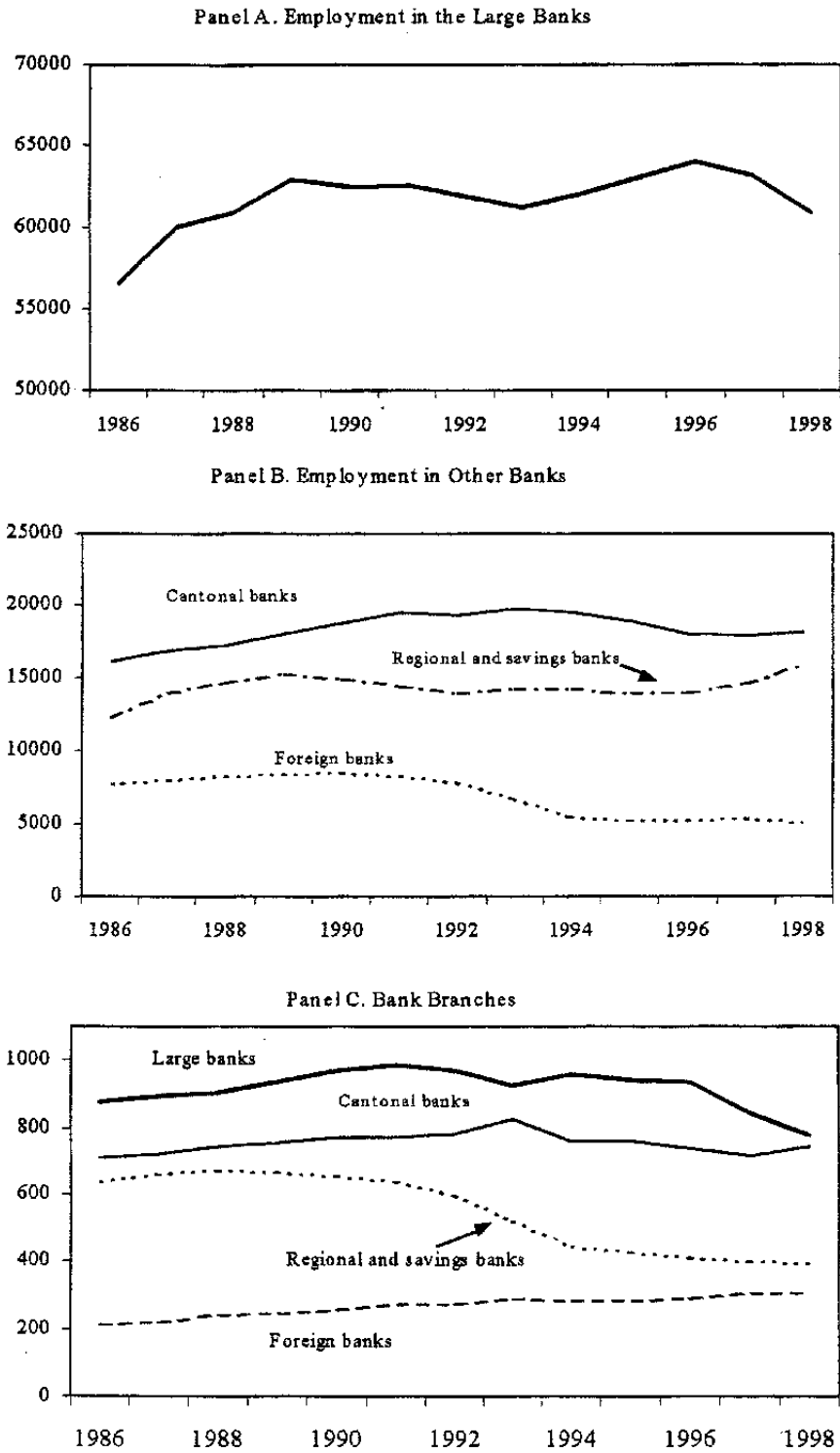
Source: Swiss National Bank.

want to sell banking services in Switzerland as none or only a few physical branches may exist.[29]

43.   The incumbent banks can respond to these pressures in several ways. One approach may be to consolidate, thus increasing the degree of market concentration (i.e., maintaining market power, if any) and reducing costs. Several indicators suggest that, to some extent, such a process of consolidation has already taken place during the 1990s. Besides the highly publicized merger between UBS and SBC, there are other signs of increased concentration: the combined share of the cantonal banks and the two large banks has been gradually increasing in the 1990s (Table I-6). The collapse in the real estate market in the early 1990s reinforced the squeezing out of the smaller regional and saving banks by the cantonal banks and the two large banks. Although most banks were severely affected by the sharp fall in collateral values resulting from the collapse in the real estate market in the early 1990s, the cantonal banks drew on public guarantees and public ownership, and the two large banks drew on more diversified revenues to withstand the losses. The regional and savings banks suffered, by contrast, from small size and geographical limitations.

44.   Another approach may be to take on more risks in the hope of generating higher earnings; an approach often taken by banks in countries which have experienced significant financial market liberalization.[30] In the case of the cantonal banks, state-ownership and state-guarantees would make such increased risk-taking virtually costless. The increased share of foreign lending in total credit (from 4 percent in 1990 to 6½ percent in 1998) is an indication that such a risk-shift may indeed be taking place. Similarly, the two large banks have undoubtedly switched to increased risk-taking as can be seen from an even stronger increase in the foreign-credit share and large losses; this strategy may be, however, motivated by the tougher competition in the international banking markets than an attempt to compensate for tighter margins in the domestic credit market.

E. Conclusions

45.   Driven by a mixture of technological change, global consolidation, political pressures, and the advent of the euro, the Swiss banks are undergoing significant structural change. The changes are likely to be positive: increased competition and a reduction of direct state involvement in the financial sector is likely to increase the degree of liquidity, flexibility, and efficiency in the domestic financial markets. The process of change is, however, not without dangers as banks could try to compensate the narrowing margins by

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[29] It has been reported that at least one prominent internet broker has recently been marketing its services successfully to Swiss residents, without having a branch in Switzerland. In addition to savings on rent the absence of a branch in Switzerland also exempted the broker from the need of a license from the Swiss authorities.

[30] See, for example, Edey and Hviding (1995).

entering into potentially more lucrative but also increasingly risky areas of business. Although there are as yet no decisive signs that such a risk-shift is indeed taking place, the continued extension of state guarantees to cantonal banks, which are subject to more lenient capital requirement, provides perverse incentives in this respect.

46.   The role of the smaller regional and savings banks is uncertain. On the one hand, their market share has been significantly curtailed during the 1990s and they appear to be increasingly crushed by the two large banks and the dominant cantonal bank (in the relevant canton). On the other hand, the lack of state protection or a parent bank with deep pockets has taught some of these banks to survive on their own. As a result, their branch network has been significantly trimmed, their cost-income ratio has declined, and their profitability has increased significantly. Overall, in spite of the international drive for consolidation and the apparent increasing economies of scale, it is likely that there will be some place for smaller banks with local focus. It is an open question, however, whether these banks will arise from the cantonal banks, the remaining regional and savings banks, the Raiffeisen banks, or completely new banks.

47.   The two large banks have recently gone through a difficult period. Although it is hard to foretell the future, it has been argued above, however, that these banks seem relatively well placed to face the increased global competition, at least when compared to other European banks. In the highly volatile "high seas" of international finance, efficient risk management is likely to be at the core of the success or failure of these banks. The low rate of return on their domestic operation is also a problem, as they may subsidize their domestic business in order to keep their Swiss links. Attempts to use their domestic market power to increase their rate of return are also likely to fail as it would only increase the incentives for market entry.

48.   As regards asset management, the Swiss private banks are likely to maintain their strong position relatively unaffected by the international pressures to relax the strict Swiss banking secrecy laws. Despite recent measures to combat money laundering, the value of assets under management by Swiss private banks has been increasing rapidly. As long as the core elements of banking secrecy are maintained, the negative impact from the introduction of additional measures against money laundering and gross tax evasion would probably be limited. It may even be argued that such measures are essential to maintain the Swiss banks' international reputation.

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II. SWITZERLAND'S EXTERNAL POSITION IN INTERNATIONAL PERSPECTIVE[31]

A. Introduction and Summary

49.   Switzerland has been running large and persistent current account surpluses for the past 35 years, and has one of the largest net foreign assets to GDP ratio among OECD countries.[32] After both of these variables had remained stable for about a decade (at 6 percent and 100 percent of GDP, respectively), the current account jumped to around 9 percent of GDP in the mid-1990s, and net foreign assets (NFA) are estimated to have climbed to around 125 percent of GDP by 1998. While the longer-run external experience poses the question whether Switzerland is an outlier from an international perspective, shorter term developments also appear to warrant an interpretation.

50.   This chapter seeks to shed light on these issues using a stylized model of international portfolio allocation, and examining the empirical validity of its implications in a panel of OECD countries. The approach is non-normative, and is partial equilibrium in nature. In particular, asset prices and returns are taken to be exogenous, and behavior is examined conditional on these variables.[33] Consequently, the model only proposes to derive a "customary" or "expected" level for the current account, but not necessarily an equilibrium or sustainable value. It provides a simple rationale why some countries tend to run higher current account surpluses persistently: when asset characteristics are stable over the longer run, it is optimal for investors not to change their portfolio substantially. Under certain assumptions the model also predicts that the portfolio share of foreign assets would positively covary with the price of some domestic assets relative to internationally traded assets.

51.   Empirical findings indicate that this approach does not cast Switzerland as an extreme outlier in terms of its average current account position during the 1990s. Given the model's assumptions, Switzerland's longer-run current account history and foreign asset position appear to be largely in line with other countries' experience. In particular, the "expected" current account surplus of around 6 percent of GDP implied by the model is in line with longer-term experience. Results are more mixed in interpreting shorter term movements within this framework. Although some of the recent surge in the current account can be attributed to Switzerland's cyclical position, factors outside the scope of the model (such as

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[31] Prepared by Kornélia Krajnyák.

[32] Although comparable data are not available, Luxembourg's NFA to GDP ratio is estimated to be higher.

[33] Other approaches (for instance Isard and Faruqee (1998), Faruqee (1995), or Alberola & al (1999)) focus on deriving an equilibrium real exchange rate consistent with internal and external balance of the economy.

valuation changes, as well as changes in returns) appear to be important for recent current account developments, particularly in the late 1990s.

B. The External Position of Switzerland—Some Stylized Facts

52.   The Swiss current account has consistently registered surpluses since the 1960s, which on average appear "high" in international comparison. Although Switzerland's structural characteristics generally thought to influence savings and investment behavior, such as demographics, public savings, and wealth, do not appear to differ significantly from other OECD countries, the country seems at first glance to be an outlier based on its current account developments, in particular, on its average level (Figures II-1 and II-2).

53.   The structure of the current account indicates that non-trade factors play an important role in determining Switzerland's external position (Table II-1). Over the past 15 years, the overall surplus was composed of a (roughly) balanced trade account, a surplus on the non-factor services account (about 3½ percent of GDP, to a large extent attributable to the financial sector), and a large factor income surplus. The latter is the net of a negative labor income balance and a large positive capital income balance (averaging about 6 percent of GDP).

Table II-1. The Structure of the Current Account

(In percent of GDP)

	Average 1991-98	Average 1985-98
Overall Current Account	7.3	6.0
Goods and services	4.3	2.8
Goods	0.4	-1.1
Services	3.9	3.8
Net factor income	4.3	4.4
Labor income	-2.0	-1.9
Capital income	6.3	6.2
Income on direct investment	1.8	1.4
Income on portfolio investment	2.6	2.5
Income on other investment	1.9	2.3
Transfers	-1.3	-1.1

Source: IFS.

54.   Given the importance of investment income flows from abroad, the current account surplus and high foreign asset holdings feed on each other. On the one hand, cumulated current account surpluses kept the NFA to GDP ratio roughly stable in the 80 to 100 percent range over the 1980s, and allowed it to increase to 128 percent by 1998. On the other hand,

Figure II-1. Current Account and Determinants of Savings and Investment,
1980-89 Averages
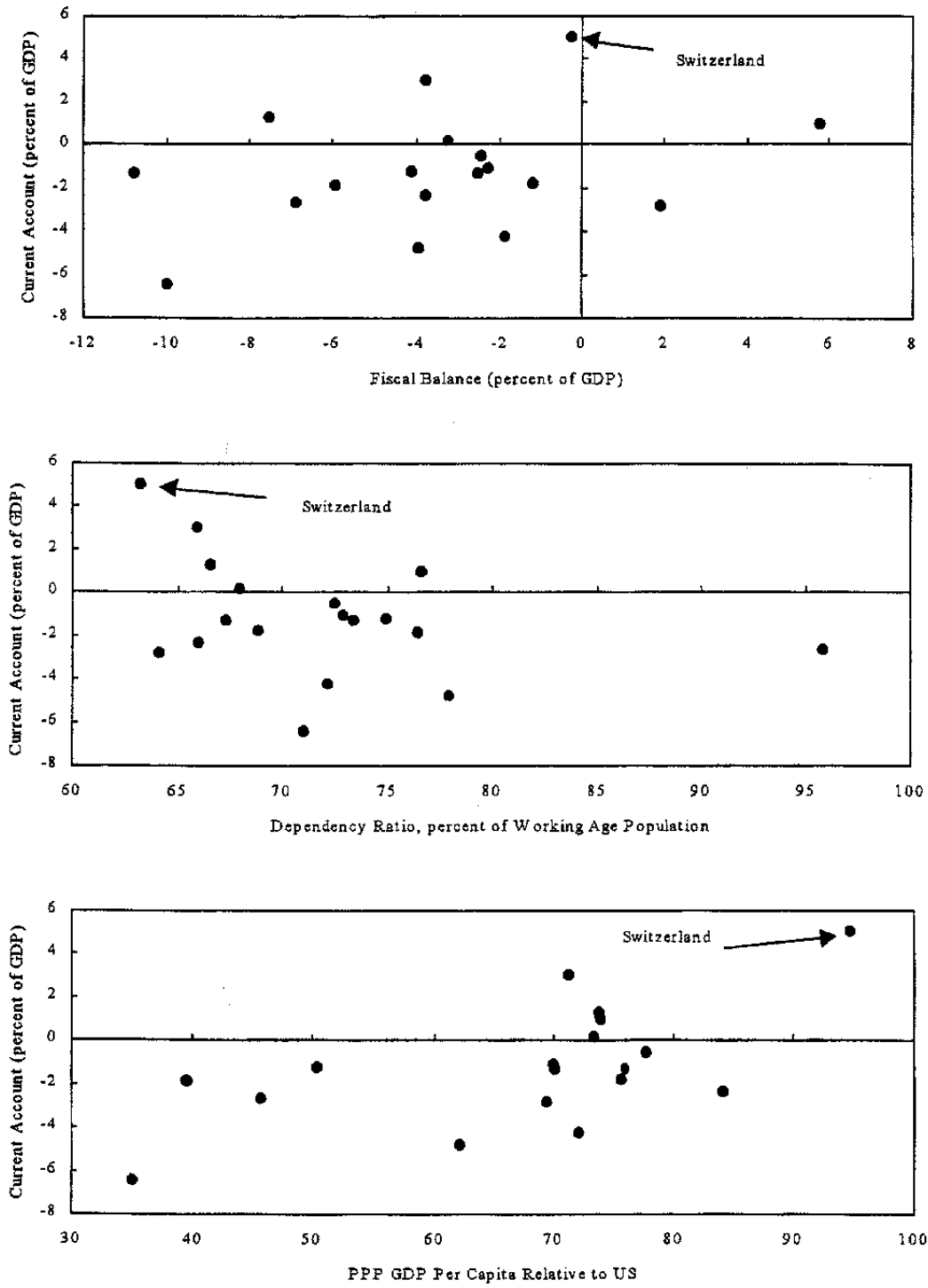
Source: Debelle-Faruquee

