

COMPARATIVE STUDY ON THE FACTORS OF COMPETITIVENESS: LUXEMBOURG-SINGAPORE



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OF COMPETITIVENESS:
LUXEMBOURG-SINGAPORE**

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COMPARATIVE STUDY ON THE FACTORS OF COMPETITIVENESS: LUXEMBOURG-SINGAPORE

Report

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Executive summary

Luxembourg and Singapore are both wealthy countries by international standards and also compared to their close neighbors. GDPs are growing again in 2010 for both countries, more rapidly in Singapore, while there are still uncertainties for many other economies in the World. Both economies are opened to the outside and their production and wealth mainly based on services activities. In macro-economic terms, there are more similarities than differences between the two countries, even if some key structural aggregates may differ.

Other marginal differences between the two countries may also be noticed regarding employment and the labour market. The employment ratio to population is higher in Singapore than in Luxembourg with a reverse effect on the dependency ratio which sets at around 50% in Luxembourg and below 40% in Singapore. Men participate more than women to the labour force in both countries, the only difference being related to the age group 55-64 in which women are more active than men in Luxembourg. Vulnerable employment is lower in Luxembourg but unemployment is higher reaching 6% against only 2% in Singapore.

In general, the population in Luxembourg is better educated but the difference is rapidly closing as Singapore records more and more graduates from the secondary and tertiary educations. Expenditures in R&D, mostly financed by the private sector, are higher in Singapore but Luxembourg is catching up in the last few years.

There are also certainly sectors that offer more opportunities for increasing the competitiveness of a country than others. The services sector, and particularly those with a high content in ICT, is by far the most promising. Both countries rely greatly on services for their economic growth and development and for their employment. Being competitive in these sectors is certainly more difficult as comparative advantages are difficult to keep from competitors. It takes time to get the acknowledgement of competences that will help making a difference with the other countries.

Despite the absence of large differences in their compared macro-economic structures and performances, the respective levels of competitiveness of the two countries are differently appreciated by the major ranking exercises in this area, particularly the ones made regularly by the World Economic Forum and the IMD Institute. In the last few years, Singapore has constantly been ranked as the first or second competitive economy in the World while Luxembourg was ranked between 10th and 15th.

Understanding better the competitiveness gap between the two countries requires to gather information and to analyze factors that are both of quantitative and qualitative natures. Some differences are linked to the perception of the business community on the incentives and government support that they can get to create and to develop their activities as well as to adaptability of the population and of the government towards changes. The business rationality that is expressed here must be sometimes questioned particularly for the reason that “better is expected from the ones that do better”. As they are in the club of the most competitive nations, Luxembourg and Singapore must do better than the others and confirm on a permanent basis their status.

To better satisfy the business community, the governments must ensure that the state of readiness and development of the physical infrastructures allows a rapid circulation and exchange of information and a fast integration of technical progress in the production process. In this area, Luxembourg, despite its size, has made important efforts in the recent years for increasing the connectivity of its economy. These efforts are acknowledged and transpire from several recent studies on the development of the knowledge society.

Important efforts remain to be done, particularly to integrate Government services in this global information system. Singapore has also been improving its potential in this area, particularly for the circulation of innovation.

The modernization of a legal and regulatory framework that is more conducive to attracting and developing business activities is another requirement that the businesses expect. Singapore has certainly done better than Luxembourg in this area as investors are better protected and doing business is easier and less costly. A particular attention should be given in Luxembourg to mobilizing the banking sector as an effective partner for business.

Last but not least, the ability of the Government to act quickly and wisely for taking benefit from opportunities and adapting to changes is viewed as a key factor for competitiveness. Here too, the businesses trust more the ability of the Government of Singapore than the one of the Government of Luxembourg. It is certain that this assessment is linked to the institutional commitments that the Government of Luxembourg has taken internally, in the context of the social and economic dialogue, and externally, with its partners of the European Union. In comparison, the Government of Singapore has more room of maneuver to act individually and quickly.

Some other differences are generated by factors which are more rooted in the respective history and culture of the two countries. Among them, the relation between the level of education and the adaptability and relevance of the work force is certainly identifiable. There are evidences that show that students in Singapore have better performances in Mathematics and Science than the students in Luxembourg; but, does that really matter when they enter the labour market? The mechanisms through which more science-educated students will become more productive technicians in businesses are not totally linear and need more exploration.

Values and attitudes of the population are also important for their influence on flexibility and adaptability to changes as well as on the perception of the future and what it can bring, for each individual as well as collectively for the whole nation. In this area, people of Singapore appear to be more flexible to change, more ready to take risks in business and more involved in their respective communities. However, people from Luxembourg are in general more satisfied with their lives.

The study has only highlighted some of the differences and similarities between the two countries at a macro level. The results are not enough conclusive at this stage to draw lessons that would help Luxembourg or Singapore in improving their respective level of competitiveness. A deeper look is also necessary at a meso level (how institutions and markets effectively work) and a micro level (key sectors).

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Introduction

Competitiveness is a key issue in a world that is more and more global and interconnected. In a situation of depression and crisis as the one we are leaving today, being competitive is a necessary condition for a country to sustain and improve its economic and social development and its way of life. Today, being competitive is a matter of survival: it can delay the effects of the downturn in activity and business on the economy and thus allow smoother transitions and adjustments; it also facilitates the implementation of measures and policies that will have an influence on the depth and the speed of the changes.

It is thus crucial for a country to analyze all the factors that make it competitive or not and to better comprehend their foundations and the way they interact among each other. These factors are of diverse natures covering for example economics, the social fabric, the legal and institutional framework, the attitude of the Government and of the people towards changes. Some of these factors can be influenced by Governments and/or other economic actors in countries while some others are imposed from outside. These factors can also evolve in conflicting directions.

The room of maneuver for Governments is sometimes very thin and the impacts of the measures and the policies taken to improve competitiveness can be very long to materialize, if they materialize.

Another difficulty stands with the measurement of competitiveness that is the result of the integration of several types of information. Perceptions from business executives, gathered through surveys, are keys in the international ranking systems that are mostly used and regarded. Confronted to concrete data, these perceptions are sometimes difficult to interpret and to validate. However, they constitute a common basis for international comparison and, whatever are their limitations, they give valuable indications on the strengths and weaknesses of a country vis-à-vis its main competitors.

Each year, Luxembourg¹ prepares and publishes a report that presents key indicators on the factors leading to competitiveness and comparisons with other countries, mainly the member states of the European Union.

This year, the comparison has been extended to non-EU country and a chapter of the report has been dedicated to comparing the competitiveness level of Luxembourg to the one of Singapore. An initial and rapid review of the existing data has been done that led to the conclusion that a deeper look at the factors making the difference between the two countries would be useful. This study tries to bring some more ground to the discussion by going into a more detailed comparative analysis between the two countries.

At this stage, it is important to consider all the existing evidences that can be compared between the two countries before drawing any conclusions on the main elements that favor competitiveness in the structures, in the fabric, in the policies and in the values of a country.

This study is organized around three main parts:

- **The first part** is dedicated to a quick overview and comparison of the main structural socio-economic bases in the two countries. The overall structure of the annual report on competitiveness in Luxembourg has been kept. However, it has not been possible to find comparable indicators for all the dimensions covered and in some cases some proxies have been used. Additional comparable indicators have also been looked at,

¹ Observatoire de la Compétitivité du Grand-duché de Luxembourg.

- **The second part** builds on the results of the main studies on competitiveness that are regularly produced and that provide international ranking among countries. The detailed elements of these rankings are looked at in order to identify additional factors that favor competitiveness,
- **In the third part**, some issues and themes that seem important to better understand the differences between the two countries are explored a little further.

A statistical annex is attached that has been built mainly on the basis of data available from the Department of Statistics of Singapore and the STATEC but also using data bases of international organizations such as the International Monetary Fund (IMF), the World Bank (WB), the United Nations Development Programme (UNDP), the International Labour Organization (ILO), the United Nations Conference on Trade and Development (UNCTAD), the Organization for Economic Cooperation and Development (OECD), the International Telecommunication Union (ITU).

The annex also includes data from the World Economic Forum (WEF), the IMD Institute, the Fraser Institute, the Heritage Foundation and the Conference Board.

The study will be circulated to a panel of officials and experts from both Luxembourg and Singapore for discussion, comments and follow-up. They will review the data and the evidences analyzed in this paper with the general aim of identifying more precisely the factors that make a small country more or less competitive in today's global and open world. They will also discuss elements conducive to improving competitiveness that need further exploration in their respective countries and environments.

1. Compared socio-economic structures and trends

This section presents the available public statistics from the official statistical systems of both countries that cover the various dimensions of the Luxembourg annual report on competitiveness. The goal is to make a comparison for the most recent years but also to discuss, when possible, trends and evolutions. The available data published by the Department of statistics of Singapore and STATEC has been used². However, there are still differences in methods and practices between the two countries and for some comparisons, data from international organizations have been used. For some indicators, references have also been given to neighbor countries within the ASEAN and the EU.

The section is structured along the main dimensions covered by the annual Luxembourg competitiveness report (LCR). On the 86 indicators of the LCR, it was possible to find directly comparable figures for only 30 of them; for 14 additional indicators, some proxies could be estimated. In total, a little more than the half of the indicators of the LCR are analyzed in this section³. Additional data have also been used to better address some important aspects of the comparison and to extend its scope.

² The list of the indicators of the Luxembourg annual report on competitiveness has been sent to the Department of Statistics of Singapore who provided a very useful and instrumental feed-back on the availability of comparable data for Singapore.

³ The statistical annex gives a table on the availability of the Indicators of the Luxembourg annual report on competitiveness for Singapore.

The dimensions of the LCR that are best covered are dimensions A “macroeconomic performances” and B “Employment”. There was no comparable indicator available for dimensions D “market operations” and F “entrepreneurship”.

