

WORLD DEVELOPMENT, 2000-2010: PRODUCTION, INVESTMENT AND SAVINGS IN 21 AREAS OF AMERICA, AFRICA, ASIA-PACIFIC, EUROPE AND EURASIA

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Abstract

In this study we present a comparison of investment and production per head in 21 areas of the World, and we find that in many poor areas there has been little improvement during the period 2000-2010. One of the main causes of this disappointing result has been the stagnation in many countries, of investment and production per capita during this decade. We present a comparison of the levels of industrial development in those areas, and we find that they are too much low in many countries. We analyze the evolution of investment and savings in 132 countries of America, Africa, Asia-Pacific, Europe and Eurasia, and we notice that it is important to foster international cooperation in order to avoid the negative consequences of low levels of investment and production per head on poverty. We include some econometric models relating investment, manufacturing and economic development with a sample of 132 countries.

Keywords: Production, Investment, Savings, America, Africa, Asia-Pacific, Europe, Eurasia, World Development, Poverty Eradication, International Cooperation.

JEL Codes: C5, O5, O50, O51, O52, O53, O54, O52, O53, O54, O55, O56, O57, E2, F21

1. Introduction

In this study we present a comparison of investment and production per head in 21 areas of the World, for the period 2000-2010. We also present a comparison of investment and savings in 132 countries. We find little improvement in many areas and countries for that period.

One of the main causes of this disappointing result has been the stagnation in many countries, of manufacturing production per capita during this decade. Economic development needs to be fostered in order to increase socio-economic quality of life all over the world, and main emphasis should be addressed to foster education, industry and investment particularly in less developed countries.

Section 2 analyses the evolution of manufacturing, investment and development in 21 major areas of America, Europe and Eurasia, Africa and Asia-Pacific.

Section 3 presents a comparison of Investment and Savings, per head, of 132 countries in years 2000 and 2010, and we may notice that although some countries have experienced a positive evolution, there are many countries that need international cooperation in order to reach sustainable development and eradicate poverty.

In section 4 we present the estimation of econometric models that show the positive impact that, generally, has the increase of investment and manufacturing production on economic development and the eradication of poverty.

Finally section 5 presents the main conclusions.

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2. Manufacturing, investment and development in 21 areas: 2000-2010.

Manufacturing production per head have experienced stagnation for the period 2000-2010, in many areas and slow growth at World level. Consequently economic development has not experience improvements in many areas.

Table 1 presents a summary of all the areas regarding manufacturing, non-manufacturing and investment per capita. In the Annex we include some tables with data of IH and SH at country level. We include 132 countries in 21 areas, following the classification of Guisan, Aguayo and Exposito (2001). Tables A1 to A4 in the Annex show the list of countries of each area. We present a more detailed analysis of manufacturing, during the period 2000-2010, by country in Guisan and Aguayo (2015a) for Europe and Eurasia, Guisan and Aguayo (2015 b) for America, and in Guisan an Exposito (2015a) for Africa and Guisan and Exposito (2015b) for Asia and Pacific.

Table 1. Manufacturing, GDP, Investment and Savings, per inhabitant in 21 areas: years 2000 and 2010 (USD at Purchasing Power Parities of year 2005)

Area	QMH 00	QMH 10	GDPH 00	GDPH 10	IH 00	IH 10	SH 00	SH 10
1. Northern Africa	659	752	4412	5851	1012	1657	1206	1427
2. North West Africa	94	144	1359	1894	80	412	403	567
3.Sahel-Central Africa	87	86	729	878	118	170	95	120
4. North East Africa	33	38	534	907	108	193	81	146
5. Eastern Africa	100	124	965	1246	168	293	126	213
6. Southern Africa	645	529	3924	4859	659	931	673	810
7. Western Asia	1149	1262	10800	12237	2005	2172	2944	2303
8.South Western Asia	513	646	3741	4836	1023	2475	1208	1824
9. India and South	245	411	1635	2887	393	983	409	975
10.China and North East	1444	2648	5547	9606	1657	3671	1796	4109
11. Indochina	708	1044	2555	4039	614	1169	717	1257
12. South Pacific	1207	1278	5320	6978	1281	1882	1476	2054
13. USA and Canada	6249	5617	38456	41594	7691	6511	7082	4801
14. Mexico & Central A.	1858	1764	9237	9848	2155	2344	1783	2172
15. Andean America	1219	1217	7064	9181	1421	2089	1508	2189
16. South Eastern America	1544	2442	8748	11921	1443	2117	1128	2442
17. Nordic and British E.	5109	3819	30081	33474	5634	5458	5673	5428
18. Central West Europe	6387	6668	31306	34227	6949	6229	7155	8260
19. West Latin Europe	4761	3562	27173	27659	5995	5698	5785	4792
20. Central E. & E.Med.	2150	2695	10812	15093	2522	3213	1988	2524
21. Russia&former USSR	1052	1527	6038	10208	1172	2435	1971	2745
Africa	278	282	2080	2638	413	620	471	578
Asia-Pacific	903	1443	4004	6333	1093	2115	1213	2315
America	3312	3052	19865	21908	3977	3811	3602	3094
Europe and Eurasia	3220	3191	17408	20828	3722	4151	3857	4195
World	1494	1728	7905	9852	1788	2403	1834	2422

Note: Data elaborated by Guisan(2014) from World Bank(2014). In case of non available data, we have included our provisional estimations. West Latin Europe includes countries from Western Europe with major languages from Latin. The list of countries by area appears in tables A1.1 to A1.4 in the Annex. Note: IH of area 16 updated on 5th-10-2015 and SH and IH of area 8 updated on 30th-6-2018. SH00 by area updated on 30th June of 2018 (Annex 3).

To achieve important improvements in development and quality of life implies that manufacturing should be fostered in many countries.

One of the main problems is that several developing areas with low levels of GDP per capita in year 2000 (below 2000 USD per year) have experienced very small annual change for 2000-2010, with increases lower than 100 Dollars per year and inhabitant: Area 2 NW Africa (53), Area 3 Sahel and Central Africa (15), Area 4 N.E. Africa (37), Area 5 E. Africa (28).

The main reason for the poverty and low level of development is that investment and manufacturing per capita is very low in the poorest areas, and thus the main priority of international cooperation should be to favour policies addressed to reach higher levels of investment, production and quality of life in those areas.

World average of real GDP per inhabitant increased from 7905 to 9852 for 2000-2010, in US Dollars at 2005 prices and Purchasing Power Parities (PPPs). These figures imply an average annual rate of increase of GDP per capita of 2.20%, and an average increase of 194.7 per year and inhabitant in USD at 2005 prices and PPPs.

In order to increase development in poorest areas and countries it is important to increase investment per inhabitant to higher levels than the savings capacity of those countries, and thus international cooperation is usually necessary in order to foster development. As shown in Guisan and Exposito(2010) there are positive impacts on economic development, both from own investments (in the country or abroad) and from foreign investment in the country.