Figure II-2. Average NFA to GDP and Current Account to GDP Ratios in 1990s
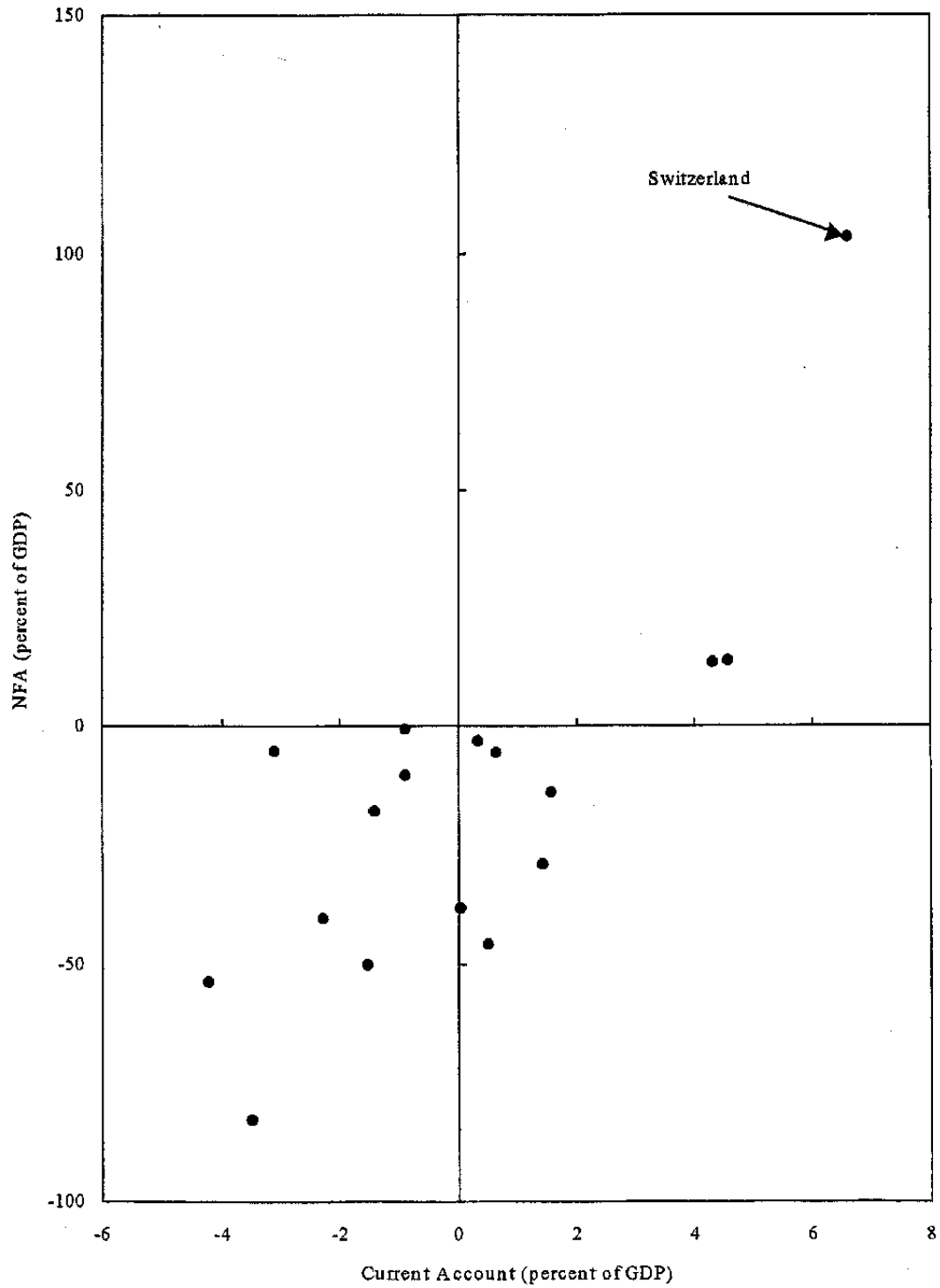
Source: WEO, IFS.

the substantial investment income flows reflect Switzerland's net international creditor position as well as the fact that its gross foreign liabilities appear to yield lower returns than its gross foreign assets (Table II-2). This return differential appears to exist for all three major categories of assets and liabilities—foreign direct investment, portfolio investment, and other investment (the largest part of which is currency and deposits of banks).[34]

55.   Over the short to medium term, the current account has exhibited substantial volatility, which appears to be highly correlated with the trade balance, but only loosely related to the real exchange rate. (Figures II-3 and II-4). The 1990s witnessed a surge in the current account balance from its previously quite stable level around 6 percent of GDP for over a decade to over 9 percent. In the first half of the decade, the surge in the current account mirrors developments in the trade balance. In recent years, however, developments in the trade balance and in the overall current account balance have diverged, reflecting mainly an increase in factor income due to a stronger foreign asset position, and most recently to higher returns.

C. Theoretical Framework

56.   To examine Switzerland's external position from an international perspective, capital rather than goods flows are considered. The capital account—the dual of the current account—is approached from the perspective of portfolio allocation, based on Kraay and Ventura (2000) and Beaulieu (1993a). The fundamental underlying assumptions are international capital mobility and risky investment.[35] Merton's model of portfolio allocation is applied to representative investor/consumers deciding how much to save, and how to allocate their savings between various assets.[36] As some of the assets are foreign, the (net) foreign asset position and its change over time emerge as a consequence of the intertemporal portfolio allocation decision.

57.   In the basic portfolio allocation model, infinitely lived representative investor/consumers maximize their expected lifetime utility arising from the consumption of a (nondurable) good, subject to an intertemporal budget constraint. Whatever amount of wealth the investor/consumer does not consume, she costlessly allocates between a riskless and several risky assets. In the case when the instantaneous utility function exhibits constant relative risk aversion, the optimal policy of the investor/consumer will involve consuming a constant share of wealth, and investing the remainder. The optimal portfolio shares of various

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[34] These three categories accounted for 15 percent, 39 percent, and 41 percent respectively of external assets, and 8 percent, 42 percent, and 50 percent of external liabilities in 1998.

[35] The formal model is described in Appendix I.

[36] Merton (1971).

Table II-2. Implicit Rates of Return on Foreign Assets and Liabilities

(In percent)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	1990s average	1985-99 average
Implicit return on assets												
Direct investment income	5.2	3.6	2.8	6.8	5.9	5.0	5.5	6.7	10.2	8.6	6.1	6.1
Portfolio investment income	5.0	5.1	4.6	3.9	3.6	4.0	3.3	2.9	3.2	4.7	3.9	4.1
Other investment income	7.8	5.4	5.2	4.2	4.3	4.4	3.8	3.7	3.5	2.3	4.1	5.2
Overall	5.8	4.7	4.3	4.1	4.0	4.1	3.7	3.7	4.3	4.1	4.1	4.5
Implicit returns on liabilities												
Direct investment income	3.9	1.9	0.4	1.8	5.6	1.1	3.2	0.6	11.0	8.6	3.8	3.5
Portfolio investment income	2.9	2.9	2.8	2.7	2.0	2.4	1.9	1.9	2.0	1.7	2.3	2.5
Other investment income	6.2	4.3	4.2	3.2	3.6	3.3	2.7	2.7	2.5	2.0	3.2	3.7
Overall	4.9	3.6	3.3	2.9	3.2	2.7	2.4	2.2	3.2	2.4	2.9	3.3
Return differential, assets-liabilities												
Direct investment income	1.3	1.7	2.3	5.0	0.3	3.8	2.3	6.1	-0.9	0.0	2.3	2.6
Portfolio investment income	2.0	2.1	1.8	1.1	1.6	1.6	1.4	1.0	1.2	3.0	1.7	1.6
Other investment income	1.6	1.1	1.0	1.0	0.7	1.1	1.2	1.0	1.0	0.3	0.9	1.4
Overall	1.0	1.1	1.0	1.2	0.8	1.4	1.2	1.5	1.1	1.7	1.2	1.3

Notes: Implicit rates of return calculated as investment income credit over the corresponding asset stock in the previous year.
Sources: IFS, and staff estimates.

Figure II-3. Current Account, Trade Balance, Output Gap, 1970-1998
(percent of GDP)
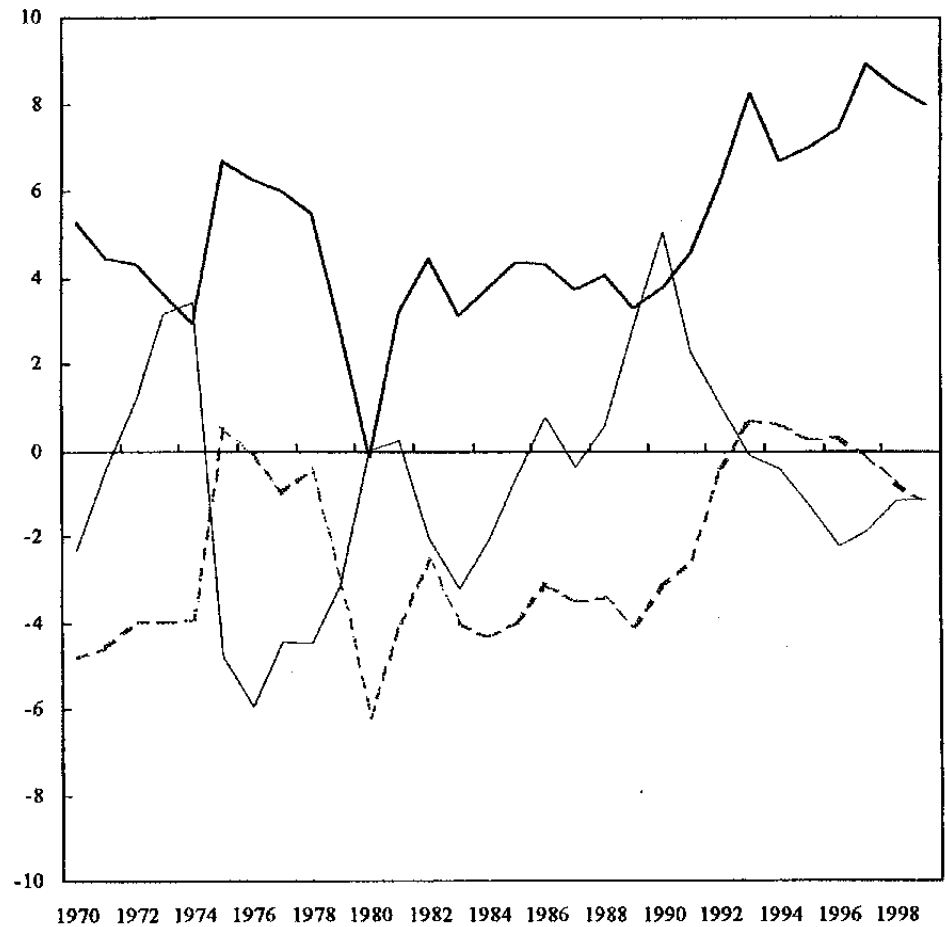
Current account balance to GDP — — — — Output gap in percent of potential GDP ———— Trade balance to GDP

Source: WEO

Figure II-4. Correlation of the Current Account and the Real Effective Exchange Rate
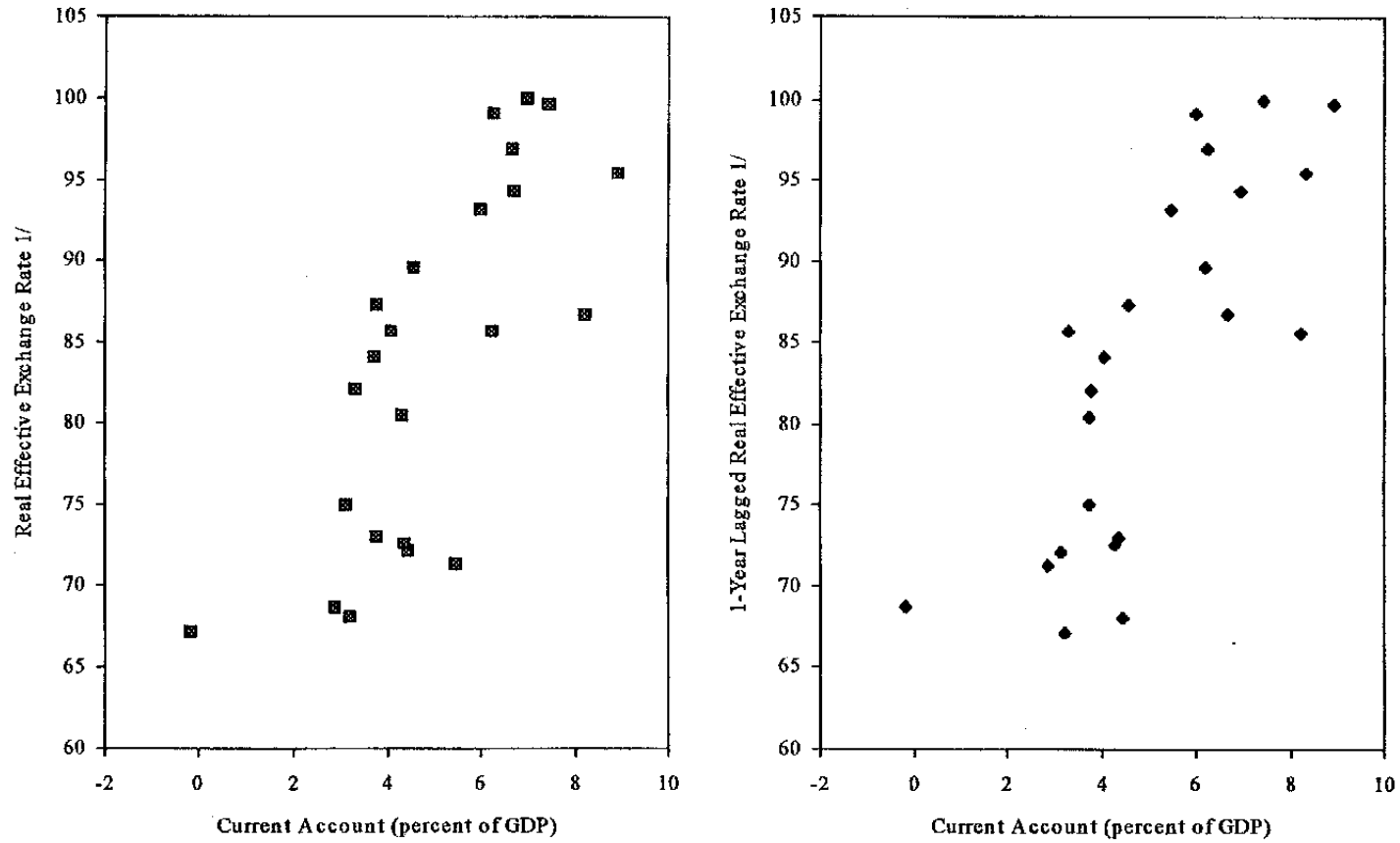
Source: WEO, IFS.
1/ Real Effective Exchange Rate based on ULC. An increase indicates a real appreciation.