1.1 Macroeconomic performances

In 2010, the GDP per capita based on Purchasing-Power-Parity reached respectively 80 119 international \$ in Luxembourg and 59 711 in Singapore. Both countries record high levels when compare to their neighbors as it shows in the table below⁴. Regional differences are deeper marked around Singapore (the GDP per capita of Singapore is 18 times higher than the one for Vietnam) than around Luxembourg (GDP per capita of Luxembourg is 4 times the one of Portugal).

Table 1: Comparison between selected countries – GDP per capita PPP – 2011

Countries	GDP per capita PPP - 2011
Luxembourg	80 119
Belgium	37 736
Germany	37 896
Slovenia	28 641
Portugal (*)	23 361
Singapore	59 711
Hong Kong SAR (*)	49 137
Korea (*)	31 713
Thailand	9 396
Vietnam (*)	3 142

Source: IMF – World Economic Outlook

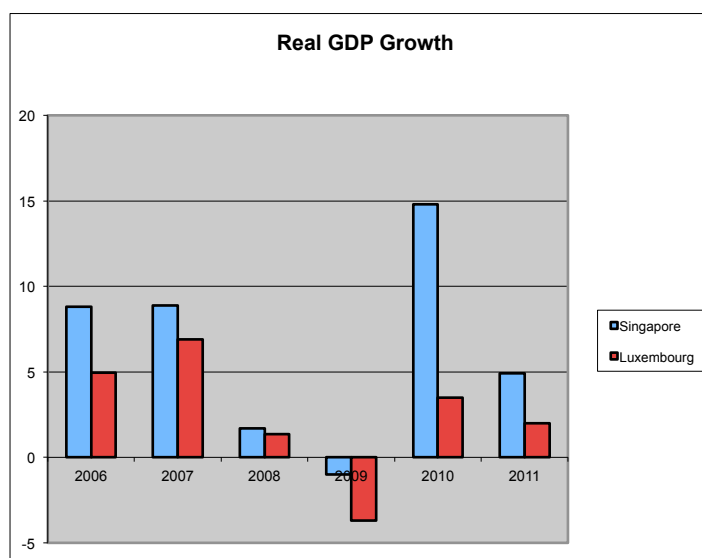
(*) = estimates

Real GDP growth followed a similar pattern in Singapore and Luxembourg between 2006 and 2010. Both countries economic growth levels have been affected by the global crisis in 2008 and 2009. However, growth has been more dynamic in Singapore, this being particularly sensible for 2010: real economic growth reached 14.5 %, a record high in this country for the decade. Prospects for 2011 are for a slower pace of economic growth in both countries, the fall being particularly dramatic for Singapore (from 14.5% to 4.9%).

Both countries records in 2010 high levels of economic growth compared to their neighbors: with 3.5%, Luxembourg comes immediately behind Germany (3.6%) but above Belgium (2.2%) or Denmark (2.1%); the 2010 growth rate of Singapore is twice the one of Thailand (7.8%) and Honk Kong (7.0%) and above the one of China (10.3%)⁵.

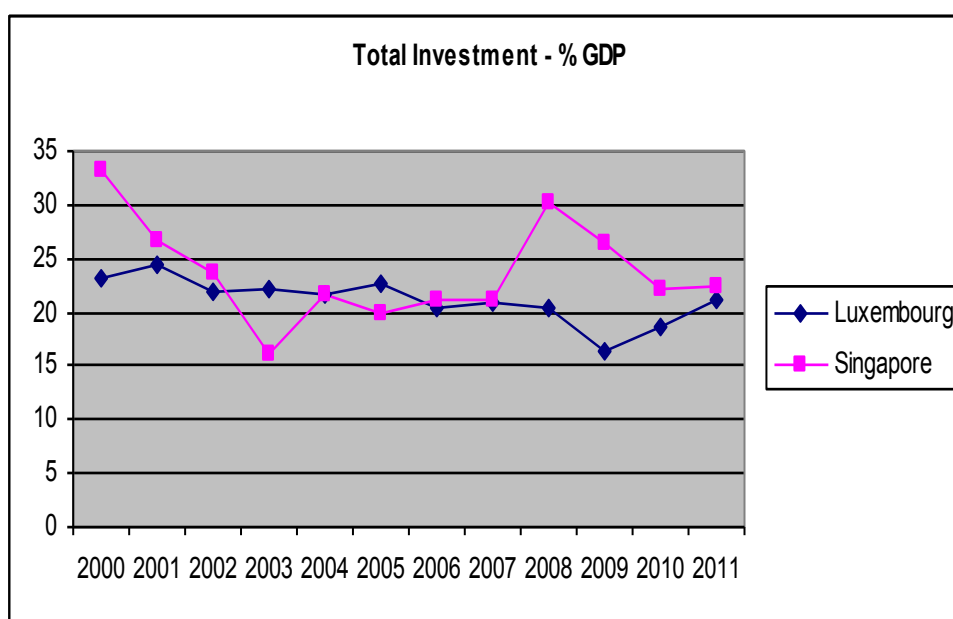
⁴ The GDP per capita indicator is not suited for Luxembourg because about 40% of the workforce in Luxembourg is made by cross-border workers from Belgium, France and Germany. These commuters are taken into account in the GDP, but not in the denominator which takes only into account national residents. Therefore this indicator overvalues Luxembourg's performance. The Gross national income per capita should be used for Luxembourg in international comparisons (see section 1.7 of this report).

⁵ The source for these regional comparisons is the World Bank.

Graph 1: Real growth of GDP - Luxembourg & Singapore, 2006-2011

Sources: Department of Statistics Singapore and STATEC

In 2010, the services contributed for 88.7% to the Luxembourg GDP, this share being of 70.5% in Singapore. These levels have not changed considerably during the last five years in both countries. Financial services and services to businesses generate more than 50% of the GDP in Luxembourg (50.8%) and only close to 30% in Singapore (29.1%). The share of wholesale and retail trade reached 17.2% in Singapore, this being almost the double than in Luxembourg (9.8%). The manufacturing industries have remained an important contributor to the GDP in Singapore in the last five years (23.2% in 2010). In Luxembourg the share of the manufacturing industries in the GDP has been regularly shrinking in the last 10 years: it was 9.1% in 2007 and only 6.1 in 2010⁶.

Graph 2: Total Investment as a share of the GDP – Luxembourg & Singapore, 2000-2011

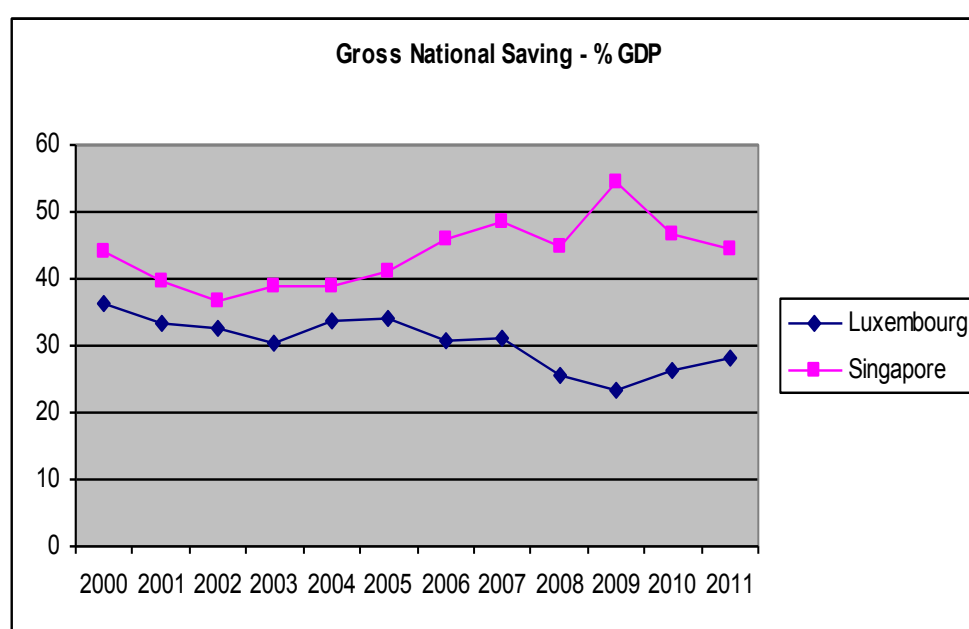
Source: IMF

⁶ See table 2 of the statistical annex

In the last three years, and despite of the economic crisis, Singapore has recorded high levels of Investment, culminating at 29.4% of the GDP in 2008 (a level close to the record one of 2000 – 33.2%)) and still reaching 22.4% of the GDP in 2011. Between 2000 and 2010, total investment declined in Luxembourg reaching a record low in 2009 (16.3%). Between 2000 and 2010, this decline reaches 30% (from 23.15% of the GDP to 16.3%). In 2011, levels in the two countries converge. These evolutions are presented in graph 2 above.

The share of the Gross National Saving in the GDP has been far higher in Singapore than in Luxembourg in the last 10 years. The difference that was minimal in 2002 (36.8% in Singapore against 32.6% in Luxembourg) has enlarged starting in 2006 and reached a maximum in 2009 (the share on saving in the GDP was two times higher in Singapore: 23.2% versus 41.8%). The difference seems to stabilize today but the level of saving is still much higher in Singapore as it is reflected in graph 3 below.

