



EU AND CHINA, COMPETITORS AND PARTNERS IN INNOVATION AND HIGH-TECH PRODUCTS TRADE INTERNATIONAL COURSE

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Abstract

This article intends to present the up-to-date situation of EU and China in the innovation activity and the complementarities and cooperation between them. We analyze also, the evolution in one of the most suggestive results of the innovation, i.e. the international trade with medium and high-technology (HT) products between the two superpowers, in the period 2007-2012. It is well known that the most suggestive factor for the competitiveness of an industry and an economy on the international market is the share of medium and high-tech products in their trade. The article demonstrates that innovation efforts deployed by developed and emerging states in the world carry on – among other things – on a more intensive and diversified international trade with medium and HT products, exemplified with the EU and China general statistical data. The statistical analysis and the conclusions constitute an original contribution of the author to understand the development of the global connections of our days.

Key words:

Innovation, international competitiveness, international trade, High-Tech (HT) products, EU-27, China

JEL Codes:

F1, O1, O3

1. Introduction

In a global world, the competitiveness is today necessarily the result of the most rich and diversified knowledge and of the application of this knowledge in society. If the economic situation of a country cannot be changed so easy, at least on short term, the technology appears to be an important agent that determines the country's competitive advantages and consequently the derived benefits, either obtained at the national level or from the international exchanges. The professional literature showed that the technological exchanges rate is determined not only from the national innovation but also from the international diffusion of knowledge and technology (Grueber, 2011).

This includes improvements in the education system and the research - development and innovation (RDI) field, supporting and including the interaction between the basic research and its application in different areas, the availability of a legislative-regulatory environment which allows the inventors to benefit from their work results (especially the protection through patents) and the building of a market structure that offers support for entrepreneurs to innovate and to be continuously concerned by the amelioration of their competitive position.

The above considerations lead to tackle the innovation performances issue of two world great economic powers (EU and China) and the reflection of their efforts in the technological innovation in the

most possible evident manner, that of the position held by these two parts in the international trade with medium and high-technology products and their bilateral trade in the same field.

2. EU more innovative than china, but the gap between the two parties is decreasing

First of all, one should present EU innovation situation. In January 2014, the European Commission adopted the Communication „For an European Industrial Renaissance”, after “European Competitiveness Report 2013, Towards Knowledge Driven Reindustrialisation” which intends to stimulate the other EU institutions to take into consideration more actions for the revival of the industrial sector and promoting its economic and competitiveness growth.

The Commission shows in this Communication that a good business environment, which stimulates the investments, encourages the technological exchanges and promotes the update and revival of the whole EU industry, constitutes a fundamental factor for the development of the community economy. In accordance with these desiderata we may say that research-development and innovation (RDI) play a capital function at the EU level and at that of its Member States (Eurostat Pocketbooks, Science, technology and innovation in Europe 2013).

Over the period 2006-2013, the EU innovation performance (a complex indicator divided in 3 sub-categories – Enablers, Firm activities and Outputs -, 8

sub-indicators and 25 single indicators) recorded an annual average growth rate of 1.7%. The Union officials appreciate that it is an unsatisfying result, but the increase was important for the creation and consolidation of the European Research Area, The Innovation Union (EC, State of the Innovation Union 2012) and the preparing and implementation of “Horizon 2020”, a major initiative of the EU Strategy “Europe 2020” (EC, Research and Innovation, Horizon 2020).

The best results, when one talks about the annual growth rate of the EU 8 innovation sub-indicators presented in The Innovation Scoreboard 2014, were registered by the indicators “Open, excellent and attractive systems” (4.5%), “Human resources” (2.3%), “Intellectual assets” (2.1%) and “Linkages & entrepreneurship” (1.7%). The indicators “Economic effects” (1.2%) and “Innovators” (0.7%) have presented positive but unsatisfactory annual growth rate. For “Finance and support” (-0.5%) and “Firm investments” (-1.4%) the indicator growth rate was negative.

The situation was not so good if we take into consideration the most representative indicator for the “Intellectual assets,” that of “Patents applications”, which recorded a low increasing rate.

An essential characteristic having a good impact on the EU innovation system is the greater interconnection recorded both by the Member States and on the international level. The explanation is that a multi-polar world appears, with new competitors and with much more distributed resources, which creates dependencies and imposes some measures taken by the Union political responsible factors in this respect.

At countries level, in 2013, the top performances were recorded by Sweden, Denmark, Germany and Finland, followed by Luxembourg, the Netherlands, Belgium and UK (EU, National R&D Information services, 2013 and EU, Research and Innovation Performance in EU Member States and Associated countries, 2012). Romania, although is a modest innovator, ranked on the 26 place between the EU Member States, recording better performances as against previous year (EU Innovation Scoreboard 2013). In 2013, it is performing twice as high as both Bulgaria and Latvia, this being a quite encouraging result for our country.

