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A Note on Switzerland's Economy

Did the Swiss economy really stagnate in the 1990's, and is Switzerland really all that rich ?

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1. Stagnation in the 1990's ?

1.1 The conventional view (national growth estimates)

The graphs in Figure 1 illustrate a widely-known "fact" about the growth performance of the Swiss economy in the 1990s. Comparing Switzerland with the OECD and the European Union as a whole, and with three neighboring countries (Austria, France, Italy),² it is seen that the curve for Switzerland's **total real GDP** - as estimated by national sources - became flat in 1991 and remained essentially so thereafter (with however a slight uptick in 1997 and 1998) whereas no comparable break occurred in the other countries or groups of countries. The latter were also hit by a recession or a slow-down in the first years of the decade, but they then resumed growing more or less along their former path. In Switzerland, by contrast, the 1990-91 years seem to have marked a break in the series, apparently ushering in a new epoch of stagnation, a kind of "steady state".

The recent Swiss picture looks even bleaker if one considers real GDP on a **per capita** basis as illustrated in Figure 2. It is seen that according to Switzerland's official national accounts, real output per capita actually declined in 1991-96. It then recovered somewhat in 1997 and 1998, but its level in the latter year remained below the 1990 peak... As against that, real GDP per capita in the other countries or groups of countries exhibits the same overall pattern as total real GDP.

Thus, judging from these two sets of graphs, Switzerland's economy would seem to "stand out" internationally in the 1990s on account of its stagnation or quasi-stagnation, in the sense that it appears to be at or close to the bottom of the international growth league.

1.2 Doubts about the conventional view

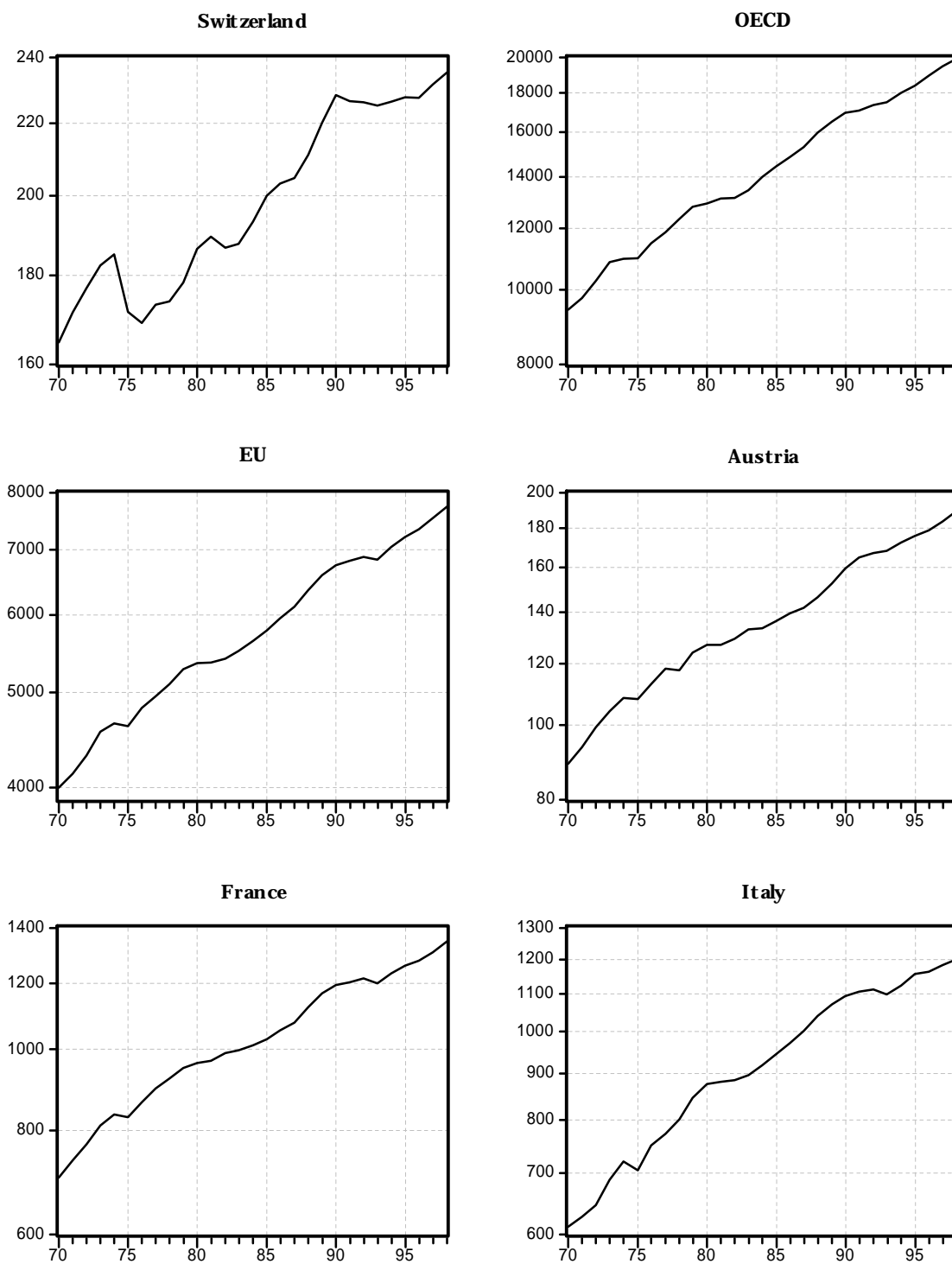
Does the picture afforded by Swiss national data correspond to reality or might it be due, at least in part, to various data (ie. measurement) problems?

¹/ Some parts of the text have been revised slightly and some figures have been corrected or brought up to date.

²/ Germany is not included because of data problems (discontinuous series or series of questionable homogeneity) arising from its re-unification.

Figure 1: Total Real GDP - International Comparison, 1970-1998

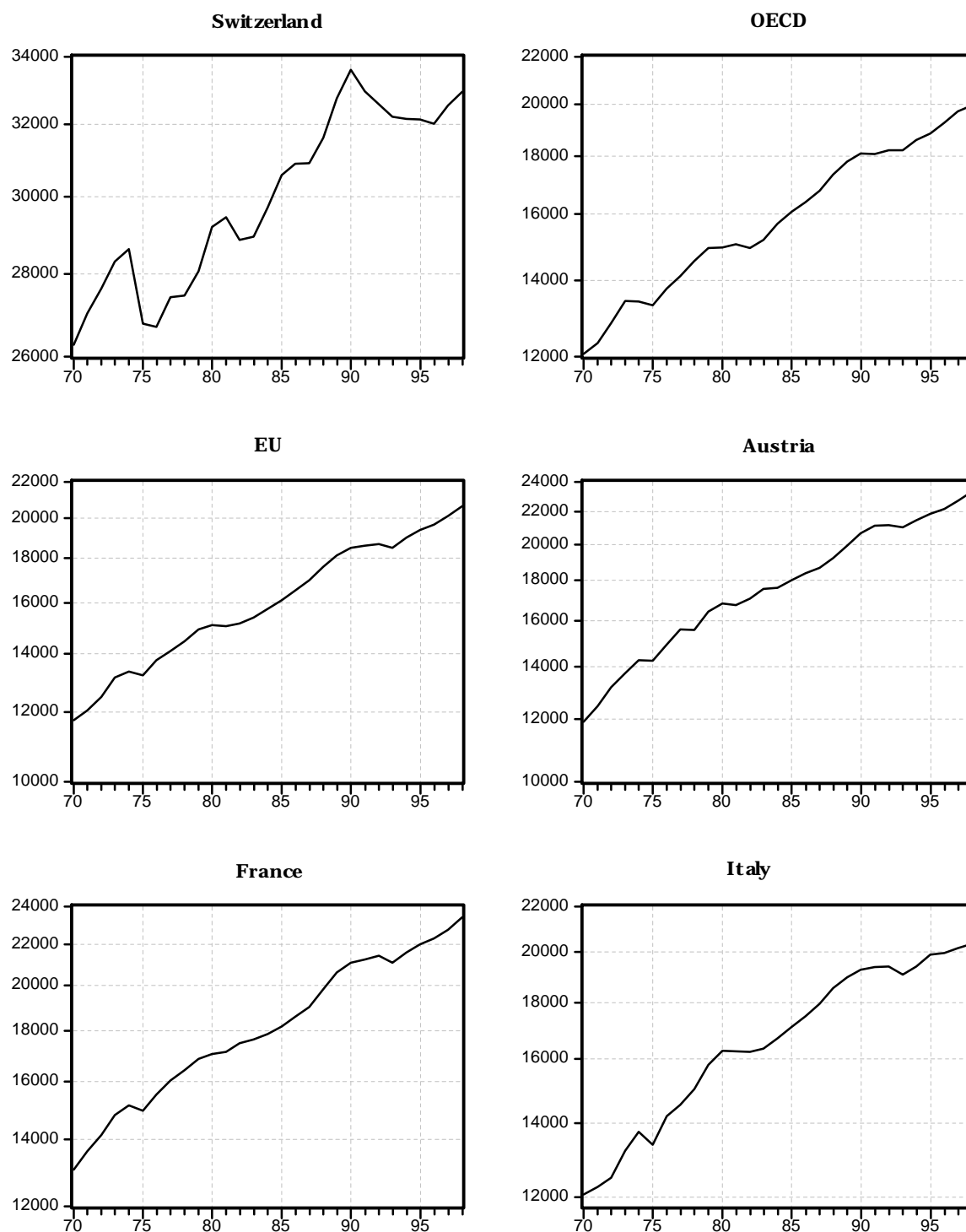
(in millions of USD at 1990 prices and exchange rates; semi-log scale)



Source: OECD-OCDE (1999), "National Accounts: Main Aggregates - 1960-1997 - Volume 1 - Comptes nationaux: principaux agrégats", Paris, Part Six, Table 7, pp. 138-139.