assets will depend on their return and risk characteristics (including covariances). The utility maximizing policy determines how an individual's, and thus a country's total wealth is split between external and internal assets when the investment alternatives are assumed to comprise risky domestic capital, risky foreign capital, and riskless (foreign) assets.[37]

58.   Kraay and Ventura (2000) show that in a simple version of this model, optimal portfolio shares will not depend on the amount of total assets held if decreasing returns are relatively unimportant compared with investment risk. This condition will be called the "Kraay-Ventura condition" and assumed to hold in the rest of the paper. In this case, given asset characteristics, holdings of any asset will depend linearly on the amount of total assets, implying that ceteris paribus, investor/consumers will allocate the increments to their wealth (their savings) between domestic and foreign assets exactly in the same proportions as their average portfolio. Thus, countries which already hold a large share of their total wealth in foreign assets, will tend to run a larger current account surplus. In contrast, debtor countries (which hold a negative share of their portfolio in foreign assets) will tend to increase their indebtedness as they invest more in domestic assets than their savings.[38] This interpretation is different from Kraay and Ventura. Their study applies the linear portfolio rule in the context of current account responses to transitory income shocks (i.e., under the model's conditions, such shocks affect domestic and foreign assets in proportions equal to the shares of those assets in the portfolio), and concludes that such shocks trigger different current account reactions in creditor and debtor countries. In contrast, this chapter takes the view that the linear portfolio "rule of thumb" is more likely to characterize the longer-run behavior of the current account than its short-term dynamics, based on the following argument.

59.   The portfolio allocation model described above assumes that changing one's portfolio is costless, and therefore adjustment of portfolio stocks is instantaneous. This assumption does not necessarily hold if the portfolio includes real as well as financial assets. Changing the amount of real capital held (for example, adjusting the size of one's house) may involve substantial transaction costs, and may lead to possibly non-smooth portfolio adjustment for the individual investor/consumer. Lumpy individual adjustment, in turn, can sum up to sluggishness over the short to medium term on the aggregate level. Over the shorter term, the observed behavior of the aggregate may deviate substantially from the predictions of the frictionless model.[39] Under certain assumptions, however, the long run behavior of the

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[37] More than one riskless asset would be redundant, therefore riskless domestic assets are not considered. (The model abstracts from issues related to nominal exchange rate risk.)

[38] The process of borrowing at stable interest rates may be constrained by debt sustainability considerations outside the scope of the chapter's partial equilibrium framework.

[39] Caballero (1990), and Bertola and Caballero (1990) demonstrate that the degree of similarity between the behavior of the individual and of the aggregate depends on the relative importance of idiosyncratic and aggregate uncertainty. If all uncertainty was idiosyncratic, the aggregate would track closely the frictionless path even over the short run. Without

aggregate—in this case, aggregate domestic and foreign assets—will continue to be well-characterized by the frictionless solution.

60.   The portfolio allocation model utilized by Kraay and Ventura (2000) is modified here in two directions: the range of assets is extended, and transaction costs are allowed for. The payoffs expected from these extensions are the following. First, room is created for a relative price variable which could be interpreted as an indicator of the real exchange rate. Second, richer dynamics induced by transaction costs could help interpret shorter term variations in international portfolios.

61.   In this extended model, consumers can invest in financial assets (which can be—as before—domestic and foreign risky assets, and a riskless foreign asset), and in a riskless (physical) asset which yields direct utility services.[40] These utility services represent an additional consumption good, which is assumed to be an imperfect substitute in utility for the other consumption good. An example could be owner occupied housing, which is on one hand a real asset, and as such can represents a substantial portion of a consumer's portfolio; but on the other hand, it is also a source of housing services that are imperfect substitutes in utility for nondurable consumption. Another way of thinking about the two domestic assets is to label them as capital invested in the traded and nontraded goods sector. Since nontraded goods (tautologically) tend to be domestically consumed, and until recently in most countries foreign ownership of nontraded sector assets tended to be negligible, the metaphor[41] appears to be broadly justified for the "utility producing" domestic asset.

62.   There is no good reason to assume that the two domestic assets trade at the same price.[42] A partial equilibrium approach is followed, and asset supplies are not modeled, so that the relative price of nontraded sector capital to traded sector capital is considered exogenous, and treated as a parameter. As this relative price also determines the relative price of traded and nontraded goods for the consumer, it will be interpreted as a measure of the real exchange rate (with an increase corresponding to "real appreciation"). In contrast, the two risky assets are assumed to demand the same price.

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idiosyncratic uncertainty, macro behavior would be qualitatively similar to micro behavior in the presence of adjustment costs. In intermediate cases, movements in the aggregate would be sluggish, and its path would track the frictionless one only over the long run.

[40] This approach is widely used to model durables consumption, see for instance Grossman and Laroque (1990) or Eberly (1994).

[41] The argument is not strictly correct, as it blurs the distinction between individual and aggregate behavior.

[42] For example, transaction costs (to be introduced later) would justify the existence of a liquidity premium.

63.   Without transactions costs, and assuming that the Kraay-Ventura condition continues to hold, adding nontraded sector capital to the range of assets does not change the international portfolio rule of thumb, i.e. savings will continue to be allocated between domestic and foreign assets in the same proportion as the existing portfolio. However, portfolio compositions will vary across countries depending not only on the return characteristics of foreign and domestic traded sector capital, but also on the relative price of nontraded goods. When nontraded goods are relatively more expensive, the optimal consumption basket will contain a smaller share of nontraded goods. If this substitution effect is strong enough, the portfolio share of nontraded sector capital will be correspondingly lower, depressing the share of domestic assets in total assets, and therefore (ceteris paribus) raising the current account surplus. The empirical implication is a positive relationship between nontraded goods prices and the share of foreign assets in total assets over the longer run.[43]

64.   When transaction costs are present, individual investors do not adjust their nontraded sector assets instantaneously. Rather, the optimal adjustment policy is characterized by periods of inaction when the nontraded sector capital stock is left drifting within a band around its "target" value. Whenever the boundaries of the band are reached, a large lumpy adjustment to the nontraded capital stock is undertaken to restore portfolio shares to the target. Intuitively, an individual investor is likely to adjust her nontraded assets upwards after experiencing a series of positive income shocks resulting in high total assets, while downward adjustment is likely to occur after a series of negative income shocks that decrease total assets.[44]

65.   If some idiosyncratic variation across individual investors is present, for instance due to differences in asset holdings, investors would not undertake adjustment simultaneously, and the lumpy adjustment process would be "smoothed out" in the aggregate. However, many individuals would be likely to adjust in the same direction at the same time after a series of aggregate positive (negative) income shocks have resulted in a buildup (erosion) of their assets. Thus, regardless of a country's international portfolio composition, the current account would tend to behave countercyclically in certain phases of the cycle (i.e., showing deficits in booms, and surpluses in recessions). This countercyclical tendency would be more pronounced in the latter stages of an upswing (downswing).

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[43] Over the shorter run, however, nontraded goods prices and the current account are likely to exhibit negative correlation. The intuition is that when nontraded prices are expected to increase, nontraded sector assets are expected to be revalued, therefore over the short term, it will be rational to shift the portfolio towards this asset.

[44] For clarity of exposition, physical depreciation of the nontraded sector asset was abstracted away. As a result of depreciation, nontraded sector assets would be adjusted upwards on a "lapse-of-time" basis even without income shocks.

66.   To summarize, the chapter's interpretation of the stylized model gives a simple rationale why some countries tend to run higher current account surpluses persistently. When asset characteristics are stable over the longer run, it is optimal for investors not to change their portfolio substantially.[45] The model also gives some insight as to the reasons behind cross-country variation in the portfolio shares of foreign and domestic assets. In addition to the risk-free return, and return and risk characteristics of assets invested in the traded goods sector domestically or abroad, a "latent return" on assets invested in the domestic nontraded goods sector (domestic durables) as proxied by their relative price is also of importance. In particular, under certain assumptions the higher relative price of these assets would tilt the optimal portfolio towards foreign assets. Regarding shorter run dynamics of the current account, sluggish portfolio adjustment due to transactions costs can introduce countercyclical movements, in particular after prolonged upswings or downswings.

67.   The next section will examine the following empirical implications of the stylized model. *First*, if asset characteristics—such as real returns, riskiness, and return covariances—are stable over the longer run, countries should on average channel abroad a portion of their savings that is proportional to the share of foreign assets in their portfolio. *Second*, over the longer run, the share of foreign assets to total assets should be positively correlated with the relative price of nontraded goods. And *third*, shorter term variations in the current account are expected, inter alia, to reflect not only variations in asset characteristics, but also cyclical factors.

D. Empirical Results

68.   In this section the empirical validity of the framework's implications is checked in an unbalanced panel of OECD countries. After discussing some data issues, the link between international portfolio shares and current accounts proposed by Kraay and Ventura (2000) is examined using a different sample and a somewhat different methodology. The results confirm that portfolio shares and current accounts tend to be closely related across countries and over the longer run. Next, some evidence is provided that over the longer run, countries with higher relative price levels tend to hold a portfolio with a higher share of foreign assets. Finally, short term movements in the current account are found to be correlated with various indicators of the economy's cyclical position.

Data issues

69.   This section discusses data issues that are likely to influence the results substantially. Details regarding data sources and definitions are relegated to Appendix II.

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[45] This may reinforce or even create an "interest rate island", with persistently low real domestic returns and a large portion of assets in foreign assets, cf. Mauro (1995).

70.   The sample includes 16 OECD economies, selected based upon data availability on international portfolio stocks. Because the approach taken is admittedly partial equilibrium in nature, Germany, Japan, and the US are not considered in the sample but are taken to constitute the "external environment."[46] In light of the difficulties associated with extending the portfolio stocks back in time, balancing the panel was not undertaken.[47]

71.   The variable central for the empirical analysis is the ratio of foreign assets to total assets, where total assets are defined as the sum of domestic capital stock and net foreign assets; and foreign assets represent the sum of residents' claims on foreign capital stock and their net foreign financial assets. When measuring this variable, the major sources of distortion appear to be (i) error in measuring domestic assets; (ii) error in measuring foreign assets; and (iii) valuation changes. Of the three, measurement error of domestic assets is the least likely to be correlated with the current account, and thus the least likely to bias the results. Unfortunately, the other two sources provide ample scope for bias to emerge. Measurement errors in foreign assets, as well as the impact of valuation changes, are likely to be more important for countries with large positive or negative net positions, possibly falsely strengthening or even driving the results. While some sensitivity analysis with respect to the treatment of valuation effects was performed (see below), an analogous procedure regarding the measurement of foreign assets does not seem feasible because of data limitations.

72.   In order to measure domestic assets, an estimate of the domestic physical capital stock was necessary. Capital stock series were constructed with an identical procedure for all countries in the sample primarily because comparable data for non-business capital stock are not available for many countries. The procedure follows Nehru and Dareshwar (1993). The initial capital stock in 1970 is estimated based on the trend value of real fixed investment, potential output growth, and an assumed 4 percent depreciation rate. Subsequent values of the capital stock are calculated by cumulating real investment data under the continued assumption of a 4 percent depreciation rate. The GDP deflator is used to calculate capital stock in current prices. The procedure yields estimates of the capital stock that are reassuringly close to actual data for those countries where the series are available. Implied average capital-output ratios are in a reasonable range, and for the 1980-98 period vary between 2.9 for Belgium and 4.5 for Norway. The construction of the series uses only national accounts data and external information in the form of a priori assumptions (depreciation rate) and independent estimates (potential output growth). This makes it unlikely that the measurement error of the capital stock estimates is systematically related to other variables of interest such as the foreign asset position and the current account.

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[46] The sample size is 16 without the G3.

[47] The results of Lane and Milesi-Ferretti (1999) indicate that such an exercise would not necessarily be successful. However, using an unbalanced panel may raise sample selection issues. Countries with long time series data on international investment position may have collected this information for reasons not unrelated to their current account.

73.   Regarding the reliability of data on foreign assets, a study by Lane and Milesi-Ferretti (1999) illustrates that for some countries, different methodologies can yield wildly different estimates of the net foreign asset position. Data on gross assets and liabilities are not likely to be much more accurate, but a solution to this measurement problem is yet to be devised.

74.   In addition to "pure" measurement error, potentially distortive valuation problems can arise due to two factors, exchange rates and equity prices. As the currency composition of foreign assets and liabilities is not known for most countries, no correction was attempted for possible revaluation effects due to exchange rate movements. In light of rapidly rising stock markets in many countries over the 1990s, however, some correction for this revaluation effect was considered.[48] In particular, two alternatives were explored. First, portfolio equity liabilities were deflated by the national share price index, and then inflated by the GDP deflator. A similar procedure was performed on portfolio equity assets, using a simple average of the US, German, and Japanese share price index to GDP deflator ratios. Second, portfolio equity assets and liabilities were simply considered as part of net foreign debt. For most countries, estimated portfolio shares hardly changed, and the empirical results proved to be stable.

Portfolio shares and current accounts

75.   Under the strong simplifying assumptions of the stylized model described in Section C, over the longer run, the current account of a country should be proportional to its savings times the share of its foreign assets in total assets. Casual observation of data averaged over decades (Figure II-5) appears to confirm this relationship. Simple correlation coefficients (reported in Table II-3) indicate the presence of a strong linear relationship between average current accounts and three alternative measures of savings times foreign assets to total assets ratios (all normalized by GDP).

76.   Regression results (Table II-4) further indicate that the constant of proportionality between the average current account is close to 1 (the value implied by the stylized model), a result also obtained by Kraay and Ventura (2000). However, comparing the three specifications reveals that the treatment of equity revaluation seems to matter both for the fit of the regression (as measured by R-square), and for the estimated slope coefficient. In

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[48] To clarify the effect of equity price changes, let us take a hypothetical country with no net foreign debt, no inward or outward FDI, but nonzero portfolio equity positions. In particular, let us assume that 10 percent of the total domestic capital stock is owned by foreigners, and domestic residents hold an equivalent amount in foreign equity. Clearly, net foreign assets are zero, so total assets are equal to the domestic capital stock, and the share of foreign assets in total assets is 10 percent. Now assume that share prices rise by 200 percent both domestically and abroad. Since portfolio equity holdings are revalued, but the domestic physical capital stock is not, total assets do not change, but foreign assets treble, therefore their portfolio share increases threefold.

