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KNOWLEDGE AT THE SERVICE OF DEVELOPMENT: AN EXPLANATION FOR THE BRAZILIAN STAGNATION

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Brazil belongs to the select group of BRICS, along with Russia, India, China and South Africa. It is considered one of the countries with the greatest growth potential in the 21st century. Currently, the country faces the challenge of managing to transform knowledge into development. Only then Brazil will have chances to occupy a prominent place among the nations promoting social inclusion and sustainable development. Unlike international perception, analysis of recent data indicates that the Brazilian production of knowledge that is development-oriented has stagnated in recent decades. This article analyses some of the reasons commonly given to justify the situation in which Brazil stands. It presents an alternative explanation. It discusses some conclusions presented in a recent report on the approach between research and development, published by UNESCO. The discovery and recognition of the problem's existence may represent a first step towards overcoming this situation.

Key Words: *Brazil, Innovation, Knowledge for Development, Entrepreneurship, Social Entrepreneurship, Knowledge Management*

INTRODUCTION

Contemporary society is experiencing a moment of paradigm shift. The factors that once generated wealth no longer have the same value today. Owning land, capital or labor no longer means having income, prestige and power. In the society in which we live, knowledge is the main factor of production. Countries that manage to put knowledge at the service of economic and social development will occupy a prominent role in this new century (Drucker, 1993). This is the biggest challenge that nations are facing.

The application for and the granting of a patent for a product or processes are considered to be one of the expressions of the transformation of knowledge into economic and social value (Crosby, 2000). The patent, in its classic formulation, is a public concession, granted by the State to the authors – whether a natural or a legal person – holders of the rights of creation and exploitation of an invention or utility model (Pavitt, 1988). Many of these patents can be transformed into products that could prolong life, reduce pain and prevent illness for thousands of people. Others create business opportunities that are able to promote the social inclusion of currently marginalized populations. Novelty is one of the requirements for the national or international submission of a patent application, depending on where the companies plan to manufacture and market its products (Mansfield, 1986).

According to information available on the United States Patent and Trademark Office website, available in Annex I, Brazil registered 88 patents in 1998. In 2008, 133 patents were registered. That is, over 10 years, in absolute terms, the Brazilian production of patents has increased! In relative terms these data become unsettling. In 1998, Brazil presented the same number of patents as the ones registered by the Chinese. In 2004, this difference increased: Brazil submitted a quarter of the patents submitted by the Chinese. In 2009, Brazil managed to register a number of patents 16 times lower than the one in China! Regarding the Indian, this difference, although smaller, can be easily perceived. In 1996, the Brazilian production of patents surpassed the Indian production. In 2006, they submitted three times as many patents as Brazil. In 2009, this difference increased even more! Table 1 illustrates this evolution.

Table 1: Increasing Trends in Patents

Country	1996	1998	2000	2002	2004	2006	2008	2009
India	37	94	131	267	376	506	672	720
China	48	88	161	390	597	970	1.874	2.270
Brazil	69	88	113	112	161	148	133	148

Source: Created from Data Shown in Annexure I

Many people were surprised by the result of the 2009-2010 edition of the "Global Information Technology" report, by the World Economic Forum. This international organization has presented, since 2002, the ranking of countries using technology at the service of growth and development. In the latest edition, Brazil has remained at the same position as in the previous ranking, continuing in the 59th place. Developing countries such as South Africa, Chile, Costa Rica, Jamaica, Jordan, Kuwait and Malaysia stand ahead of Brazil. China, which occupied the 17th position in the previous ranking, now occupies the 13th. The table 2 below illustrates this evolution.