Figure 2: Real GDP per Capita - International Comparison, 1970-1998

(in USD at 1990 prices and exchange rates; semi-log scale)



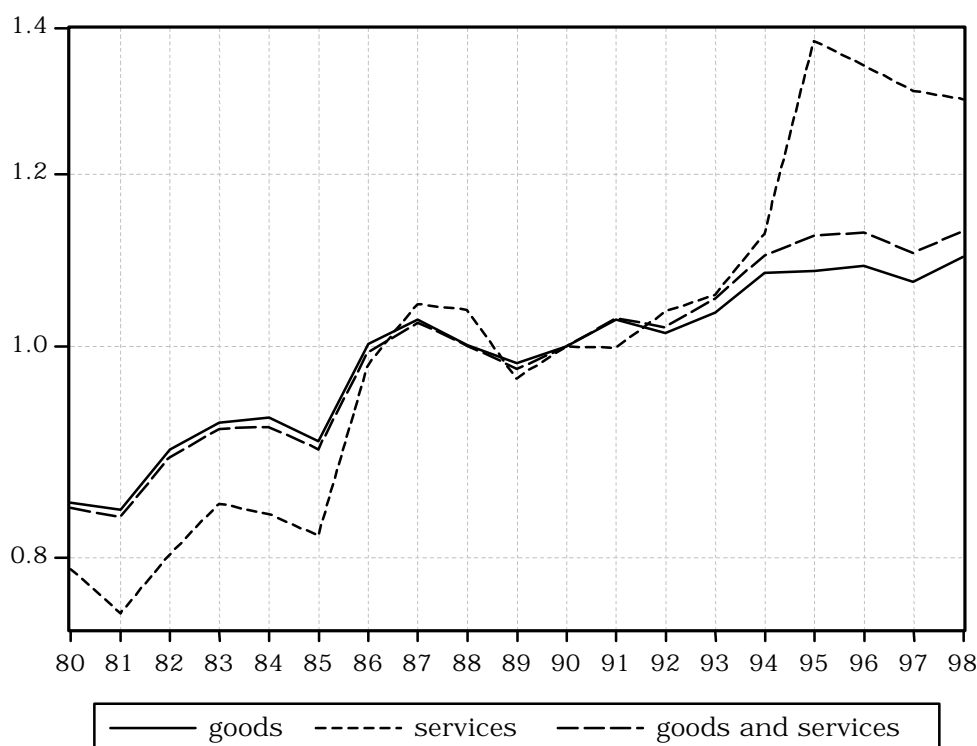
Source: OECD-OCDE (1999), "National Accounts: Main Aggregates - 1960-1997 - Volume 1 - Comptes nationaux: principaux agrégats", Paris, Part Six, Table 7, pp. 138-139 and Part Eight, Table 1, pp. 174-175.

1.2.1 Ulrich Kohli's findings

In two seminal papers, Ulrich Kohli (University of Geneva) identified several reasons why recent economic growth has most likely been underestimated in Switzerland.³ His first (1993) paper concentrates on the so-called terms of trade effect: since Switzerland's terms of trade have tended to evolve quite favorably as shown by Figure 3,⁴ deflating Swiss nominal exports by the import price index (thus measuring, as it were, their real "purchasing power" on world markets) will result in a higher growth rate for exports, and hence also for real GDP considered as an (imperfect) measure of economic welfare.⁵

Figure 3: Switzerland's Terms of Trade, 1980-1998

(semi-log scale)



Source: Créa databank.

As Figure 3 also shows, the improvement in the Swiss terms of trade has been particularly strong for services, a fact to which we shall return below (section 1.2.2).

Ulrich Kohli's second (1997) paper deals firstly with the more technical problem of which indices are or should be used when computing real GDP and hence its growth path. Real GDP is typically computed as a direct Laspeyres quantity index of the various GDP components while the GDP price deflator is conventionally calculated as a direct Paasche index. Arguing as he does that this may be unsatisfactory on various grounds, Kohli re-computes

^{3/} U. Kohli, "GNP Growth Accounting in the Open Economy: Parametric and Nonparametric Estimates for Switzerland", *Revue suisse d'économie politique et de statistique*, 1993/129, 601; *Swiss Real GDP Growth, 1980-1996*, working paper, mimeo, University of Geneva, 1997.

^{4/} Meaning that the average price of Swiss exports has tended to increase faster than the average price of Swiss imports.

^{5/} It would appear that the fairly impressive and continuous improvement in Switzerland's terms of trade may be attributed, in first approximation and at least in part, to the above-average performance of Swiss export industries on world markets.

Switzerland's total real GDP using four different indices (ie. the conventional Laspeyres and Paasche indices, Fisher's ideal as well as Törnqvist superlative index) in both their direct and chain version. He thus gets eight different estimates of Switzerland's real GDP in the 1980-1996 period.

Interestingly enough, Kohli finds that his various estimates of total real GDP remain closely bunched in the 1980s, only to diverge sharply in the 1990s. For (e.g.) 1996, the estimated growth rates range from -1.4% (Laspeyres' chain index) to +3.2% (Paasche's direct index). The Törnqvist chain index, preferred by Kohli on methodological grounds together with the Fisher index, falls in-between, yielding an estimated growth rate of 0.1%.

Another possible source of underestimation or distortion examined by Kohli in his 1997 paper concerns the deflation of Switzerland's GDP component termed "changes in inventories and statistical discrepancy". One feature of the Swiss national accounts which, until recently, used to distinguish them from their foreign counterparts was that they did not indicate inventory changes and statistical discrepancy separately, but bunch them into one aggregate.⁶ Moreover, the corresponding price deflator, which the official tables did not indicate but which can be calculated, tended to fluctuate most wildly, suggesting that something might have been amiss with this aggregate when taken in real terms. Kohli tried to correct for this in various ways, and furthermore selecting a geometric average of the growth factors indicated by the Fisher and implicit Törnqvist chain indices (see above), he reached the following general conclusion :

(...) One can venture that real growth might have been about 1.6% in 1994, 0.8% in 1995 and -0.4% in 1996, a performance that is not quite as bad as the official figures suggest. [These official figures are: 0.5% in 1994, 0.6% in 1995 and 0.0% in 1996].⁷

But there are other reasons than those examined by Kohli why Switzerland's real growth may have been underestimated in the 1990s, as we shall now see.

1.2.2 Productivity growth in the services sector

It is well known that estimating real growth, ie. the change in **real** value added, is very arduous for services in general,⁸ and particularly so for financial-banking,⁹ information-technology¹⁰ and insurance¹¹ services. The balance of informed opinion is that real

^{6/} This peculiarity has now been corrected: inventory changes and statistical discrepancy are reported separately in today's Swiss national accounts. But this was not the case for the data available at the time Kohli wrote his paper.

^{7/} Adding up the annual growth rates calculated by Kohli yields a total of 2.0%, as against 1.1% for the official figures. This means that, according to Kohli, growth in 1994-96 was almost twice that indicated by the official data.

^{8/} See for example: M.N. Baily and R.J. Gordon, "The Productivity Slowdown, Measurement Issues, and the Explosion of Computer Power", *Brookings Papers on Economic Activity*, 1988/2, 347-429; S. Fisher, "Symposium on the Slowdown in Productivity Growth", *Journal of Economic Perspectives*, 1988/2, 3-7; Z. Griliches, "Productivity Puzzles and R&D: Another Non-Explanation", *Journal of Economic Perspectives*, 1988/2, 9-21; D.W. Jorgenson, "Productivity and Postwar US Economic Growth", *Journal of Economic Perspectives*, 1988/2, 23-41. Also see the updated and enlarged internet version of: OECD, *Measurement of Valued Added at Constant Prices in Services Activities, Sources and Methods*, Paris, 1987.