Figure II-5. Current Accounts and Savings Times the Portfolio Share of Foreign Assets
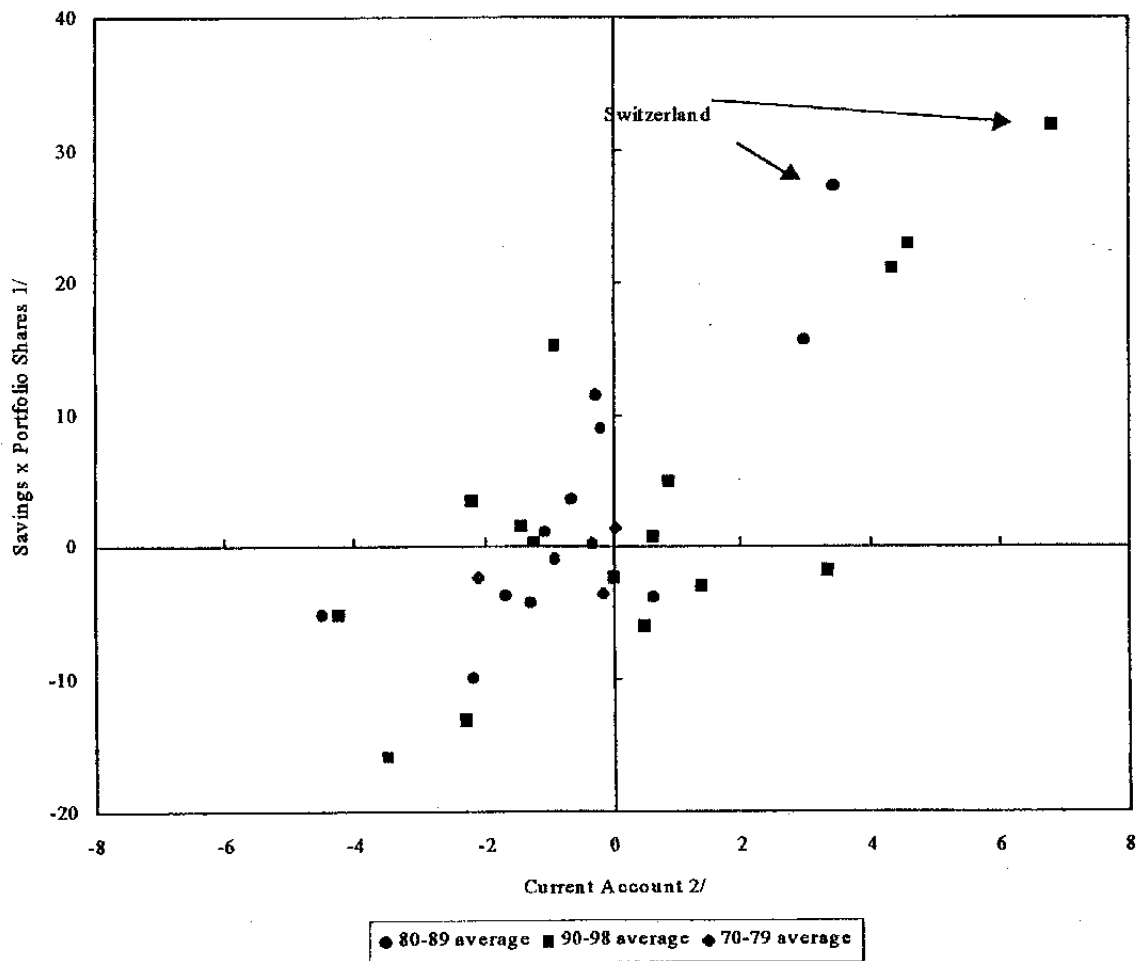
Sources: WEO, IFS.

1/ Unadjusted portfolio shares.

2/ Averages taken over data within decades.

Table II-3. Simple Correlation Coefficients

(Average current account, and various measures of "expected" current account)

		CA	CA f	CA m	CA v
Sample including Switzerland					
	CA	1.00			
	CA f	0.79	1.00		
	CA m	0.77	0.98	1.00	
	CA v	0.78	0.98	1.00	1.00
Sample excluding Switzerland					
	CA	1.00			
	CA f	0.79	1.00		
	CA m	0.77	0.98	1.00	
	CA v	0.78	0.98	1.00	1.00

Notes:

Sample of 16 OECD countries, averages within decades.

CA--current account in percent of GDP.

CA f--savings to GDP ratio times share of foreign assets. Foreign assets calculated as FDI assets, plus net portfolio investment, plus net other investment.

CA m--savings to GDP ratio times share of foreign assets. Foreign assets calculated as FDI assets plus portfolio equity assets, plus net non-equity portfolio investment, plus net other investment. Portfolio equity assets and liabilities corrected for variation in shareprice indices.

CA v--savings to GDP ratio times share of foreign assets. Foreign assets calculated as FDI assets plus portfolio equity assets, plus net non-equity portfolio investment, plus net other investment.

Table II-4. Average Current Accounts

	Specification 1		Specification 2		Specification 3	
	Including Switzerland	Excluding Switzerland	Including Switzerland	Excluding Switzerland	Including Switzerland	Excluding Switzerland
Pooled OLS						
CA f	0.93	0.99				
	0.12	*0.16*				
CA m			0.70	0.79		
			0.11	*0.16*		
CA v					0.72	0.80
					0.10	*0.15*
constant	-0.32	-0.27	-0.66	-0.66	-0.62	-0.59
	0.27	*0.29*	*0.31*	*0.31*	*0.28*	*0.28*
Adj. R-square	0.64	0.52	0.57	0.44	0.62	0.48
P-value, slope=1	0.55	0.94	0.01	0.21	0.01	0.18
Random effects						
CA f	0.93	0.98				
	0.15	*0.20*				
CA m			0.72	0.85		
			0.14	*0.19*		
CA v					0.77	0.85
					0.13	*0.17*
constant	-0.34	-0.30	-0.72	-0.73	-0.69	-0.64
	0.36	*0.39*	*0.42*	*0.43*	*0.38*	*0.39*
Adj. R-square	0.65	0.54	0.59	0.46	0.63	0.50
P-value, Hausman-test	0.86	0.93	0.54	0.53	0.26	0.59
P-value, slope=1	0.66	0.90	0.04	0.45	0.07	0.38
Random effects with varying slopes						
CA f, 80s	0.82	1.06				
	0.19	*0.26*				
CA f, 90s	0.94	0.83				
	0.16	*0.20*				
CA m, 80s			0.53	0.83		
			0.16	*0.29*		
CA m, 90s			0.82	0.85		
			0.14	*0.19*		
CA v, 80s					0.63	0.93
					0.16	*0.27*
CA v, 90s					0.80	0.81
					0.13	*0.17*
constant	-0.38	-0.34	-0.71	-0.74	-0.69	-0.66
	0.36	*0.38*	*0.42*	*0.44*	*0.38*	*0.39*
Adj. R-square	0.64	0.54	0.62	0.47	0.64	0.50
P-value, Hausman-test	0.62	0.70	1.00	0.89	0.98	0.89
P-value, slope80=1	0.35	0.81	0.00	0.56	0.02	0.78
P-value, slope90=1	0.70	0.40	0.21	0.44	0.11	0.28
P-value, slope80=slope90	0.54	0.33	0.02	0.92	0.21	0.60

Notes:

Dependent variable: current account to GDP ratio, decade averages.

Standard errors in italics.

Specifications 1, 2 and 3 use the FDI-based, revalued, and raw measures of foreign assets to to total assets in the construction of the right hand side variable.

Hausman test null: difference in random effects and fixed effects coefficient estimates is not systematic.

Slope null: coefficient on CA f (CA m, CA v) is equal to 1.

particular, the fit is best and the slope coefficient closest to one in specification 1, when net, rather than gross portfolio equity assets are considered in foreign assets. When no correction for revaluation is made (specification 3), the fit deteriorates and the estimated slope coefficient declines. When portfolio equity holdings are adjusted for share price increases (specification 2), the fit worsens further and the slope decreases marginally. Both in specifications 2 and 3, the null of unity slope can be rejected at the 5 percent level.

77.   All equations were estimated for samples both including and excluding Switzerland. Comparing the estimates for the two samples indicates that the presence or absence of this country does not influence importantly the numerical results. Based on this, Switzerland does not appear to be a particularly extreme outlier. Further, comparing random effects and fixed effects estimates by way of the Hausman specification test suggests that unmodeled country characteristics are not systematically related to the right hand side variable.

78.   Finally, the last horizontal panel reports estimates with time varying slopes. Many developed countries, including some in the sample, maintained restrictions on capital flows well into the 1980s.[49] This may weaken the relationship between the current account and the right hand side variable for earlier observations. The results to some extent confirm these expectations—slope coefficients for the 1980s tend to be less precisely estimated, as indicated by larger standard errors. In the sample including Switzerland they also tend to be somewhat smaller, although at conventional levels of significance the null of equality can only be rejected in specification 2.

Relative price levels and current accounts

79.   Incorporating nontraded goods combined with further assumptions yielded the conclusion in Section C that relative prices of nontraded goods over the longer run should be positively related to the share of foreign assets in total assets. In addition to measurement problems discussed previously, empirically testing this hypothesis immediately raises the question how to measure this relative price in a way that makes cross-country comparison possible. One possibility would be to assume that traded goods prices are equalized due to arbitrage, and then use for each country its index of nontraded to traded goods prices. Another alternative—which is followed in this chapter due to data limitations—is to apply the (log) general price level as a proxy variable.[50] GDP price level information was spliced together from the Penn World Tables (for the 1970-89 period) and from OECD comparative

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[49] See for instance IMF (1997).

[50] If traded goods prices are equalized, and the general price index is a geometric average of traded and nontraded prices $P=P_{NT}{}^{\alpha}P_T{}^{1-\alpha}$, $ln(P)$ will trivially be a good proxy for $ln(P_{NT}/P_T)$. If traded goods prices are some multiple $\gamma=P_{NT}{}^{\beta}$ of world market prices as suggested by a "nontraded component" argument, the general price level will be $P=\gamma\,(P_{NT}/P_T)^{\alpha}$, and $ln(P)$ will be an admissible proxy for $ln(P_{NT}/P_T)$ if country specific fixed effects are controlled for.

price level data (for the 1990s) to obtain a series for the general price level. Figure II-6 plots decade averages of this variable against the share of foreign assets in total assets[51] and illustrates that the relationship is likely to be weak in the data.

80.   The regression results reported in Table II-5 bear out the first impression of a weak relationship. Although the estimates indicate the existence of a statistically significant positive relationship between (log) price levels and foreign asset portfolio shares as measured by the both the adjusted and unadjusted foreign asset to total asset ratios (columns 3 through 6), the relationship is not very precisely estimated. Furthermore, the first two columns indicate complete lack of correlation between price levels and the FDI-based share of foreign assets to total assets. This is not surprising given that this measure of portfolio composition only considers a subset of foreign assets. To the extent that FDI occurs mostly in the traded goods sector, this measure is not expected to be closely related to the price level. As the specification test indicates, the random and fixed effects point estimates do not differ systematically. The domestic price level appears to be positively correlated with the portfolio share of foreign assets even after controlling for country specific fixed effects.[52] Dropping Switzerland from the sample does not appear to influence the results qualitatively.

81.   The last two columns of Table II-5 correlate the price level and the current account. Statistically significant positive slope coefficients are found, indicating that higher domestic prices tend to coincide with higher current account surpluses.

Cyclical positions and current accounts

82.   This section decomposes observed short term current account behavior into five components. The first component (Term 1) captures investment that would have been channeled abroad, had returns and thus the desired foreign assets to total assets ratio remained constant. The second component (Term 2) is an adjustment term, due to changes in the desired foreign assets to total assets ratio. Clearly, to adjust to a 1 percentage point change in the desired portfolio shares requires larger international capital flows, and thus a larger change in the current account in the case of countries with higher asset levels (normalized by GDP). Hence, the adjustment term is scaled by the total assets to GDP ratio. The third term incorporates cyclical effects not directly attributable to changes in expected returns (Terms 3a and 3b). In a frictionless framework cyclical effects would not matter. However, when transactions cost are present, the length of stretches with positive (negative) output gaps (Term 3a), and the cyclical position of the economy (as captured by the output gap in Term 3b) would represent relevant information regarding the current account. While Terms 1 through 3b are related to the decisions of residents' investment decisions, the fourth

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[51] Measured without valuation corrections.

[52] These fixed effects implicitly control for return and risk characteristics of assets that may vary across countries but are stable over time.

Figure II-6. Price Levels and the Portfolio Share of Foreign Assets
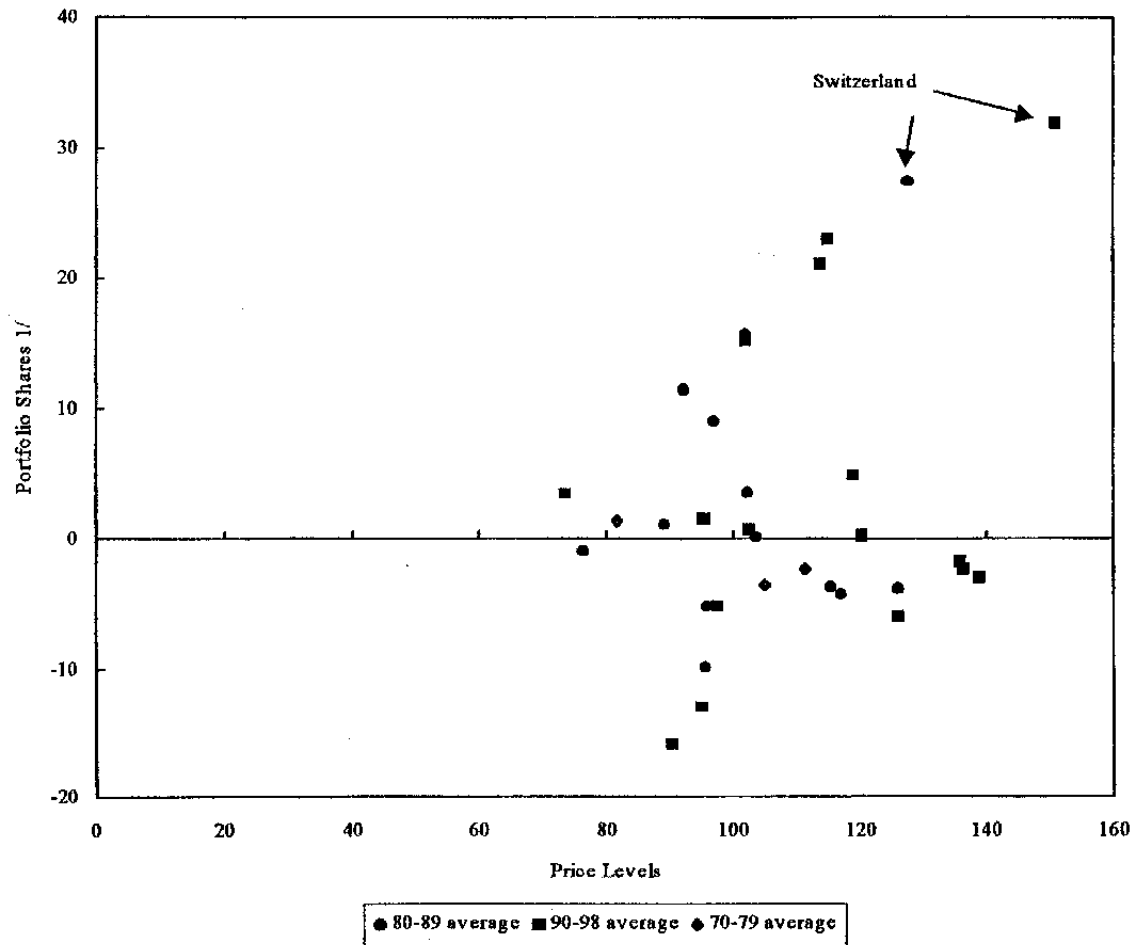
Sources: WEO, IFS, OECD Main Economic Indicators, Penn World Tables, staff estimates.