Table 2: The Networked Readiness Index Rankings

Country	2008/2009	2007/2008	2006/2007
China	13th	17th	13th
Malaysia	28th	26th	26th
Chile	39th	34th	31st
Jordan	44th	47th	57th
South Africa	52nd	51st	47th
Jamaica	53rd	46th	45th
India	54th	50th	44th
Kuwait	57th	52nd	54th
Brazil	59th	59th	53rd

Source: The Global Information Technology Report 2008-2009 © 2009 World Economic Forum

In this paper we analyze one of the problems that hinders Brazil's way to the production of knowledge at the service of development: the evaluation policy for scientific and technological production, which values only national scientific production that is presented in the form of an article published in an indexed academic journal, with quality and international recognition. Methodologically, two reasons commonly given to justify this situation will be analyzed in a critical way: the lack of public funding for Science and Technology and the small number of researchers with a doctor's degree in Brazil. Then, some consequences of this policy will be analyzed.

Verifying the existence of this problem represents a first step towards overcoming one of the obstacles that can explain the position in which Brazil stands among the nations that use technology at the service of growth and development.

First Reason

One of the reasons that are commonly given to justify this situation relates to the small amount of public investment in Science and Technology (S & T). The question posed is: Does Brazil invests insufficiently in Science & Technology?

According to data available on the Ministry of Science and Technology website, which was consulted during the preparation of this paper, Brazil maintained, over the last decade, an average of investment in S & T between 1.3% and 1.6% of the Gross Domestic Product (GDP), cf. Table 3.

Table 3: National Expenditure on Science and Technology (S & T)

Ano	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
%	1.30	1.33	1.30	1.26	1.24	1.27	1.28	1.38	1.47	1.63
Billions	15,2	17,2	19,2	21,3	24,0	27,2	30,3	36,6	44,2	51,1

Source: http://www.mct.gov.br/index.php/content/view/29140.html

This percentage can be considered low if compared to those of South Korea (3%), Australia (1.5%), Singapore (2.2%) and Israel (3.5%). However, if the expenditure per full-time researcher is calculated, the situation changes radically. For an idea of the magnitude of this budget, it is enough to mention that Brazil invested \$ 193,000 per full-time researcher in 2000 (Brandao, 2006). This sum is equivalent to the one spent by the United States and higher than the one spent by many developed countries such as Canada (\$ 162,000), Japan (\$ 153,000), UK (\$ 152,000) and Australia (\$ 118,000). This amount increased even more during the last decade, especially because many state governments are allocating significant portions of their revenue to their respective Foundations of Research Support.

Carlos Henrique de Brito Cruz is the scientific director of the São Paulo Research Foundation (FAPESP) in Brazil and a professor at the Gleb Wataghin Institute of Physics at the University of Campinas (Unicamp). Hernan Chaimovich is a full professor at the Institute of Chemistry at the University of São Paulo and chief executive officer of the Butantan Foundation. They were responsible for the chapter that discussed Brazil's situation in the context of countries that combine research and development. According to them:

A substantial slice of government R&D funding comes from state governments, via foundations they fund, mission-oriented, state-owned institutes and state-owned institutions of higher education. In 2008, about 32% of public R&D expenditure originated from state funds. (Cruz e Chaimovich, 2010:107-108). Public investment in Science and Technology is not, therefore, pitiable.

And why this investment is not transformed into knowledge at the service of development in Brazil? The evaluation policy for scientific and technological production represents a problem to be overcome. The criteria used by this policy for the evaluation of productivity values exclusively the bibliographic production on academic vehicles recognized by the scientific community. This policy does not recognize any other kind of production or activity. The creation of an innovative product or process that becomes a patent is not used as an indicator in the current evaluation policy for scientific and technological production adopted by agencies that promote scientific activity in our country.

In Brazil, the vast majority of full-time researchers work in public institutions of higher education. Some of them on laboratories and research centers linked to ministries or public agencies. They are all evaluated with the same indicator of productivity: the publication of scientific articles in academic journals with international circulation. This policy explains why the number of patents has stagnated while there is growing number of articles. Cruz and Chaimovich (2010) present related data. According to them:

The number of scientific publications originating from Brazil has grown steadily over the past 26 years, culminating in 26 482 in 2008 (Figure 8). In parallel, Brazil's world share of articles has climbed from 0.8% in 1992 to 2.7% in 2008. (Cruz e Chaimovich, 2010).