Graph 3: Share of the Gross National Saving in GDP – Luxembourg & Singapore, 2000-2011

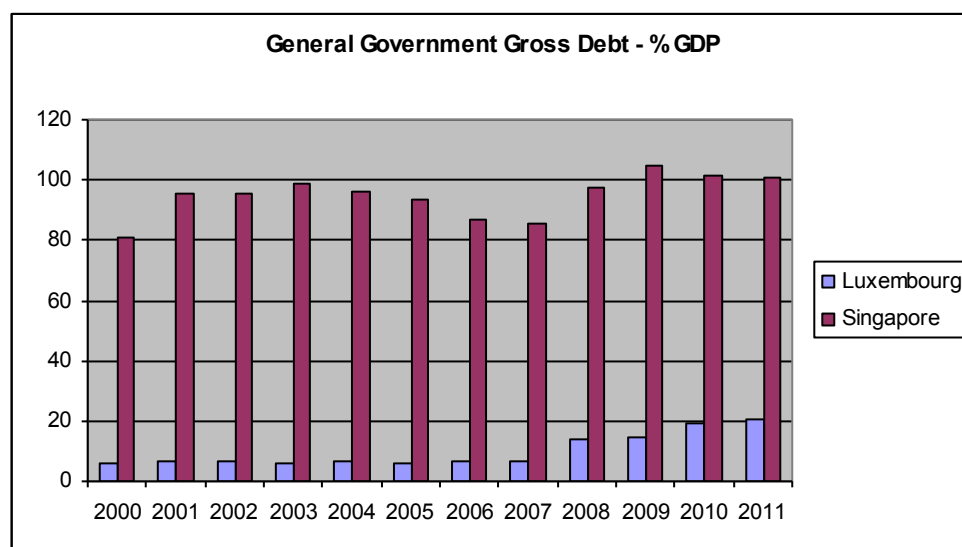


Source: IMF

Government Gross debt is very low in Luxembourg compared to Singapore: it was 13 times lower in 2000 and is still around 5 times lower in 2011. The level of the Debt in Singapore as a percentage of the GDP increased in 2008 and reached a peak in 2009, this being the conjunction of a negative evolution of the GDP growth (- 1%) and of a continued effort in investment mainly through public resources despite the crisis.⁷ The very good situation that prevailed in Luxembourg between 2000 and 2007 worsened in 2008 when the ratio of the Gross Debt on GDP doubled. This ratio is in 2011 more than 3 times what it was during the period 2000-2007⁸.

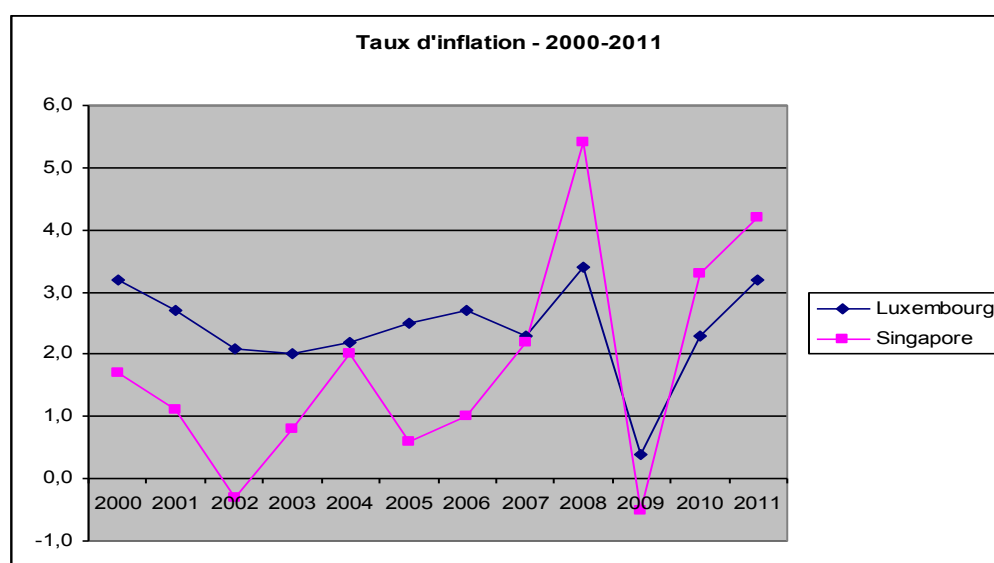
⁷ The Singapore Government does not need to finance her expenditures via the issuance of Government bonds. It has enjoyed healthy budget surpluses over terms of Government in the past decades. Singapore Government Securities are issued for reasons unrelated to the Government's fiscal needs, namely, to develop the domestic debt market.

⁸ Singapore government's borrowings are not for spending. Singapore Government Securities (SGS) are issued to develop the domestic debt market and Special Singapore Government Securities (SSGS) are non-tradable bonds issued specifically to meet the investment needs of the Central Provident Fund (CPF) Board.

Graph 4: General Government Gross Debt – Luxembourg & Singapore, 2000-2011

Source: IMF

Both Luxembourg and Singapore have very opened economies where external trade (both in goods and services) is an important leverage for generating growth⁹. Between 2000 and 2008, the annual percentage changes for the volume of both exports and imports of goods and services have been positive in the two countries, with peaks in 2004 for Singapore (22.9 and 19.1 percentage changes for respectively the volume of imports and the volume in exports) and 2006 for Luxembourg (12.8 and 13.0 percentage changes for respectively the volume of imports and the volume in exports). In 2009, these percentage changes have been negative for both countries (more than 10% for the volume of imports and more than 8% for the volume of exports) this being mainly linked to the global crisis. Singapore recovered more sharply than Luxembourg in 2010. In 2011, Luxembourg did better than Singapore for both imports and exports (see table 4a in the statistical annex¹⁰).

Graph 5: Compared inflation rates – Luxembourg & Singapore, 2000-2011

⁹ See section 3.1 below for more analysis on trade in services.

¹⁰ The comparison above is made on data from the IMF. Recent estimates from DOS suggest a different evolution for 2011 (see table 4b in the statistical annex).

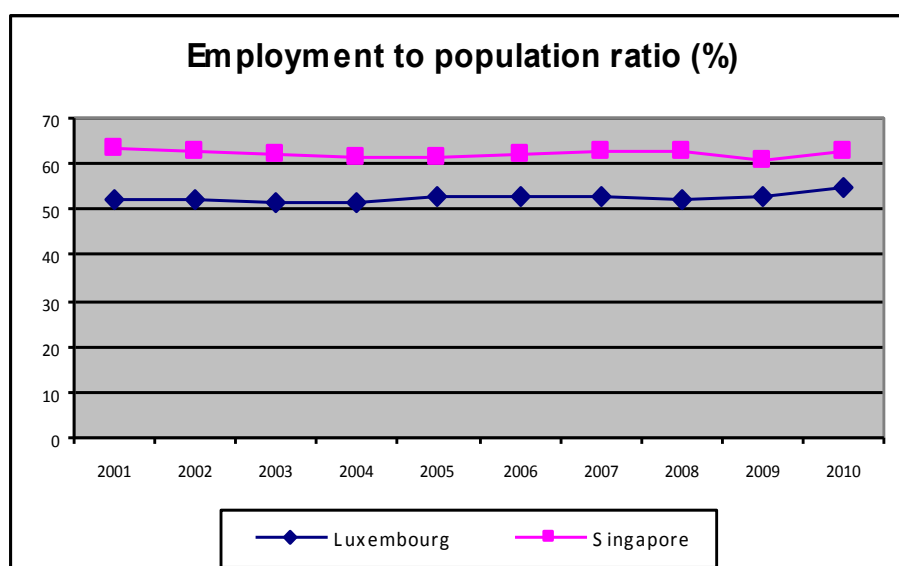
Sources: Department of Statistics Singapore and STATEC

The inflation rate reached a peak in Singapore in 2008 (6.6%) to come back to a more normal level in 2009 (0.6%) and increase again in 2010 (2.8%) and in 2011 (5.2%). Luxembourg recorded similar movements between 2008, 2010 and 2011 but of a lower magnitude. The evolution of the inflation rate of the two countries between 2000 and 2011 are given in the table above.¹¹

1.2 Employment and unemployment

The ratio employment to population is higher in Singapore than in Luxembourg but the gap is progressively narrowing. In 2001 the ratio was 63.6 in Singapore and 51.9 in Luxembourg, a difference of 11.7 points; in 2010 the ratio was 63.0 in Singapore and 55.0 in Luxembourg, a difference of 8 points. The ratio remained pretty stable in Luxembourg during the whole period and the gap has been mainly reduced by a decrease in the ratio for Singapore.

Graph 6: Compared employment to population ratios – Luxembourg & Singapore, 2001-2010



Source: World Bank

Active people in Singapore are mainly employed in the service sector (69.3% in 2010, this share being stable since 2005) and to a lesser extend in manufacturing (17.3% in 2010 down from 20.5 in 2005). The labour force is made by 56.2% of men and 47.3% of women. The proportion of resident workers (Singapore citizens and permanent residents) in the labour force was 65% in 2010; it dropped from 70% in 2001 and 82% in 1991¹².

In Luxembourg, the services (in particular banks and insurance services) contribute for more than 75% of the employment. The total employment rate¹³ in Luxembourg was in 2010 at 65.2%; the male employment rate was 73.1% and the female employment rate only at 57.2%. This later rate progressed since 2000 but slowly (it was then at 50.1%). Cross-border

¹¹ The annual inflation rate for Singapore is here estimated from the CPI for "All Items Less Accommodation". Other data are given in tables 5a and 5b of the statistical annex

¹² Data from the Singapore labour force survey.