1/ Unadjusted portfolio shares.
2/ Averages taken over data within decades.

Table II-5. Portfolio Share of Foreign Assets and the Price Level

Dependent variable	Foreign assets to total assets, f		Foreign assets to total assets, m		Foreign assets to total assets, v		Current account to GDP	
	Including Switzerland	Excluding Switzerland	Including Switzerland	Excluding Switzerland	Including Switzerland	Excluding Switzerland	Including Switzerland	Excluding Switzerland
Random effects								
Price level	8.16	4.03	16.72	13.67	19.29	15.01	4.84	3.37
	7.29	*7.63*	*6.64*	*7.13*	*6.55*	*7.04*	*1.92*	*1.82*
Constant	-37.80	-19.94	-74.91	-62.20	-87.21	-68.77	-23.23	-16.69
	34.08	*35.52*	*31.11*	*33.23*	*30.71*	*32.82*	*8.97*	*8.46*
Chi-square	1.25	0.28	6.34	3.67	8.65	4.54	6.32	3.41
R-square within	0.04	0.04	0.27	0.27	0.34	0.31	0.15	0.08
R-square between	0.04	0.00	0.04	0.01	0.05	0.01	0.13	0.07
Hausman test p-value	0.81	0.61	0.83	0.19	0.77	0.19	0.77	0.48
Fixed effects								
Price level	7.06	6.81	17.40	18.21	20.20	19.61	5.46	5.11
	8.61	*9.33*	*7.36*	*7.94*	*7.26*	*7.86*	*2.82*	*3.05*
Constant	-32.66	-32.78	-78.07	-83.31	-91.43	-90.13	-26.08	-24.73
	40.19	*43.38*	*34.35*	*36.93*	*33.91*	*36.54*	*13.13*	*14.13*
Regression F	0.67	0.53	5.59	5.26	7.73	6.23	3.73	2.80
R-square within	0.04	0.04	0.27	0.27	0.34	0.30	0.10	0.08
R-square between	0.04	0.00	0.04	0.00	0.05	0.00	0.15	0.07

Notes:

The three concepts of foreign assets to total assets ratios correspond to the definitions in Table II-3.

Price level measured in logs.

Standard errors in italics.

term ("Capital inflows") is a control for the behavior of foreign investors.[53] Finally, the fifth term is an unattributed residual.

83.   The decomposition is performed in three stages. In the first stage, expected domestic real returns are constructed by projecting real bond yields on their own lags, lagged values of the output gap and foreign returns, and country constants.[54] In the second stage, foreign asset to total asset ratios are projected on expected domestic and actual foreign returns, and country constants.[55] From this second stage regression, "desired" portfolio shares are constructed, which are then used in the construction of Terms 1 and 2 in the decomposition stage.

84.   Table II-6 reports the results.[56] In line with the findings of Section D, the point estimates indicate that when expected returns do not change, and the economy operates at potential, the current account could be expected to change roughly in proportion to Term1, the product of the foreign assets to total assets ratio and the savings rate. If expected returns do change, so do the "desired" portfolio shares. The effect of this on the current account would be reflected through Term 2, the positive coefficient indicating that whenever investors target a higher portfolio share of foreign assets, the current account tends to

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[53] Technically, this variable is constructed by fitting a (country specific) linear trend to the "investment by foreigners in the domestic economy to GDP" ratio, with the numerator defined appropriately for the specification. As the effects of foreigners' (expected) investment on the current account depend on whether it influences the amount of domestic assets held by domestic residents, the coefficient on this variable is expected to be between zero and -1, closer to zero in specification 1.

[54] Foreign returns are real bond yields in Germany, Japan, and the US. With respect to all three countries, different coefficients are allowed for different country groups. With respect to German bond yields, real returns in "core" and "periphery" European countries and in the non-European countries in the sample are allowed to have different coefficients. For Japanese rates, the two Pacific countries and the rest of the sample can have different coefficients, while Canada is separated from all other countries with respect to the US yields.

[55] Coefficients on foreign returns are allowed to vary across country groups in this stage as well. The estimated equation includes a shift variable for Switzerland, intending to capture a change in statistical methodology in 1993 in the measurement of foreign assets.

[56] Several other specifications were considered. Foreign output gaps turned out to be insignificant, and did not influence the estimates of other parameters. In contrast, including the price level in the regressions, which also induced only marginal changes in other point estimates, yielded a positive significant coefficient. The final specification presented in Table 4 however does not include this variable because it would be redundant as its effects are already incorporated in the desired portfolio shares (Term 1).

Table II-6. Decomposition of the Current Account

Variable	Specification 1		Specification 2		Specification 3	
	Coefficient	Std. Error	Coefficient	Std. Error	Coefficient	Std. Error
Sample including Switzerland						
Constant	-0.64	0.20	-0.71	0.23	-1.02	0.23
Term 1: unchanged returns	0.98	0.06	0.89	0.05	0.84	0.06
Term 2: adjustment term	0.12	0.04	0.08	0.03	0.06	0.02
Term 3a: length of recession	-0.10	0.04	-0.13	0.04	-0.14	0.04
Term 3b: output gap	-0.29	0.07	-0.29	0.08	-0.25	0.07
Capital inflows	0.01	0.08	-0.15	0.09	-0.03	0.06
Regression F-statistics	51.88		53.06		54.42	
Adjusted R-squared	0.54		0.56		0.58	
P-value for Term1 coeff=1	0.77		0.03		0.01	
Sample excluding Switzerland						
Constant	-0.62	0.20	-0.64	0.24	-0.92	0.24
Term 1: unchanged returns	0.99	0.09	0.95	0.07	0.94	0.08
Term 2: adjustment term	0.12	0.05	0.09	0.03	0.07	0.03
Term 3a: length of recession	-0.10	0.04	-0.13	0.04	-0.15	0.04
Term 3b: output gap	-0.27	0.08	-0.28	0.08	-0.23	0.08
Capital inflows	0.00	0.08	-0.18	0.09	-0.05	0.07
Regression F-statistics	31.33		34.86		35.27	
Adjusted R-squared	0.43		0.47		0.49	
P-value for Term1 coeff=1	0.88		0.50		0.44	

Notes:

Dependent variable: current account to GDP ratio.

Estimated equation: $CA=a0+a1*bf(-1)*s(-1)+a2*ay*(bf-bf(-1))+a3*score+a4*gap+a5*inflow$ b is foreign assets to total assets ratio; bf its forecast value; s is savings over GDP; ay is the asset to GDP ratio; score is an indicator variable measuring the length of period of positive (negative) output gaps; gap is the output gap; inflow is forecast capital inflow to GDP ratio.

Pooled OLS estimates.

Specifications 1, 2 and 3 use FDI-based, revalued, and raw measure of foreign assets to total assets ratios to construct the right hand side variables.

White-corrected standard errors in parenthesis. Standard errors are not corrected for the fact that Term 1 and Term 2 contain estimated components.

increase and—consequently—foreign assets are being accumulated. Terms 3a and 3b capture cyclical effects. In line with expectations, it is found that the length of periods of economic downswings/upswings (Term 3a) is also correlated with the current account over the shorter term in addition to the size of the output gap (Term 3b). The negative sign of the coefficients indicates that current accounts tend to behave countercyclically in the sample.

E. An Application to Switzerland's Experience in the 1990s

85.   The empirical results of the previous section seem to indicate that Switzerland's persistent, high current account surpluses can be interpreted in the framework of a portfolio allocation-type model stylized model. Under the model's conditions, assuming that asset characteristics are stable over time, and decreasing returns are relatively unimportant compared to investment risk, investor behavior in the past (as captured by the portfolio composition) is a good predictor of current investor behavior, and therefore of the current account. Based on these considerations, the fixed effects point estimates presented in Table II-4 would imply an "expected" current account surplus for Switzerland of about 6 percent of GDP. The "decomposition approach" (presented in Table II-6), which attempts to exploit higher-frequency information, would put this value in a roughly similar range, between 6½ and 8 percent of GDP depending on the specification. This latter procedure may not successfully control for short term variations in the current account, and its multi-stage nature makes it likely that the point estimates are very imprecise.

86.   Based on the decomposition of the current account presented in Section D, the increase in Switzerland's current account surplus during the 1990s can partially be attributed to changes in asset characteristics and to cyclical conditions. Estimated changes in the "targeted" portfolio share (due for instance to changes in foreign returns) tended to push up the current account in 1993-97. In most specifications, however, the estimated magnitude of the effect is small, around ½ percent of GDP. Cyclical conditions, in particular the prolonged recession might have contributed to the portfolio shift towards foreign assets via two channels. First, foreign assets might have become relatively more attractive due to cyclical variations in expected returns. Second, negative income shocks cumulated over nearly a decade likely have reduced total assets and thus might have lead to the postponement of real domestic investment or even to a shift of savings towards foreign assets. Estimates of the magnitude of these cyclical effects in 1997 are in the 1-1½ percentage point of GDP range. Of the 4½ percent of GDP change in the current account between 1991 and 1997, about 2¼ percent might be due to different cyclical conditions in Switzerland.

87.   In 1998, the Swiss current account surplus continued to stay above its longer-run average, and—based on data for the first three quarters—it is likely to have risen further to well above 10 percent of GDP in 1999. The recent increase in the current account surplus is largely due to higher net investment income that reflects both a larger NFA position and higher implicit return differentials between foreign assets and liabilities (Table II-2). In particular, implicit return differentials on portfolio assets and liabilities are estimated to have widened to 3 percentage points, compared with a longer-run average of about 1.5 percentage

points. However, rising return differentials may partially reflect the statistical effects of equity market gains, as well as the depreciation of the Swiss franc against the US dollar.[57]

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[57] While share prices in Switzerland rose by about 10 percent during 1999, the US and German share price indices registered gains of about 25 and 30 percent, respectively, over the same period. At the same time, the Swiss franc depreciated by about 5 percent vis-à-vis the US dollar.

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A Stylized Model of Portfolio Allocation

88.   This appendix elaborates the theoretical framework sketched in Section C of the main text.

Framework and assumptions

89.   The economy of the stylized model is populated by a continuum of identical agents of measure 1. Agents maximize their expected lifetime utility subject to an intertemporal budget constraint. They derive (flow) utility from an index of traded goods and nontraded goods consumption flow. Nontraded consumption flow is assumed to be proportional to the current stock of assets invested in the nontraded goods sector. For simplicity, we assume that the constant of proportionality is one.[58]

90.   In addition to deciding how much to consume, agents must also decide how to allocate their portfolio. There are four investment possibilities. First, assets can be kept in the form of capital in the domestic traded goods sector. Second, they can be invested in capital abroad in the traded goods sector. These two assets are assumed to earn a risky rate. In addition to risky investment, there are two possibilities to earn a riskless rate: to invest in the domestic nontraded sector, or to invest in riskless foreign bonds. While agents can costlessly adjust their portfolio between the first three assets, changing the amount held in nontraded sector capital is assumed to be costly.

91.   Formally, the representative consumer solves the following problem:

$$\max{}_{<c,h,k,k^*,\xi>} E_0 \int_0^\infty (\ln(C_t)e^{-\delta t} dt \qquad (1)$$

subject to:

$$C_t = (c_t^{\frac{\theta-1}{\theta}} + h_t^{\frac{\theta-1}{\theta}})^{\frac{\theta}{\theta-1}} \qquad (2)$$

$$da =$$
$$= (\pi dt + \sigma d\varpi)k + (\pi^* dt + \sigma^* d\varpi^*)k^* + \qquad (3)$$
$$+ \rho dt(a - k - k^* - hP) + (-\varphi dthP + hdP) - cdt - \kappa h\_P\_\xi$$

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92.   According to (1) and (2), the traded and nontraded goods consumption flows c and h are combined into a flow consumption index C with a constant elasticity of substitution $\theta > 1$. Instantaneous utility is logarithmic in C. Expected lifetime utility is obtained as the expected discounted sum (with a time preference rate δ) of instantaneous utilities.

93.   Equation (3) specifies the agent's budget constraint, without the time indices for notational simplicity. Total assets a accumulate based on returns, portfolio allocation, consumption choices, and adjustment costs. The first two terms on the right hand side of (3) specify returns from assets invested in the domestic and foreign traded sector, respectively. During the interval dt, assets in these two forms (k and k^*) yield random returns $\pi dt + \sigma d\omega$ and $\pi^* dt + \sigma^* d\omega^*$, respectively, where $d\omega$ and $d\omega^*$ are Wiener processes with mean zero, variance dt, and covariance ηdt. The parameters $\pi, \pi^*, \sigma, \sigma^*$ determine the mean and variance of returns. The third term specifies the safe return earned on foreign bonds. The amount of assets kept in this form is determined as total assets a, minus assets held in traded sector capital $k+k^*$, minus assets held in nontraded sector capital hP, where P is the relative price of nontraded sector capital in terms of traded sector capital. (Whenever P increases, nontraded sector capital becomes more expensive in terms of traded sector capital, and the real exchange rate is said to appreciate.) The fourth term is the return on assets invested in nontraded sector capital, which has two components: depreciation (at the instantaneous rate φ), and capital gains or losses from relative price changes. The fifth term is consumption during the interval dt, while the last term specifies adjustment costs related to changing the amount of assets held in nontraded sector capital. If adjustment happens in an instant τ, the indicator variable ξ, which is equal to zero when no adjustment occurs, takes the value 1. Adjustment costs will then be a share κ of the stock of nontraded sector capital held at τ^-, the instant immediately preceding adjustment. Because adjustment costs are not proportional to the size of the adjustment, discrete adjustments will be undertaken.[59]

The no-transaction-cost benchmark ($\kappa=0$)

94.   If we define the relative "shadow price" of nontraded sector capital as:[60]

$$P_s = P(\varphi + \rho) - dP/dt \tag{4}$$

and ignore transaction costs, the asset accumulation equation (3) can be rewritten as:

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[59] Grossman and Laroque (1990) motivate this assumption regarding adjustment costs.

