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Economic Development in OECD countries during the 20th century.

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Note: A wider version of the first part of this paper was published in by Guisan, Cancelo and Aguayo(2001) in the *Review on Economic Cycles*[1] Vol.3, December 2001, free downloadable on line and other parts are related with articles by Guisan, Aguayo and Exposito(2001) published in the journal *Applied Econometrics and International Development* [2], and in the working paper by Guisan, Exposito and Cancelo(2000) in the number 44 of this series: *Economic Development* [3] which is free downloadable.

[1] http://www.usc.es/economet/cycles.htm
[2] http://www.usc.es/economet/aeid.htm
[3] http://www.usc.es/economet/eaa.htm and at http://ideas.uqam.ca

Abstract: We present an analysis of economic growth and cycles in main EU, USA, Japan and other OECD countries during the period 1900-1997, and more detailed data and analysis of main economic aggregates for 25 OECD countries during the period 1964-94, including comparisons of Private and Public Consumption, Investment, External Trade and Population. The economic comparisons have into account both exchange rates and purchasing power parities. Some important aspects of demand and supply are analysed in relation with their influence both on economic growth and cycles. We use exponential rates of growth which are interesting for seeing the important influence that moderation of fertility rates have had in the increase of real GDP by inhabitant in OECD countries in comparison with other areas of the World. OECD countries have been generally advanced in education development and that has been one of the more important factors that explain their good performance during the first and second half of 20th century.

JEL classification E23, F0, O51, O52, O57

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1.- Economic growth in OECD and non-OECD countries in 1900-1997

The important growth of GDP per head in the majority of OECD countries during the 20th century, particularly in the second half, has been due both to demand side and supply side evolution and, in a great extent, to the educative level of population and its influence both on the increase of production rates of growth and on the decrease of population reproduction rates

Table 1 show a comparison of rates of growth of real Gross Domestic Product, Gdp, Population, Pop, and Gdp per head, Gdph, based on exponential relations what implies rates of growth measured as percentage of increase on current, non lagged, values of the variables, and the accomplishment of the following identity:

$$\lambda_3 = \lambda_1 - \lambda_2 \quad (1)$$

where λ means exponential rate of growth and subscript 1 refers to real Gdp, 2 to Population and 3 to real Gdph.

For the 15 European countries belonging to European Union, EU, in 2000, real GDP multiplied by 9.3 throughout the century, going from 805 billions of dollars, at 1990 prices, in 1990 to 7527 in 1997. As population in the EU multiplied by only 1.6, from 233.7 million people in 1900 to 374.1 in 1997, the result was that real GDP per inhabitant multiplied by nearly 6, going from 3.4 thousands of dollars in 1990 to 20.1 in 1997.

En USA real GDP multiplied by 18.7, from 353.5 billions of dollars in 1990 to 6629.5 in 1997, while population multiplied by 3.5, rising from 76.1 million people in 1900 to 266.7 million in 1997. The result was that real GDP per inhabitant multiplied by 5.3, going from 4.6 thousand $ to 24.85 in 1990.

In Japan real GDP multiplied by 50.7, from 65.8 thousands of dollars in 1900 to 3343.7 in 1997, while population multiplied by 2.8, rising from 43.8 million people in 1900 to 126.1 million in 1997. As a consequence real GDP by inhabitant multiplied by 17.6, from only $1.5 thousand 1990 to the incredibly high value of $26.5 thousand in 1997. These figures imply that Japan has experienced a very important economic evolution in world terms, having the greatest growth rate of real GDP and also the greatest growth rate of production per inhabitant.

Table 1 shows that several areas of the world have had rates of growth of real GDP higher than main OECD countries, but they have had generally also higher rates of increase of population than OECD, and the difference between both, has been generally higher in main OECD countries. So OECD high rates of growth in Gdp by inhabitant have been mainly due to the moderation in fertility rates, very much related with the high level of education of population, as we can see in Guisan, Aguayo and Exposito(2001).