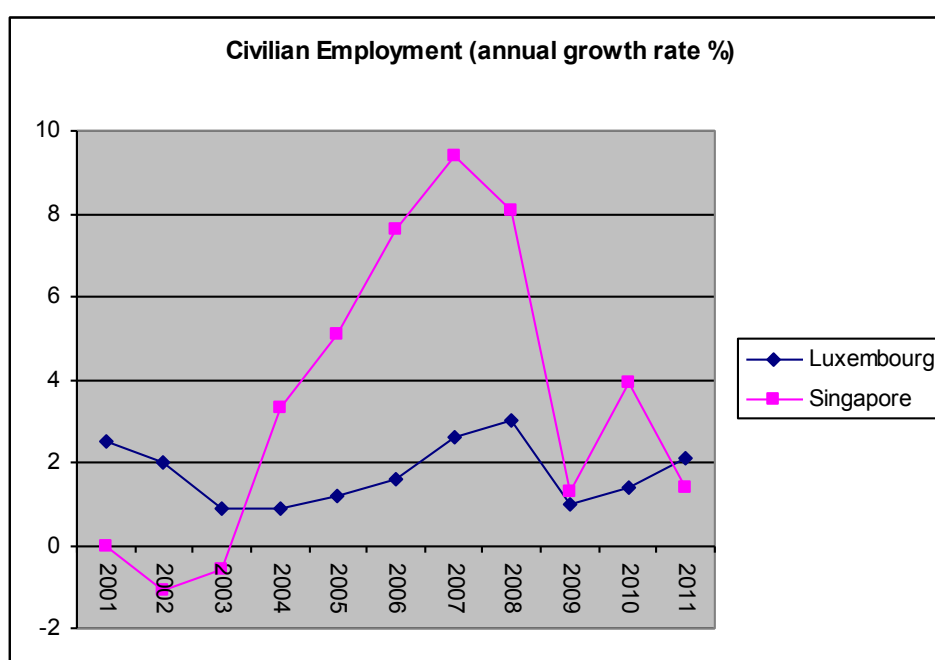
¹³ The employment rate is the ratio between the number of persons occupied aged 15-64 and the total population for the same age group. In Luxembourg, the ration is derived form the Community survey on work forces (SLF) which covers all the EU member states.

workers represent in 2010 39% of total employment. This percentage was only of 29% in 2000 and 21% in 1995.

Civilian employment followed similar evolutions in the two countries between 2001 and 2010. However, the changes have been more intense in Singapore. In 2011, the growth rate of civilian employment was higher in Luxembourg.

Both countries employment figures reflect the economic boom that occurred in 2004-2007 (annual growth rates of 7.6%, 9.4% and 8.1% respectively for these three successive years in Singapore) followed by the downturn that started in 2007-2008 and plummeted in 2009 (growth rate of civilian employment of only 1%). The recovery in 2010 is again here more rapid in Singapore (3.9%) than in Luxembourg (1.4%) but not lasting in 2011.

Graph 7: Compared evolution of the civilian employment - Luxembourg & Singapore, 2001-2011

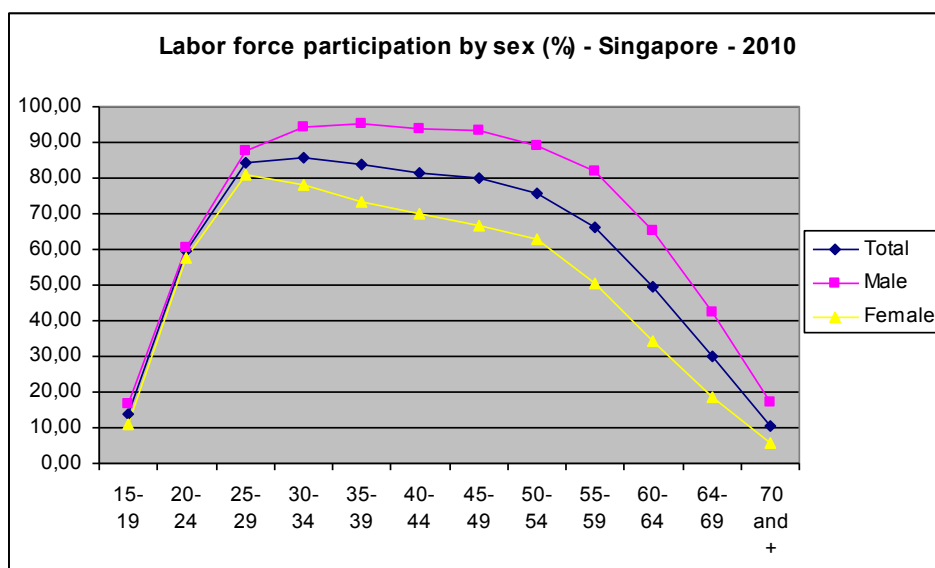


Source: IMF

In Luxembourg, the employment rate for the population group aged 15-64 remained very stable in the last 5 years. The rate is higher for men (73.1% in 2010) than for women (57.2% in 2010). The employment rate for the population group aged 55-64 increased regularly since the mid 2000 (from 31.7% in 2005 to 39.6% in 2010). There are more women aged 55-64 still in the labour force than men of the same age group (in 2010, the employment rates for this age group were respectively of 31.3% and 47.7% for men and women)¹⁴.

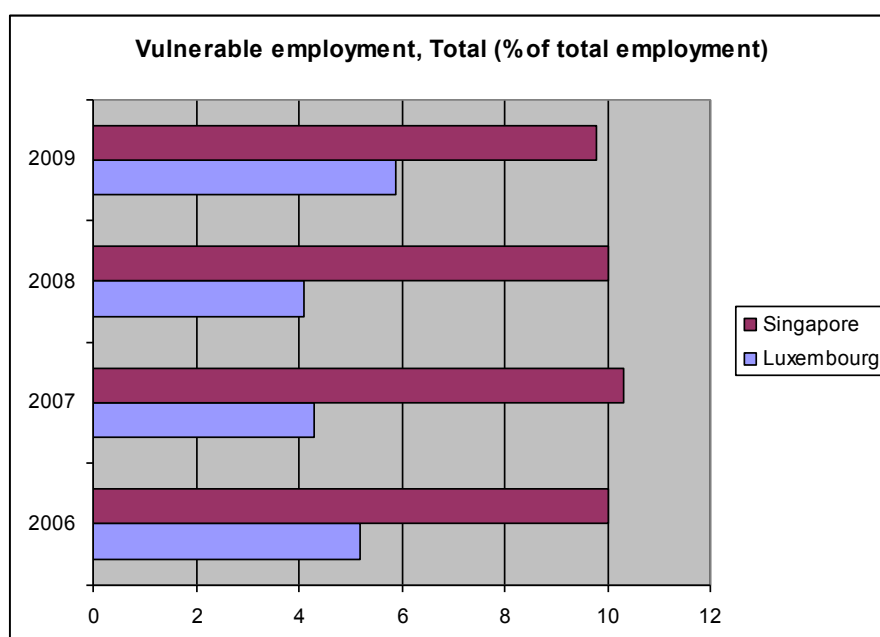
In Singapore, the labour force participation for men is higher than the one for women for all the age groups considered. The gap in favor of men culminates for the age groups 55-59 and 60-64 as it shows in the graph 8 below.

¹⁴ See table 6b in the statistical annex.

Graph 8: Labour force participation by sex – Singapore, 2010

Source: Ministry of Manpower – Singapore

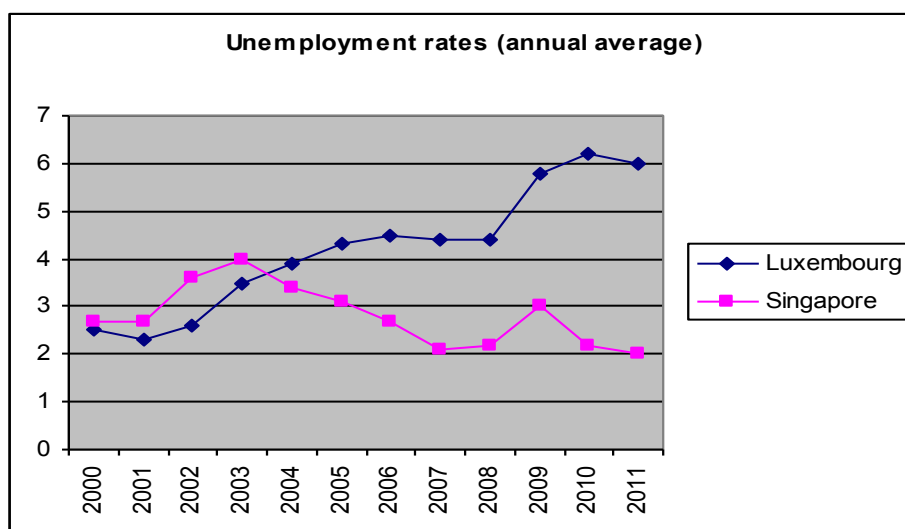
The proportion of vulnerable employment¹⁵ is higher in Singapore than in Luxembourg. However, while the proportion has been stable in Singapore between 2006 and 2009, it has increased in Luxembourg in 2009 after a regular decline between 2006 and 2008.

Graph 9 – Vulnerable employment – Luxembourg & Singapore, 2006-2009

Source: World Bank

While remaining at a reasonable level compared to its European neighbors, the unemployment rate in Luxembourg has constantly increased since 2001 and has reached today 6.0% (annual average). The unemployment rate in Singapore has followed a downturn trend since 2003 (with a small increase in 2009) and is now estimated at 2.0%.

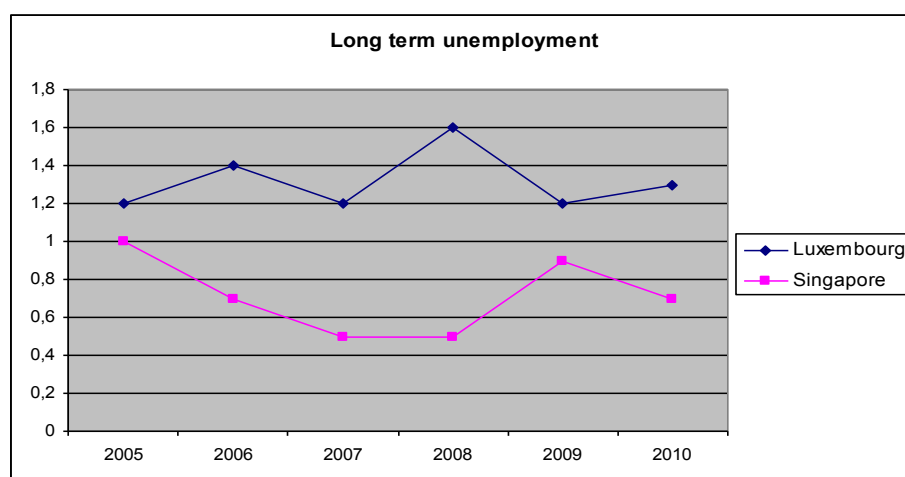
¹⁵ Vulnerable employment is unpaid family workers and own-account workers as a percentage of total employment - International Labour Organization, Key Indicators of the Labour Market database.