If this number represents the efforts of many scientists disclosing their production in international journals, it is also a response to the productivity criteria set by the two government agencies that are responsible for promoting science and technology in Brazil: The Coordination for the Improvement of Higher Education Personnel (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES), linked to the Ministry of Education, and the National Research Council (Conselho Nacional de Pesquisa – CNPq), linked to the Ministry of Science and Technology.

The Coordination for the Improvement of Higher Education Personnel (CAPES) plays a role in the expansion and consolidation of master's and doctoral programs in all Brazilian states. CAPES adopts an evaluation system for all postgraduate programs in Brazil, in the search for a standard of academic excellence that is guided mainly by the production of articles published in indexed and internationally recognized journals.

It's also worth noting that the production of these articles is not made in any manner and in any dissemination medium. It obeys strict rules, which are universally accepted by the national academic community. Brazilian scientists must publish their articles exclusively on journals that were well-rated by CAPES. For that purpose, CAPES created a set of procedures called QUALIS, designed for stratifying the quality of intellectual production. All scientific journals, both national and foreign, are evaluated by different committees of CAPES researchers, which grant a score for the article published in each scientific communication medium.

At the end of one year, the researcher calculates the points he scored according to the number of articles published in the respective scientific journal. This mechanism for evaluating journals has, therefore, an inducing role on the scientific production. Furthermore, any other type of intellectual production does not receive any order of assessment or score. Thus the preparation of textbooks, magazines or books published in commercial publishing companies has no value, even if it is very well accepted by the audience and critics. Products available on the web, accessed by thousands of people, do not score any points in the production of a scientist as well.

All academic journals indexed with the highest degree are either American or European. One can assume from that there is a homogeneous and abstract international scientific community and a neutral science, at the service of itself, ruled by universal criteria of quality and excellence. A brief review of bibliographic production in North American journals, which represent the hegemonic knowledge, would be enough to dismantle this logic. Many scientists from developing countries highlight some structural obstacles and subtle prejudices that hinder the dissemination of researches conducted in the poorest nations of the developed world (Gibbs, 1995). This, however, is not the focus of this article.

What is important to reiterate now is that investing about 1% of the GDP is not such a small amount of money. The main problem is not the absolute or relative value of the investment but its objective and purpose. Presently, *every* Brazilian researcher has his productivity measured exclusively by the number of articles published in journals indexed and evaluated by CAPES. The submission, in the form of a patent, of a concrete result for the country's development or for the resolution of serious problems that affect the vast majority of Brazilians is not valued. For this reason, the economic and social impacts of this investment are not perceived by society. For this reason, patent production has stagnated while article production remains increasing. The central problem does not lie, therefore, in the lack of investment. It is clear that the country could invest more in science and technology! However, the main problem does not lie in the amount invested, but on its purpose. The Brazilian scientific and technological policy does not encourage research that seeks to solve vital and strategic problems to the nation. It aims to transform this investment into articles published in indexed journals that generate little impact on society.

Second Reason

The second suggested reason that could be hindering the production of knowledge at the service of development is associated with the idea that there are not enough professionals with a PhD in Brazil. Some experts justify that Brazil does not occupy a place of prominence in the ranking of countries using technology at the service of development because it has a small number of professionals with a doctor's degree.

According to the Coordination of Improvement of Higher Education Personnel (CAPES, 2010) report of 2010, the number of people who concluded their doctorate in Brazil rose from 2,830 in 1996 to 10,711 in 2008. These indicators correspond to an increase of 278% in 12 years. There are, according to this same source, 87,063 people holding the title of doctor in 2008. For Cruz and Chaimovich (2010):

Although Brazil has managed to increase the number of doctorates granted each year to 10,711 in 2008, the country still faces a shortage, especially in engineering. The number of graduates may seem high but this translates into just 4.6 doctorates per 100,000 inhabitants, a ratio 15% lower than in Germany and roughly one-third that of the Republic of Korea. (Cruz e Chaimovich, 2010:109-110).