Table 1
Growth of Gdp, Population and Gdp per head at 1990 prices
(% of exponential yearly rate in 1900-1950 and 1950-98)

Area	Gdp		Pop		Gdph	
	1950	1998	1950	1998	1950	1998
Western Europe	1.41	3.34	0.51	0.50	0.90	2.84
East Europe + ex-Urss	1.96	1.97	0.17	0.48	1.79	1.49
Turkey	2.03	5.00	1.27	2.32	0.76	2.68
USA	3.07	3.39	1.38	1.20	1.69	2.19
Latin America	3.39	4.04	1.45	2.33	1.94	1.71
China	0.13	5.80	0.57	1.71	-0.44	4.09
India	0.60	4.24	0.45	2.08	0.15	2.16
Japan	2.25	5.78	1.28	0.86	0.97	4.92
Asia-other countries	2.24	5.19	1.80	2.28	0.44	2.91
Africa	2.32	3.42	1.40	2.51	0.92	0.91
World	1.90	3.84	0.89	1.77	1.01	2.07

Note: Gdp is real Gross Domestic Product, Pop is Population and Gdph is Gross Domestic Product by inhabitant. For each variable the first column is the exponential rate of yearly growth for 1900-1950 and the second for 1950-98. In the case of Turkey the first rate correspond to 1913-50.
Source: own calculations from data by Maddison(1987) and (2000).

USA was the richest of the three, both at the beginning and at the end of the 20th century, in great part due to the educational level of the population which was higher here than in Japan and in the large majority of EU countries. All of them have attained a very high level of production per inhabitant which means they potentially have a good level of welfare. Although some people in rich countries have not got a level close to the mean, due to problems of work and wealth distribution, the level reached let these countries the possibility of improving well-being conditions for all their citizens.

From another perspective, as the world income per head at the end of the 20th century only reached the level of that of the USA in 1900, we can see that these countries are extremely fortunate and ought to become heavily involved in common policies which encourage the economic and social development of less developed countries, LDCs.

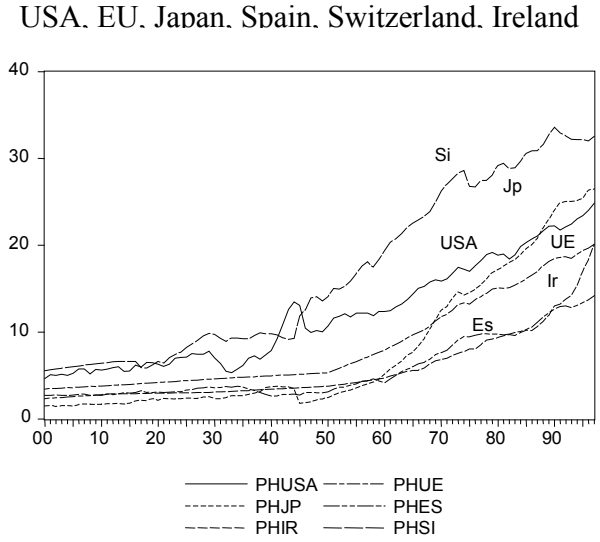
Table 2 and Graph 1 show the evolution of real Gdph, or real production by inhabitant (PH), in the EU, the USA and Japan and includes also, for the purpose of comparison, the values of this variable in Ireland, Spain and Switzerland. The real production by head is expressed in dollars at 1990 prices and ex-change rates.

Table 2. Gross Domestic Product, Population and Production per inhabitant 1900-97
European Union (EU), USA (U) and Japan (J)