^{9/} See for example: J.H. Boyd and M. Gertler, "Are Banks Dead? Or Are the Reports Greatly Exaggerated?", *Federal Reserve Bank of Minneapolis Quarterly Review*, 1994/18/3; M.J. Mandel, "Financial Services: The Silent Engine", *American News Commentary, Business Week*, Dec. 21, 1998, 59-60.

^{10/} See for example: *Information Technology Outlook*, OECD, Paris, 1997.

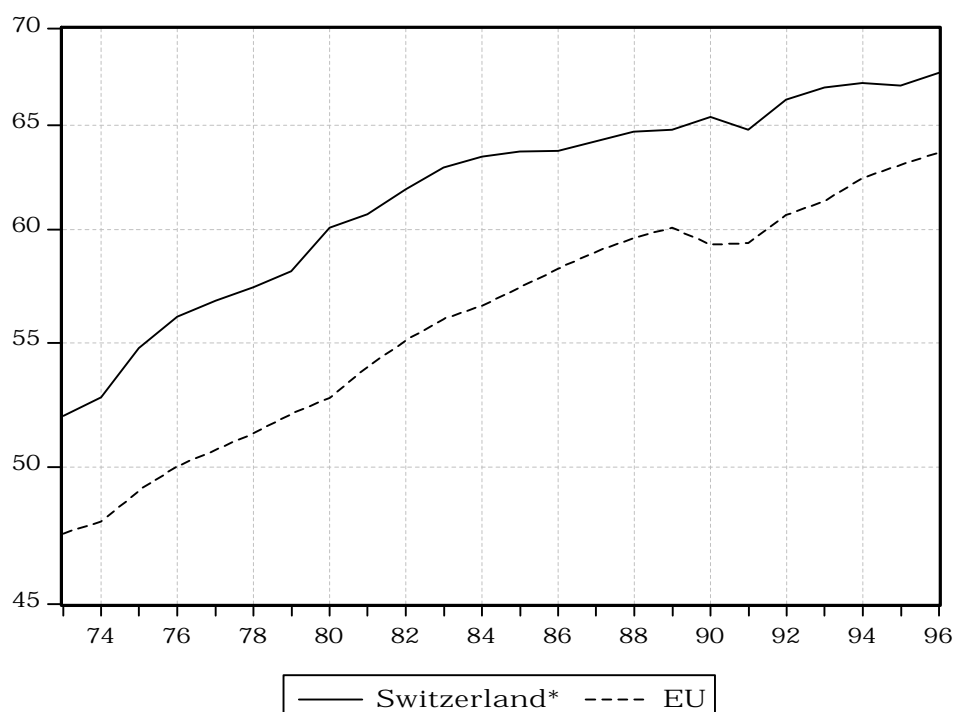
^{11/} See for example: J. Gadrey, "A propos de l'analyse économique des services d'assurance: le concept de produit et la question de son évaluation", *Revue économique*, 1994/45/2, 193-213.

productivity growth in those sectors tends to be seriously underestimated in most national accounts, if not in all of them.

The resulting underestimation of real GDP growth may however vary by country depending first on country-specific national-accounting techniques and, second, on the overall importance of the services sectors in each country. It may well be that the underestimation is **especially** important on both counts in the case of Switzerland.

Whereas it is difficult to generalize about country-specific national-accounting techniques (however see below), Figure 4 shows that the share of services in total civilian employment is significantly larger in Switzerland than in the European Union taken as a whole.¹² Moreover, the slight reversal of the positive trend which occurred in the early 1990s was longer and more pronounced in the EU than in Switzerland.

Figure 4: Share of Services in Total Civilian Employment
(in %; semi-log scale)



* The service sector employment and the civilian employment time series for Switzerland were adjusted backwards to account for a break in the series in 1991. The adjustment consisted in "inflating" the 1973-1990 "old" figures by the average ratio derived for the years 1991, 1992 and 1993, for which both "old" and "new" figures are available.

Source: OECD-OCDE (1997) "Labour Force Statistics - 1976-1996 - Statistiques de la population active", Paris, Table 4.0, pp. 26-27 and Table 7.0, pp. 40-41.

Another clue to an underestimation of real productivity growth in services that may be more important in Switzerland than elsewhere is the fact that the Swiss terms of trade for services have improved massively over time (see above, Figure 3), more so it would seem than for most other countries.

^{12/} We use the share in employment rather than the share in output precisely because of the difficulties associated with measuring output in the services activities.

1.2.3 Other factors

A related issue has to do with productivity growth in the public sector and especially in the official administrations (which include public education). If our information is correct, reported real productivity growth in this sector seems to be essentially nil in Switzerland because - there being no markets - the changes in real output are calculated from the changes in real inputs, ie. mostly hours worked.¹³ In France, by contrast, a real productivity growth factor equal to 1% p.a. is apparently inserted "by hand".

On a more technical level, national statistical offices in many countries¹⁴ use the so-called double-deflation method to estimate real value added in service activities whereas Switzerland applies the direct extrapolation method.¹⁵ The former is demonstrably more precise than the latter, and it is not impossible that Switzerland's use of the less sophisticated method also leads to an underestimation of real growth in the services sector.

To sum up: there are thus many reasons to suspect that the reported growth of real GDP has been underestimated in Switzerland, particularly in the 1990s, and it may well be that this underestimation has been more serious in Switzerland than in many other OECD countries and perhaps in most.

Does that mean that Switzerland's stagnation in the 1990s may be nothing more than a statistical artefact? In other words, does it mean that the Swiss economy might not, after all, have fallen behind the other industrialized countries, or most of them? Our answer to these questions is a **qualified no**; ie. it will be argued in the next two sections that there has indeed been a problem of **slow growth**, although **not as acute** as suggested by national data.

1.3 Another View (PPP surveys)

Another, altogether different way of assessing and comparing the "growth performance" of the OECD countries is by reference to the cross-section results of the periodic **PPP** (purchasing power parity) **surveys** masterminded by the OECD. As the reader may know, these surveys allow the computation of "artificial" or "non-market" exchange rates (ie. PPP exchange rates) which equalize the purchasing power of any given sum in the various national currencies concerned.¹⁶ Given these PPP exchange rates, total and per capita GDP can then be meaningfully compared in the various participating countries,¹⁷ and the latter may be ranked in each survey year by reference to an index equal to 100 for the OECD as a whole.

Table 1 indicates the per capita GDP ranking of 25 OECD countries in the 1990, 1993 and 1996 survey years. (The figures for 1997 are extrapolations based on inflation rate differentials and are reproduced for information purposes only). The 1990 survey is the first one in

^{13/} To illustrate: as far as we know, the (minuscule) contribution of our Institute to Switzerland's real GDP is still measured in the official national accounts on the basis of hours worked. Yet, because of the huge advance in computer technology (software as well as hardware), we can do today in two or three days what used to take us a month.

^{14/} Ie. Japan, Denmark, the United States, Germany, France, Canada, the Netherlands and Sweden.

^{15/} Often basing the extrapolation on a single indicator. On this, see the updated and enlarged internet version of: OECD, *Measurement of Valued Added at Constant Prices in Services Activities, Sources and Methods*, Paris, 1987.

^{16/} The PPP exchange rates often diverge considerably from the market rates. For example, the American dollar was worth 1.236 Swiss francs on the market in 1996 (annual average) whereas the PPP exchange rate was 2.05 francs to the US dollar.

^{17/} Ie. much more meaningfully than if market exchange rates are used.

which Switzerland participated fully, the Swiss figures in the OECD tables for earlier years being indirect estimates of questionable accuracy. A close look at the methodology used by the OECD and the considerable amount of effort and information that goes into the PPP surveys suggest that the resulting country rankings are probably fairly reliable, although of course not perfectly so.¹⁸ In that respect, it is noteworthy that these PPP results are used, as a rule, by Brussels to determine the member countries' contributions to the EU budget.

Table 1: GDP per Capita - Indices Using Current PPPs (OECD=100)

	1990	1993	1996	1997*
Canada	114	108	110	111
Mexico	36	38	35	36
United States	137	136	135	136
Japan	110	114	117	114
Australia	99	97	103	102
New Zealand	82	83	84	83
Austria	103	106	108	107
Belgium	103	109	108	108
Denmark	105	109	118	119
Finland	100	86	92	95
France	107	103	100	99
Germany	99	102	103	103
Greece	57	61	64	65
Iceland	107	104	114	116
Ireland	70	79	90	96
Italy	100	98	100	99
Luxembourg	141	156	155	154
Netherlands	98	99	102	103
Norway	108	118	124	125
Portugal	59	64	67	68
Spain	73	74	74	74
Sweden	105	93	96	95
Switzerland	131	130	122	121
Turkey	29	31	29	30
United Kingdom	98	94	95	95
OECD 25	100	100	100	100

*Extrapolations based on inflation-rate differentials.