3. Investment and savings per head in 132 countries

In tables 2.1 to 2.5 we show the evolution of the difference between investment per capita and savings per capita in countries 132 countries. Countries with a positive balance are receiving foreign support to development through investment.

As seen in Guisan, Aguayo and Exposito(2014) with a sample of Asian countries, and in the next section with a sample of 132 countries all over the World, both variables, investment and savings, have usually a positive impact on sustainable development. Countries with savings surplus (savings higher than investment) get returns on their investments abroad, and countries with investment surplus (investment higher than savings) get returns from the inflow of investment in the domestic market.

Countries with high levels of investment per head (IH) and/or savings per head (SH) have more facilities for economic development and poverty eradication while countries with low levels in both variables have usually a low level of production per head, a low level of income per capita and high percentage of population in poverty or extreme poverty.

In the following tables we show the evolution of IH and SH in countries of America, Africa, Asia-Pacific, Europe and Eurasia, for the period 2000-2010. Data have been calculated from World Bank Indicators, in Dollars (USD) at 2005 prices and Purchasing Power Parities (PPPs). Country number follows the same order that in previous international comparisons of 132 countries, as in Guisan, Aguayo and Exposito (2001).

America

2.1. Investment and Savings in countries of America (USD at 2005 PPPs)

Country number	Country	IH00 PP05	SH00 PP05	IH00-SH00	IH10 PP05	SH10 PP05	IH10-SH10
4	Argentina	1647	1338	309	3160	3226	-66
13	Bolivia	641	392	249	740	1087	-348
15	Brazil	1426	1109	317	1936	1663	273
21	Canada	6495	7470	-974	7821	6490	1331
24	Chile	2305	2200	105	2916	3146	-230
27	Colombia	1029	836	193	2013	1606	407
30	Costa Rica	1380	1055	325	2073	1588	485
35	Dominican R	1140	892	248	1382	611	771
36	Ecuador	1098	1428	-329	1885	1633	252
38	El Salvador	846	796	50	795	657	138
48	Guatemala	713	476	238	629	553	77
50	Haiti	321	NA	NA	249	19	230
51	Honduras	811	609	203	808	571	237
59	Jamaica	NA	979	NA	1418	843	576
78	Mexico	2897	2414	483	3106	3042	64
88	Nicaragua	635	169	465	719	336	383
93	Panama	1956	1874	81	3255	2238	1017
95	Paraguay	720	417	303	906	1049	-143
96	Peru	1117	950	168	2090	1952	138
125	United States	7822	7039	782	6367	4615	1752
126	Uruguay	1241	975	266	2413	2109	304
128	Venezuela RB	2295	3252	-956	2285	3454	-1169
	Average of America	3977	3602	375	3811	3094	717

Note: Elaborated, in this article, by Guisan(2014) from World Bank Statistics. NA= Not available. SH00 by area updates on 30th June of 2018.

The highest levels of investment per capita of year 2010 in America corresponded to 2 countries: Canada and the United States, with more than 6000, which are the only cases with value higher than American average.

There were 3 countries with value higher than 3000, and below 3500: Argentina, Mexico and Panama. There were 6 countries with value of investment per capita between 2000 and 3000: Chile, Colombia, Costa Rica, Peru, Uruguay and Venezuela.

Several countries reached a value of IH10 between 1000 and 2000: Dominican Republic, Ecuador and Jamaica.

The lowest values of investment per capita in year 2010, below 1000 corresponded to Bolivia, El Salvador, Guatemala, Haiti, Honduras, Nicaragua and Paraguay.

The highest positive differences between investment and savings, with values higher than 1000, corresponded to Canada and the United States. Between 500 and 1000: Dominican Republic and Jamaica. Between 250 and 500: Brazil, Colombia, Costa Rica, Ecuador, Nicaragua and Uruguay.

Africa

Table 2.2. Investment and Savings in Countries of Africa(USD at 2005 PPPs)

Country number	Country	IH00 PP05	SH00 PP05	IH00-SH00	IH10 PP05	SH10 PP05	IH10-SH10
2	Algeria	1522	NA	NA	3132	2597	535
3	Angola	395	632	-237	807	879	-72
12	Benin	224	118	106	367	103	264
14	Botswana	3131	4011	-880	3531	3293	238
17	Burkina Faso	152	45	108	211	93	117
18	Burundi	20	14	7	45	0	45
20	Cameroon	311	275	37	339	324	15
22	C.Afri.R.	73	NA	NA	64	34	30
23	Chad	202	NA	NA	452	119	333
28	Congo DR	8	NA	NA	45	20	25
29	Congo R	695	937	-242	782	1694	-913
31	Cote d'Ivoire	194	141	53	236	200	36
37	Egypt AR	842	758	84	1047	986	61
39	Eritrea	163	27	136	73	0	73
41	Ethiopia	105	84	21	201	155	46
46	Ghana	244	152	91	394	302	92
49	Guinea	202	152	51	214	105	109
63	Kenya	219	180	39	286	231	55
70	Lesotho	502	275	227	402	161	241
73	Madagascar	129	77	51	176	48	129
74	Malawi	99	71	28	196	35	161
76	Mali	214	137	77	184	94	90
77	Mauritania	303	NA	NA	602	0	602
81	Morocco	775	715	60	1484	1300	184
82	Mozambique	157	56	101	200	92	109
84	Namibia	666	979	-313	1363	1971	-608
89	Niger	62	28	34	115	30	85
90	Nigeria	NA	NA	NA	465	777	-313
102	Rwanda	115	83	32	249	107	142
104	Senegal	281	196	84	503	191	312
105	Sierra Leone	27	-15	42	117	97	20
109	South Africa	1197	1197	0	1825	1559	266
116	Tanzania	156	112	43	371	272	99
118	Togo	138	8	131	167	9	158
119	Tunisia	1470	1252	218	2258	1738	520
122	Uganda	147	109	39	271	214	57
131	Zambia	175	-10	185	314	315	-1
132	Zimbabwe	386	NA	NA	30	0	30
	Average of Africa	413	471	-52	620	578	42

Note: Elaborated, in this article, by Guisan(2014) from World Bank Statistics. NA=Not available. SH00 by area updates on 30th June of 2018.

Average investment per capita in year 2010 of 39 African countries amounted to only 620 Dollars of year 2005, which is very low in comparison with World average (1408). The highest values, more than 2000, correspond to Algeria, Botswana and Tunisia. The

lowest values correspond to countries with less than 250 Dollars: Burkina Faso, Burundi, Central African R., Congo DR, Cote d'Ivoire, Eritrea, Ethiopia, Guinea, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Sierra Leone, Togo and Zimbabwe.