	GDP90EU	POPEU	PHEU	GDP90U	POPU	PHU	GDP90J	POPJ	PHJ
1900	805377	233731	3.45	353534	76100	4.65	65845	43850	1.50
1910	961091	254335	3.78	520936	92385	5.64	81717	49180	1.66
1920	1070588	256206	4.18	671363	106464	6.31	119809	55960	2.14
1930	1248840	271074	4.61	863349	123154	7.01	150373	64450	2.33
1940	1404918	283338	4.96	1043042	132093	7.90	265465	71930	3.69
1950	1529058	287965	5.31	1621339	151708	10.69	205969	83200	2.48
1960	2499920	315797	7.92	2233000	180671	12.36	479960	93260	5.15
1970	3999470	340349	11.75	3254400	205052	15.87	1296980	103720	12.50
1980	5358150	355225	15.08	4294500	227757	18.86	2006960	116800	17.18
1990	6742040	364525	18.50	5554100	249911	22.22	2970090	123540	24.04
1997	7527170	374151	20.12	6629500	266792	24.85	3343730	126166	26.50

Source: Guisan et al(2001b,c), based on OECD statistics and historical statistics from several authors cited in the bibliography. GDP is measured in billion dollars at 1990 prices and exchange rates, Population in thousands of people and Production per inhabitant in $90 thousand per head.

Graph 1. Evolution of real production by inhabitant (PH)
in several OECD countries, 1900-1998



Source: Guisan et al(2001a).

The case of Switzerland is very outstanding as this country has already devoted, in 18th and 19th centuries, a great deal of attention to education and that has contributed a lot to the high level of development and social welfare. In some aspects this country is a positive example for many others, even for USA as they also have very high standards of well-being in important areas such as very low levels of delinquency and in the eradication of poverty through efficient social policy.

It is also interesting to observe the comparison between Spain, Ireland and Japan. These countries had very similar PH values in 1900, but Japan was the first of them to see an increase in the real rate of growth experiencing higher values from 1960 onwards and Ireland began an important take-off in 1987. Although Spain has

experienced and important growth this country has not performed as well as Ireland and Japan during the second half of 20th century, mainly due to the lower values of expenditure in education and civil research in Spain and the consequences of these factors on economic growth.

Before finishing this section we would like to remember that important contributions to the statistical data selection and analysis made by Maddison(2001), Summers and Heston(1991) and Barro and Lee(1997), as well as the publications of the OECD Statistical Office and Education Centre, and other international organizations and the work of the researchers on economic growth, many of which are cited in Guisán et al(2001c) and Liesner(1984) like Feinstein, Kendrick, Kuztnets and Mitchell.

In the next section we present a more detailed information about OECD countries during the period 1964-94.

2.- Economic growth in 25 OECD countries 1964-94

In table 3 we present data of real Private Consumption, Public Consumption and Gross Domestic Product of the 25 that belonged to OECD at the beginning of 1994, for the years 1964 and 1994, per person at 1990 prices, according to the mixed criteria of exchange rates and purchasing power parities used by Cancelo and Guisan(1998).

Table 3. Private Consumption (CHX), Public Consumption (GHX) and GDP per person (thousand dollars of 1990 by inhabitant, having into account exchange rates and PPPs)

	CHX		GHX		PHX	
	1964	1994	1964	1994	1964	1994
1.Canada	5.85	11.39	2.08	3.84	9.99	19.65
2.Mexico	2.47	4.07	0.20	0.48	2.91	4.99
3.USA	8.24	15.40	2.89	3.70	13.62	22.95
4.Japan	4.11	12.94	0.83	2.03	6.56	22.91
5. Australia	5.73	10.60	1.30	3.01	9.37	17.71
6.New Zealand	6.78	8.67	1.49	2.16	9.98	13.75
7.Austria	4.71	10.82	1.81	3.51	8.72	19.68
8.Belgium	5.54	11.74	1.34	2.62	8.84	18.71
9.Denmark	7.31	12.02	2.40	5.46	12.36	23.07
10.Finland	4.98	10.06	1.63	4.22	9.85	19.82
11.France	5.90	11.66	1.85	3.76	9.98	19.78
12.Germany	4.62	10.92	1.91	3.69	9.66	19.45
13.Greece	2.67	6.96	0.47	1.41	3.98	9.27
14.Iceland	5.64	11.85	1.13	4.15	10.21	21.10
15.Ireland	3.96	8.21	0.86	1.95	5.37	14.71
16.Italy	4.19	10.97	1.60	3.20	8.12	18.32
17.Luxembourg	7.16	16.05	1.71	3.53	12.96	30.30
18.Netherlands	5.40	10.88	1.61	2.59	9.53	18.84
19.Norway	6.03	11.93	1.59	5.13	10.43	26.50
20.Portugal	2.29	6.64	0.30	1.67	3.31	9.39
21.Spain	3.51	7.84	0.67	2.11	5.33	12.65
22.Sweden	7.58	10.69	2.97	5.98	13.70	21.92
23.Switzerland	9.89	15.12	2.06	3.57	17.64	27.90
24.Turkey	1.99	3.25	0.19	0.53	2.34	4.39
25.UK	5.57	10.44	2.25	3.48	9.47	16.72