The other superpower presented in this proceeding, China has a worse innovation performance in relation with the EU. Its composite indicator is 44% of that of EU, but this mega country continues to reduce the gap by performing faster in innovation field and at a higher rate than the EU (EC, Innovation Scoreboard 2014).

China has worse performances for the majority of indicators from innovation sector. The weakest results were recorded by China at 10 from the 12 indicators used by the European Commission in the international comparison. Mainly, it is about „License and patent

revenues from abroad”, „Public-private co-publications”, „International co-publications”, „Patent applications” and „Tertiary education”. China is outperforming the EU only on two indicators: „Doctorate graduates” (where the country is performing 31% better as a result of having 2.2 new doctorate graduates per 1,000 population aged 25-34 as compared to 1.7 in the EU) and „R&D expenditures in the business sector” (1.82% of GDP in China compared to 1.29% in the EU). The best performances obtained by China (but inferior to those of EU) are at 5 indicators belonging to “Open, excellent and attractive research system”, “Linkages & entrepreneurship”, “Intellectual Assets” and “Economic Effects” (the international co-publications, public-private co-publications, PCT patents, PCT patents societal changes and license and patent revenues from abroad).

However, for 9 indicators, Chinese growth rate rose, over the period 2006-2013, and the rise was greater than in the EU case. So, we may speak about a reduction of the gap between the two great global powers, from the point of view of innovation performance.

EU and China are also partners in RDI field. Science and innovation are now on the top of the European and Chinese agendas, also at the forefront of EU 2020 strategy and the 12th Five-Year Plan, respectively, offering many opportunities to work together. In the FP7's main programme Cooperation (Delegation of the European Union to China Science, Research and Innovation: Co-operation between the European Union, Member States and China, 2012), China participated in many research and innovation fields like Information and Communication Technologies, Space, Transport etc. Within EU „Horizon 2020” (as in the past FP7) collaborations are underway between the two sides also on global challenges such as environment (climate change), new and renewable energies, and health.

Among the EU Member States which are collaborating with China in this activity, the more active are: Germany, Spain, Sweden, UK, France and Italy.

3. EU and China - Competitors, but also partners, on the international market

As the data from Table 1 show, the EU-China bilateral trade recorded an increase over the analysed period, (a remarkable 87.3% at export and 16.7% at import). Both in 2007 and in 2012, EU-China mutual trade recorded a deficit, but this deficit had a little decreasing trend (220.4 bill dollars in 2007 and 187.5 bill dollars in 2012)

It is evident that the groups 5,6,7,8 dominate the bilateral trade, namely the groups containing medium and high-tech products, this being a characteristic of research and innovation activity of the two partners (including also the multinational companies present in China).

Table 1. Bilateral trade EU-27-China, in bill. dollars, 2007-2012

2007				
Total	Export	%	Import	%
	98.7	100	319.1	100
0 - Food and live animals	1.1	1.1	4.5	1.4
1 - Beverages and tobacco	0.5	0.5	0.1	0.0
2 - Crude materials, inedible, except fuels	7.1	7.3	3.7	1.2
3 - Mineral fuels, lubricants and related materials	0.1	0.1	0.9	0.3
4 - Animal and vegetable oils, fats and waxes	0.0	0.0	0.1	0.0
5 - Chemicals and related products, n.e.s.	9.3	9.5	1.1	3.2
6 - Manufactured goods classified chiefly by material	12.2	12.5	50.1	1.7
7 - Machinery and transport equipment	57.3	58.8	147.1	46.3
8 - Miscellaneous manufactured articles	6.1	6.3	99.9	31.4
9 - Commodities and transactions not classified elsewhere in the SITC	3.8	3.9	1.6	0.5
2012				
Total	Export	%	Import	%
	184.9	100	372.4	100
0 - Food and live animals	3.5	1.9	5.3	1.4
1 - Beverages and tobacco	1.9	1.0	0.2	0.1
2 - Crude materials, inedible, except fuels	12.2	6.6	3.6	1.0
3 - Mineral fuels, lubricants and related materials	2.5	1.4	0.4	0.1
4 - Animal and vegetable oils, fats and waxes	0.0	0.0	0.1	0.0
5 - Chemicals and related products, n.e.s.	2.4	11.0	16.5	4.4
6 - Manufactured goods classified chiefly by material	17.5	9.5	46.2	12.4
7 - Machinery and transport equipment	106.9	57.8	185.2	49.7
8 - Miscellaneous manufactured articles	14.2	7.7	111.1	29.8
9 - Commodities and transactions not classified elsewhere in the SITC	4.5	2.4	3.2	0.9

Source: United Nation Comtrade, 2014

An interesting segment in the two parties trade is that of high-tech (HT) products (see table 2). In 2007, EU-27 HT products export on international market was of 268.0 bill. dollars, while in 2012, this value attained 350.7 bill. dollars. From the point of view of China, the corresponding values were 338.4 bill. dollars and 592.2 bill. dollars (UN Comtrade, 2014).