However, a question can be asked: Where will the average of 10,000 doctors who graduate each year in Brazil work?

The immediate answer is: they will work teaching in higher education. Recent data on the percentage of the distribution of doctors entitled in Brazil in the 1996-2006 period, employed during 2008, by section of the National Classification of Economic Activities (CNAE) of employing establishments indicates that 76.7% of professionals with a PhD work in education whereas 1.3% of them work in the industry of technology transfer.

Why are not all these doctors hired by companies? One answer seems to be connected to the prevailing business culture while another relates to the current evaluation policy of productivity in science and technology.

Thus, on the one hand, there is a business culture that is refractory to the production of knowledge at the service of development. According to estimates of "Technological Innovation Survey" (2007), in a universe of more than 91,000 industrial companies, less than 7,000 had internal activities of research and development. According to a study from the "National Association for Research, Development and Engineering of Innovative Companies" ("Associação Nacional de Pesquisa, Desenvolvimento e Engenharia das Empresas Inovadoras" – ANPEI), only 0.8% of those employed in companies engaged in Research and Development (R & D). This percentage represents about 41,000 people. Only 750 of those have PhD! South Korea, with a population four times smaller than Brazil, employs over six thousand doctors in companies. The fact that South Korea employs so many Doctors in companies generates a noticeable consequence. In 2009, South Koreans submitted more than 9,566 patent applications in the U.S., compared with just over a hundred from Brazil. Both countries have a community of scientists of similar size, but in Korea, about 80% of scientists dedicate to guiding the production of knowledge for development, whereas in Brazil, the same sector absorbs less than 10% of this skilled workforce.

The idea that basic research is conducted in universities seems to prevail in Brazilian business culture whereas the production of knowledge at the service of development happens in industries, without the necessary participation of doctors.

Yet another perspective can be identified on the Triple Helix idea developed by Etzkowitz and Leydesdorff (2004). These authors recognize the importance of the University-Industry-Government interaction. For them, this is the basis of the process of production of knowledge at the service of development. This development model has been analyzed and followed by different businessmen, entrepreneurs and researchers all over the world (Etzkowitz, 2008).

This seems to have been the effort undertaken by the Program of Research Support in Business (Programa de Apoio à Pesquisa em Empresas – PAPPE) developed by FINEP in a partnership with the Foundation for Research Support in the State of Rio de Janeiro (FAPERJ) in 2004. The Financier of Studies and Projects (Financiadora de Estudos e Projetos – FINEP) is a public company managed by Brazil's Ministry of Science, Technology and Innovation. Its mission is to promote Brazil's economic and social development through public incentives for Science, Technology and Innovation in companies, universities, institutes of technology and other public or private institutions. It seeks to operate in the entire innovation chain, focusing on strategic, structuring and impacting actions for the country's sustainable development. Pereira Neto and colleagues (2004) have evaluated the experience and have identified three different forms of spinning the Triple Helix. In the first, there would be the "university's broods" initiatives: companies designed and/or constructed by researchers and/or students and that are (pre) incubated. In the second form, authors have identified the companies that are "university's children": companies created in the academia, but that already have the necessary economic maturity and technological expertise to fight for their place in the market. The third category contains companies that hunt talents in the academia. They are big and often traditional companies, seeking ideas and Doctors in the academia in order to streamline their processes and products. These authors emphasized that greater government incentive would be necessary so that research institutions and companies would interrelate in order to fulfill their roles by integrating a true system of innovation and of production of technology at the service of growth and development.