26.EU15	4.08	10.56	1.47	3.32	7.36	18.02
27.OECD	4.73	11.20	1.56	2.81	7.91	18.08

In table 4 we present the real values of Investment, Exports and Imports based on exchange rates at 1990 prices.

Table 4. Investment (IH), Exports (XH) and Imports (MH) per person
(thousand dollars at 1990 prices and exchange rates)

	IH		XH		MH	
	1964	1994	1964	1994	1964	1994
1.Canada	1.79	4.22	1.51	6.84	1.22	6.64
2.Mexico	0.35	0.66	0.16	0.74	0.28	0.94
3.USA	2.48	4.50	0.65	2.78	0.64	3.43
4.Japan	1.77	7.45	0.29	2.97	0.44	2.48
5. Australia	2.61	3.97	1.07	3.86	1.34	3.73
6.New Zealand	1.88	2.70	1.54	4.42	1.73	4.21
7.Austria	2.29	5.50	1.55	8.84	1.63	8.98
8.Belgium	2.05	3.61	3.40	16.63	3.47	15.89
9.Denmark	3.30	3.84	2.80	10.20	3.44	8.45
10.Finland	3.41	3.84	1.91	8.30	2.07	6.60
11.France	2.31	4.02	0.99	5.36	1.06	5.02
12.Germany	2.91	4.86	1.48	5.58	1.26	5.61
13.Greece	1.09	1.89	0.17	1.63	0.42	2.61
14.Iceland	3.12	3.56	3.86	8.65	3.54	7.12
15.Ireland	1.03	2.18	1.13	11.13	1.61	8.76
16.Italy	2.37	3.36	0.80	4.95	0.83	4.16
17.Luxembourg	4.79	8.07	8.84	30.05	9.54	27.40
18.Netherlands	2.75	3.84	2.86	11.65	3.08	10.12
19.Norway	3.35	6.19	3.31	13.48	3.85	10.23
20.Portugal	0.73	1.95	0.62	2.74	0.64	3.61
21.Spain	1.14	2.71	0.41	3.14	0.40	3.16
22.Sweden	3.47	3.86	2.73	9.60	3.05	8.20
23.Switzerland	5.34	8.40	4.33	12.69	3.97	11.86
24.Turkey	0.19	0.63	0.07	0.47	0.09	0.49
25.UK	1.79	3.02	1.43	4.76	1.57	4.98
26.EU15	1.76	3.80	1.04	6.18	1.00	5.85
27.OECD	1.63	4.05	0.74	4.15	0.74	4.13

In this table we see that all the countries increased at a great deal both investment by inhabitant and external trade. So for OECD as a whole the value of investment by inhabitant arose from 1.63 to 4.05 thousand dollars at 1990 prices, during the period 1964-94.

The relatively low levels of IH in some countries, like Mexico and Turkey, are not due to a lack of interest of these countries in increasing savings and capital formation, but to the problem they had in those decades with very high increases of population.

The increase in Imports is highly related with the increase in Exports, so Exports play an important place in explaining the Imports capacity of a country. Usually small and medium-sized countries have a greater need of increasing the value of XH and MH

for improving development than bigger ones, and so the highest levels of this variables in 1994 correspond to countries like Luxembourg, Denmark, Ireland, Switzerland, Norway, Belgium and Netherlands.