[60] This is a slight abuse of notation, because dP/dt is not defined if P is not continuous.

$$da =$$
$$= (\pi dt + \sigma d\varpi)k + (\pi^* dt + \sigma^* d\varpi^*)k^* +$$
$$+ \rho dt(a - k - k^*) - P_s h dt - c dt \tag{3'}$$

95.   If there are no transaction costs, all decision variables are adjusted instantaneously, and the Bellman equation associated with (1)-(3) is:

$$\delta V(a, P_s) = \max_{<c,h,k,k^*>} \{\ln(C) + V_a \frac{E(da)}{dt} + \frac{V_{aa}}{2} \frac{E(da^2)}{dt} +$$
$$+ V_{P_s} \frac{E(dP_s)}{dt} + \frac{V_{P_s P_s}}{2} \frac{E(dP_s^2)}{dt} + V_{aP_s} \frac{E(dP_s da)}{dt}\} \tag{5}$$

96.   If the relative price of traded and nontraded sector capital P_s is constant, the problem (1)-(3) eventually collapses to Merton's model, with a known solution. When P_s is a parameter, the value function $V(.)$ is time invariant and depends only on total assets a, so that the last three terms in (5) can be set to zero. Therefore, the following first-order conditions must be satisfied:

$$0 = \frac{1}{C} \frac{\partial C}{\partial c} - V_a \tag{6}$$

$$0 = \frac{1}{C} \frac{\partial C}{\partial h} - V_a P_s \tag{7}$$

$$0 = V_a (\pi - \rho) + V_{aa}(\sigma^2 k + \sigma \sigma^* \eta k^*) \tag{8}$$

$$0 = \dot{V}_a(\pi^* - \rho) + V_{aa}(\sigma^{*2} k^* + \sigma \sigma^* \eta k) \tag{9}$$

97.   Combining equations (5) and (6) and substituting $\partial C/\partial c$, and $\partial C/\partial h$ yields the familiar formula linking the consumption mix to relative prices:

$$\frac{h}{c} = P_s^{-\theta} \tag{10}$$

That is, the ratio of nontraded to traded goods consumption is negatively related to the relative "shadow price" P_s of nontraded goods. Using the relation in equation (10), it is straightforward to show that (1)-(3) is equivalent to the standard portfolio allocation problem (Merton (1971)), and thus the value function is logarithmic in a. In this case, the first order conditions imply that consumption of traded and nontraded goods are proportional to total

assets; and that the share of both domestic and foreign traded sector capital holdings in total assets is constant.[61] Equations (11)-(14) below characterize the solution:

$$c = \frac{\delta}{(1 + P_s^{1-\theta})} a \tag{11}$$

$$hP = \frac{\delta P_s^{-\theta} P}{(1 + P_s^{1-\theta})} a \tag{12}$$

$$k = (\sigma^2 (1 - \eta^2))^{-1} \{(\pi - \rho) - (\pi^* - \rho) \frac{\sigma}{\sigma^*} \eta\} a \tag{13}$$

$$k^* = (\sigma^{*2} (1 - \eta^2))^{-1} \{(\pi^* - \rho) - (\pi - \rho) \frac{\sigma^*}{\sigma} \eta\} a \tag{14}$$

98.   It can be easily verified that (i) traded goods consumption c is increasing in the shadow price of nontraded goods; and (ii) nontraded goods consumption h is decreasing in the shadow price of nontraded goods. Ceteris paribus, an increase in the shadow price of nontraded goods, or a (permanent) real appreciation will tilt consumption patterns toward the relatively cheaper traded good. From equation (12), this consumption pattern will be matched by a lower portfolio share of nontraded sector capital. As the portfolio shares of domestic and foreign traded sector capital remain unchanged, the lower portfolio share of nontraded sector capital is matched by a higher portfolio share of riskless foreign assets. As a result, countries where the shadow price of nontraded sector capital is higher, will have higher foreign assets to total assets ratios.

99.   Equations (13) and (14) specify a relationship between holdings of risky assets and the level of total assets which is seemingly linear in a.[62] However, the expected returns on domestic traded sector capital, π, may depend on the total stock of capital invested in this sector k, which in turn may destroy the linearity of the relationship. Kraay and Ventura (1999) show that this is not the case if decreasing returns to k are not important relative to the investment risk σ. If this condition is met, the portfolio rules are indeed linear in a, implying that investors will allocate increments to their wealth—their savings—between various assets in the same proportions as their existing portfolio.[63] As this is also true for the split between

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[61] This is a ceteris paribus argument which is valid only if expected returns and the risk characteristics of the assets do not change either with time, or as a result of changes in a. The latter assumption is used following Kraay and Ventura throughout the paper.

[62] This is a result of the assumption of constant relative risk aversion embedded in the functional form of the instantaneous utility function.

[63] It could be argued that decreasing returns become relevant for "large" changes in a. In this case, the argument would only hold for *changes* in savings.

foreign and domestic assets, countries with higher nontraded shadow prices would—ceteris paribus—also tend to run larger current account surpluses.[64]

Transaction costs

100. If nonproportional transaction costs are present, consumers will in general find it optimal not to adjust h instantaneously. Instead, they will follow an S-s rule which keeps the portfolio share of nontraded sector capital within a band. In periods of inaction ("inside the band"), the ratio hP/a will only evolve as a result of stochastic shocks to a, as well as changes in hP due to physical depreciation (at the instantaneous rate φ). At the boundaries of the band, nontraded sector capital holdings will be adjusted in a lumpy fashion.

101. Intuitively, the portfolio share of the nontraded sector capital will tend to hit the boundaries after a series of positive (negative) shocks to wealth. If a increases due to favorable shocks, the portfolio share of nontraded sector capital erodes and eventually hits the lower bound. When this happens, the investor regroups her assets from financial to real assets. As a result, foreign assets decline. On the country level, after a long upswing (both in creditor and debtor countries), the joint observation of a domestic investment boom and a current account deficit is likely. The opposite argument holds for downward adjustment after a long downswing.

102. Although an explicit closed form solution to the problem (1)-(3) does not exist, Beaulieu (1993a) provides a solution method and shows that the optimal policy is indeed an S-s rule, and that the position and the width of the band depends on the model's parameters. His simulation results indicate that the investor's attitude toward risk varies depending on her nontraded sector capital holdings. In particular, she tends to be more risk averse when her nontraded sector capital holdings are close to the optimum, and less risk averse when they substantially deviate from the optimum. Since riskless financial assets are foreign, attitudes towards risk matter for international portfolio allocation and thus for the current account. However, this effect is likely to be of second order magnitude.

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[64] As the portfolio composition and the size of the current account are related to the shadow price P_s of nontraded sector capital, rather than to its relative price P, short-term responses to unanticipated movements in P would differ from the long-run effects. For instance, if P were to increase, the revaluation effect (dP/dt in equation (4)) would decrease the instantaneous shadow price of nontraded sector capital, resulting in a larger desired nontraded asset position, lower desired foreign assets to total assets ratios, and a decline in the current account surplus.

Data

Sources

103.   The sources of the data used in Sections D and E are the International Financial Statistics (international investment position, exchange rates, stock market indices); the WEO database (GDP, current account, investment, GDP deflator); the Penn World Tables and the OECD Main Economic Indicators (price level).

Sample

104.   The sample includes 16 OECD economies, selected based upon data availability on international investment position. The three largest economies (Germany, Japan, and the US) were not considered in the sample. Thus, the sample includes the following countries and time periods:

Australia	1986-98
Austria	1980-98
Belgium	1981-98
Canada	1970-98
Denmark	1991-98
Finland	1975-98
France	1989-96
Italy	1972-98
Netherlands	1980-97
New Zealand	1989-98
Norway	1988-93
Portugal	1993-98
Spain	1981-98
Sweden	1982-98
Switzerland	1984-97
United Kingdom	1980-98

Definition of variables

Alternative definitions of the share of foreign assets in total assets

FDI-based measure, used in specification 1 in Tables II-4 to II-6
        (FDI assets + net portfolio investment + net other investment)/
        (domestic capital stock – FDI liabilities).

Measure corrected for stock market valuation effects, used in specification 2 in Tables II-4 to II-6
        (revalued FDI assets + revalued portfolio equity assets + net non-equity portfolio assets + net other investment)/
        (domestic capital stock-revalued FDI liabilities-revalued portfolio equity liabilities).

Raw measure, used in specification 3 in Tables II-4 to II-6
  (FDI assets + portfolio equity assets + net non-equity portfolio assets + net other investment)/
  (domestic capital stock-FDI liabilities-portfolio equity liabilities).

Other variables

Table II-2

Implicit rate of return on assets (t) = investment income credit (t) / asset stock (t-1).
Implicit rate of return on liabilities (t) = investment income debit (t) / liability stock (t-1).

Tables II-3 and II-4

CA   = current account to GDP ratio.
CA f   = savings rate x FDI based measure of share of foreign assets in total assets.
CA m   = savings rate x share of foreign assets in total assets corrected for stock market valuation effects.
CA v   = savings rate x share of foreign assets in total assets.

Table II-6

Term1   = savings rate (t-1) x forecast value of share of foreign assets in total assets (t-1).
Term 2   = (forecast value of share of foreign assets in total assets (t) – forecast value of share of foreign assets in total assets (t-1)) x total assets to GDP ratio.
Term 3a = length of period (in years) with positive output gap if output gap is positive; (-1)*length of period (in years) with negative output gap if output gap is negative.
Term 3b = output gap.
Capital inflows = forecast value of capital inflows to GDP ratio.

Table A1. Switzerland: Real GDP Developments

(Percentage changes at 1990 prices) 1/

	1994	1995	1996	1997	1998	1998				1999		
						1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.
Private consumption	1.0	0.6	0.7	1.3	2.3	2.2	2.2	2.4	2.6	2.2	2.1	2.0
Public consumption	2.0	-0.1	2.0	0.6	-0.2	-0.1	-0.4	-0.2	0.1	0.2	0.3	0.3
Gross fixed investment	6.5	1.8	-2.4	1.5	4.4	4.3	4.3	4.0	3.2	2.3	2.5	2.8
Construction	7.0	-3.8	-6.2	-1.5	0.4	1.5	1.3	0.6	-1.0	-1.3	0.3	1.9
Machinery and equipment	5.8	9.7	2.5	4.9	8.6	7.5	7.6	7.6	7.6	6.2	4.8	3.7
Final domestic demand	2.5	0.8	0.1	1.2	2.4	2.4	2.3	2.4	2.3	1.9	1.9	2.0
Inventory accumulation 2/	0.1	1.0	0.3	0.1	1.7	2.3	1.6	1.0	1.0	0.2	-0.3	0.6
Total domestic demand	2.7	1.8	0.4	1.3	4.1	4.7	4.0	3.3	3.4	2.1	1.6	2.5
Exports of goods and non-factor services	1.8	1.6	2.5	9.0	4.6	9.8	6.4	3.0	0.6	0.8	2.6	4.6
Imports of goods and non-factor services	7.9	5.1	2.7	8.1	9.4	14.1	10.3	6.8	5.5	3.2	3.6	6.8
Foreign balance 2/	-2.0	-1.3	-0.1	0.4	-2.0	-1.6	-1.6	-1.6	-2.1	-1.1	-0.5	-1.0
GDP	0.5	0.5	0.3	1.7	2.1	3.0	2.4	1.7	1.2	1.0	1.2	1.5

Source: Swiss Institute for Business Cycle Research, data tape.

1/ For quarterly data, growth rates are with respect to the same quarter of the previous year; calculated from seasonally adjusted figures.
2/ Contribution to growth of GDP.

Table A2. Switzerland: Components of Nominal GDP

(In millions of Swiss francs, at current prices)

	1994	1995	1996	1997	1998
Private consumption	211,182	216,053	219,780	223,904	228,514
Public consumption	54,800	55,025	56,643	56,213	56,485
Gross fixed investment	78,717	77,644	73,884	72,888	75,473
Construction	45,437	43,814	39,940	38,141	38,209
Machinery and equipment	33,280	33,830	33,945	34,747	37,264
Final domestic demand	344,699	348,723	350,307	353,005	360,472
Inventory accumulation	-3,274	47	486	2,347	5,077
Total domestic demand	341,425	348,769	350,793	355,351	365,549
Exports of goods and non-factor services	127,004	127,501	131,467	147,690	152,909
Imports of goods and non-factor services	111,015	112,942	116,427	131,452	138,447
Foreign balance	15,989	14,560	15,041	16,238	14,462
GDP	357,414	363,329	365,833	371,590	380,011

Source: Swiss Institute for Business Cycle Research, data tape.

Table A3. Switzerland: Components of Real GDP

(In millions of Swiss francs, at current prices)

	1994	1995	1996	1997	1998
Private consumption	182,932	183,990	185,204	187,617	191,985
Public consumption	49,354	49,320	50,322	50,649	50,523
Gross fixed investment	80,755	82,187	80,253	81,450	84,997
Construction	47,450	45,655	42,823	42,184	42,367
Machinery and equipment	33,306	36,532	37,430	39,266	42,630
Final domestic demand	313,042	315,496	315,779	319,716	327,505
Stockbuilding 1/	-3,002	116	1,139	1,382	6,731
Total domestic demand	310,040	315,613	316,917	321,098	334,236
Exports of goods and non-factor services	119,835	121,769	124,783	135,986	142,176
Imports of goods and non-factor services	115,356	121,279	124,589	134,655	147,346
Foreign balance	4,478	491	193	1,331	-5,170
GDP	314,518	316,104	317,111	322,429	329,066

Source: Swiss Institute for Business Cycle Research, data tape.

1/ Including statistical discrepancy.

Table A4. Switzerland: Implicit Price Deflators

(Percent changes)

	1994	1995	1996	1997	1998
Gross domestic product	1.6	1.1	0.4	-0.1	0.2
Total domestic demand	0.0	0.3	0.2	0.0	-1.2
Private consumption	1.1	1.7	1.1	0.6	-0.3
Public consumption	0.4	0.5	0.9	-1.4	0.7
Gross fixed investment	-2.0	-3.1	-2.5	-2.8	-0.8
Construction	0.0	0.2	-2.8	-3.1	-0.3
Machinery and equipment	-4.6	-7.3	-2.1	-2.4	-1.2
Exports of goods and non-factor services	-0.4	-1.2	0.6	3.1	-1.0
Imports of goods and non-factor services	-4.8	-3.2	0.3	4.5	-3.7
Memorandum items:					
Final domestic demand	0.1	0.4	0.4	-0.5	-0.3
Total demand	0.0	0.3	0.2	0.0	-1.2

Source: Swiss Institute for Business Cycle Research, data tape.