As part of this trade, in 2007, the EU HT products export to China was of 18.3 bill. dollars and EU HT products import from China was of 80.8 bill. dollars (weights of 18.5% and, respectively, 25.3% from EU

total export, respectively, import of HT products). In 2012, the EU export to China recorded 30.3 bill. dollars and the import from the same country, 111.6 bill. dollars (weights of 16.4% and, respectively, 30.0%) It is evident that in spite of the values, we assisted to a decrease of export share and an increase of import share of HT products in the EU trade with China, as compared with EU total HT products trade. A great part of the respective bilateral trade is made from complementary products, belonging to the same groups.

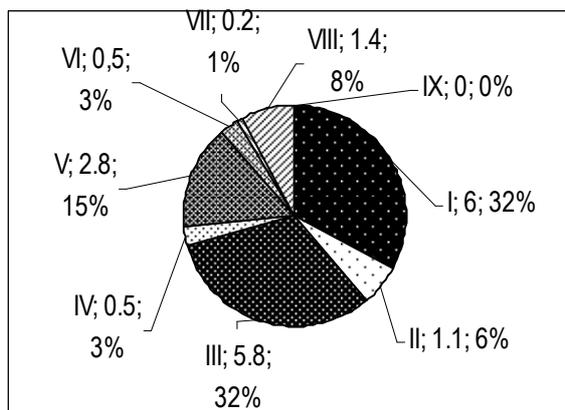
Table 2. HT products groups as SITC rev.3

High-tech products groups
- Gr. I – Aerospace industry [7921+7922+7923+7924+7925+79291+79293+(714-71489-71499)+87411];
- Gr. II – Computers – office machines [75113+75131+75132+75134+(752-7529)+75997];
- Gr. III – Electronics- telecommunication [76381+76383+(764-76493-76499)+7722+77261+77318+77625+77627+7763+7764+7768+89879];
- Gr. IV – Pharmaceuticals [5413+5415+5416+5421+5422];
- Gr. V – Scientific instruments [774+8711+8713+8714+8719+8721+(874-87411-8742)+88111+88121+88411+88419+89961+89963+89966+89967];
- Gr. VI – Electrical equipments [77862+77863+77864+77865+77867+77868+7787+77884];
- Gr. VII – Chemical industry [52222+52223+52229+52269+525+531+57433+591];
-Gr.VIII – Non-electrical equipments [71489+71499+7187+72847+7311+73131+73135+73142+73144+73151+73153+ (7316 –73162-73166-73167-73169)+73312+73314+73316 +7359 + 73733 +73735],
- Gr. IX – Armament [891]

Source: Eurostat, Statistics in focus 25/2009

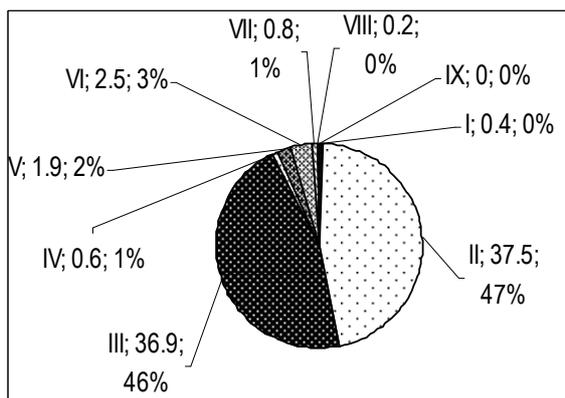
As the Figures 1 and 3 show, the structure of EU HT products exports to China changed fairly significant between 2007 and 2012, becoming more equilibrated. The Group III - Electronics-telecommunication contracted, mainly in favour of Groups V (Scientific instruments) and VIII (Non-electrical equipments). The Group I (Aerospace industry), a basic industry of EU economy, remained practically at the same weight (32%), in both years. Otherwise, the four products groups constitute strengths both in the EU innovation and production areas.