Source: OECD-OCDE (1999), "National Accounts: Main Aggregates - 1960-1997, Volume 1 - Comptes nationaux : principaux agrégats", Paris, Part Seven, Comparative Tables Based on PPPs, Table 3, pp. 162-163.

Table 1 shows that per capita GDP in Switzerland decreased but slightly between 1990 and 1993 relative to an OECD average equal to 100, ie. from 131 to 130, which is probably not

¹⁸/ For a discussion of these matters as well as for some results that can be obtained from the OECD PPP data, see: J.Ch. Lambelet, "Niveau de vie et niveaux des prix en Suisse et dans les autres pays de l'OCDE", *Analyses & Prévisions*, Institut Créa, Université de Lausanne, Spring 1994 edition.

significant. From 1993 to 1996, however, it fell by **no less than 8 points**, ie. from 130 to 122. This is particularly interesting inasmuch as it means that Switzerland hardly lost any ground during the recession years of the early 1990s, but that it **did** fall back significantly **after** the OECD-wide recession had ended. We shall return to this finding later on when examining the possible reasons for Switzerland's relative growth under-performance in the 1993-1996 (possibly 1993-1998) years.

Let it also be noted, by anticipation on this paper's last section ("Is Switzerland really all that rich?"), that per capita GDP nevertheless remained comparatively high in Switzerland in 1996, its level (122) being surpassed in that year only by Luxembourg (155), the United States (135) and Norway (124). Thus, Switzerland still ranked **number four** among the 25 OECD countries considered.

A wealth of other intriguing and possibly significant information can be extracted from Table 1.¹⁹ Thus, the United States apparently managed to "hold its rank" for all practical purposes between 1990 (137) and 1996 (135), as did Italy (100 in both years), but not Canada (with a fall from 114 to 110). Germany, on the other hand, appears to have gained ground (from 99 to 103) despite the difficulties arising from its re-unification.²⁰ Regarding the less-affluent OECD countries, it may be a matter of concern that if Portugal, Greece and especially Ireland managed to forge ahead (respectively from 59 to 67, 57 to 64, and 70 to 90), this was not the case for Mexico (36 to 35), Spain (73 to 74) and Turkey (29 in both years). Curiously or not, Britain's thatcherite reforms did not prevent its slipping somewhat (from 98 to 95, meaning that by 1996 it was hardly ahead of...Ireland). Similarly, New Zealand's much talked-about reforms seem to have had practically no impact on its ranking (which increased but slightly, from a low 82 to a barely higher 84), although it could of course be argued that, absent these reforms, it would have fallen back. Similarly, much has been made of the "Dutch model", but its impact does not seem to have been overwhelming, at least as far as per capita GDP goes, the Dutch index having increased but modestly from 98 to 102. Denmark, on the other hand, has attracted much less international curiosity although it managed an impressive jump from 105 to 118 (as did Norway, but for more down-to-earth - or "down-to-sea" - reasons, of course). Contrary to what may have been expected, Japan improved its relative standing between 1990 and 1996 (from 110 to 117), as did - surprisingly? - Belgium (from 103 to 108), Austria (also from 103 to 108) and Australia (from 99 to 103). Finally, France's index fell by almost as much as Switzerland's (ie. by 7 points as compared to 9) while Sweden's retreated by exactly as many points as Switzerland, but from a significantly lower initial level, with the result that Sweden's per capita GDP appears to be less, nowadays, than the OECD average.

1.4 Comparing the two views

Comparing the two views (national growth estimates vs. PPP results) may give some indications about the extent to which national sources tend to underestimate - or possibly overestimate - real per capita growth in the countries considered.

¹⁹/ Of course, the 1990-1996 changes in the various countries' ranking which will be pointed out presently in this paragraph may be due in part to short-term country-specific cyclical influences (the national business cycles not being fully synchronized) rather than to longer-term "structural" factors.

²⁰/ Both figures (1990 and 1996) refer to re-unified Germany; see OECD (1999), p. 163.

Table 2: GDP per Capita Indices Using Current PPPs (OECD=100) for 1996

	As originally published by the OECD*	As obtained from national real growth factors	Difference
	A	B	(B-A)
Canada	110	109	-1.1
Mexico	35	35	-0.1
United States	135	141	5.6
Japan	117	114	-2.0
Australia	103	107	3.7
New Zealand	84	84	0.2
Austria	108	105	-2.3
Belgium	108	104	-4.3
Denmark	118	114	-4.2
Finland	92	93	0.6
France	100	106	6.0
Germany	103	97	-6.5
Greece	64	57	-7.5
Iceland	114	105	-9.5
Ireland	90	94	4.2
Italy	100	100	0.1
Luxembourg	155	165	10.4
Netherlands	102	103	0.8
Norway	124	126	1.5
Portugal	67	63	-4.0
Spain	74	75	1.1
Sweden	96	100	4.2
Switzerland	122	119	-2.9
Turkey	29	31	1.7
United Kingdom	95	99	4.4
OECD 25	100	100	0.0
OECD 25 (unweighted average)	97.8	97.8	0.0

*See Table 1.

Source: OECD-OCDE (1999), "National Accounts: Main Aggregates - 1960-1997, Volume 1 - Comptes nationaux : principaux agrégats", Paris, Part Seven, Comparative Tables Based on PPPs, Table 3, pp. 162-163.

To that end, Table 2 was constructed in the following manner. First, a 1996/1990 "growth factor" for real per capita GDP was calculated for each country from its own national accounts (as compiled and published by the OECD). Then, this factor was applied to each country's **1990** GDP-per-capita **PPP** index as indicated in Table 1. In the next step, the resulting 1996 indices were re-based so as to make their unweighted mean equal to the unweighted mean of the 1996 PPP indices (ie. 97.8). The final adjusted indices are shown in column B of Table 2.²¹ The third column (B-A) is the difference between the 1996 rankings

^{21/} The OECD country indices are expressed on the basis of OECD=100. Since the latter average does not

obtained from the adjusted national real growth factors (column B), on the one hand, and the 1996 PPP rankings (column A), on the other hand. A **positive** figure in this third column means that national statistics **overestimate** growth relative to the PPP results, and vice-versa for a negative figure.

On the face of it, national sources would thus seem to **overestimate** per capita real growth - as compared to what the PPP surveys indicate - in the following countries, ranked in decreasing order: Luxembourg (by 10.4 points over the 1990-1996 period), France (6.0 points), United States (5.6), United Kingdom (4.4), Ireland and Sweden (4.2), Australia (3.7), Turkey (1.7), Norway (1.5), Spain (1.1), Netherlands (0.8), Finland (0.6), New Zealand (0.2) and Italy (0.1).

Conversely, the figures in column 3 of Table 2 point to per capita real growth being **underestimated** by the national accounts of the following countries: Iceland (by 9.5 points), Greece (7.5), Germany (6.5),²² Belgium (4.3), Denmark (4.2), Portugal (4.0), **Switzerland (2.9)**, Austria (2.3), Japan (2.0), Canada (1.1) and Mexico (0.1).

These over- or underestimation factors must however be taken with a goodly pinch of salt. For one thing, the weighting of each country's GDP components does not stay constant in the successive PPP surveys (or then only by accident), although the weights are not likely to have changed much over a six-year period. Neither are these weights necessarily the same as those used in the national accounts, be they constant or not. This means that the national growth calculations and the PPP results are comparable **to a limited extent** only; or, alternatively, that at least part of the identified discrepancies can be explained on these grounds.

For another thing, the PPP results should not necessarily be taken as the "revealed (growth) truth", as it were, for they too may suffer from problems, distortions and sundry imprecisions of their own. More generally, it is perfectly possible that national sources could actually underestimate (or overestimate) growth in **all** countries, so that the figures in the third column of Table 2 would only indicate the **relative** severity of the underestimation (overestimation) problem in the various countries.²³

Be that as it may, the calculated discrepancies between national estimates and PPP results, which range from -9.5 to +10.4 points over six years,²⁴ are nevertheless of a magnitude which suggests that there is indeed - that there must be - significant problems with measuring real growth in the industrialized countries, problems which are likely to have become relatively acute in recent years for the reasons discussed earlier. Incidentally, this raises the question as to how these data problems might affect econometric model-building when based on national

involve any country-specific weighting (or, if one prefers, all countries' per capita PPP GDPs have the same weight), the growth factors can be applied straightforwardly to the 1990 PPP figures, and all that is needed is to re-base the 1996 derived indices so as to make their unweighted arithmetic average equal to that of the 1996 PPP indices.