Graph 10 – Unemployment rate - Luxembourg & Singapore, 2000-2011

Source: IMF

Long term unemployment is lower in Singapore than in Luxembourg but are low in both countries compared to their close neighbors. The gap has narrowed in 2009 but is expanding again in 2010.

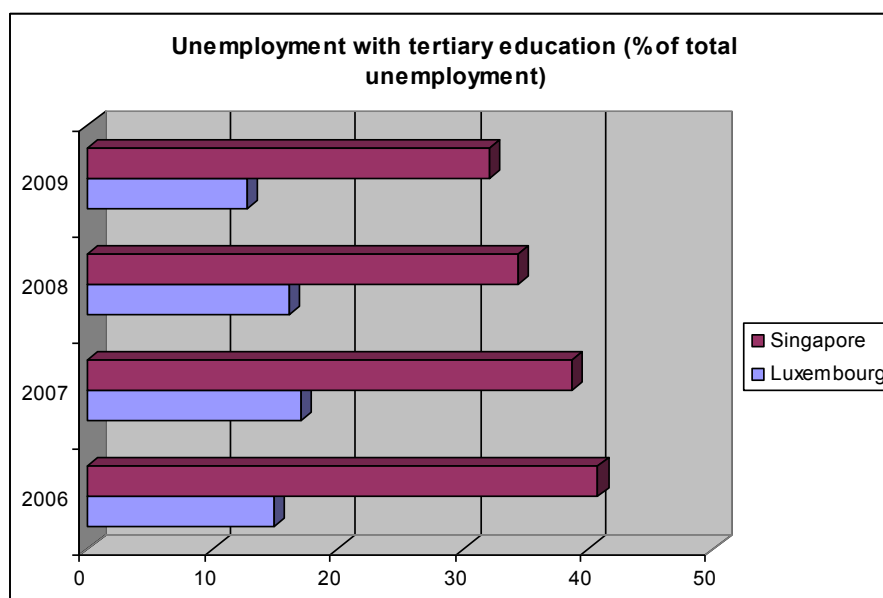
Youth unemployment remained stable in both countries since 2005: the unemployment rate of persons under 25 is estimated at 16.1% in Luxembourg for 2010 (the rate was 14.3% in 2005); the unemployment rate of persons under 30 is estimated at 5.5% in Singapore for 2010 (the rate was 6.2% in 2005 – see table 10b in the statistical annex).

Graph 11 – Long term unemployment - Luxembourg & Singapore, 2005-2010

Sources: LFS (Eurostat and MOM-Singapore)

Unemployment concerns more the workers with tertiary education in Singapore than in Luxembourg: in 2009, the share of the people with a tertiary education in the total unemployment was 12.8% in Luxembourg and 32.1% in Singapore. Unemployment of people with a tertiary is higher for women than men in Singapore (in 2009, the share were respectively of 28.6% for the men and 38.6% for the women – see table 11 of the statistical annex) while it is lower in Luxembourg (in 2009, the shares were respectively of 13.2% for the men and 12.3% for the women).

Graph 12 – Unemployment for people with tertiary education – Luxembourg & Singapore, 2006-2009



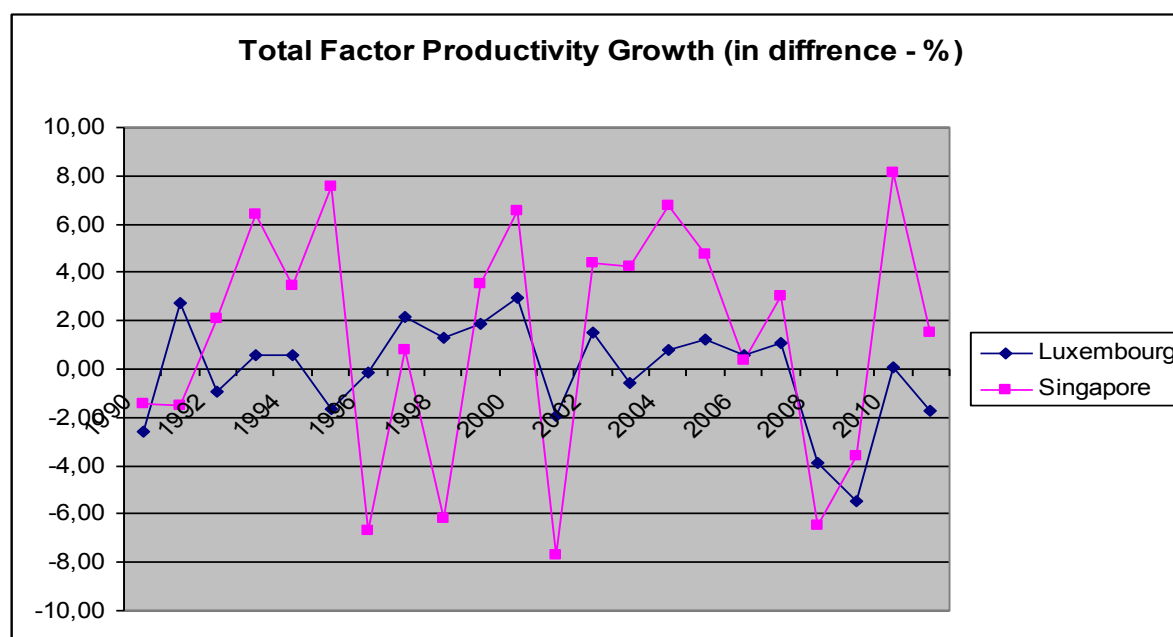
Source: World Bank

The share of part-time job in total employment is very low in Singapore (0.1%) and reaches more than 17% in Luxembourg (see table 7b of the statistical annex).

1.3 Productivity and labour cost

Total factor productivity growth evolved very hieratically in both Luxembourg and Singapore in the last 20 years. It fell sharply in the two countries in 2008 and 2009 (-3.9% and -6.5% for respectively Luxembourg and Singapore in 2008), recovered in 2010 (very slightly for Luxembourg) and slowed again in 2011 (-1.7% for Luxembourg and 1.5 for Singapore).

Graph 13 – Total factor productivity growth – Luxembourg & Singapore, 1990-2011



Source: Conference Board

Labour productivity also decreased sharply in both 2008 and 2009 and is now recovering in both countries, but in a more intense way in Singapore (see Table 2 below). After having increased strongly in both 2008 and 2009, real unit labour costs for the total economy in Luxembourg decreased by -0.7% in 2010. The downturn started a year earlier in Singapore: after having grown by respectively 5.8% and 4.7% in 2007 and 2008, the unit labour cost index for the overall economy recorded a slight increase in 2009 (0.6%) and decreased in 2010 (-2.7% - see table 13 of the statistical annex).

Table 2 – Labour productivity - Luxembourg & Singapore, 1995-2005, 2005-2010, 2008, 2009, 2010

	Labour productivity (annual average growth)				
	1995-2005	2005-2010	2008	2009	2010
Luxembourg	1,2	-0,5	-3,2	-4,6	1,8
Singapore	2,3	0,3	-6,8	-2,4	8,8

Source: IMF

In its latest report, the Conference Board ranked Luxembourg 1st for labour productivity per hour among 39 other countries (not including Singapore). This is a noticeable result in a period when the gains of productivity are weakening in all the advanced economy.

Available data in Luxembourg and Singapore for labour unit costs are presented in table 13 of the statistical annex.

1.4 Market operations, Institutional and regulatory framework and Entrepreneurship

There are only few data that are comparable between Luxembourg and Singapore on the three chapters of the Annual Luxembourg Competitiveness Report that concern: Market operations, institutional and regulatory framework and Entrepreneurship. They have been here regrouped together.

Regarding market operations, 7 of the 10 indicators were not available in Singapore (D1: % of full-time workers on minimum wage, D3: Price of gas for industrial users, D4: Market share of the primary operator in the cellular telephone market, D5: Composite basket of fixed and cellular telecommunications, D7: Broadband internet access rates in US\$ PPP, D10: Total State aid excluding horizontal objectives and D11: Market share of the former primary operator in the fixed telephone market). For the three other indicators (D2: Price of electricity for industrial users, D8: Basket of domestic royalties for 2MBbit leased lines and D9: Value of public contracts using open procedure procurement), it has not been possible to find suitable proxies despite the indications given by the Department of Statistics Singapore.

Regarding the Regulatory framework, only 2 components can be compared. The first one concerns the level of taxes on incomes and on corporate (indicator E1: Effective top statutory tax rate on corporate income (%) and E2: Top statutory personal income tax rate (%)).

In Singapore, residents will pay a personal income tax that varies between 0 and 20%. Some deductions will be granted under certain limited provisions. Non-Resident individuals are normally taxed at a flat rate (15% or resident rate on employment income, whichever gives rise to higher tax, and 20% on other income). Corporate tax rate has been fixed at 17% in 2010. There are exemptions for the first \$300 000 of the normal chargeable income. A qualifying new company enjoys full tax exemption for the first \$100 000 of its normal

chargeable income and a further 50% exemption for the next \$200 000 for its three consecutive first years of operation¹⁶.

In Luxembourg, the top statutory personal income rate was 39% in 2010, this being slightly above the EU-25 average (37.26%). In the EU, the top rate for 2010 was recorded in Sweden (56.4%) and the lowest in Bulgaria (10%). The effective top statutory tax rate on corporate income was 28.59% in 2010 for Luxembourg, this being above the EU-27 average (23.20%). In 2010, the highest EU rate was recorded in Malta (35%) and the lowest in Ireland (12.5%)¹⁷.