Figure 1. EU-27 HT products export to China, in bill. dollars and %, in 2007



Source: United Nation Comtrade, 2014

Figure 2. EU-27 HT products import from China, in bill. dollars and %, in 2007



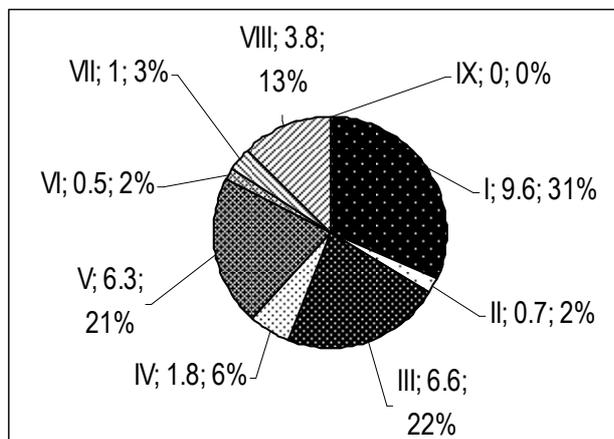
Source: United Nation Comtrade, 2014

As from the EU HT products imports from China, they are dominated in a great proportion by the groups II (Computers – office machines) and III (Electronics - telecommunication). The other 7 groups register extremely small weights, between 0% and 3%. The predominance of the two groups reflects not only the competitive superiority of Chinese products, superiority based mainly in the case of Group II products on price (because a great part of them are produced in China by American, Nippon and even European companies which hold production units in China) but also a complementarity of production ranges, about which we discussed above.

The Group III, although present in a significant weight also in the EU export to China, is equally impressive in the imports originated from this country, from the same considerations as the Group II. The

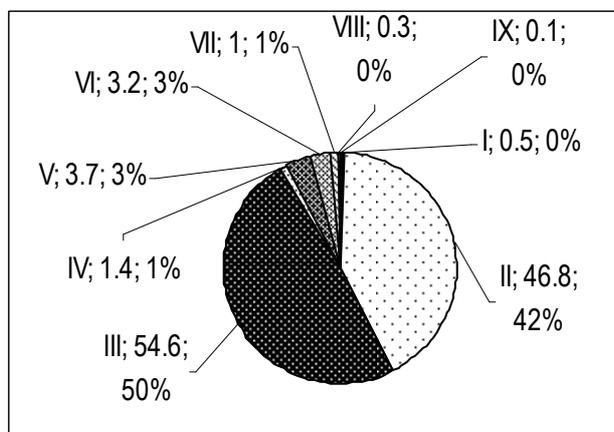
presence of the two groups means a pronounced specialisation of Chinese industry on these HT products, this fact indicating also a dynamic innovation activity.

Figure 3. EU-27 HT products export to China, in bill. dollars and %, in 2012



Source: United Nation Comtrade, 2014

Figure 4. EU-27 HT products import from China, in bill. dollars and %, in 2012



Source: United Nation Comtrade, 2014

From the point of view of EU Member States, the greater volumes of the HT products exports to China belong to Germany, France, Sweden, the Netherlands, UK and Italy (namely those countries with a very developed industry and an active innovation activity). As to the import, there are much more European destinations with close weights in the total, because Chinese merchandises are very competitive from the point of view of price and even the least developed countries from the Central and Eastern Europe prefer to choose them instead of those coming from European countries, USA, Japan or other developed states.

4. Conclusions

From this short analysis, the following conclusions may be deduced:

- The EU is more innovative than China, but the gap between the two global powers became smaller;
- In the EU, both the public (financed at community and national level) and the private innovation activity developed in the last years;
- In China, the RDI dedicated to goods production is promoted first of all by the companies (many of them being foreigner) but also by the Chinese state;
- EU innovation excellence areas are: I, III, IV, V, VI and VIII, respectively, aerospace industry, electronics-telecommunication, pharmaceuticals, scientific instruments, electrical and non-electrical equipments;
- China has a large range of innovation areas, but its excellence consists of computers- office machines and electronics- communication, and in a minor measure of pharmaceuticals and electrical and non-electrical equipments;
- Over the period 2007- 2012, the value of the HT products trade between EU and China increased moderately (an overall 33.4%);
- The general manufactured commodities trade between EU and China is dominated by the groups 5,6,7,8, i.e. Chemicals and related products, Manufactured goods classified chiefly by material, Machinery and transport equipment, Miscellaneous manufactured articles; in the majority proportion there are medium and high-tech products;
- The EU exports structure was more equilibrated than that of imports (dominated by two products groups, II and III);
- Regarding the bilateral HT products trade between the two parties, we must consider the great share of groups I, III, V and VIII in the EU exports and of groups II and III in the EU imports. The group III – electronics-telecommunication -is an evident example for the complementarities of the two industries and the price competitiveness of the Chinese products.
- As we can anticipate now, the mutual trade, in general, and that of medium and HT products, in particular, between the two global superpowers will develop in a fast rate in the future. The EU reindustrialisation efforts will determine, in our opinion, a decrease of trade deficit recorded by EU, as a whole and for HT products, and a better configuration of EU imports from its Asian partner.
- Romania, as an EU Member State, must intensify its cooperation with China in the RDI sector and also the external trade with this country, offering more manufactured, and if possible, medium and high-trade products.

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