^{22/} This result for Germany should however be taken with caution, because the German national accounts give real GDP for re-unified Germany from 1991 on only (no figure for 1990) whereas the data for West Germany stop in 1994. Consequently, the national real growth factor for (re-unified) Germany refers to the 1991-1996 period, which means that real growth has been implicitly assumed to be zero between 1990 and 1991.

^{23/} This follows from the way the second column of Table 2 was constructed - see above.

^{24/} It is true that these extreme values concern two very small economies, ie. Luxembourg (+10.4) and Iceland (-9.5), for which both national accounting and PPP calculations may run into difficult specific problems linked to their size. (For example, it is known that the residents of Luxembourg do a lot of direct shopping across the border; the question can be raised as to how this is handled in both the Luxembourg national accounts and its PPP coverage). Excluding these two very small economies, the largest discrepancies concern, on the one hand, France (+6.0), the United States (+5.6) and the United Kingdom (+4.4); and on the other hand, Greece (-7.5), Germany (-6.5) and Belgium (-4.3).

time-series often covering several decades (ie. not just the 1990s), no matter what form the model-building efforts take (conventional structural models, VAR and other time-series models, computable-general-equilibrium models, etc.).²⁵

1.5 An alternative approach ?

Table 3: GDP per Capita Indices Using Current PPPs (OECD=100) for 1996

	As originally published by the OECD*	As obtained from national real growth factors	As obtained from national real growth factors (rebased)	As obtained from national nominal growth factors
	A	B	C	D
Canada	110	109	109	104
Mexico	-	-	-	-
United States	135	141	140	140
Japan	117	114	114	102
Australia	103	107	106	102
New Zealand	84	84	84	80
Austria	108	105	104	108
Belgium	108	104	103	104
Denmark	118	114	113	109
Finland	92	93	92	88
France	100	106	105	103
Germany	-	-	-	-
Greece	-	-	-	-
Iceland	114	105	104	110
Ireland	90	94	93	91
Italy	100	100	100	116
Luxembourg	155	165	164	160
Netherlands	102	103	102	100
Norway	124	126	125	120
Portugal	-	-	-	-
Spain	74	75	74	86
Sweden	96	100	99	103
Switzerland	122	119	118	117
Turkey	-	-	-	-
United Kingdom	95	99	98	105
OECD 20	100	100	100	100
OECD 20 (unweighted average)	107.4	108.2	107.4	107.4

*See Table 1.

Source: OECD-OCDE (1999), "National Accounts: Main Aggregates - 1960-1997, Volume 1 - Comptes nationaux : principaux agrégats", Paris, Part Seven, Comparative Tables Based on PPPs, Table 3, pp. 162-163, and Part Three, Main Aggregates: Countries, pp. 31-91.

^{25/} To illustrate from our Swiss forecasting experience: since the early 1990s, Créa's various econometric models have consistently tended to overestimate real growth as indicated by the national accounts. The operators in charge of these models (the first author being one of them) have often had the feeling that their models' *ex ante* results were more realistic than the *ex post* official data. Maybe it was more than a feeling.

In view of all this, an alternative approach comes to mind. Let us assume that all or at least most industrialized countries actually experienced approximately the same degree of inflation in the 1990s because they shared more or less the same macroeconomic environment and the same policy objectives, particularly in Europe. Considering all the problems involved in estimating real variables such as per capita real GDP (see above), using **nominal** variables - eg. per capita nominal GDP - might conceivably yield a better indication about the various countries' **relative** growth performance. In other words, ignoring the (presumably small) differences in underlying inflation may conceivably mean smaller distortions than those arising from the various national practices in matters such as deflation and real productivity estimates.

To verify this hypothesis, we have eliminated four OECD countries (Mexico, Greece, Portugal, Turkey) in which inflation during the 1990-1996 period was clearly completely out of step with rest of the OECD. On top of that, we also had to discard Germany because no consistent official figures are available for nominal per capita GDP in the 1990-1996 period.²⁶

Applying the various national **nominal** 1996/1990 growth factors to the 1990 PPP indices for the remaining 20 countries and re-basing the resulting indices (just as has been done when using real growth factors) yields the figures in column D of Table 3.

Comparing columns C and D with column A, it is seen that for the following seven countries the nominal indices (column D) are **closer** to the PPP results (column A) than the real indices (column C): Australia, Austria, Belgium, France, Iceland, Ireland and Luxembourg. The opposite is however true for twelve of the remaining countries while the nominal and the real approaches give exactly the same value for the United States.

Generalizing, the simple correlation coefficient between column C and A is .975 while it is only .916 between column D and A. This means that the real approach yields results which are significantly closer to the PPP figures than is the case for the nominal approach. In other words, all the national-level efforts that go into calculating real variables such as real per capita GDP do not appear to be in vain (in the 1990s) in spite of all the difficulties involved. Had we found otherwise, that would have been revolutionary indeed.

1.6 Back to Switzerland

But let us return to the case of Switzerland and let it be assumed that the PPP results for that country are more reliable than the national real growth estimates, an assumption which at least the authors have no trouble accepting. This would mean that real per capita growth has been **underestimated** by a total of about **3 index percentage points** over the 1990-1996 years, which translates into an average annual growth rate of per capita GDP underestimated by somewhat less than 0.4 percentage points. The corresponding putative underestimation of the average annual growth for total real GDP amounts to 0.1 percentage point.²⁷

If this is correct, as we believe it is, the conclusion then is that the Swiss economy has indeed been characterized by relatively slow growth in the 1990s (ie. up to 1998 at least), although not as slow as indicated by national data. In other words, "**weak real growth**" rather than outright "stagnation" is likely to have characterized the Swiss economy in the 1990s.

^{26/} See note 21 above.

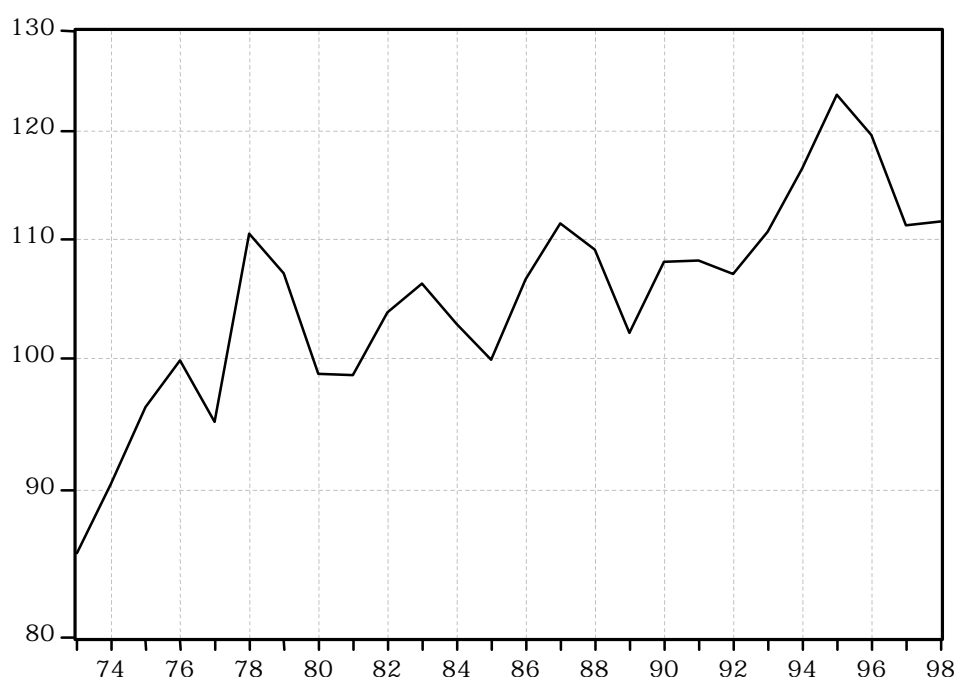
^{27/} It is noteworthy that this estimate (ie. an underestimation by 0.1 percentage point p.a.) is exactly the same as that found by Kohli, on average, for the years 1994-1996.

1.7 Why this weak growth ? A few hypotheses

A first hypothesis is the general **convergence** proposition: in a world that enjoys overall peace and where technological know-how and capital circulate fairly freely, it is to be expected that richer countries will tend to grow more slowly than poorer countries, and vice-versa. This is of course a medium- to long-term proposition, but it is interesting that there is some *prima facie* evidence in its favor even in the comparatively short 1990-1996 period.²⁸ Therefore, weak(er) growth in Switzerland could possibly be due, at least in part, to this general proposition.²⁹

Figure 5: Swiss Franc Real Effective Exchange Rate

(weighted index for 15 major trade partners,
November 1977=100, semi-log scale)



Source: SNB.