Asia and Pacific

Table 2.3. Investment and Savings in countries of Asia and Pacific (USD at 2005 PPPs)

Country number	Country	IH00 PP05	SH00 PP05	IH00- SH00	IH10 PP05	SH10 PP05	IH10- SH10
6	Australia	6942	5785	1157	9638	8361	1277
9	Bangladesh	207	243	-36	363	572	-209
25	China	932	986	-53	3257	3608	-351
26	Hong-Kong China	8042	9531	-1489	8580	12514	-3934
53	India	412	430	-17	1068	1036	33
54	Indonesia	597	679	-81	1260	1240	21
55	Iran, IR	2530	2990	-460	NA	NA	NA
57	Israel	4828	3908	920	4052	4757	-704
60	Japan	7153	8012	-858	6183	7263	-1080
61	Jordan	799	835	-36	791	471	319
62	Kazakhstan	973	1081	-108	2741	3055	-315
64	Korea R	5422	5771	-350	7879	8554	-675
65	Kuwait	3696	16802	-13105	NA	NA	NA
67	Lao PDR	407	247	160	596	448	148
69	Lebanon	1666	NA	NA	4125	1511	2614
75	Malaysia	2773	3698	-924	2830	4349	-1519
80	Mongolia	588	467	122	1477	982	495
83	Myanmar	70	NA	NA	396	671	-275
85	Nepal	217	199	18	373	368	5
87	New Zealand	4835	3736	1099	4912	NA	NA
92	Pakistan	328	386	-58	370	525	-154
94	Papua-N.Guinea	432	628	-196	395	450	-55
97	Philippines	554	976	-422	731	968	-237
103	Saudi Arabia	3746	5718	-1972	4483	5327	-844
106	Singapore	12310	17533	-5223	12386	23848	-11462
111	Sri Lanka	859	675	184	1266	1128	138
114	Syria	633	820	-186	892	797	95
117	Thailand	1318	1719	-401	1990	2370	-380
129	Vietnam	479	495	-16	1118	916	202
130	Yemen R	392	702	-310	276	216	61
	Average of Asia-Pacific	1093	1213	-120	2115	2315	-200

Source: Elaborated by Guisan, Aguayo and Exposito(2014) from World Bank statistics. NA=Not available. SH00 by area updated on 30th June of 2018.

Average investment per capita of Asia-Pacific in year 2010 is very close to World average, although there are important differences between countries. The most outstanding countries and territories, with the highest values in table 2.3, are Singapore, with 12386 in year 2010 followed by Australia with 9638, Hong-Kong China with 8580, Korea R. with 7879, Japan with 6183. There is a second group of countries, with values of IH10 between 3000 and 6000: China, Israel, Lebanon, New Zealand and Saudi Arabia. There are a third group of countries with values close to World average. There is a fourth group

with very low values of IH10, below 1000: Bangladesh, Jordan, Lao PDR, Myanmar 396, Nepal 373, Pakistan, Papua-New Guinea, Philippines, Syria and Yemen.

Europe and Eurasia

2.4. Investment and Savings in Countries of Europe and Eurasia (USD at 2005 PPPs)

Country number	Country	IH00 PP05	SH00 PP05	IH00- SH00	IH10 PP05	SH10 PP05	IH10- SH10
1	Albania	1197	1149	48	1986	1029	957
5	Armenia	435	92	344	1635	921	714
7	Austria	7716	7716	0	7657	8746	-1089
8	Azerbaijan	523	423	100	1527	4116	-2589
10	Belarus	1453	1336	116	5076	3129	1948
11	Belgium	6659	NA	NA	6625	7501	-875
16	Bulgaria	1234	891	343	2864	2729	135
32	Croatia	2008	1797	211	3772	3528	244
33	Czech R	4897	4222	675	5100	4751	349
34	Denmark	6661	7296	-634	5533	7384	-1851
40	Estonia	3095	2542	553	3308	4022	-714
42	Finland	5493	7690	-2197	5871	6509	-639
43	France	5845	6430	-585	5736	5178	558
44	Georgia	632	422	211	889	450	439
45	Germany	6734	6122	612	5795	7725	-1930
47	Greece	4732	2675	2057	3920	1120	2799
52	Hungary	3671	2719	952	3121	3463	-342
56	Ireland	7715	8037	-321	3973	4407	-434
58	Italy	5821	5544	277	5535	4612	923
66	Kyrgyz R	300	225	75	570	395	175
68	Latvia	2048	1621	427	2676	3072	-396
71	Lithuania	1789	1224	565	2605	2876	-271
72	Macedonia, FYR	1591	1663	-72	2336	2231	106
79	Moldova	349	233	116	660	442	218
86	Netherlands	7387	9401	-2015	6909	8669	-1760
91	Norway	8728	15275	-6546	10526	16906	-6379
98	Poland	2936	2231	705	3636	2931	705
99	Portugal	5713	3468	2244	4247	2260	1987
100	Romania	1368	1094	274	3424	2872	552
101	Russian F	1637	3101	-1465	3240	3921	-682
107	Slovak R	3308	2799	509	4717	4054	664
108	Slovenia	5324	4732	592	5667	5517	150
110	Spain	6531	5777	754	6194	5072	1122
112	Sweden	5217	6377	-1159	6231	8429	-2199
113	Switzerland	7999	12172	-4173	7231	13520	-6289
115	Tajikistan	90	NA	NA	443	49	393
120	Turkey	1948	1670	278	2501	1708	793
121	Turkmenistan	1284	NA	NA	4349	3638	711
124	United Kingdom	5251	4376	875	5008	3880	1127
	Average of Europe and Eurasia	3722	3857	-135	4151	4195	-44

Note: Elaborated, in this article, by Guisan from World Bank Statistics. NA=Not available. SH00 by area updates on 30th June of 2018.

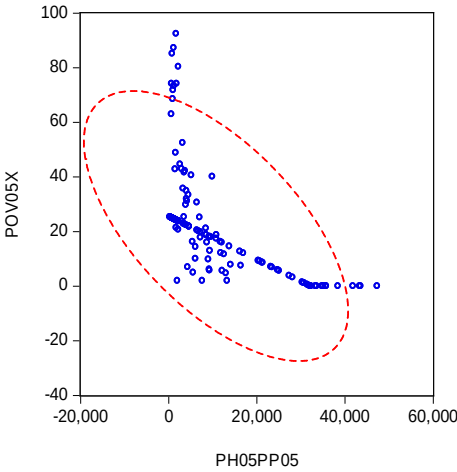
Investment, production and poverty in low income countries

Poverty count, measured by the percentage of people below 2\$ per day in purchasing power parities, is yet very high in many less developed countries, and besides there are other types of poverty even in some developed countries. Usually high values of poverty count are frequent in low income countries. Improvement of education and investment per capita usually increases production per capita and have an important impact on poverty diminution and increase of average well-being of population.

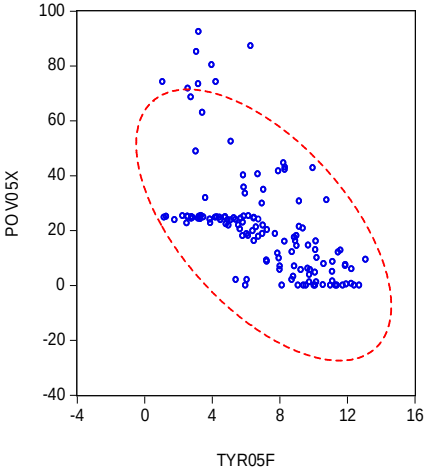
Graphs 1 and 2 show the impact of production per capita, and the educational level of population on the diminution of poverty. We have used several international sources for year 2005 in 132 countries, including Barro and Lee(2010), World Bank, and our own estimations in case of non available data.