Table 5 present the evolution of total Gross Domestic Product and Population, as well the percentages of increase of these variables during all the period 1964-94.

Table 5. Evolution of real GDP and Population in OECD countries 1964-94
(billion dollars at 1990 prices and million people)

	Gross Domestic Product			Population		
	1964	1994	%	1964	1994	%
1.Canada	192.89	574.83	198.01	19290	29251	51.64
2.Mexico	122.41	464.87	279.78	42118	93010	120.83
3.USA	2613.52	5982.99	128.92	191889	260651	35.83
4.Japan	635.94	2863.01	350.20	96900	124960	28.96
5. Australia	106.98	315.94	195.33	11418	17838	56.23
6.New Zealand	25.84	48.48	87.60	2589	3526	36.19
7.Austria	63.02	158.07	150.85	7224	8031	11.17
8.Belgium	82.93	189.23	128.17	9378	10116	7.87
9.Denmark	58.34	120.10	105.85	4720	5205	10.28
10.Finland	44.82	100.83	124.96	4549	5088	11.85
11.France	482.19	1145.07	137.47	48310	57900	19.85
12.Germany	724.46	1583.49	118.58	74963	81423	8.62
13.Greece	33.85	96.63	185.50	8510	10426	22.51
14.Iceland	1.93	5.63	191.96	189	267	41.27
15.Ireland	15.39	52.54	241.31	2864	3571	24.69
16.Italy	419.73	1047.98	149.68	51675	57190	10.67
17.Luxembourg	4.25	12.24	188.01	328	404	23.17
18.Netherlands	115.63	289.84	150.66	12127	15382	26.84
19.Norway	38.55	114.91	198.12	3694	4336	17.38
20.Portugal	29.09	92.93	219.45	8800	9902	12.52
21.Spain	167.63	495.24	195.43	31426	39150	24.58
22.Sweden	104.99	192.52	83.36	7662	8781	14.60
23.Switzerland	103.84	196.35	89.09	5887	7037	19.53
24.Turkey	71.75	266.20	271.01	30628	60576	97.78
25.UK	511.46	976.55	90.93	53991	58395	8.16
26.EU15	2857.76	6553.26	129.31	326862	370964	13.49
27.OECD	6771.39	17386.5	156.76	731646	972416	32.94

Note: The value of real GDP was calculated with the formula GDPX=CX+GX+I+X-M, where the variables CX and GX are measured having into account both exchange rates and purchasing power parities, while I, X and M are calculated with exchange rates, as explained in Cancelo and Guisan(1998).

The highest percentages of increase of real GDP in the period 1964-94 corresponded to Japan with 350, Mexico with 279, Turkey with 271, Ireland with 241. Other countries have had also important percentages of increase in this variable and OECD as a whole had an increase of 157%.

The problem with Mexico and Turkey as that they have had also very high levels of population growth with a percentage of increase of 120 in Mexico and 98 in Turkey what has supposed that the rate of growth of Gdp by inhabitant has been low. While OECD as a whole multiplied real Gdp by 2.57, Population by 1.33, and Gdp by inhabitant, by 1.93 that is the ratio between both quantities, Mexico multiplied real Gdp

by 3.8, population by 2.2 and Gdp by inhabitant by 1.7. In the case of Turkey the corresponding factors where 3.71 for real Gdp, population by 1.98 and Gdph by inhabitant by 1.87. So Mexico and Turkey had a rate a little lower than OECD for Gdp by inhabitant due to their high rates of population growth.