A second hypothesis relates to Swiss **monetary policy** and its effect on the real exchange rate of the franc. As Figure 5 shows, Switzerland's currency went through a phase of very

^{28/} Let X_i be the *i*th country's ranking in 1990 and let Y_i be its 1996 ranking (see Table 1). Then, the convergence proposition can be tested by means of the following equation

$$Y_i = a + b \cdot X_i + e_i,$$

with convergence corresponding to $E(a) > 0$ and $E(b) < 1$. Estimating this equation by OLS yields (standard errors and t-statistics are indicated in parentheses below the parameters):

$$Y_i = 5.23 + .976 \cdot X_i, \quad r^2 = .93 \text{ and } F = 287.4$$

(5.68) (.058)
(0.92) (17.0)

It is seen that the parameters' estimated values correspond to expectations under the hypothesis of convergence, although the constant is not significantly different from zero at the 5% level and the slope not significantly different from one.

^{29/} The estimated equation listed in the preceding footnote predicts a rank of 133 for Switzerland in 1996 as against an actual rank of 122. This is an indication that Switzerland's 1996/1990 fall back is hardly likely to be due to the convergence phenomenon.

strong **real** appreciation in 1993, 1994 and 1995, which in turn was surely due to a monetary policy stance that was overly restrictive. Whereas the Federal Reserve under Alan Greenspan knew or sensed that underlying domestic economic conditions made it possible to pursue an expansive monetary policy in these years without risking to rekindle inflation, the Swiss National Bank continued single-mindedly to give exclusive priority to price stability. In hindsight, this "overkill" feature of their policy is freely acknowledged today by the Swiss monetary authorities.³⁰ It is recalled from Table 1 that Switzerland managed to "hold its (PPP-GDP) rank" between 1990 and 1993, and that its fairly precipitous decline occurred between 1993 and 1996. In our opinion, that is a strong clue in favor of this second hypothesis. Should the next OECD PPP survey, scheduled for 1999 (with results available around 2001), show an improvement in Switzerland's ranking, with e.g. a climb-back to, say, around 128 (from 122 in 1996), then the case will become very strong that monetary policy was indeed the key element in the country's 1993-1996 relative economic decline.

A third hypothesis, for which there is some (in our view, fairly strong) evidence,³¹ has to do with Swiss **consumers' demand**: for various reasons, the consumers' "animal spirits" remained inordinately depressed in those years, for an inordinately long time - meaning that the economy may have suffered from insufficient aggregate demand in the Keynesian sense.³²

A fourth and final hypothesis, stressed by the IMF among many others,³³ refers to an increasing burden due to various **structural rigidities**, of which there is surely no dearth in the Swiss economy. It is however not clear that these rigidities are - or have become - more pervasive and/or more weighty in Switzerland than in (most of) the other industrialized countries.

These four hypotheses are **not** mutually exclusive. Probably all of them played a part in Switzerland's weak growth performance. What we do not know - what no one seems to know so far - is their **relative importance** in explaining the slowdown of the Swiss economy in the 1990s. Although this is surely a crucial issue for Swiss economic policy and for the country at large, the only possible conclusion is therefore: more research is (urgently) needed...

^{30/} Twice a year, the Créa Institute produces and publishes economic forecasts for Switzerland, meaning that there were six forecasting exercises in these 1993-1995 years. For forecasting purposes, the franc exchange rate is projected exogenously. It turned out subsequently that in each of these six forecasting exercises, the franc's appreciation had been underestimated, sometimes by a wide margin. This was because the operators could not bring themselves to believe that the Swiss National Bank would allow the country's currency to go on appreciating in real terms so steadily and so strongly. Of course, this was another reason why our forecasts turned out to have been systematically too "optimistic" in these years.

^{31/} See the following sources: *Manifesto by Swiss Economists*, Lausanne, Créa Institute, January 1997; J.C. Lambelet, "Private Consumption: The New 'Animal Spirits'?", *Analyses & Prévisions*, Institut Créa, Fall 1996 edition; J.M. Natal, "Switzerland's Economy: Why the 'Six-Year Stagnation'? Using a VAR Model as a Simulation and Forecasting Tool", *Analyses & Prévisions*, Institut Créa, Fall 1997 edition. In a recent seminal paper, J.P. Danthine, J.B. Donaldson and T. Johnsen have shown, on a theoretical level, that a negative shock affecting consumers' confidence could instead result in **stronger** real growth, essentially because higher saving by consumers translates into higher investment (see: "Productivity Growth, Consumer Confidence and the Business Cycle", *European Economic Review*, 1998/42, 1113-1140); their model however concerns a closed economy; in a small open economy like Switzerland's, higher saving by consumers may largely take the form of increased investment abroad, with no or little effect on domestic investment.

^{32/} On top of this, it is possible and even likely that Swiss **fiscal policy** (or rather policies) also tended to be too restrictive in those years.

^{33/} See for example: Ketil Hviding, *Switzerland's Long-Run Growth Slowdown*, Washington, IMF, n.d.

2. Fabulously rich Switzerland...

It was noted above that, in spite of the 1993-1996 slowdown, Switzerland's 1996 **per capita** GDP remained on the high side in international (PPP) comparison, the country ranking fourth among 25 OECD member countries.

2.1 Why so rich ?

This of course raises the question as to **why** Switzerland is or appears to be relatively **rich**. Is this due to consistently low interest rates, a high overall saving rate, a surfeit of capital and hence a fairly high investment level? And/or to a set of very efficient export industries (including services such as banking and insurance)? And/or to the Swiss economy being very much an open one, at least insofar as trade is concerned? And/or, possibly, to the virtues of a (hypothetical) "Swiss model", meaning things such as political stability; strong work ethics; private and corporate income tax rates (both average and marginal) which remain on the low side in international comparison; a sizable stock of high-quality human capital, particularly because of an apprenticeship system emphasizing on-the-job training; fairly efficient public administrations; comparatively little corruption; a relatively flexible labor market characterized by decentralized wage-bargaining, general labor-management cooperation and very little strike activity? Etc.

In the following, it will be argued that the main explanation could very well be rather more **down-to-earth**. Putting it in a nutshell and somewhat bluntly: it appears that the main reason why the country seems to be relatively rich in international comparison - ie. why it has a high per capita GDP - is that **many people work in Switzerland**, and those who do tend to **work a lot** (*ceteris paribus*).

2.2 Participation rates

Looking at the first column of Table 4, it is seen that Switzerland had, in 1996, the highest overall **labor force participation rate** (55.4%) among 25 OECD countries, followed by Iceland (54.8%), Denmark (53.6%), Japan (53.3%) and Luxembourg (52.9%). It should be noted that these percentages are calculated as the total number of employed and unemployed divided by total resident population, where each person employed is counted as one unit no matter whether she/he has a full-time job or a part-time one.

Calculating the participation rate as the ratio of persons employed - defined as above - and unemployed to the population of **working age** (second column of Table 4), the 1996 Swiss participation rate remains high (76.4% vs. an EU average of 67.6%), but not as high as that of Iceland (83.5%), Denmark (79.5%), Norway (79.2%), Sweden (77.8%) and the United States (77.1%). The difference is largely due to the age structure of the population, there being comparatively fewer young people in Switzerland. Furthermore, the first column is the more relevant one in the present context because GDP per capita is the "affluence indicator" generally used, ie. GDP divided by total population.

2.3 Hours worked "normally"

Regarding the second proposition (Swiss residents who work tend to **work a lot**), the third column of Table 4 shows that among the 16 countries for which such data exist, the number of "hours normally worked per week by a full-time employee" is the second highest in Switzerland (42.1 hours per week), after the United Kingdom (43.9 hours).

Table 4: Labour Force Participation and Normal Weekly Hours - International Comparison, 1996

	Labour force participation rate		Hours normally worked per week by full-time employees
	% of total population	% of working-age population	
Canada	50.8	74.8	n.a.
Mexico*	36.2	61.9	n.a.
United States	50.9	77.1	n.a.
Japan	53.3	72.0	n.a.
Australia	50.2	73.7	n.a.
New Zealand	49.4	75.7	n.a.
Austria**	48.3	71.1	40.0
Belgium***	42.4	62.2	38.3
Denmark	53.6	79.5	38.7
Finland	49.4	73.7	38.7
France	43.9	67.4	39.8
Germany	48.0	70.8	40.0
Greece*	40.6	61.0	40.4
Iceland	54.8	83.5	n.a.
Ireland	41.3	62.3	40.4
Italy**	40.6	57.7	38.6
Luxembourg*	52.9	61.1	39.5
Netherlands	48.5	69.9	39.4
Norway	51.4	79.2	n.a.
Portugal	49.2	67.5	41.2
Spain	41.1	61.3	40.6
Sweden	48.4	77.8	40.0
Switzerland*	55.4	76.4	42.1
Turkey	36.3	56.0	n.a.
United Kingdom	48.6	76.1	43.9
EU 15	41.9	67.6	40.4

* Data for 1995 in the first column.