Table 14 of the statistical annex gives a breakdown of the Government operating revenues for Singapore: in 2010, Income taxes represented 40.5% of the total revenue and the taxes on goods and services 17.3%.

The second component of the regulatory framework for which a limited comparison is possible concerns e-Government (indicators E9: degree of sophistication of on-line Government services and E10: on-line availability of Government services).

Singapore launched its first e-Government master plan in 2000 and since then there have been regular plans to provide a large variety of services to both the population and the businesses. The Government has also proposed a vision for 2015. There is a central portal to access the e-Government services. Each year since 2005, the Government of Singapore carries out surveys to assess the satisfaction of the users of its e-services. The results of these surveys are made available on line.

The 2010 survey (on year 2009) shows that 84% of the population has transacted with Government electronically (via the Internet, automated kiosks, email, telephone via the Interactive Voice Recognition System, SMS, etc.), either on their own or with help, at least once in the past 12 months of the year. 66% of the users have been either very or extremely satisfied with the service, a noticeable increase compared to 2008 when this proportion was 54%¹⁸.

In Luxembourg, the degree of sophistication of e-Government services is rated for 2010 at 87%, this being below the EU-25 average (90%). In the EU, the lowest rates are recorded by Greece and Cyprus (70% and 71% respectively) and the highest in Austria and Ireland (100%). Luxembourg has made important efforts in the last 10 years to improve its e-services. The degree of sophistication of its e-services was rated at only 15% in 2000 and 56.5% in 2005. The availability of e-services in Luxembourg for 2010 is rated at 72%, again below the EU-25 average. At lower rates, there is still Greece (48%) and at higher rates, Austria, Ireland and Sweden (100%). In this area, the efforts made by Luxembourg in the last few years are even more visible: the availability of e-services was rated at only 23% in 2005 and 5% in 2000¹⁹.

Regarding entrepreneurship, Singapore doesn't have data on 2 of the 4 indicators (F1: Propensity for entrepreneurship and F2: Self-employed jobs as a % of total employment). For the two other indicators (F3: Net change in the number of companies and F4: Volatility among companies), information has been looked for on the web site of the Accounting and Corporate Regulatory Authority (ACRA), the Government agency in charge of the registration of businesses and companies.

¹⁶ Source : Yearbook of statistics Singapore – Chapter 17 : Public Finances

¹⁷ Source : European Commission, Structures of the taxation systems in the EU (2004, 2005)

¹⁸ Source : e-government web-site - Singapore

¹⁹ CAP GEMINI for European Commission.

In fiscal year 2009/2010, 51 304 new companies and businesses have registered to ACRA. Between 2003/04 and 2009/10, this was an average of 46 130 new registrations per year. For 2009/2010, the rate of creation can be estimated at around 14.5%. Between 2000 and 2007, the rate of business creation remained around 10% in Luxembourg (10.4% in 2007).

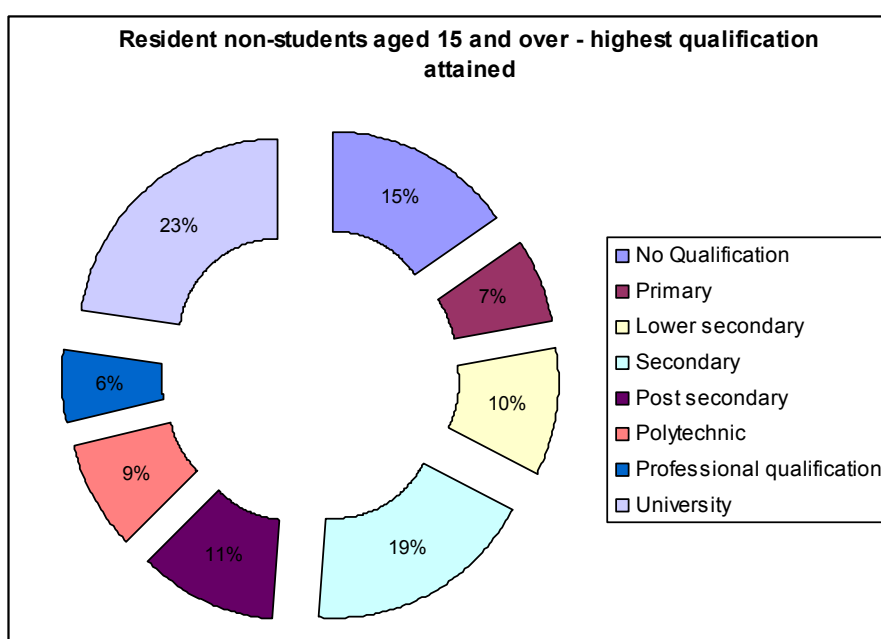
1.5 Education and training

Enrolment rates (for all levels) are very high in both Luxembourg and Singapore and thus they don't have the importance that they can have in other less developed environments. The percentage of the population aged 25-64 that reached a secondary superior level was 77.7% in Luxembourg and 52% in Singapore for 2010. This rate increased in Luxembourg from 60.9% in 2000. By comparison, the average EU27 rate is 72.7% in 2010. For the same year, in Singapore the rate is higher for the men (55.7%) than for the women (48.5%).

The number of graduates from tertiary education for the age group 30-34 reached 46.1% in Luxembourg in 2010; this ratio was 47.2% for Singapore the same year²⁰.

In Singapore, 23% of the population 15 and over attained a university qualification in 2010, while 15% didn't get any qualification from the education system²¹.

Graph 14: Highest qualification attained – Singapore, 2010

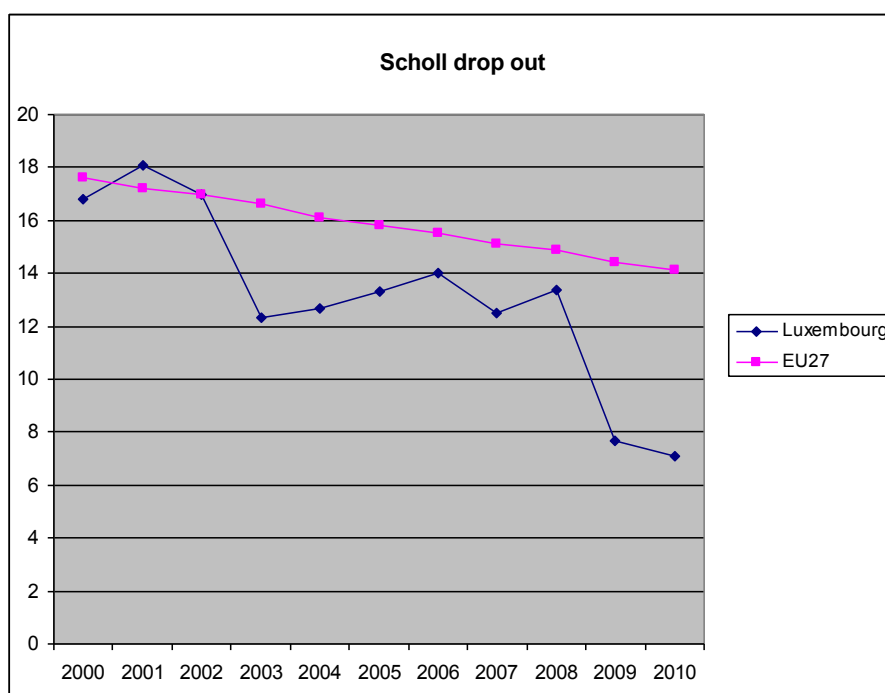


Source: Department of Statistics Singapore

In Luxembourg, the percentage of youths leaving the education system dramatically decreased in the last 10 years, moving from 16.87% in 2000 to 7.1% in 2010. For comparison, the EU27 average is still at 14.1% in 2010.

²⁰ The proportion of 47.2% for Singapore refers to non-student residents aged 30-34 with university degree only. The proportion with tertiary education which also includes Polytechnic Diploma and Professional Qualification & Other Diploma was 70.3% among resident non-students aged 30-34 years in Singapore in 2010.

²¹ Source: for Luxembourg, data from Eurostat ; for Singapore, statistical yearbook, chapter on Population.

Graph 15 – School drop out – Luxembourg and EU27, 2000-2010

Source: Eurostat

The survival rates to grade 5 are very high in both Luxembourg and Singapore: 96% in Luxembourg (2007) and 99% in Singapore (2008)²².

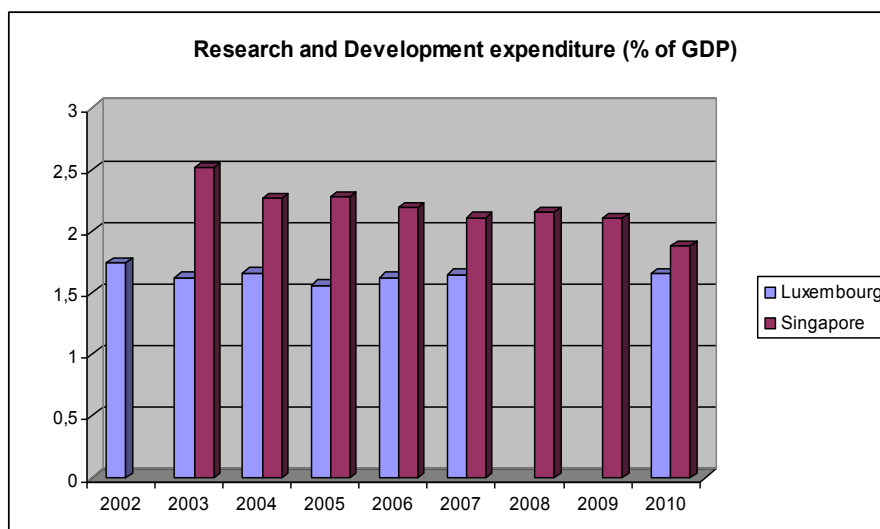
Singapore dedicates 3% of its GDP and 11.6% of its total Government expenditures to Education (UNESCO – 2009). The annual spending per student was estimated in Luxembourg at 13 054 Euro SPA in 2007; the amount was 9 878 Euro SPA for the primary level and 16 150 Euro SPA for the secondary level: a student in the secondary level was thus 1.6 times more expensive than a student of the primary level. In 2010, this ratio was only 1.4 in Singapore.