Table 6
Annual rates of growth of GDP and Population in 1964-74, 1974-84 and 1984-94

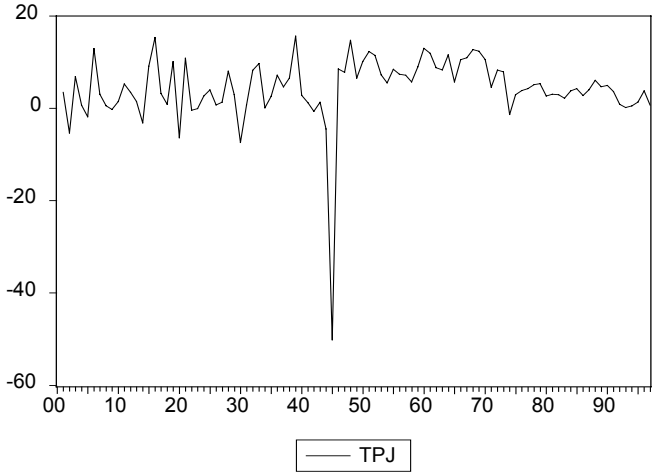
	1964-74		1974-84		1984-94	
	GDP	Population	PIBX	POB	PIBX	POB
1.Canada	5.29	1.72	3.29	1.17	2.55	1.30
2.Mexico	6.67	3.31	4.63	2.72	2.38	2.00
3.USA	3.25	1.09	2.43	1.01	2.72	0.98
4.Japan	8.23	1.29	3.93	0.86	3.34	0.40
5. Australia	4.63	1.86	3.13	1.28	3.28	1.36
6.New Zealand	3.49	1.59	1.37	0.72	1.51	0.79
7.Austria	4.76	0.51	1.97	-0.06	2.63	0.62
8.Belgium	4.51	0.41	1.76	0.09	2.12	0.26
9.Denmark	3.39	0.67	1.98	0.13	1.94	0.18
10.Finland	4.96	0.31	2.90	0.40	0.40	0.41
11.France	4.79	0.83	2.07	0.48	1.95	0.51
12.Germany	3.73	0.53	1.92	-0.15	2.28	0.46
13.Greece	6.22	0.52	2.93	0.99	1.59	0.52
14.Iceland	4.80	1.30	4.04	1.11	2.09	1.07
15.Irland	4.16	0.87	3.77	1.23	4.60	0.12
16.Italy	4.70	0.65	2.57	0.28	2.04	0.09
17.Luxembourg	3.86	0.79	1.02	0.31	5.95	0.99
18.Netherlands	4.82	1.11	1.73	0.63	2.80	0.65
19.Norway	3.96	0.76	4.13	0.38	3.04	0.46
20.Portugal	6.82	-0.05	1.91	1.33	3.17	-0.09
21.Spain	6.50	1.13	1.49	0.86	3.11	0.23
22.Sweden	3.13	0.63	1.81	0.21	1.01	0.52
23.Switzerland	3.54	0.93	0.91	0.07	2.01	0.79
24.Turkey	4.81	2.46	4.89	2.31	3.70	2.13
25.UK	2.77	0.41	1.43	0.05	2.34	0.33
26.EU15	4.24	0.63	1.97	0.29	2.22	0.35
27.OCDE	4.40	1.14	2.57	0.89	2.63	0.83

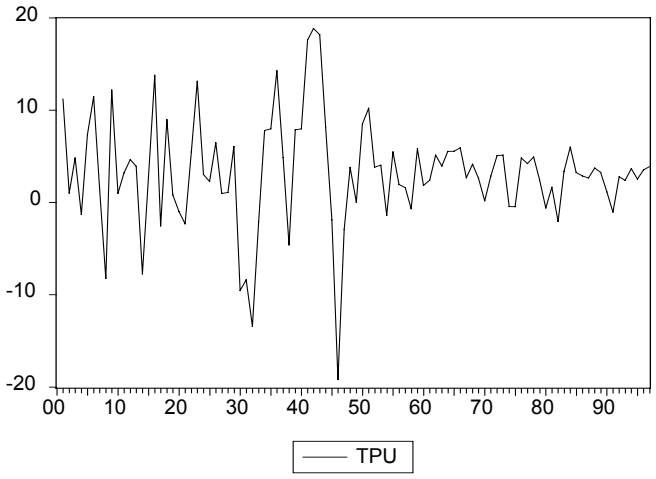
3.- Cycles and causal relations between supply and demand