** Data for 1994 in the first column.

*** Data for 1993 in the first column.

Sources: OECD-OCDE (1997), "Labour Force Statistics - 1976-1996 - Statistiques de la population active", Paris, Table 3.0, pp. 24-25, for the first column; OCDE (1998), "Perspectives de l'emploi, juin 1998", Paris, Tableau B in "Annexe statistique", p. 209, for the second column; OFS (1999), "Annuaire statistique de la Suisse", Zürich, Table 3.12, p. 115, for the third column.

These data are however not sufficient to answer the question as **to what extent** Switzerland owes its fabled affluence to the amount of work put in by its people (or possibly to other factors). In particular, what about the hours worked by the self-employed and by people with part-time jobs? All the more so than the relative importance of both categories, and especially the second one, varies quite substantially across countries. For example, it is known that the proportion of part-time jobs is or has become unusually high in several countries, Switzerland being one of them. Incidentally, this does not necessarily mean that the labor market is malfunctioning, in the sense that all part-time jobs should be considered as second-class precarious occupations; for there is good evidence to the effect that these jobs are in fact often much sought-after, especially by (married) women.

2.4 The grand total of hours worked per year

All this suggests that a better indicator would be, quite simply, **GDP per hour worked**; meaning each country's GDP - put on a comparable basis with the help of PPP exchange rates - divided by the **grand total** of hours worked **per year**. Note that this will also make allowance for vacations and official holidays, since vacation length and the number of official holidays per year vary significantly across countries. (For example, vacations tend to be especially long in France and short in the USA while the number of official holidays is especially small in Switzerland).

The idea is simple, but its implementation turns out to be rather arduous on account of the available data. The following results should therefore be taken with great caution and as a first approximation only.

A **direct estimation** of the grand total of hours worked in 1996 is available - so far as we have been able to determine - for four countries only: Finland, Germany, Norway and Switzerland. In the latter case, this grand number (ie. 6'555 million hours) is an extrapolation based on a sample survey ("micro-census").³⁴ Given that the sample is made up of no less than 16'200 persons,³⁵ this extrapolation would appear fairly reliable.

As to the other countries for which usable data exist (ie. 12 other OECD countries, there being no usable data for 9 countries), the grand total of hours worked in 1996 was obtained **indirectly** by multiplying average annual hours worked by the average annual number of persons employed, where care was taken to select consistent series, or as consistent as possible. This indirect approach is however fraught with statistical difficulties of all sorts and the resulting grand totals should be taken with caution, about which more in a moment.³⁶

2.5 GDP per capita, per person employed and per hour worked

Column 6 in Table 5 indicates the indices for **GDP at PPP per hour worked** for the 16 countries concerned whereas column 4 gives the indices for **GDP at PPP per person employed**, both series having been re-based in the same manner as previously. These two columns may then be compared with column 2, ie. the indices for **GDP at PPP per capita** as discussed earlier.³⁷

³⁴/ See: *Enquête suisse sur la population active* (ESPA), Office fédéral de la statistique, Berne.

³⁵/ Out of a labor force of somewhat less than 4 million. Data for 1998.

³⁶/ The ILO is currently engaged in an effort to gather data on total hours worked per year, the results of which should become available (for a limited number of countries) in the course of the current year. - This ILO study has indeed been published - in early September - since this paper was written (*Key Indicators of the Labour Market*, ILO, Geneva). Although it was ordered at the time of publication, we were still waiting for it in late October...

³⁷/ As far as we know, the first time anyone tried to compute GDP at PPP per person employed **and** per hour worked was in an OECD working paper by Dirk Pilat (*Labour Productivity Levels in OECD: Estimates for Manufacturing and Selected Service Sectors*, September 1996). His relevant table is reproduced in an APPENDIX to the present paper, together with the raw data underlying Table 5. There are significant discrepancies (ie. by more than 5 points) between his 1994 GDP-per-person-employed indices and our 1996 indices for the following four countries (out of 25): Japan, Greece, Ireland and the Netherlands; the simple correlation coefficient between the two series is 0.982 (n=25). In the case of GDP-per-hour-worked, as the reader may check, significant discrepancies are present for the following seven countries (out of 16): USA, Japan, New Zealand, Germany, Norway, Spain and Sweden; the corresponding simple correlation coefficient is 0.938 (n=16). It may be, given the sources used by Dirk Pilat for total hours worked (see bottom of his table), that our indices are more precise and up-to-date.

Table 5: Real GDP per Capita and Labour Productivity Measures - International Comparison, 1996*

	GDP at PPP per capita USD (1)	GDP at PPP per capita OECD=100 (2)	GDP at PPP per person employed USD (3)	GDP at PPP per person employed OECD=100 (4)	GDP at PPP per hour worked USD (5)	GDP at PPP per hour worked OECD=100 (6)
Canada	22735	110	49585	106	28.6	109
Mexico	7181	35	20401	44	10.4	40
United States	27831	135	57741	124	29.6	113
Japan	23980	117	46534	100	24.6	94
Australia	21223	103	46256	99	24.8	94
New Zealand	17345	84	37972	81	20.7	79
Finland	19030	92	45926	98	27.2	104
France	20520	100	53352	114	32.0	122
Germany	21221	103	48595	104	32.0	122
Iceland	23533	114	44366	95	23.9	91
Norway	25547	124	52363	112	36.8	140
Portugal	13816	67	30252	65	15.1	57
Spain	15183	74	47254	101	26.1	99
Sweden	19730	96	44007	94	28.3	108
Switzerland	25015	122	46899	100	27.1	103
United Kingdom	19521	95	43783	94	25.3	96
OECD 25	20576	100	47337	100	-	-
OECD 25 (unweighted avg)	20134	97.8	45700	97.8	-	-
OECD 16 (unweighted avg)	20213	98.2	44705	95.7	25.8	98.2

*Raw data on total GDP at PPP, population, employment and total hours worked are provided in Table A1 in the Appendix.

Sources: OECD-OCDE (1999), "National Accounts: Main Aggregates - 1960-1997, Volume 1 - Comptes nationaux : principaux agrégats", Paris; OECD-OCDE (1997), "Labour Force Statistics - 1976-1996 - statistiques de la population active", Paris; OCDE (1998), "Perspectives de l'emploi, juin 1998", Paris; OFS (1999), "Annuaire statistique de la Suisse", Zürich; direct information from the statistical offices of Finland, Germany, Norway and Switzerland on total hours worked. Authors' calculations in the last four columns.

For most countries, the three ranking indices differ considerably, the United Kingdom being one exception (with 95 for GDP per capita, 94 for GDP per person employed and 96 for GDP per hour worked) together with Canada (110, 106, 109). Several countries experience a steady **fall in ranking** as one moves from GDP per capita to GDP per person employed to GDP per hour worked - thus the United States (135, 124, 113), Japan (117, 100, 94), Australia (103, 99, 94), New Zealand (84, 81, 79), Iceland (114, 95, 91) and Portugal (67, 65, 57).

The reverse, ie. an **increase in ranking**, obtains for Finland (92, 98, 104), France (100, 114, 122) and Germany (103, 104, 122). Finally, the results are **mixed** for Mexico (35, 44, 40), Norway (124, 112, 140), Sweden (96, 94, 108) and Switzerland (122, 100, 103).

The cases of **France** and **Germany** are particularly striking. Whereas their 1996 per capita GDP is about average (100 and 103), they have the highest GDP per hour worked among the 16 OECD countries considered (122 in both cases, ie. more than the US which comes in at 113), if one excepts the special case of Norway (140).³⁸ One possible explanation is that high

^{38/} To put it rather sweepingly: if an hour worked means turning an oil well's tap on and off, that hour of work

labor costs in France and Germany (including all social levies as well as indirect costs such as those connected with hiring and firing) have resulted in capital being substituted for labor on a massive scale. It is possible that these high labor costs have also brought about a high "intensity level" of the work effort.

If this is so, it would mean - somewhat ironically or sadly - that once a resident has managed to break into France's or Germany's "magical circle" made up of those who have a job (the "insiders"), that person will find herself/himself not only surrounded (burdened?) by a lot of productive equipment, but she/he may also have to work very hard. As a result, that person may then - understandably - start yearning for as short a work-week and as long an annual vacation period as possible, while also - just as understandably - longing for (early) retirement...

2.6 Back to Switzerland

Table 5 confirms the hypothesis or suspicion that Switzerland's high per capita GDP is largely the **result of a high input of labor**: per person employed, the Swiss index is exactly equal to the OECD average (100) and the country ranks hardly higher on the output-per-hour-worked scale (103).