Graphs 3 and 4, elaborated by the author, from international statistics, show the positive impact of education and investment per head on economic development.

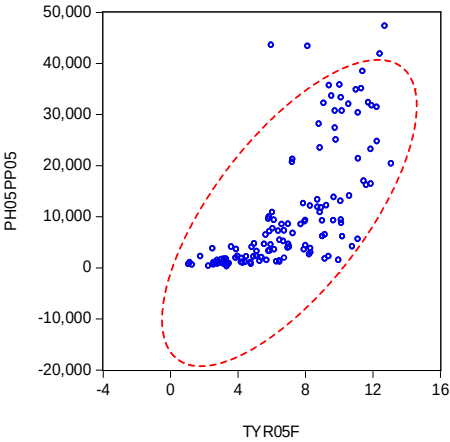
Graph 1. Poverty and Production per head



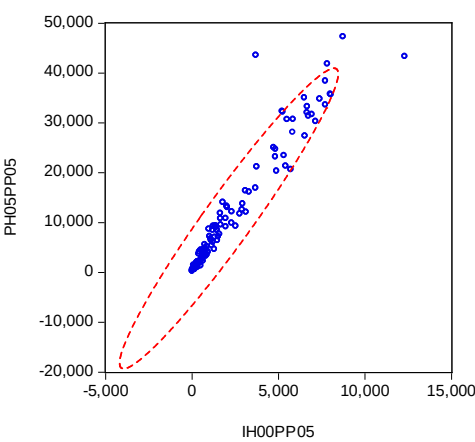
Graph 2. Poverty and Education



Graph 3. Education and development



Graph 4. Investment and development



Accordingly to this study, and to the empirical findings of the studies cited in the bibliography and other interesting studies, the Increase of investment per capita is usually a necessary condition to foster sustainable development and eradicate poverty.

As seen in Guisan and Exposito(2006), poverty count (below 2 \$ of income per day), around years 2000 and 2005, reached very high percentages of population in many African countries, higher than 80% in 6 countries, and percentages between 50% and 79% in 13 countries.

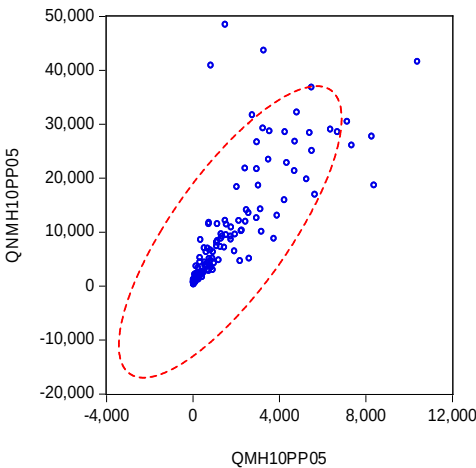
As seen in Guisan and Exposito (2010) and (2012) the poverty count, of people below 2 Dollars of income per day, around the year 2005, was higher than 80% in 2 Asian and 6 African countries. Percentages between 20 and 80 per cent, affected to 11 Asian countries and 17 African countries. Only 9 Asian countries and 3 African countries presented poverty percentages below 20%.

In Guisan, Aguayo and Exposito (2015) we present a comparison of 7 channels of international development aid, including investment. Cooperation in this regard is very important for sustainable development and poverty eradication particularly in countries with very low levels of the variable IH10.

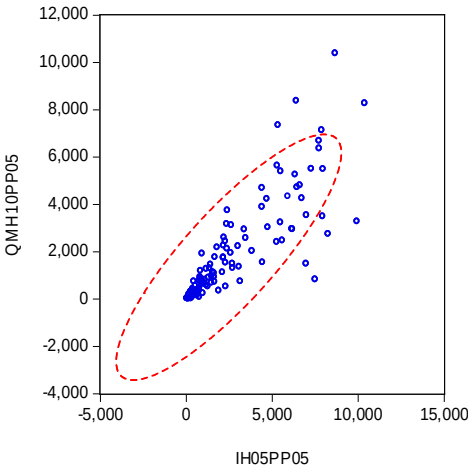
4. Econometric models: Impact of manufacturing and investment on economic development

Graphs 5 and 6, show, respectively, the positive impact of Manufacturing Production on Non Manufacturing Production, and the positive impact that, usually, has Investment per capita on manufacturing production per head. Data of graph 5 refer to year 2010 as well as QMH10PP05 in graph 6. Investment per head in graph 6 is the value of year 2005, representing the annual average value for the period 2001-2010. All variables are expressed in USD at 2005 Prices and Purchasing Power Parities.

Graph 5. Manufacturing and Non-Manufacturing



Graph 6. Investment and Manufacturing



Source: Elaborated by Guisan(2014) from World Bank Statistics.

Equation 1 shows the positive effect of manufacturing on non manufacturing production with a sample of 132 countries in year 2005. Equation 2 shows the positive effect that investment per capita, usually, has on economic development. The equation

relates real GDP per capita of each country in year 2010 (expressed in USD at 2005 prices and purchasing power parities) with its lagged value in year 2000, and the value of investment per head for the period 2001-2010.

Equation 1. Effect of manufacturing on non manufacturing production

Dependent Variable: QNMH10PP05. Method: Least Squares. Sample: 1 132				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
QNMH00PP05	1.233731	0.014558	84.74536	0.0000
QMH10PP05-QMH00PP05	1.478117	0.280626	5.267208	0.0000
R-squared	0.967429	Mean dependent var		10044.67
Adjusted R-squared	0.967179	S.D. dependent var		10911.97
S.E. of regression	1976.877	Akaike info criterion		18.03146
Sum squared resid	5.08E+08	Schwarz criterion		18.07514
Log likelihood	-1188.076	Hannan-Quinn criter.		18.04921
Durbin-Watson stat	1.964938			

Equation 2. Effect of Investment on real Production per head

Dependent Variable: PH10PP05. Method: Least Squares. Sample: 1 132				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PH00PP05	0.835181	0.063063	13.24359	0.0000
Investment per head (accumulated)*	0.141855	0.025679	5.524061	0.0000
R-squared	0.968362	Mean dependent var		11767.71
Adjusted R-squared	0.968119	S.D. dependent var		12598.27
S.E. of regression	2249.449	Akaike info criterion		18.28979
Sum squared resid	6.58E+08	Schwarz criterion		18.33347
Log likelihood	-1205.126	Hannan-Quinn criter.		18.30754
Durbin-Watson stat	1.790740			

*Note: Investment per head (accumulated) for the period 2001-2010 is the sum of IH for those years. Variables in US Dollars at 2005 prices and Purchasing Power Parities (USP at PP2005).