Table A5. Switzerland: Household Disposable Income and Savings

(Percent change, unless otherwise indicated)

	1994	1995	1996	1997	1998
National income	1.8	3.0	1.2	4.5	2.1
Income from property and entrepreneurship	3.8	4.6	3.4	15.8	2.6
Gross income from dependent employment	1.1	2.4	0.4	0.2	1.9
Personal income from property and entrepreneurship	0.1	0.0	6.3	15.8	-0.2
Transfers to households	2.8	2.7	3.5	3.0	3.0
Direct taxes	7.6	-2.6	3.0	2.9	3.1
Social security contributions	2.2	4.1	2.1	3.2	2.7
Household disposable income	0.0	2.5	1.7	2.9	1.5
Saving	-17.1	4.5	1.1	12.6	-4.0
Saving ratio (in percent)	*9.0*	*9.2*	*9.1*	*10.0*	*9.4*
Private consumption, nominal	2.1	2.3	1.7	1.9	2.1
Private consumption, deflator	1.1	1.7	1.1	0.6	-0.3
Private consumption, real	1.0	0.6	0.7	1.3	2.3

Source: Swiss Institute for Business Cycle Research, data tape.

Table A6. Switzerland: Labor Market

(In millions, unless otherwise indicated)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Population	6.67	6.72	6.75	6.84	6.91	6.97	7.02	7.06	7.08	7.10	7.15	7.20
Labor force	3.63	3.72	3.84	3.91	3.90	3.95	3.96	3.96	3.98	3.99	3.99	3.99
Employment	3.61	3.70	3.82	3.87	3.80	3.78	3.79	3.80	3.81	3.80	3.85	3.89
Unemployment	0.02	0.02	0.02	0.04	0.09	0.16	0.17	0.15	0.17	0.19	0.14	0.10
Unemployment rate (in percent)	*0.6*	*0.5*	*0.5*	*1.1*	*2.6*	*4.5*	*4.7*	*4.2*	*4.7*	*5.2*	*3.9*	*2.7*

Sources: Swiss Institute for Business Cycle Research, data tape; and Federal Statistical Office.

Table A7. Switzerland: Prices, Wages and Productivity

(Percentage changes) 1/

	1995	1996	1997	1998	1998		1999			
					3rd Qtr.	4th Qtr.	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Wholesale price index	0.0	-2.4	0.1	-1.5	-1.9	-2.9	-2.9	-2.3	-1.0	0.8
Raw materials prices	10.1	3.3	-1.7	-22.4	-22.5	-26.7	-14.9	1.8	22.9	36.0
Consumer price index	1.8	0.8	0.5	0.1	0.1	-0.1	0.3	0.6	1.0	1.4
Goods	0.3	0.2	0.6	-0.3	-0.3	-0.9	-0.5	0.2	1.0	2.1
Services	3.0	1.3	0.5	0.3	0.4	0.5	0.8	0.9	0.9	0.9
Oil products	-1.7	7.1	5.7	-10.2	-10.7	-14.2	-9.6	0.0	10.6	23.4
Non-oil products	1.9	0.6	0.4	0.3	0.4	0.4	0.6	0.6	0.7	0.8
Gross wage income per employed person	1.9	0.1	0.5	0.7	...	...	...	...	...	...
Real GDP per employed person	0.1	0.0	1.9	0.8	0.5	0.3	0.3	0.8	1.1	...
Unit labor cost, economy-wide	1.9	0.1	-1.4	-0.1	...	...	...	...	...	...
Export prices 2/	-2.0	0.3	3.6	-1.1	-0.9	-0.8	-0.8	-0.1	1.5	...
Import prices 2/	-2.2	-0.3	4.4	-4.3	-4.5	-4.0	-3.2	-3.3	-3.4	...

Sources: Swiss Institute for Business Cycle Research, data tape; and IMF, World Economic Outlook database.

1/ For quarterly data, growth rates are with respect to the same quarter of the previous year.
2/ Deflators for goods.

Table A8. Switzerland: Federal Government Finances

(In billions of Swiss francs, unless otherwise indicated)

	1994	1995	1996	1997	1998	1999 Estimates	2000 Budget
Expenditure 1/	41.6	40.9	44.2	44.4	46.9	47.0	48.1
In percent of GDP	*11.6*	*11.2*	*12.1*	*12.0*	*12.3*	*12.1*	*12.0*
Current expenditure	35.9	36.3	38.8	37.8	41.0	41.7	43.0
In percent of GDP	*10.0*	*10.0*	*10.6*	*10.2*	*10.8*	*10.7*	*10.7*
Personnel	5.0	4.9	4.9	4.8	4.8	4.9	4.1
Goods 2/	5.4	5.4	5.4	5.0	5.4	5.7	5.4
Interest	3.1	3.1	2.9	3.1	3.3	3.7	3.5
Transfers	22.4	22.9	25.5	24.9	27.5	27.4	30.0
Cantons and Municipalities	8.1	8.2	8.7	9.1	10.5	10.9	11.5
Social security and other	14.4	14.7	16.8	15.8	17.0	16.5	18.5
Capital expenditure 3/	5.7	4.5	5.4	6.6	5.9	5.3	5.1
Revenue	34.6	36.2	38.5	38.9	47.1	43.3	45.6
In percent of GDP	*9.7*	*9.9*	*10.5*	*10.5*	*12.4*	*11.1*	*11.4*
Taxes	31.4	32.1	35.0	34.7	39.9	38.9	41.8
Other	3.2	4.0	3.4	4.2	7.2	4.4	3.9
Fiscal balance cash basis	-6.9	-4.7	-5.8	-5.5	0.2	-3.7	-2.4
In percent of GDP	*-1.9*	*-1.3*	*-1.6*	*-1.5*	*0.0*	*-1.0*	*-0.6*
Railway loans	0.6	1.1	0.8	0.0	0.0	0.0	0.0
Fiscal balance adjusted	-7.6	-4.8	-6.6	-5.5	0.2	-3.7	-2.4
In percent of GDP	*-2.1*	*-1.3*	*-1.8*	*-1.5*	*0.0*	*-1.0*	*-0.6*
Memorandum item:							
Defense expenditure	5.9	5.9	5.9	5.4	5.4	5.1	5.0
In percent of GDP	*1.7*	*1.6*	*1.5*	*1.5*	*1.4*	*1.3*	*1.2*

Source: Federal Ministry of Finance.

1/ Up to 1996 excluding railway loans.
2/ Includes military procurement.
3/ Includes loans to unemployment insurance fund.

Table A9. Switzerland: Federal Government Tax Revenue

(In billions of Swiss francs, unless otherwise indicated)

	1994	1995	1996	1997	1998	1999 Estimate	2000 Budget
Direct federal tax	9.0	8.2	9.0	9.7	9.7	9.8	9.7
Withholding tax	3.5	2.1	3.3	2.3	5.4	2.7	3.8
Stamp duties	2.0	1.7	2.0	2.5	3.3	3.1	3.3
Turnover tax/VAT 1/	9.4	12.4	12.1	12.5	13.3	15.2	16.3
Fuel taxes	4.3	4.3	4.4	4.1	4.7	4.7	4.8
Other	3.3	3.4	3.4	3.6	3.6	3.5	3.9
Total	31.5	32.1	34.2	34.7	39.9	38.9	41.8
In percent of GDP	*8.8*	*8.8*	*9.3*	*9.3*	*10.5*	*10.0*	*10.4*

Source: Federal Ministry of Finance.

1/ VAT was introduced at the beginning of 1995; in January 1999, the VAT rate was raised by 1 percentage point to 6.5 percent.

Table A10. Switzerland: Federal Government Assets and Liabilities

(End-of-period; in billions of Swiss francs, unless otherwise indicated)

	1992	1993	1994	1995	1996	1997	1998
Assets	60.8	74.8	83.4	94.8	98.0	107.7	120.3
Financial assets	19.7	25.0	26.5	33.0	30.3	33.2	43.6
Administrative and other	16.5	19.0	20.3	20.2	20.5	21.9	23.8
Balancing item 1/	24.6	30.9	36.6	41.6	47.2	52.6	52.9
Liabilities	60.8	74.8	83.4	94.8	98.0	107.7	120.3
Gross financial debt	55.6	69.8	78.3	89.2	91.7	100.0	112.3
In percent of GDP	*16.4*	*20.3*	*22.3*	*24.6*	*25.2*	*26.9*	*29.5*
Current payables	3.8	5.1	6.9	11.2	3.2	4.4	4.6
Short-term debt	13.5	17.6	19.3	22.6	26.9	27.7	24.9
Medium- and long-term debt	18.3	26.1	29.8	32.0	34.8	40.6	52.5
Other 2/	20.0	20.9	22.4	23.4	26.8	27.3	30.2
Valuation adjustments	3.3	3.6	3.8	4.0	4.5	5.5	5.3
Other	1.8	1.4	1.2	1.5	1.9	2.2	2.7
Memorandum item:							
Net financial debt 3/	36.0	44.9	51.8	56.3	61.4	66.8	68.7
In percent of GDP	*10.6*	*13.1*	*14.7*	*15.5*	*16.9*	*18.0*	*18.1*

Source: Federal Ministry of Finance, *Staatsrechnung* .

1/ Amount by which liabilities exceed all other assets.
2/ Largely deposits of federal pension fund (EVK) with the federal government.
3/ Difference between gross financial debt and financial assets.

Table A11. Switzerland: General Government Finances

	1991	1992	1993	1994	1995	1996	1997	1998	1999 Est.	2000 Proj.
					(In billions of Sw F)					
Confederation 1/										
Revenue	31.5	32.8	31.4	34.6	36.1	38.5	38.9	44.1 2/	43.3	45.6
Expenditure	35.5	37.8	41.1	41.6	40.9	44.2	44.4	46.9	47.0	48.1
Balance	-4.0	-5.0	-9.7	-6.9	-4.8	-5.8	-5.5	-2.8	-3.7	-2.5
Cantons										
Revenue	41.8	44.2	47.0	48.8	50.1	52.9	53.7	56.2	55.7	57.9
Expenditure	45.6	48.3	52.4	52.5	52.1	55.1	56.8	57.0	56.9	59.4
Balance	-3.8	-4.2	-5.4	-3.7	-2.0	-2.2	-3.0	-0.8	-1.2	-1.5
Communes										
Revenue	31.1	33.3	35.9	37.0	37.6	38.2	37.9	39.2	40.1	41.5
Expenditure	33.2	36.0	37.1	37.9	38.4	38.7	38.5	39.5	40.6	42.0
Balance	-2.2	-2.6	-1.2	-0.9	-0.8	-0.5	-0.6	-0.3	-0.5	-0.5
Territorial authorities										
Revenue	86.3	91.1	94.5	100.2	103.6	107.5	108.1	119.2	118.8	123.9
Expenditure	96.3	103.0	110.8	111.7	111.1	116.0	117.3	120.2	124.2	128.5
Balance	-10.0	-11.8	-16.3	-11.5	-7.5	-8.5	-9.2	-3.9	-5.4	-4.5
Social security										
Revenue	32.2	33.8	38.1	38.8	40.9	41.2	41.9	41.8	44.9	45.1
Expenditure	29.3	33.8	35.0	37.4	40.2	39.9	41.7	42.0	45.0	45.5
Balance	2.9	0.0	3.1	1.4	0.7	1.4	0.3	-0.2	-0.1	-0.4
General government										
Revenue	109.9	115.7	122.3	127.8	132.7	135.6	137.6	145.3	146.3	149.5
Expenditure	117.0	127.5	135.0	138.1	139.7	143.8	146.5	149.4	151.8	154.4
Balance	-7.1	-11.8	-13.3	-10.1	-6.8	-7.1	-8.9	-4.1	-5.5	-4.9
Gross debt										
Confederation	43.9	55.3	66.0	73.3	79.9	86.0	93.1	105.3	109.0	111.5
Cantons	35.0	40.8	47.0	51.6	53.4	56.8	60.2	61.0	62.2	63.7
Communes	31.0	33.8	35.0	36.0	37.0	37.5	38.0	38.3	38.8	39.3
General government debt (gross)	109.9	129.8	147.9	160.9	170.4	180.3	191.3	204.6	210.0	214.5

Table A11. Switzerland: General Government Finances (conluded)

	1991	1992	1993	1994	1995	1996	1997	1998	1999 Est.	2000 Proj.
					(In percent of GDP)					
Confederation										
Revenue 1/	9.4	9.6	9.0	9.7	9.9	10.5	10.5	11.6	11.1	11.4
Expenditure 2/	10.6	11.0	11.8	11.6	11.2	12.1	11.9	12.4	12.1	12.0
Balance	-1.2	-1.5	-2.8	-1.9	-1.3	-1.6	-1.5	-0.7	-0.9	-0.6
Cantons										
Revenue	12.5	12.9	13.4	13.7	13.8	14.5	14.5	14.8	14.3	14.4
Expenditure	13.7	14.1	15.0	14.7	14.3	15.1	15.3	15.0	14.6	14.8
Balance	-1.1	-1.2	-1.5	-1.0	-0.5	-0.6	-0.8	-0.2	-0.3	-0.4
Communes										
Revenue	9.3	9.7	10.3	10.3	10.3	10.4	10.2	10.3	10.3	10.3
Expenditure	10.0	10.5	10.6	10.6	10.6	10.6	10.4	10.4	10.4	10.4
Balance	-0.6	-0.8	-0.3	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1
Territorial authorities										
Revenue	25.9	26.6	27.0	28.0	28.5	29.4	29.1	31.4	30.6	30.8
Expenditure	28.9	30.1	31.7	31.3	30.6	31.7	31.6	31.6	31.9	32.0
Balance	-3.0	-3.5	-4.7	-3.2	-2.1	-2.3	-2.5	-1.0	-1.4	-1.1
Social security										
Revenue	9.7	9.9	10.9	10.8	11.3	11.3	11.3	11.0	11.6	11.2
Expenditure	8.8	9.9	10.0	10.5	11.1	10.9	11.2	11.1	11.6	11.3
Balance	0.9	0.0	0.9	0.4	0.2	0.4	0.1	-0.1	0.0	-0.1
General government										
Revenue	32.9	33.8	34.9	35.7	36.5	37.1	37.0	38.2	37.6	37.2
Expenditure	35.0	37.2	38.6	38.7	38.4	39.3	39.4	39.3	39.1	38.4
Balance	-2.1	-3.4	-3.8	-2.8	-1.9	-1.9	-2.4	-1.1	-1.4	-1.2
Primary balance	-0.5	-1.6	-1.8	-0.7	0.3	0.4	-0.1	1.1	0.6	1.0
Gross debt										
Confederation	13.2	16.1	18.9	20.5	22.0	23.5	25.1	27.7	28.0	27.7
Cantons	10.5	11.9	13.4	14.5	14.7	15.5	16.2	16.1	16.0	15.9
Communes	9.3	9.9	10.0	10.1	10.2	10.3	10.2	10.1	10.0	9.8
General government debt (gross)	32.9	37.9	42.3	45.0	46.9	49.3	51.5	53.8	54.0	53.4

Sources: Federal Finance Administration; and staff estimates and projections.
1/ Excluding cash surplus of the civil servant pension fund; from 1997 onwards, including loans to the railways.
2/ Excluding revenue from the partial privatization of Swisscom, amounting to Sw F 2.9 billion.