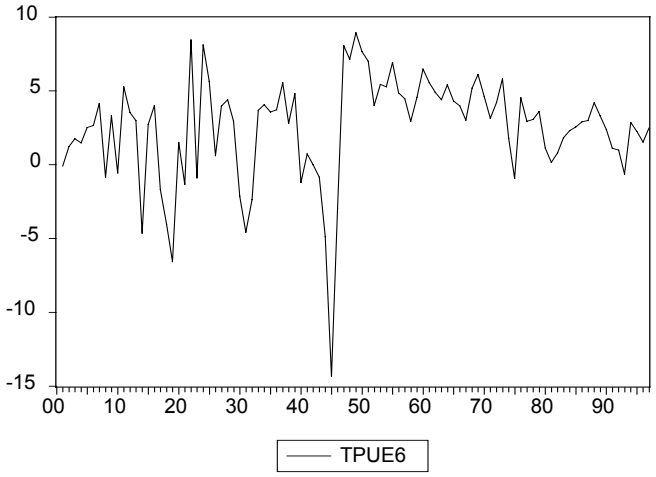
The analysis of economic fluctuations is interesting nowadays if we consider not only short term relations but also medium and long term relevant causes, and if we think not only about demand but also about supply, as fluctuations are generally a consequence of some imbalance in both sides of economics, understanding supply in a wider sense than it has been usually thought.

First of all we present Graphs 2, 3 and 4 which show the rates of growth of real GDP in the USA, Japan and the EU, the latter being a group of 6 European countries representing the evolution of the EU, including Germany, UK, France, Italy, Spain and the Netherlands.

Graphs 2, 3 and 4
Rates of growth of real GDP in Japan, USA and EU (6 countries)







Source: Guisan et al(2001b)

In the last graphs we have seen that the biggest fluctuations correspond to war periods, and that generally the second half of the century present lest fluctuations than the second half in the countries included in the graphs.

We observe that the main fluctuations were due to the second world war and to the 1929-33 economic crisis of the USA and its international consequences.

The speedy rate of post-war recovery is remarkable, especially in Japan were the war resulted in a significant decrease in the level of production in percentage terms.

From 1973 petrol crises and other fluctuations in international trade and investment flows have reduced the rates of growth in many countries, as it is shown in the graphs for USA, Japan and European Union, and in other areas of the World as it is shown in other articles as we can see in the following paragraphs.

On the other hand in Guisan and Aguayo(2001) a more detailed analysis is presented for areas of Europe and America and in Guisan and Exposito(2001) for areas of Asia and Africa, where we can see that some areas with the highest averages rates of growth of real GDP are also areas with low level of stability, and thus that stability is not a cause of sustained growth, although it may be desirable on other grounds.

In those papers and other there cited we can see that the great performance of OECD countries, reaching generally high levels of income by inhabitant during the second half of the 20th century, was more due to the moderation in fertility rates than to the high level of real GDP growth rates.

The important differences between the advanced countries of OECD and less developed countries, LDCs in the evolution of development during the 20th century are explained in a high degree by the education level of population, as Denison(1967) already envisaged many years ago, and more recently several authors have confirmed, like it is shown in Guisan and Neira(2001) and other articles.

Regarding stability we think that although the main causes of growth and fluctuations are very much related, more stability does not imply more growth and for world development it seems more urgent to guarantee sustained growth than stability. Stability is always advisable when the rate of growth of real Gdp is not too low for the circumstances of a country and the lack of oscillations does not imply a lower average value for this rate.

The different evolution of countries is also analysed in Guisan, Aguayo and Exposito(2001), where several cross-section models of the world are presented for explaining the relations among important variables in economic development like education, industrial production, external trade, and population growth, having into account both demand side relations and supply side restrictions to development.

In Basu and Taylor (1999), and others cited there, some relevant issues are analysed concerning the real character of monetary shocks, the impact of real shocks due to technological change, and the roll of inflexibility of wages and prices on cyclical fluctuations. They recognise the important part supply plays in long term development

although they think, as many authors do, that economic cycles are mainly explained in the short term by demand-side factors.