Both manufacturing per head and investment per head, as well as other variables that may have an important general effect in many countries, or in particular countries, are usually necessary to foster economic development and poverty diminution.

4. Conclusions

In this study we have present comparative data for 21 areas and 132 countries worldwide, in order to assess the evolution of investment, production, poverty and international development. The main conclusion is that economic development for the period 2000-2010 was not enough to get fast improvements on economic development and poverty diminution in many less developed countries. It is urgent to design more cooperative policies in this regard, in order to increase education, production and investment in many areas and countries.

Accordingly to equation 1, an increase of 1 unit in manufacturing production per head implies an average increase of 1.47 on non manufacturing production per head, showing the great importance of increasing manufacturing production in many countries with low levels of economic development.

Accordingly to equation 2, an increase of 1 unit in investment per head has an impact of 0.14 on the increase of production per head, showing the great importance of

international cooperation in order to increase investment per capita in less developed countries. Countries with low levels of production, savings and investment per head need a fast increase of education and investment per head, among other factors, in order to get sustainable development and diminution of poverty.

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Annex 1. Countries and territories by area

Table A1.1. Areas of Africa: countries and population (million)

Area	Countries and territories	Pop 2000	Pop 2010
1. N Africa	2 Algeria, 37 Egypt AR, 77 Mauritania, 81 Morocco, 119 Tunisia	138	162
2. NW Africa	12 Benin 31 Cote d'Ivoire 46 Ghana 49 Guinea 90 Nigeria 104 Senegal, 105 Sierra Leone 118 Togo	190	246
3. Sahel-Central Africa	17 Burkina F. 18 Burundi 20 Cameroon 22 C. African R 23 Chad 28 Congo DR, 29 Congo 76 Mali 89 Niger 102 Rwanda	130	172
4. NE Africa	39 Eritrea 41 Ethiopia	68	88
5. Eastern Africa	63 Kenya 73 Madagascar 116 Tanzania 122 Uganda	106	139
6. Southern Africa	3 Angola 14 Botswana 70 Lesotho 74 Malawi 82 Mozambique 84 Namibia 109 South Africa 131 Zambia 132 Zimbabwe	116	139

Table A1.2. Areas and countries of Asia and Pacific: countries and population (million)

Area	Countries and territories	Pop 2000	Pop 2010
7. Western Asia	57 Israel 61 Jordan 65 Kuwait 69 Lebanon 103 Saudi Arabia 114 Syrian, 130 Yemen	73	93
8. SW Asia	55 Iran 92 Pakistan	202	248
9. India and S.	9 Bangladesh 53 India 85 Nepal 111 Sri Lanka	1189	1424
10. China and NE	25 China 26 H-K cn 60 Japan 64 Korea R 80 Mongolia	1446	1524
11. Indochina	19 Cambodia 67 Lao PDR 83 Myanmar 117 Thailand 129 Vietnam	206	224
12. South East & Pacific	6 Australia 54 Indonesia 75 Malaysia 87 N. Zealand 94 Papua N.G., 97 Philippines 106 Singapore	337	400

Table A1.3. Areas and countries of America: countries and population (million)

Area	Countries and territories	Pop 2000	Pop 2010
13. USA and Canada	21 Canada 125 USA	313	343
14. Mexico & Central Am.	30 Costa Rica 35 Dominican R. 38 El Salvador 48 Guatemala, 50 Haiti, 51 Honduras 59 Jamaica 78 Mexico 88 Nicaragua 93 Panama	152	178
15. SW: Andean America	13 Bolivia 24 Chile 27 Colombia 36 Ecuador 96 Peru 128 Venezuela	128	146
16. SE America	4 Argentina 15 Brazil 95 Paraguay 126 Uruguay	220	245

Table A1.4. Areas and countries of Europe and Eurasia: countries and population (million)

Area	Countries and territories	Pop 2000	Pop 2010
17. Nordic and British Europe	34 Denmark 42 Finland 56 Ireland 91 Norway 112 Sweden 124 UK	87	92
18. Central Europe West	7 Austria 11 Belgium 45 Germany 86 Netherlands 113 Switzerland	124	126
19. W. Latin Europe	43 France 58 Italy 99 Portugal 110 Spain	167	182
20. Central, Baltic, East Mediterranean	1 Albania 16 Bulgaria 32 Croatia 33 Czech R. 40 Estonia 47 Greece, 52 Hungary, 68 Latvia 71 Lithuania 72 Macedonia 98 Poland 100 Romania 107 Slovak R. 108 Slovenia 120 Turkey	192	196
21. Russia and East	5 Armenia 8 Azerbaijan 10 Belarus 44 Georgia 62 Kazakhstan 66 Kyrgyz R. 79 Moldova 101 Russian F. 115 Tajikistan 121 Turkmenistan 123 Ukraine 127 Uzbekistan	281	279

Table A2. Investment and Savings per head in 132 countries (USD at 2005 PPPs), 2000-2010

nb	IH 00	IH 10	SH 00	SH 10	Dif 10	nb	IH 00	IH 10	SH 00	SH 10	Dif 10
1	1197	1986	1149	1029	-957	67	407	596	247	448	-148
2	1522	3132	NA	2597	-535	68	2048	2676	1621	3072	396
3	395	807	632	879	72	69	1666	4125	NA	1511	-2614
4	1647	3160	1338	3226	66	70	502	402	275	161	-241
5	435	1635	92	921	-714	71	1789	2605	1224	2876	271
6	6942	9638	5785	8361	-1277	72	1591	2336	1663	2231	-106
7	7716	7657	7716	8746	1089	73	129	176	77	48	-129
8	523	1527	423	4116	2589	74	99	196	71	35	-161
9	207	363	243	572	209	75	2773	2830	3698	4349	1519
10	1453	5076	1336	3129	-1948	76	214	184	137	94	-90
11	6659	6625	NA	7501	875	77	303	602	NA	0	-602
12	224	367	118	103	-264	78	2897	3106	2414	3042	-64
13	641	740	392	1087	348	79	349	660	233	442	-218
14	3131	3531	4011	3293	-238	80	588	1477	467	982	-495
15	1426	1936	1109	1663	-273	81	775	1484	715	1300	-184
16	1234	2864	891	2729	-135	82	157	200	56	92	-109
17	152	211	45	93	-117	83	70	396	NA	671	275
18	20	45	14	0	-45	84	666	1363	979	1971	608
19	182	342	141	247	-95	85	217	373	199	368	-5
20	311	339	275	324	-15	86	7387	6909	9401	8669	1760
21	6495	7821	7470	6490	-1331	87	4835	4912	3736	NA	NA
22	73	64	NA	34	-30	88	635	719	169	336	-383
23	202	452	NA	119	-333	89	62	115	28	30	-85
24	2305	2916	2200	3146	230	90	465	465	NA	777	313
25	932	3257	986	3608	351	91	8728	10526	15275	16906	6379
26	8042	8580	9531	12514	3934	92	328	370	386	525	154
27	1029	2013	836	1606	-407	93	1956	3255	1874	2238	-1017
28	8	45	NA	20	-25	94	432	395	628	450	55
29	695	782	937	1694	913	95	720	906	417	1049	143
30	1380	2073	1055	1588	-485	96	1117	2090	950	1952	-138
31	194	236	141	200	-36	97	554	731	976	968	237
32	2008	3772	1797	3528	-244	98	2936	3636	2231	2931	-705
33	4897	5100	4222	4751	-349	99	5713	4247	3468	2260	-1987
34	6661	5533	7296	7384	1851	100	1368	3424	1094	2872	-552
35	1140	1382	892	611	-771	101	1637	3240	3101	3921	682
36	1098	1885	1428	1633	-252	102	115	249	83	107	-142
37	842	1047	758	986	-61	103	3746	4483	5718	5327	844
38	846	795	796	657	-138	104	281	503	196	191	-312
39	163	73	27	0	-73	105	27	117	-15	97	-20
40	3095	3308	2542	4022	714	106	12310	12386	17533	23848	11462
41	105	201	84	155	-46	107	3308	4717	2799	4054	-664
42	5493	5871	7690	6509	639	108	5324	5667	4732	5517	-150
43	5845	5736	6430	5178	-558	109	1197	1825	1197	1559	-266
44	632	889	422	450	-439	110	6531	6194	5777	5072	-1122
45	6734	5795	6122	7725	1930	111	859	1266	675	1128	-138
46	244	394	152	302	-92	112	5217	6231	6377	8429	2199