Anyway, some authors advocate the idea that innovation is not made only inside companies. Thus, the innovation process is complex, dynamic and nonlinear. It is extremely dependent on an appropriate environment that encourages interaction between companies and research centers and that has adequate funding and legislation, constantly valuing human capital.

Doctors are not absorbed by the companies also because their training sought to obey the evaluation policy for scientific and technological production that values exclusively academic activity that is turned into articles published in journals that are well-qualified by the Coordination for the Improvement of Higher Education Personnel (CAPES) rather than the production of technologies at the service of growth and development.

The postgraduate programs cover today virtually all Brazilian territory, in all areas of knowledge. They are all organized to train researchers who will work mainly at the very university from which they graduated or at other institutions of higher education, as professors and researchers. And how are doctors that train future doctors are assessed? Both professor and student are encouraged from day one to publish articles in indexed journals, with quality internationally recognized by CAPES. In fact, the student is induced to write and publish articles, since scientific initiation scholarship. He is not encouraged to innovate or to find technological solutions that could contribute to the country's development. The evaluation policy for scientific and technological production induces the student and the professor to focus exclusively on the production of articles. This is not the main indicator of productivity. It is the only one.

It is important to reiterate at this point that, by keeping the current pace of 10,000 doctors graduating each year, Brazil will have, by the end of this decade, about 100,000 new doctors. If the current evaluation policy for scientific and technological production is to be kept, a question must be asked: Where will these doctors perform their professional activity? If the corporate culture remains refractory to the presence of Doctors in the company, it is to ask the question: Where will these doctors perform their professional activity? Since there won't be enough room for everyone to teach in higher education, some of them will work as bank tellers, taxi drivers or other activity at the service sector. With any luck, some will become associates or members of a technology-based or knowledge-intensive company. In this case, the country's effort to invest in the training of these professionals will have been worthwhile. But this possibility does not invalidate the finding of the discrepancy between the number of doctors graduated every year in our country and the hostile economic and social environment that is being developed to absorb them and the logic that guides the public policy of evaluation on science and technology, which interferes with the training of doctors If most of the doctors keep on directing their professional practice towards the production of articles, companies and businessmen will continue to regard them as professionals who do not have any potential to contribute to the development of their product or process.

A recent report by CAPES (2010) showed that the number of doctors in Brazil corresponds to one researcher for every 1,000 inhabitants. In China in 2004 there were about 1.2 researchers per 1,000 inhabitants. That is, the relative number of Doctors in Brazil is similar to the one found in China. As noted above, the result of the work of Doctors in these two countries in terms of technological innovation and submission of patents is extremely uneven.

The problem does not lie in the lack of doctors, but in the destination that is being built for them. Where will they return to society the investment made in their training? How many will work on innovative companies? The central problem lies not, therefore, in the lack of doctors. It is clear that the country could have more doctors! The main problem is not the shortage of doctors, but the purpose of their work. The doctors are not prepared to try to solve problems that are vital and strategic to the nation. They graduate ready to publish articles in indexed journals that generate little impact on society.

The current evaluation policy for scientific and technological production that values only bibliographic production has, therefore, serious consequences on the scientist's life and on the production of technology at the service of growth and development.

Consequences

Brazil's position in the ranking of countries using technology to promote growth and development and on the submission and granting of patents in international agencies seems to be one of the consequences of the current evaluation policy for scientific and technological that values exclusively the production of articles in journals that are indexed and well evaluated by the agency of Brazil's Ministry of Education.

Cruz and Chaimovich (2010) reached similar conclusions. In their opinion the small number of scientists working in the business sector directly affects the number of patents originating from Brazil, in the same way that dominant industrial sectors and export coefficients do. There may be a correlation between these low patent figures and the level of qualification of researchers employed in the business sector, given the small fraction with an advanced graduate degree. (Cruz e Chaimovich, 2010:114).

There is another, perhaps even more serious consequence of this evaluation policy for scientific and technological production: the death of helpless victims.