Perhaps during the last decades there has been an excessive concentration in economic literature on the short term, and it is our opinion that this is not entirely beneficial because very frequently, short run relationships cannot be fully understood unless we consider the main forces that account for the medium and the long term. Here, it is important to outline the important intersectoral relationships and the role of external trade. We should consider both a keynesian demand side model and the supply side perspective, as Klein(1983) has pointed out.

From the supply side we should imagine that imports are composed of many goods like energy, raw materials, machinery, and so on, which play an important part in the productive process like intermediate goods or capital goods. Thus when the international consequences of economic deceleration in the main economies provoke a reduction of exports from other countries, this provokes a reduction in the capacity of financing their imports and very frequently will result in internal deceleration.

As Klein (1983) has pointed out, it is very important to always include both demand and supply perspectives, and the inter-industrial and inter-sector relations. Very frequently though, economic authorities rely only on short-term and demand side approaches to control the negative consequences of great economic fluctuations, and use measures such as the reduction of interest rates to expand demand and to encourage investment in order to maintain a sustained level of growth rate. Sometimes, this is not enough.

Economic analysis of growth and fluctuation needs, in our opinion, an open view of supply-side economics, understanding the perspective not like in a narrow way only focused in deregulation but as a wider view, in the lines mentioned by Klein(1997), and thus having into account productivity, education, institutions and many important factors that are generally well developed in industrialized countries but not enough developed generally in less industrialized countries.

Many economists and economic advisers think that increasing consumption will induce an increase in income, following a keynesian model, but reality does not always behave this way. Keynesian models account for an important half of the story but the other half depends largely on the supply side.

The analysis of causal relations in econometric applications is noteworthy but over the last few decades there been a great confusion about this important subject owing to some frequently made errors in the application and interpretation of co-integration analysis, brought about by the rigid application of this technique in many articles in economic reviews over the last two decades of co-integration analysis vogue. Some shortcomings of cointegration techniques for analysing causality are shown in Guisán(2001), with an application to the relation between Private Consumption and real GDP in 25 OECD countries.

The analysis of causal relations implies more than co-integration techniques. We need to understand and know economic history, integrate different economic theories and perspectives in an organised way that take into account several relevant aspects of

supply and demand and we also need to estimate econometric models that compare results in different countries or circumstances.

In the Guisan et al(2001a) we present some results that show the importance that industry and external trade has in explaining both economic growth and cycles from the supply side in OECD countries, as very often imports and/or exports are advanced indicators of fluctuations as external trade restrictions usually influences negatively industrial development not only because they could imply a fall of demand but also because imports are also needed to improve industry from the supply side.

Related with this perspective in Guisan et at(2001b) we present some international cross-section models that have into account inter-sector relations and the important positive influence of education on economic development.

Imports are not only substitutes of some internal production but generally speaking they are also largely important complementary factors of production that on the whole contribute to increase the level of manufacturing and thus the level of general growth.

The consequences of insufficient growth of imports can be responsible for some constraints on the development of industrial activity and, subsequently, some constraints on the development of other sectors, mainly services to enterprises, and finally cause low growth of family income and consumption.

The situation in Latin American countries and other areas with lower level of industrialization than OECD average, is that economic growth very often experiences stagnation and even recession because external debt crises, which after all are the consequence of an imbalance between imports needs and exports capacity.

Those countries need to improve their exports in order to increase their capacity of imports for improving industrial development. Their trade should not be exclusively related with exports of raw materials to industrialized countries, but mainly fostering trade of industrial products with their neighbours, in a similar way to the trade that exists between different states of USA and between different countries of European Union.

We think that in the next few decades new approaches to the study of international fluctuation will arise, with more emphasis on some important real sources of growth in relation to important variables like industrial production, external trade, education and social capital.

These variables influence not only the trends in economic growth but also contribute in several ways to explain the causes of economic fluctuations. Good institutions for example have a lot to do with security and low risk, that are some of the main factors for ensuring a sustained level of foreign investment that can be very important for improving economic development in many countries.

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