47	4732	3920	2675	1120	-2799	113	7999	7231	12172	13520	6289
48	713	629	476	553	-77	114	633	892	820	797	-95
49	202	214	152	105	-109	115	90	443	NA	49	-393
50	321	249	NA	19	-230	116	156	371	112	272	-99
51	811	808	609	571	-237	117	1318	1990	1719	2370	380
52	3671	3121	2719	3463	342	118	138	167	8	9	-158
53	412	1068	430	1036	-33	119	1470	2258	1252	1738	-520
54	597	1260	679	1240	-21	120	1948	2501	1670	1708	-793
55	2530	2530	2990	NA	NA	121	1284	4349	NA	3638	-711
56	7715	3973	8037	4407	434	122	147	271	109	214	-57
57	4828	4052	3908	4757	704	123	739	1167	887	1041	-126
58	5821	5535	5544	4612	-923	124	5251	5008	4376	3880	-1127
59	1418	1418	979	843	-576	125	7822	6367	7039	4615	-1752
60	7153	6183	8012	7263	1080	126	1241	2413	975	2109	-304
61	799	791	835	471	-319	127	261	737	NA	664	-73
62	973	2741	1081	3055	315	128	2295	2285	3252	3454	1169
63	219	286	180	231	-55	129	479	1118	495	916	-202
64	5422	7879	5771	8554	675	130	392	276	702	216	-61
65	3696	6970	16802	NA	NA	131	175	314	-10	315	1
66	300	570	225	395	-175	132	386	30	NA	0	-30

Source: Elaborated by Guisan(2014) from World Bank statistics. Notes: Nb: number of country in the alphabetical list of 132 countries. Dif10 is the difference between savings per head and investment per head in year 2010. In black colour: data of countries with ih or sh higher than 4000 USD per capita. Nb is the number of countries in alphabetic order, accordingly to the list below.

Lis of countries:

1Albania, 2 Algeria, 3 Angola, 4 Argentina. 5 Armenia, 6 Australia, 7 Austria, 8 Azerbaijan. 9 Bangladesh. 10 Belarus, 11 Belgium, 12 Benin, 13 Bolivia, 14 Botswana, 15 Brazil, 16, Bulgaria, 17, Burkina Faso, 18 Burundi, 19 Cambodia, 20 Cameroon, 21 Canada, 22 Central African Rep., 23 Chad, 24 Chile, 25 China, 26 Hong-Kong (Cn), 27 Colombia, 28 Congo. Dem. Rep., 29 Congo. Rep., 30 Costa Rica, 31 Cote d'Ivoire, 32 Croatia, 33 Czech Rep., 34 Denmark, 35 Dominican Rep., 36 Ecuador, 37 Egypt. Arab Rep., 38 El Salvador, 39 Eritrea, 40 Estonia, 41 Ethiopia, 42 Finland, 43 France, 44 Georgia, 45 Germany, 46 Ghana, 47 Greece, 48 Guatemala, 49 Guinea, 50 Haiti, 51 Honduras, 52 Hungary, 53 India, 54 Indonesia, 55 Iran. Islamic R.56 Ireland, 57 Israel, 58 Italy, 59 Jamaica, 60 Japan, 61 Jordan 62 Kazakhstan, 63 Kenya, 64 Korea. Rep., 65 Kuwait, 66 Kyrgyz Rep., 67 Lao PDR, 68 Latvia, 69 Lebanon, 70 Lesotho, 71 Lithuania, 72 Macedonia FYR, 73 Madagascar, 74 Malawi, 75 Malaysia, 76 Mali, 77 Mauritania, 78 Mexico, 79 Moldova, 80 Mongolia, 81 Morocco, 82 Mozambique, 83 Myanmar, 84 Namibia, 85 Nepal, 86 Netherlands, 87 New Zealand, 88 Nicaragua, 89 Niger, 90 Nigeria, 91 Norway, 92 Pakistan, 93 Panama, 94 Papua New Guinea, 95 Paraguay, 96 Peru, 97 Philippines, 98 Poland, 99 Portugal, 100 Romania, 101 Russian Federation, 102 Rwanda, 103 Saudi Arabia, 104 Senegal, 105 Sierra Leone, 106 Singapore, 107 Slovak Rep., 108 Slovenia, 109 South Africa, 110 Spain, 111 Sri Lanka, 112 Sweden, 113 Switzerland, 114 Syrian Arab Rep., 115 Tajikistan, 116 Tanzania, 117 Thailand, 118 Togo, 119 Tunisia, 120 Turkey, 121 Turkmenistan, 122 Uganda, 123 Ukraine, 124 United Kingdom, 125 United States, 126 Uruguay, 127 Uzbekistan, 128 Venezuela RB, 129 Vietnam, 130 Yemen. Rep., 131 Zambia, 132 Zimbabwe

Annex 2 on line at the journal Website: <http://www.usc.es/economet/eaat.htm>

Annex 2. Macro-econometric models and impact of financial capacity on development

Macroeconometric models demand, supply and disequilibrium approaches.

Accordingly to Guisan(2006) and (2013), we consider several macroeconometric approaches for the evolution of real Gross Domestic Product (GDP), having into account demand and supply. We have included two variables related with financial capacity.