The case of Dengue fever seems to be exemplary in this sense. Dengue fever is a worldwide public health problem. It is estimated that there are about one hundred (100) million infections per year, causing millions of cases of febrile illness and approximately 250,000 cases of dengue hemorrhagic fever. In Brazil, this epidemic began in 1986 and now occurs in all regions of the country, with tens of thousands of cases reported annually, some with hemorrhagic and fatal manifestations. Dengue control, today, follows the same general rules of combating vector mosquitoes, preconized by sanitarian doctor in the early twentieth century. Control and eradication of the vector mosquito of the disease is undoubtedly a rather complex and difficult procedure. It is recognized that the ideal alternative to the control of the epidemic would be the creation and production of a vaccine, as the one for yellow fever, with excellent immunizing capacity.

As the summer begins in Brazil, Dengue outbreak turns into a threat. On these occasions, newspapers systematically blame the federal, state and municipal governments for the epidemic overrunning cities. The press also places the responsibility on citizens for not taking the recommended preventive measures. In our opinion, the evaluation policy for scientific and technological production cannot be left out of the analysis of the causes that lead the country to live annually this dramatic situation.

The problem, again, is not lack of money. The development agencies have funded research on Dengue. The problem also is not a lack of doctors. There are numerous PhD researchers in the country devoted to the subject. The problem is that these doctors receive this funding anxious to transform this knowledge into articles published in a journal indexed and well qualified.

These evaluation criteria of the Brazilian scientific production inhibit a researcher from engaging in more pragmatic studies, which can take years without achieving a concrete result. He should continue to receive funding and advises in despite of not publishing nothing about their findings. Conversely, he should not publish at all! If he discloses his findings, he will lose the right to patent his discoveries.

Thus, the application for patents and production of technology at the service of growth and development collide head-on with the current evaluation policy for scientific and technological production.

This can be justified as *novelty* is a crucial element in the submission of a patent. The article 8 of the Law 9279 of 14 May 1996 states that "In order to be patentable, an invention must meet the requirements of novelty, inventive activity and industrial application." The determining of *novelty* is made through the investigation of its uniqueness. That is, if the researcher publishes part of his research, the basis of his invention, he will lose the right to patent it. That is, if the researcher of Dengue follows the current evaluation policy for scientific and technological production and publishes part of his findings, he will lose the right of patenting it. This may be one of the reasons to explain why technological innovation has not developed as it should, in Brazil. Thus, we may affirm that by acting this way, Brazilian government is contributing to the death of defenseless children and citizens. It is not placing science and technology at the service of citizenship and of the improvement in living conditions for Brazilians.

Final Remarks

This article does not condemn evaluation as "a systematic process to determine the extent to which a program or intervention has achieved the intended goals" (Sessions, 2001).

We do not question CAPES's importance in the introduction, maintenance and development of an evaluation system and its consequences on raising and preserving the quality of postgraduate education in our country. This article did not intend to question the actors and authorities responsible for designing these criteria. They are serious, skilled and responsible professionals.

The direction that the evaluation of scientific and technological production has been taking forces us, however, to reflect on the sole indicator used – the publishing of articles in indexed journals, well-evaluated by CAPES – especially on its impacts on the process of scientific and technological innovation that the country dispenses with.

This policy that universalizes this single criterion to all areas of knowledge can be considered one of the reasons for the decreased production of technology at the service of growth and development in Brazil. According to Cruz and Chaimovich (2010):

In 2009, 103 utility patents for Brazilian inventions were issued by the United States Patents and Trademark Office (USPTO), almost the same number as five years previously (106) (Cruz e Chaimovich, 2010: 113).

These authors consider this to be a very small number, especially when one takes into consideration the size of Brazil's economy and of its scientific infrastructure. Meanwhile, the country's position in the ranking of published articles has increased significantly.