Before drawing some conclusions from these findings, a further word of caution is necessary. The indices for GDP per person employed and per hour worked rest on rather shaky statistical foundations and they are therefore rather fragile. To illustrate just how fragile, here are the GDP-per-hour-worked indices for the four countries for which there are direct estimates for the grand total of hours worked, but for which this grand total can also be calculated indirectly in the same manner as for the other 12 countries:

1996 GDP at PPP per hour worked (OECD=100) using		
	<u>Direct estimates</u>	<u>Indirect estimates</u>
Finland	103	97
Germany	122	117
Norway	140	141
Switzerland	103	112

As it happens, the difference is largest in the case of Switzerland. This is probably because the direct estimate of total hours worked is more encompassing, in the case of Switzerland, than the data underlying the indirect estimate.

Our own feeling - for what it's worth - is that Switzerland will probably come in at a level higher than 103 (but not necessarily as high as 112) if and when comparable figures for total hours works become available for a larger number of countries.

Be that as it may, one finding about Switzerland seems quite robust. Ie. its oh-so-high income or, if one prefers, its fabled affluence is nothing but **a myth** if due account is taken of the amount of work put in by its people. In other words, there is wealth and wealth: a high

will of course be highly "productive", given the way productivity is defined here (ie. real value added divided by work hours).

income due to effort and diligence is one thing; a high income due to nature's bounty - be it oil, other natural resources, climate or whatever - is quite another thing.

2.7 The lessons

Widely-believed and firmly-entrenched myths generally carry a **price**. Here are three examples of what its reputation as a wealthy country has (or might still) cost Switzerland.

- The **global settlement** extracted last summer from the Swiss banks in the dormant accounts' affair. As one knows, the price tag for that settlement amounts to 1.25 billion dollars, not counting the very high costs of various search efforts or the "voluntary" contributions to sundry funds. There are many reasons why the Swiss banks finally caved in:³⁹ above all, the fact that their important, nay, vital stake in the American banking-financial business meant that they were highly vulnerable there (threatened boycotts, etc.) and could be made hostage to the U.S. legal system; the possibility - however far from certain - that their past search efforts were not as thorough as they should have been; a weak "internal front" in Switzerland itself on account of the authorities' timidity - to call it that - in fending off the assault as well as the insecurity created by a large fraction of the national media and by left-leaning revisionist historians; a wide-spread propensity to guilt feelings; etc. However, another factor surely explains why Switzerland and the Swiss banks were singled out as the first target in what looks more and more like a general campaign against European interests, ie. precisely the country's **reputed affluence**.

- As was recently publicized, **membership in the EU** would cost Switzerland something like 3 billion francs per year on a net basis. This high figure is partly due to the fact that the contributions to the EU budget depend on the level of per capita GDP at PPP, without any consideration given to per capita labor input.

- Expressed per 1'000 residents, Switzerland gave shelter to 5.75 **asylum seekers** in 1998, the highest figure by far in all of Europe (the average for Europe⁴⁰ comes in at 0.91). In absolute numbers, there were 41'200 asylum seekers in Switzerland in 1998 as against 98'700 in Germany whose population is more than ten times larger.⁴¹ The Swiss national media have seen to it that these facts are largely unknown to the Swiss public and the myth has been implanted instead that Switzerland is quite niggardly and unsympathetic when it comes to accepting asylum seekers. When the facts are nevertheless pointed out, eg. on the occasion of a public debate, the parry is apt to be that "Oh yes, this is true, but then Switzerland is so much richer than the other European countries..."

Under these circumstances, every effort should be undertaken to **uproot** the myth of Switzerland's fabulous wealth - abroad and, just as much, at home. In other words, every occasion, ranging from public utterances by the authorities to private conversations, should be used to set the record straight and drive the point home.

^{39/} See: J.C. Lambelet, *Le mobbing d'un petit pays - Onze thèses sur la Suisse pendant la Deuxième Guerre mondiale*, Lausanne, éditions L'Age d'Homme, 1999, especially chapter 8.

^{40/} Ie. for the EU countries, Norway and Switzerland.

^{41/} See a table in *The Economist*, Feb. 20, 1999; it should be added that the relative orders of magnitude are the same for duly accepted refugees.

APPENDIX

Table A1: Basic Labour Productivity Related Statistics - International Comparison, 1996

	Total GDP at 1996 prices and 1996 PPPs	Population mid-year estimate	Total employment	Total annual hours worked
	(billions of USD)	(thousands)	(thousands)	(millions)
Canada	681.3	29969	13740	23798
Mexico*	660.7	92007	32385	63313
United States	7390.6	265557	127996	249720
Japan	3018.2	125864	64860	122521
Australia	388.6	18311	8401	15685
New Zealand	64.4	3714	1696	3117
Austria**	178.3	8059	3737	n.a.
Belgium***	225.5	10157	3761	n.a.
Denmark	128.1	5262	2627	n.a.
Finland	97.5	5125	2123	3586
France	1197.8	58372	22451	37403
Germany	1737.9	81896	35763	54260
Greece*	138.8	10476	3824	n.a.
Iceland	6.3	269	142	264
Ireland	66.9	3621	1316	n.a.
Italy	1183.0	57380	20571	n.a.
Luxembourg*	13.2	416	213	n.a.
Netherlands	327.4	15523	7028	n.a.
Norway	111.9	4381	2137	3037
Portugal	137.1	9927	4532	9105
Spain	596.2	39270	12617	22837
Sweden	174.4	8841	3963	6159
Switzerland	177.7	7105	3789	6555
Turkey	376.1	62695	21395	n.a.
United Kingdom	1147.9	58801	26218	45410
OECD 25	20226.3	982998	427285	-

* Data for 1995 in the third column.

** Data for 1994 in the third column.

*** Data for 1993 in the third column.

Sources: OECD-OCDE (1999), "National Accounts: Main Aggregates - 1960-1997 - Volume 1 - Comptes nationaux : principaux agrégats", Paris, Part Seven, Table 1, p. 163 for the first column and Part Eight, Table 1, p. 175 for the second column; OECD-OCDE (1997), "Labour Force Statistics - 1976-1996 - Statistiques de la population active", Paris, Part I, Table 4.0, p. 27 for the third column; national accounts statistical sources for Finland, Germany, Norway and Switzerland as well as authors' calculations based on OCDE (1998), "Perspectives de l'emploi, juin 1998", Paris, Tableau F in "Annexe statistique", p. 225 for the fourth column.

Table A2:

Income and Labour Productivity Levels in OECD Member Countries, 1994

	GDP per Capita (OECD=100)	Employment/ Population Ratio, 1994	GDP per Person Engaged (OECD=100)	Annual Hours Worked per Person		GDP per Hour Worked (OECD=100)
United States	136.8	47.2	123.4	1,611		121.5
Japan	111.3	51.6	91.8	1,812		80.3
Germany	105.5	42.9	104.6	1,529		108.5
France	103.0	38.5	113.9	1,524		118.4
Italy	100.2	35.2	121.3	1,482		129.7
United Kingdom	94.7	43.8	92.0	1,498		97.4
Canada	109.4	45.4	102.5	1,676		97.0
Australia	98.6	44.5	94.2	1,657		90.2
Austria	108.4	43.0	107.4	1,576	¹	108.0
Belgium	108.2	36.4	126.5	1,581	¹	126.9
Denmark	110.2	47.5	98.9	1,638	¹	95.7
Finland	86.9	39.8	93.1	1,654		89.2
Greece	60.7	36.3	71.1	1,720	¹	65.5
Iceland	103.4	47.2	92.5	n.a.		n.a.
Ireland	81.6	34.3	101.2	1,700	¹	94.4
Luxembourg	158.0	52.5	128.3	n.a.		n.a.
Mexico	38.8	34.9	47.4	2,079		36.1
Netherlands	99.7	38.5	110.3	1,321		132.4
New Zealand	87.1	44.2	83.9	1,851	²	71.9
Norway	117.8	46.9	107.0	1,462		116.0
Portugal	66.2	42.6	66.1	1,704		61.4
Spain	72.8	30.0	103.5	1,903		86.3
Sweden	93.4	44.7	89.0	1,563		90.3
Switzerland	128.4	54.0	101.2	1,647		97.5
Turkey	28.3	32.5	37.1	n.a.		n.a.
OECD	100.0	42.6	100.0	1,585		100.0

1) Hours worked are for 1992. 2) Hours worked are from 1996 Employment Outlook.

Source: GDP per capita and population based on OECD National Accounts - Main

Aggregates, 1960-1994, Paris, 1996; Employment from OECD Analytical Database;

Hours worked for 1992 from Maddison (1995), updated to 1994 with time series from 1996 Employment Outlook.