From a disequilibrium point of view GDP may be expressed as:

$$GDP_t = \min (GDP_t^d, GDP_t^{s1}, GDP_t^{s2})$$

The following models are simplified versions to explain the three variables of the right side, which include the relevant relationships from our perspective. It is easy to implement more detailed equations within this framework. For example in the case of QB in model 3 we may add several explanatory variables related with supply and demand. Credit for example plays a role in the explanation of this variable.

Model 1. Demand Approach (Keynsian model): $GDP_t = GDP_t^d$

(1.1) $GDP_t^d = C_t + G_t + IS_t + EXP_t - IMP_t$	(6) $W_t = f(W_{t-1}, D(PM_t), \text{other variables})$
(2.1) $L_t = f(L_{t-1}, D(L_t^*), D(PA_t));$ $L_t^* = f(GDP_t, KA_t, t)$ (<i>f. de producción</i>)	(7) $D(W_t) = W_t - W_{t-1}$
(3) $C_t = f(D(LINC_t), D(CFIN1) C_{t-1})$	(8) $D(PM_t) = PM_t - PM_{t-1}$
(4) $IS_t = f(D(GDP_t), D(CFIN2), IS_{t-1})$	(9) $PM_t = GDP_t / L_t$
(5) $D(GDP_t) = GDP_t - GDP_{t-1}$	(10) $LINC = (L_t * W_t)$

GDP_t is real Gross Domestic Product, C is real Private Consumption, G is real Public Consumption, IS is real Investment (including stocks variation), as to say real Gross Capital Formation, L_t is employment W is average real wage (compentasion of employees divided by the number of employees). PM is mean productivity of labour, and $CFIN1$ is Financial Capacity for Consumption, and $CFIN2$ is Financial Capacity for Investment. $LINC$ is compensation of labour.

Model 2. Supply of primary inputs (Neoclassical Model): $GDP_t = GDP_t^{s1}$

(1.2) $GDP_t^{s1} = f(KA_t, L_t, t)$ (<i>Production function</i>)	(7) $D(W_t) = W_t - W_{t-1}$
(2.2) $L_t = L_t = f(L_{t-1}, D(L_t^*), D(PA_t));$ $L_t^* = f(GDP_t / W_t)$ (<i>Productivity funcion</i>)	(8) $D(PM_t) = PM_t - PM_{t-1}$
(3) $C_t = f(D(LINC_t), D(CFIN1) C_{t-1})$	(9) $PM_t = GDP_t / L_t$
(4) $IS_t = f(D(GDP_t), D(CFIN2), IS_{t-1})$	(10) $LINC = (L_t * W_t)$
(5) $D(GDP_t) = GDP_t - GDP_{t-1}$	(11) $KA_t = KA_{t-1} + I_{t-1} - A_{t-1}$
(6) $W_t = f(W_{t-1}, D(PM_t))$	(12) $I_t = IS_t - VS_t$

KA is Capital Stock (available), L is labour, PA is Active Population, I is investment (fixed capital formation). The endogenous variables explained by the model are: GDP , L , KA , I , W , PM , y the increases of these variables that appear in Model 2. Exogenous variables are time (t), $D(PA)$, $D(CFIN1)$, $D(CFIN2)$. Employment equation is based on marginal productivity with the desired level of employment by firms and institutio is a function of GDP/W . In a simplified version we may consider Wage as exogenous and relations (6) to (8) would disappear from Model 2.

Model 3. Supply of intermediate inputs and intersectoral relationships (approach by Guisan(1980 and (2001) based on Kaldor and Input-Output supply relationships)

(1.3) $GDP_t^{s2} = QA_t + QI_t + QB_t + QS_t$	
(2.3) $L_t = f(L_{t-1}, D(L_t^*), D(PA_t));$ $L^* = f(GDP_t/W_t, KA_t/W_t) (*)$	(11) $KA_t = KA_{t-1} + I_{t-1} - A_{t-1}$
(3) $C_t = f(D(LINC_t), D(CFIN1) C_{t-1})$	(12) $I_t = IS_t - VS_t$
(4) $IS_t = f(D(GDP_t), D(CFIN2), IS_{t-1})$	(13) $QB_t = f(QB_{t-1}, D(QS_t), \text{other variables})$
(5) $D(GDP_t) = GDP_t - GDP_{t-1}$	(14) $QS_t = f(QS_{t-1}, D(QI_t), D(IMPB_t), D(EXPB_t))$
(6) $W_t = f(W_{t-1}, D(PM_t))$	(15) $IMPB_t = f(IMPB_{t-1}, D(CIMPB), D(C_t))$
(7) $D(W_t) = W_t - W_{t-1}$	(16) $CIMPB_t = EXPB_t + SALEXPS_t + CFIN3$
(8) $D(PM_t) = PM_t - PM_{t-1}$	(17) $EXPB_t = F(EXPB_{t-1}, D(QI_t), \text{Other})$
(9) $PM_t = GDP_t/L_t$	(18a) $QI = \text{exogenous}$ (18b) $QI = f(\text{domestic demand and foreign trade})$
(10) $LINC = (L_t^* W_t)$	(19) to (23): Identities for: $D(QS), D(IMPB), D(EXPB), D(QI), D(CIMPB)$.

(*) L^* by Guisán(1983), (2001), (2007) when the economy is not working at full capacity.

The role of QI is very important for economic growth and development. Human capital and social capital, including quality of government, have usually an important role to foster the increase of industrial production total and per capita (QHI). Government may design specific policies for industrialization, or may simply allow QI depend on market evolution. The question is that austerity policies that diminish, at the same time Labour Income ($LINC$) and family credit, usually lead to a diminution of domestic demand which has a negative impact on QI and, thus, on GDP and GDP per head.

Credit and development in 6 OCDE countries

Tabla A3. Estimation of (18b): Industrial real production per head as function of its lagged value and the increases of Domestic Demand (DDH) Exports (XH), Imports (MH) and time (TI)

Dependent Variable: $QHI00?$				
Method: Pooled Least Squares. Sample: 1965 2010.				
Included observations: 46. Cross-sections: 6. Total pool (unbalanced): 136				
White diagonal standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Stat.	Prob.
$QHI00?(-1)$	0.988554	0.007812	126.53	0.0000
$D(DDH00?)$	0.191715	0.021249	9.0221	0.0000
$D(XH00?)$	0.397063	0.044286	8.9659	0.0000
$D(MH00?)$	-0.081625	0.034644	-2.3560	0.0200
TI	-0.001175	0.000663	-1.7722	0.0787
R-squared	0.996795	Mean dependent var		3.711046
Adjusted R-squared	0.996697	S.D. dependent var		1.493331
S.E. of regression	0.085821	Akaike info criterion		-2.0370
Sum squared resid	0.964853	Schwarz criterion		-1.9299
Log likelihood	143.5179	Hannan-Quinn criter.		-1.9935
Durbin-Watson stat	1.443561			

Source: Elaborated by Guisan(2014) (section 1.3). Data source: OECD statistics

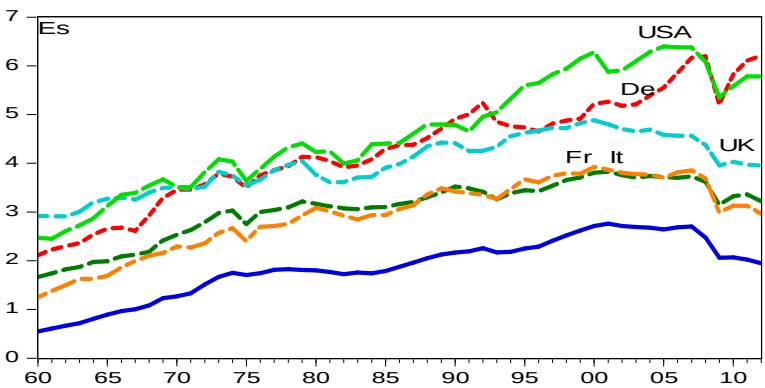
When the main restriction to development arise from Model 3, due to the lack of enough industrial development and to foreign trade deficit, a country that applies at the same time

restrictions on credit and on labour income, may worsen the economic evolution because industry may diminish due to the diminution of domestic demand.