1.6 Knowledge economy

In 2010, the share of expenditures for Research and Development in the GDP was very comparable in Luxembourg and Singapore: respectively 1.65% and 1.88%. However, in the last 8 years, this share has always been higher in Singapore reaching 2.52% in 2003 (only 1.62% in Luxembourg). It must however be noted that the share stayed stable in Luxembourg during the period while it decreased regularly in Singapore.

²² Source : UNESCO

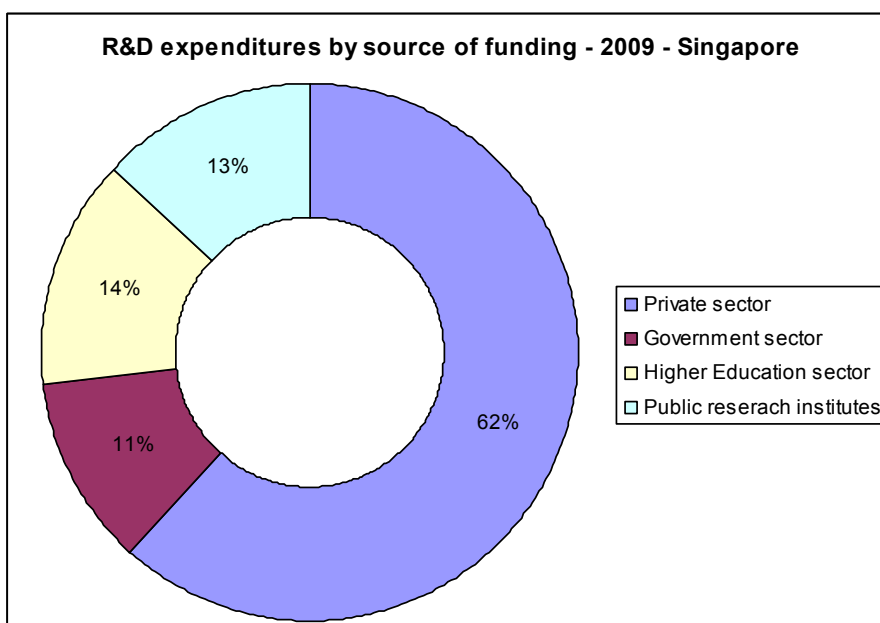
Graph 16: R&D expenditures as percentage of the GDP – Luxembourg & Singapore, 2002-2010



Source: World Bank

R&D expenditures are mostly funded by the private sector in Singapore (more than 60% in 2009), the remaining expenses being shared almost equally between the Government (11%), the Higher education sector (14%) and the Public Research Institutes (13%). For the same year, the share of Government in R&D expenditures in Luxembourg was 18.2%.

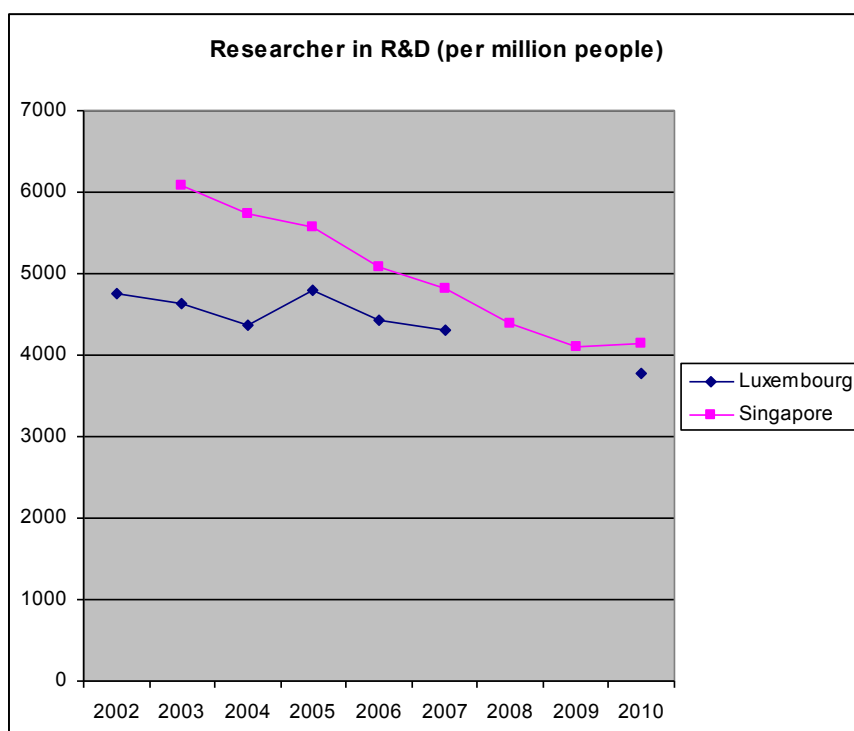
Graph 17: R&D expenditures by source of Funding – Singapore, 2009



Source: Agency for Science, Technology and Research - Singapore

The situations of the two countries are also converging for the number of researchers involved in R&D activities per million people. In 2004, the ratio for Singapore was 30% higher than in Luxembourg; in 2010, the difference is only of 9%.

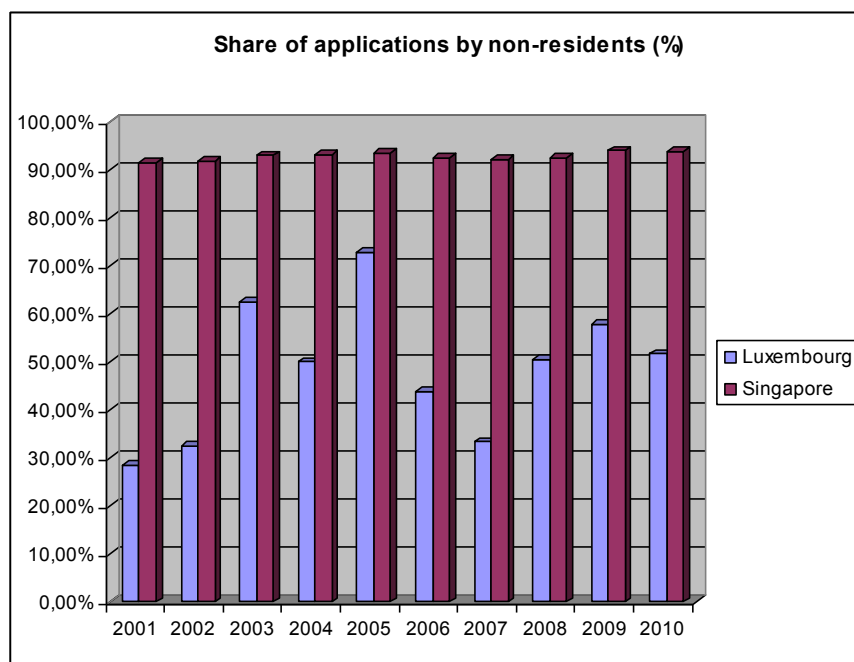
Graph 18: Researchers in R&D per million people – Luxembourg & Singapore, 2002-2010



Source: World Bank

Between 2001 and 2010, there was an annual average of 8770 patent applications in Singapore and 78 in Luxembourg (in the last 2 years, the number of patent applications raised to a total of 121 in 2009 and 176 in 2010). Most of the applications in Singapore were made by non-residents (the proportion is around 90% all along the 2001-2010 period). In Luxembourg applications by non-residents have reached a peak in 2005 (72%) and are now since 2008 around 50% of the total patent applications.

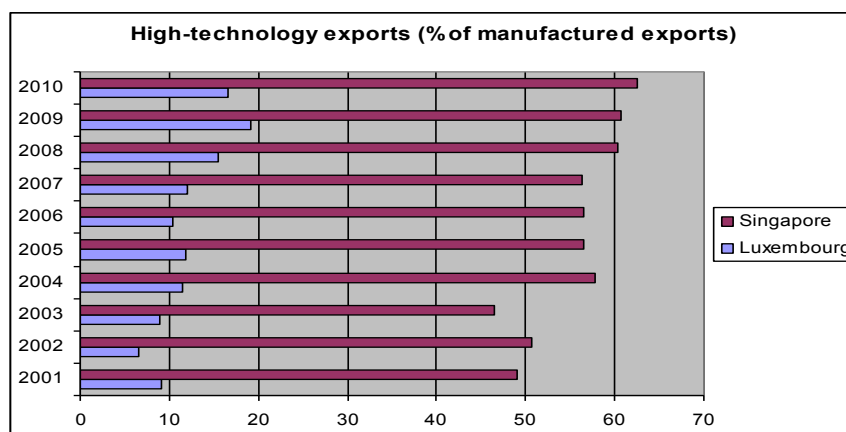
Graph 19: Share of the patent applications by non-residents – Luxembourg & Singapore, 2001-2010



Source: World Bank

In 2010, high-technology products represented more than 60% of the manufactured exports in Singapore. This is a record high during the period 2001-2010 during which this share increased from 49.06% to 62.56% (more than 13 points). In comparison, this share was only 16.50% in 2010 in Luxembourg, an increase compared to the 2001 level but lower than in Singapore (from 9.03% to 16.50% - more than 7 points).