Table A12. Switzerland: Interest Rates and Equity Prices

| | Three Month Rates | | Return on | Swiss Market |
	Sw F LIBOR	Euribor 1/	Federal Bonds	Index 2/
	(Annual rates, in percent)			
1996	1.88	3.23	4.18	3,621
1997	1.50	3.32	3.54	5,214
1998	1.55	3.51	2.87	7,092
1999	1.35	2.98	2.81	7,133
1996				
I	1.73	3.38	4.19	3,371
II	2.35	3.28	4.35	3,609
III	2.08	3.21	4.25	3,670
IV	1.92	3.13	3.91	3,835
1997				
I	1.79	3.14	3.67	4,354
II	1.46	3.14	3.53	5,063
III	1.51	3.20	3.47	5,654
IV	1.80	3.66	3.50	5,784
1998				
I	1.22	3.51	2.93	6,851
II	1.79	3.58	3.09	7,560
III	1.71	3.48	2.96	7,393
IV	1.47	3.49	2.51	6,565
1999				
I	1.26	3.05	2.44	7,160
II	1.08	2.61	2.55	7,139
III	1.15	2.83	3.03	7,011
IV	1.92	3.43	3.43	7,222
1998				
Jan.	1.19	3.53	3.10	6,344
Feb.	1.00	3.49	2.85	6,910
Mar.	1.48	3.56	2.86	7,300
Apr.	1.53	3.62	3.08	7,470
May	1.69	3.55	3.10	7,584
Jun.	2.16	3.53	3.09	7,625
Jul.	1.94	3.50	3.17	8,185
Aug.	1.61	3.46	2.89	7,551
Sep.	1.57	3.53	2.84	6,443
Oct.	1.26	3.57	2.69	5,912
Nov.	1.75	3.62	2.54	6,861
Dec.	1.41	3.19	2.30	6,921
1999				
Jan.	1.27	3.07	2.44	7,280
Feb.	1.26	3.10	2.46	7,067
Mar.	1.25	2.97	2.40	7,133
Apr.	0.99	2.58	2.40	7,260
May	1.02	2.58	2.51	7,081
Jun.	1.22	2.67	2.74	7,075
Jul.	1.12	2.69	2.89	7,029
Aug.	1.10	2.70	3.01	6,948
Sep.	1.92	3.09	3.19	7,057
Oct.	2.05	3.49	3.53	6,942
Nov.	1.86	3.45	3.34	7,337
Dec.	1.85	3.34	3.40	7,389

Source: WEFA and Bloomberg.
1/ The three month interbank rate in Germany for the period before 1999.
2/ Base value equals to 1,500 as of June 30, 1988.

Table A13. Switzerland: Money and Credit

(Percentage changes over a year earlier)

	1992	1993	1994	1995	1996	1997	1998	1999
Banknotes	0.1	1.5	1.9	0.7	2.4	2.8	1.9	3.0
Sight deposits with SNB	-9.9	3.9	1.0	-4.0	14.1	26.5	9.4	-6.2
Monetary base	-0.9	1.7	1.8	0.3	3.4	5.0	2.8	1.9
M1	2.0	10.5	5.6	6.8	11.7	10.1	7.8	8.3
Saving deposits	3.6	21.5	14.2	3.4	12.1	3.6	-1.1	-1.3
M2	2.8	16.1	10.2	4.9	11.9	6.5	3.1	3.4
Time deposits	0.9	-17.5	-7.5	-5.8	-9.6	-0.8	-8.0	-8.4
M3	2.1	3.9	5.1	2.2	6.9	5.1	1.0	1.4
Dometic credit 1/	2.4	3.6	3.5	2.8	-0.2	2.6	-0.5	5.0
Public sector	6.6	27.5	3.9	1.5	3.8	0.1	-23.4	-1.6
Private sector	2.2	1.8	3.5	2.9	-0.6	2.9	1.6	5.5

Sources: Swiss Institute for Business Cycle Research, data tape; and IMF, International Financial Statistics database.

1/ For 1999, January-October 1999.

Table A14. Switzerland: Exchange Rate Developments

	Sw F per euro	Sw F per US$	£ per Sw F	Nominal Effective Exchange Rate 1/	Real Effective Exchange Rate 2/
	(Percentage changes over a year earlier)			(1990=100)	
1991	1.90	1.43	0.813	96.4	98.4
1992	1.68	1.41	0.801	98.7	100.6
1993	1.78	1.48	0.985	105.2	105.3
1994	1.65	1.37	0.894	105.2	105.3
1995	1.57	1.18	0.749	112.8	112.2
1996	1.60	1.24	0.792	111.1	109.1
1997	1.64	1.45	0.887	104.3	100.9
1998	1.62	1.45	0.875	107.0	102.1
1999	1.60	1.50	0.929	105.4	100.5
1996					
I	1.56	1.19	0.778	114.0	112.4
II	1.59	1.24	0.816	111.2	109.2
III	1.59	1.22	0.787	111.9	109.6
IV	1.64	1.29	0.786	107.4	105.0
1997					
I	1.70	1.44	0.882	102.2	99.5
II	1.65	1.45	0.884	103.8	100.7
III	1.62	1.49	0.917	104.2	100.6
IV	1.60	1.43	0.863	107.0	103.0
1998					
I	1.59	1.48	0.897	107.4	102.9
II	1.63	1.49	0.903	105.4	100.6
III	1.63	1.47	0.890	106.3	101.3
IV	1.60	1.36	0.812	109.0	103.7
1999					
I	1.60	1.43	0.873	107.2	102.1
II	1.60	1.51	0.942	105.5	100.5
III	1.60	1.53	0.955	104.5	99.7
IV	1.63	1.54	0.945	104.3	99.7
1998					
Jan.	1.59	1.48	0.902	107.6	103.2
Feb.	1.58	1.46	0.893	108.1	103.5
Mar.	1.60	1.49	0.896	106.6	101.9
Apr.	1.62	1.51	0.901	104.9	100.2
May.	1.63	1.48	0.903	105.7	100.8
Jun.	1.63	1.49	0.906	105.7	100.8
Jul.	1.65	1.51	0.921	104.5	99.7
Aug.	1.64	1.50	0.916	105.9	101.0
Sep.	1.61	1.40	0.835	108.4	103.2
Oct.	1.59	1.34	0.788	109.9	104.6
Nov.	1.61	1.38	0.833	108.0	102.6
Dec.	1.59	1.36	0.814	109.2	103.8
1999					
Jan.	1.61	1.38	0.838	107.5	102.3
Feb.	1.60	1.43	0.876	107.2	102.2
Mar.	1.60	1.47	0.905	106.7	101.7
Apr.	1.60	1.50	0.930	105.7	100.8
May.	1.60	1.51	0.933	105.6	100.6
Jun.	1.60	1.54	0.963	105.2	100.2
Jul.	1.60	1.55	0.985	104.6	99.7
Aug.	1.60	1.51	0.939	105.0	100.2
Sep.	1.60	1.53	0.940	104.1	99.4
Oct.	1.59	1.49	0.898	104.9	100.1
Nov.	1.60	1.55	0.956	104.2	99.5
Dec.	1.60	1.58	0.981	103.8	...

Source: IMF, International Financial Statistics database.
1/ Against the 21 most important trading partners.
2/ Against the 10 most important trading partners and based on relative consumer prices.

Table A15. Switzerland: Balance of Payments

(In billions of Swiss francs)

	1993	1994	1995	1996	1997	1998
Current account balance	28.7	23.9	25.1	27.2	37.6	34.6
Merchandise trade balance	2.5	2.2	1.0	1.1	-0.5	-2.2
Exports	96.8	99.4	99.8	102.2	114.2	118.4
Imports	94.4	97.2	98.8	101.0	114.7	120.6
Non factor services balance	16.8	15.6	15.2	15.4	18.9	19.0
Exports	31.7	30.9	30.8	32.4	36.7	38.7
Of which : Tourism	11.3	11.4	11.2	11.0	11.5	11.4
Imports	14.9	15.3	15.6	17.1	17.8	19.7
Of which : Tourism	8.8	8.8	8.8	9.4	10.1	10.3
Factor services balance	13.5	10.7	13.9	15.6	24.1	23.2
Capital services balance	20.7	17.5	20.8	22.4	30.6	29.7
Capital income	35.6	35.1	35.8	39.3	49.4	61.9
Capital payments	14.9	17.6	15.0	16.8	18.8	32.1
Labor services balance	-7.2	-6.9	-6.9	-6.9	-6.5	-6.5
Labor income	1.4	1.5	1.5	1.5	1.5	1.5
Labor payments	8.5	8.3	8.3	8.4	8.1	8.0
Net unrequited transfers	-4.1	-4.7	-5.0	-4.9	-4.9	-5.4
Capital account balance	-31.2	-22.5	-14.8	-35.1	-37.0	-42.2
Foreign direct investment	-13.1	-10.2	-11.8	-16.2	-18.8	-13.7
Abroad	-13.0	-14.8	-14.4	-20.0	-26.1	-20.6
Into Switzerland	-0.1	4.6	2.6	3.8	7.3	6.9
Portfolio investment	-26.3	-24.9	-4.6	-11.8	-17.3	-6.6
Abroad	-44.8	-26.1	-10.5	-27.7	-30.4	-21.5
Into Switzerland	18.5	1.2	5.9	15.9	13.1	14.9
Banking sector	14.1	14.8	-1.1	-17.9	-0.8	-17.6
Increase in credit claims	-3.6	-26.3	-11.2	-74.5	-74.3	-66.3
Increase in credit liabilities	6.0	41.4	1.9	60.7	74.8	49.3
Net increase in fiduciary funds	14.0	-0.5	7.6	-3.0	-3.1	-1.5
	-2.3	0.2	0.6	-1.2	1.7	1.0
Enterprises	1.0	-2.0	5.2	2.7	0.3	-5.4
Increase in claims	0.8	-11.9	5.8	-7.2	4.3	-14.4
Increase in liabilities	0.2	9.8	-0.6	9.9	-4.0	9.0
Other private sector	-6.0	-0.1	-2.8	8.0	-0.8	0.8
Other public sector	-0.1	-0.1	0.2	0.0	0.5	0.3
Changes in national bank reserves (- = increase)	-1.4	0.9	3.7	-7.8	-4.9	-0.1
Revaluation of national bank reserves (- = increase)	0.8	-2.3	-3.5	4.4	1.8	-0.9
Errors and omissions	-2.4	-0.2	11.2	-11.4	-2.7	-9.0

Source: Swiss National Bank.

Table A16. Switzerland: Volumes and Values of Merchandise Trade 1/

(In billions of Swiss francs, unless otherwise indicated)

	1992	1993	1994	1995	1996	1997	1998
Exports							
Volume (at 1990 prices)	91.9	93.3	96.5	98.9	100.9	108.9	114.1
Percent change	*4.0*	*1.4*	*3.4*	*2.6*	*2.0*	*7.9*	*4.8*
Unit value index 2/	104	103.8	103.0	100.9	101.3	104.9	103.7
Percent change	*0.9*	*0.0*	*-0.7*	*-2.0*	*0.3*	*3.6*	*-1.1*
Value	95.4	96.8	99.4	99.8	102.2	114.2	118.3
Percent change	*4.9*	*1.4*	*2.7*	*0.5*	*2.3*	*11.8*	*3.6*
Imports							
Volume (at 1990 prices)	94.6	94.3	102.0	106.0	108.7	118.2	129.8
Percent change	*-4.9*	*-0.3*	*8.1*	*4.0*	*2.5*	*8.7*	*9.8*
Unit value index 2/	102.3	100.1	95.3	93.2	92.9	97.0	92.9
Percent change	*2.4*	*-2.2*	*-4.8*	*-2.2*	*-0.3*	*4.4*	*-4.3*
Value	96.8	94.4	97.2	98.8	101.0	114.7	120.6
Percent change	*-2.6*	*-2.6*	*3.0*	*1.7*	*2.2*	*13.5*	*5.1*
Terms of trade index 3/	101.4	103.7	108.2	108.3	109.0	108.1	111.6
Percent change	*-1.5*	*2.3*	*4.3*	*0.1*	*0.6*	*-0.8*	*3.2*

Source: Swiss Institute for Business Cycle Research, data tape.

1/ On a national accounts basis.
2/ Value divided by volume.
3/ Export unit value divided by import unit value.

Table A17. Switzerland: Composition of Foreign Trade

(In billions of Swiss francs, current prices)

	1993	1994	1995	1996	1997	1998
Exports, total	86.7	90.2	92.0	94.1	105.1	109.1
Agriculture	3.4	3.6	3.5	3.5	3.8	3.8
Energy	0.1	0.1	0.1	0.1	0.3	0.2
Textiles	4.3	4.3	4.0	3.7	3.9	4.0
Paper	2.2	2.3	2.5	2.5	2.8	3.0
Leather, rubber, plastics	2.7	2.9	2.9	2.7	3.0	3.2
Chemicals	22.3	23.5	23.6	26.0	29.6	31.3
Minerals	0.7	0.7	0.7	0.7	0.8	0.8
Metals	7.4	7.8	8.3	8.2	9.1	9.6
Machinery	24.8	26.1	27.3	28.0	30.8	31.9
Vehicles	1.8	1.7	1.9	2.4	2.5	2.8
Precision instruments, watches	15.3	15.5	14.9	14.7	16.7	16.7
Other	1.6	1.7	1.6	1.7	1.7	1.8
Imports, total	83.8	87.3	90.8	92.0	103.1	106.9
Agriculture	7.9	8.3	8.1	8.3	8.9	9.3
Energy	3.4	3.0	2.7	3.4	4.9	3.4
Textiles	8.5	8.4	7.9	7.8	8.4	8.6
Paper	3.7	3.9	4.2	4.0	4.2	4.4
Leather, rubber, plastics	3.4	3.6	3.6	3.5	3.7	3.9
Chemicals	11.9	12.5	13.0	13.5	16.8	17.8
Minerals	1.9	2.0	2.0	2.0	2.0	2.1
Metals	7.3	7.9	8.9	8.0	8.9	9.5
Machinery	18.0	19.0	20.5	20.8	23.1	24.6
Vehicles	8.4	9.2	10.6	11.2	11.3	12.3
Precision instruments, watches	5.9	5.8	5.6	5.8	6.9	6.8
Other	3.5	3.6	3.7	3.8	3.9	4.2
Exports, total	86.7	90.2	92.0	94.2	105.1	109.1
Raw materials and semi-finished products	25.0	26.5	27.0	26.7	29.7	30.4
Energy	0.1	0.1	0.1	0.1	0.3	0.2
Equipment goods	30.1	31.3	33.3	34.1	37.5	39.2
Consumption goods	31.4	32.3	31.6	33.2	37.7	39.2
Imports, total	83.8	87.3	90.8	92.0	103.1	106.9
Raw materials and semi-finished products	25.7	27.4	28.7	27.1	30.5	31.2
Energy	3.4	3.0	2.7	3.4	4.9	3.4
Equipment goods	21.2	22.3	26.0	26.8	29.1	30.9
Consumption goods	33.4	34.5	33.4	34.7	38.7	41.4

Source: *Die Volkswirtschaft.*