This paper intended to stress that this evaluation indicator has become an obstacle to the production of technology at the service of growth and development in Brazil. It did not have the illusion of admitting that this is the only problem, nor the most important. It only emphasizes its existence. It did not have the illusion of admitting that the removal of this obstacle will allow the country to recover the lost time and to reach a prominent position in the ranking of countries that use technology at the service of growth and development. Acknowledging its existence, along with its logic, functioning and consequences, may contribute to its replacement by broader criteria, which take into account other relevant activities in the academia, which establish closer ties between universities and companies and value the production of knowledge and which are in tune with social, scientific and technological demands. Criteria that value the production of technology at the service of growth and development in Brazil.

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Annexure I

Number of Patents Granted as Distributed by Year of Patent Grant Breakout by U.S. and Foreign Country of Origin

http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_all.htm, viewed on January 21, 2013

Country	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
U.S.	69419	69923	90697	94089	97011	98655	97124	98590	94128	82586	102267	93690	92001	95037
Japan	24059	24191	32118	32514	32922	34890	36339	37248	37032	31834	39411	35941	36679	38066
Germany	7125	7292	9582	9895	10824	11894	11957	12140	11367	9575	10889	10012	10085	10353
United Kingdom	2676	2906	3729	3904	4092	4358	4202	4037	3905	3560	4329	4031	3843	4011
France	3016	3202	3991	4097	4173	4456	4421	4126	3686	3106	3856	3720	3813	3805
Taiwan	2419	2597	3805	4526	5806	6545	6730	6676	7207	5993	7920	7491	7779	7781
Canada	2638	2817	3536	3678	3925	4063	3857	3894	3781	3177	4094	3970	4125	4393
Korea, South	1567	1965	3362	3679	3472	3763	4009	4132	4671	4591	6509	7264	8730	9566
Italy	1385	1417	1821	1686	1967	1978	1962	2022	1946	1591	1899	1836	1916	1837
Switzerland	1192	1179	1374	1390	1458	1557	1532	1433	1405	1106	1388	1280	1403	1454
Sweden	971	970	1346	1542	1738	1933	1824	1629	1388	1189	1360	1278	1260	1231
Netherlands	886	895	1382	1396	1410	1494	1681	1570	1537	1200	1647	1596	1725	1558
Australia	566	568	830	832	860	1032	992	1049	1093	1032	1538	1545	1613	1550
Israel	525	577	820	792	836	1031	1108	1260	1092	976	1325	1219	1312	1525
Finland	453	468	629	695	649	769	856	944	954	751	1005	943	908	997
Belgium	516	561	755	718	756	796	801	727	678	577	720	624	605	707
Austria	387	393	408	505	537	632	559	639	575	492	626	554	575	767
Denmark	334	432	500	588	509	556	559	611	530	473	546	511	566	537
China,Hong Kong	247	261	373	413	548	621	589	681	641	596	753	756	717	587
China, Republic	48	66	88	99	161	265	390	424	597	565	970	1235	1874	2270
Spain	187	193	308	265	318	340	358	358	312	318	381	363	418	403
Norway	150	157	232	246	266	282	261	279	255	242	272	286	297	292
Singapore	97	100	136	152	242	304	421	460	485	377	469	451	450	493
India	37	48	94	114	131	180	267	356	376	403	506	578	672	720
South Africa	116	114	132	127	125	137	123	131	115	108	127	116	124	139
New Zealand	78	109	145	134	136	160	173	165	192	143	173	165	169	198
Ireland	86	76	78	100	137	164	142	182	197	169	198	161	188	189
Russian Fed.	118	112	194	185	185	239	203	203	173	154	176	193	181	204
Brazil	69	67	88	98	113	125	112	180	161	98	148	118	133	148
Mexico	46	57	77	94	100	87	105	93	102	95	88	90	77	80
Malaysia	24	29	35	34	47	56	62	63	93	98	131	173	168	181