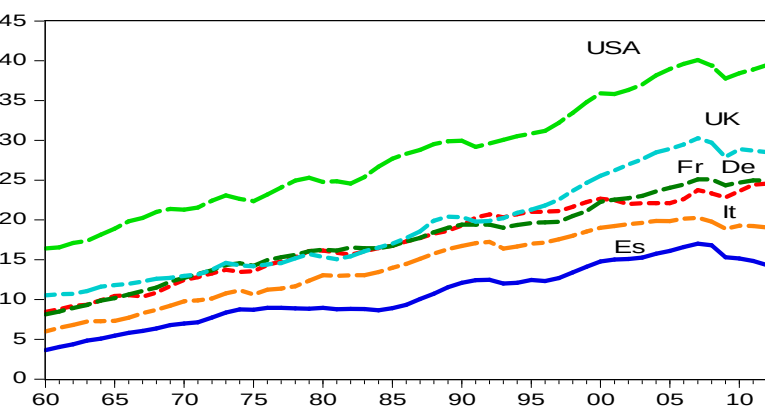
It depends on labour income, credit to families and other variables. A simultaneous diminution of labour income and family credit, beyond the normal limits advised by the solvency of the country, has usually a negative effect on domestic demand and on industrial production and development. A demand problem lead to a supply problem.

In the following graphs, elaborated from OECD and BIS statistics, we show the evolution of industrial production per head (QHI), domestic demand per head (DDH), labor income per head (LINCH) and family credit per head (CR1H). Data are expressed in thousand Dollars per capita at 2000 prices and exchange rates. DDH is the sum of Consumption and Investment per head.

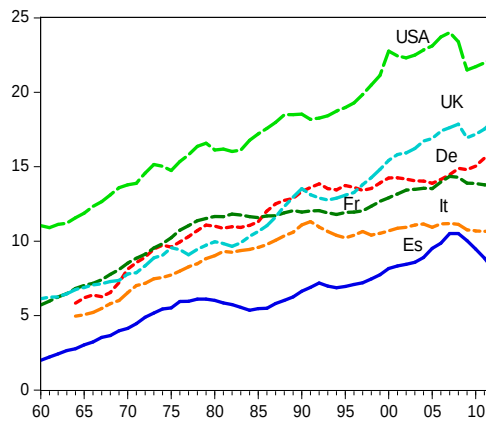
Grapha A1. Value added of industry per head (QHI) in 6 OECD countries, 1960-2012 (thousand Dollars per inhabitant at 2000 prices and exchange rates)



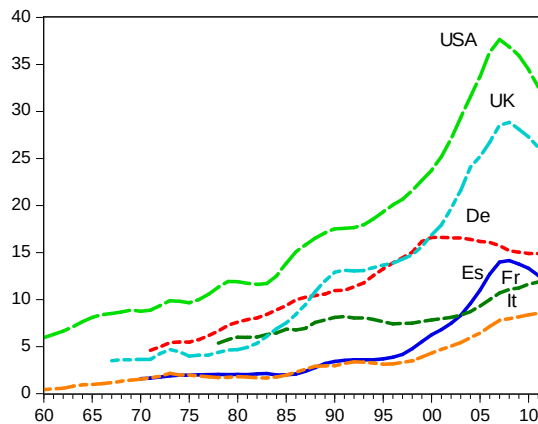
Graph A2. Domestic Demand per head (DDH) in 6 OECD countries, 1960-2012 (thousand Dollars per inhabitant at 2000 prices and exchange rates)



Graph A3. Evolution of labour income per head in 6 OECD countries, 1960-2012



Graph A4. Evolution of family credit per head (CR1H)



In the cases of USA, UK and Spain (Es) there was an important diminution of CR1H after the crisis started in year 2008. Spain shows the lowest level of labour income per head and has experienced a diminution of this variable in the period 2008-2012, with negative consequences on QHI.

Economic recovery of many European countries requires recovery of industrial production and labour income per head, and should avoid a simultaneous diminution of credit and family income.

Annex 3. Investment and Savings per capita: data update and analysis of the relationship between IH, SH and PH.

Data Update

In the update of 30th June of 2018, we have included data for several countries with previous NA (Not Available) data for SH00, given the new availability. Savings per capita are calculated applying the percentage of “Gross Domestic Savings on GDP” to GDP per capita when available, or “Gross Savings on GDP” in other case. Countries with update of value of SH00 (Savings per capita in year 2000 in USD at 2005 Purchasing Power Parities), in alphabetical order, are: 2. Algeria, 11. Belgium, 22 Central African R., 23 Chad, 28 Congo D.R., 69. Lebanon, 77. Mauritania, 83. Myanmar, 90. Nigeria, 115. Tajikistan, 121. Turkmenistan, 127. Uzbekistan, and 132. Zimbabwe.

We have revised the averages by area of the values of SH00 in table 1 and in tables 2.1 to 2.4, having into account the new available data for this variable.

Relationship between IH, SH and PH

There is a high degree of linear correlation between these variables. With this sample of 132 countries there was a correlation in year 2010 of 87% between IH and SH, as well as between SH and PH, and of 95% between IH and PH.

Accordingly to our macroeconometric approach IH is important for economic development, due to their important impact on the availability of primary inputs, increasing the stock of physical capital per inhabitant and per worker. IH depends, at a great extent on the values of SH, and SH depends strongly on the real value of production per head. The percentage of Savings per capita on real Gross Domestic Product per capita, usually vary between 20% and 40%, and thus the degree of economic development, measured by real GDP per capita is usually of uppermost importance to get enough investment per capita to guarantee sustainable development.

For countries with low levels of PH and SH it is of great importance to get increases of IH through international cooperation cooperation to development.

More information on international comparisons and bibliography at the Blogs of economic development edited by M.C. Guisan.

<https://euroamericanassociation.blogspot.com.es> (World Development in English)

<https://economyaydesarrollointernacional.blogspot.com.es> (Latin America, North America and Europe, in Spanish)