Graph 20: Share of High-technology in manufactured exports (%) – Luxembourg & Singapore, 2001-2010

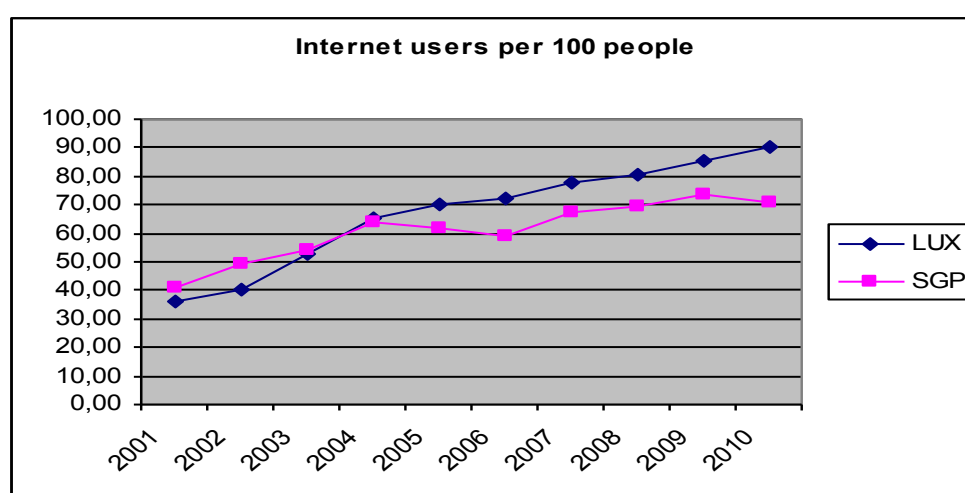


Source: World Bank

Mobile cellular subscriptions increased rapidly in the two countries between 2001 and 2009 to reach comparable levels: the number of subscriptions per 100 people is 144.68 in Luxembourg and 139.21 in Singapore (this number doubled in Singapore between 2001 and 2009). Internet users have also dramatically increased: in 2009 more than 8 persons in 10 were internet users in Luxembourg (87.31 per 100) and almost 7 in 10 in Singapore (69.00 per 100). These figures more than doubled in Luxembourg between 2001 and 2009.

The number of subscribers to fixed broadband internet has increased regularly since 2000 in both countries²³.

Graph 21: Internet users – Luxembourg & Singapore, 2001-2010



Source: World Bank

²³ Table 18 of the statistical annex.

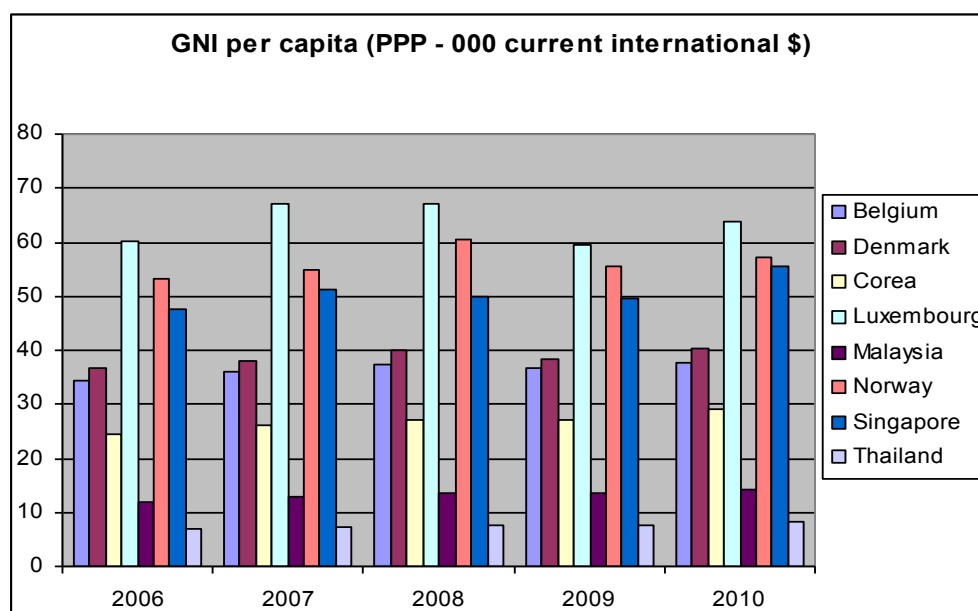
1.7 Social cohesion

The Human Development Index is a composite indicator that combines the relative performances of countries in different areas: economic growth (GDP growth) and the situations in health (life expectancy and mortality rate) and education (enrolment rate). As such, it reflects a proxy statistical status of human conditions.

In the latest ranking 2011 (HD Report dated 2011), Luxembourg was number 2 and Singapore number 26 (the value of the HDI was 0.867 and 0.866 for respectively Luxembourg and Singapore – By comparison, Norway was ranked number 1 with a HDI value of 0.938 and Cambodia ranked number 124 with a HDI value of 0.494). Both countries have thus a high HDI and the basic social indicators that compose the HDI are very similar. The ranking of both countries has been stable since 2005.

The Gross National Income of Singapore increased more largely than the one of Luxembourg between 2001 and 2010 (33% against 72%). GNI per capita in PPP is 63 950 current international \$ in Luxembourg and 55 380 in Singapore for 2010. These levels are high compared to the other countries of their respective neighborhoods.

Graph 22: Compared GNI between selected countries – 2006-2010



Source: World Bank

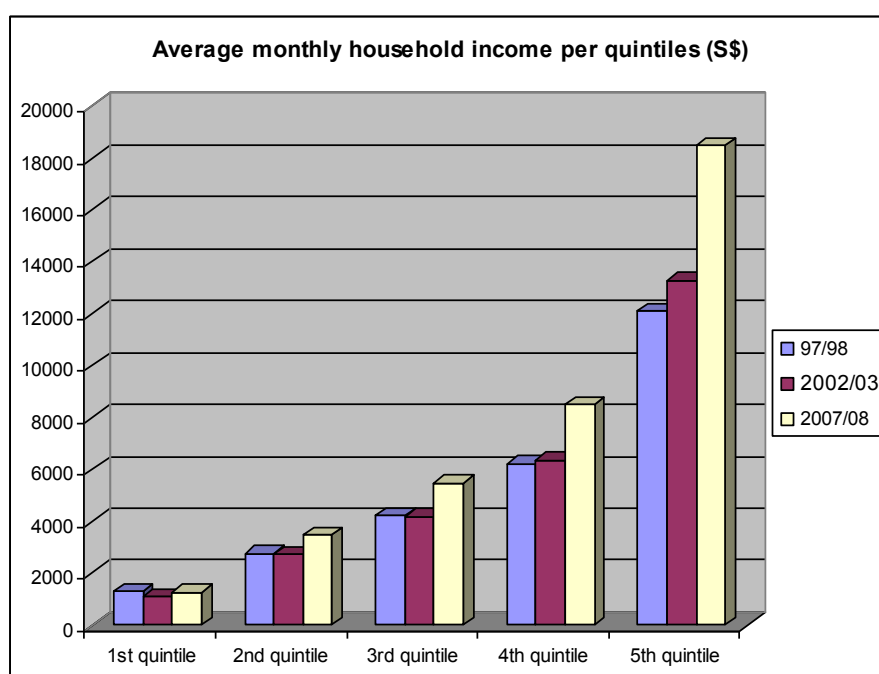
This comparable wealth is not shared similarly in the two countries: in 2009, the Gini coefficient in Luxembourg and Singapore were respectively of 30.8 and 42.5. By comparison, the Gini coefficients for Indonesia and Thailand were respectively at 37.6 and 42.5, the one for India at 36.8 and the one for Norway at 25.8 (source: Human Development report 2011 – UNDP). In Singapore, the 10% richest households takes a higher share of income and the 10% poorest households takes a lower share of income, as shown in the table below.

Table 3 – Income inequalities – Luxembourg & Singapore, 2009

	Luxembourg	Singapore
Percentage of households income going to the lowest 10% households	3.5	1.9
Percentage of households income going to the highest 10% households	23.8	32.8

Source: UNDP

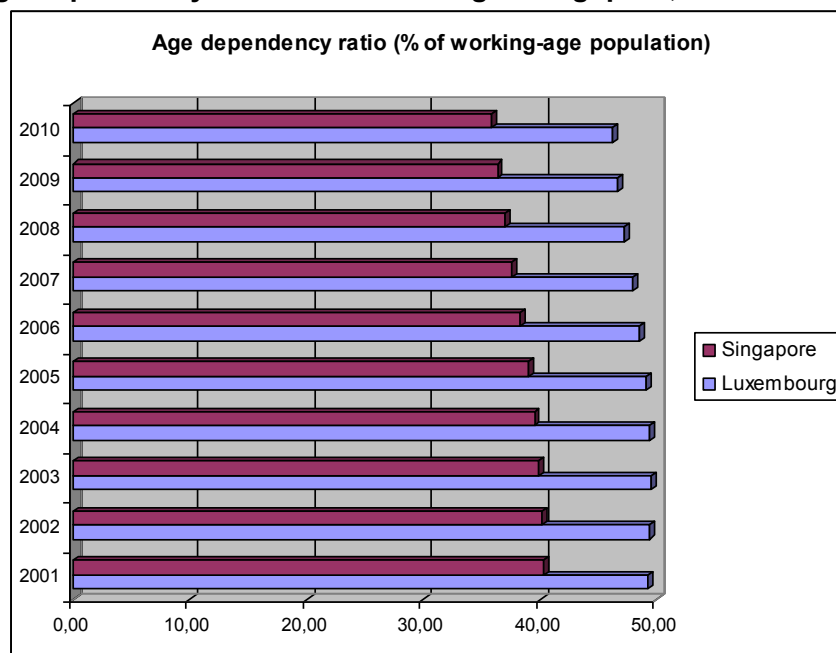
Graph 23 below, that is built on the results of successive household budget surveys carried out by the Department of Statistics Singapore, shows that inequalities have increased in Singapore between 1997 and 2007: while the average monthly income generated by the first quintile of households remained pretty stable, the one generated by the 5th quintile has increased by more than 50%. The average monthly income of the 5th quintile is in 2007 15 times higher than the one of the 1st quintile (it was only 9 times higher in 1997).

Graph 23: Average monthly income – Singapore, 1997/1998, 2002/2003, 2007/2008

Source: Department of Statistics Singapore

Between 2001 and 2010, the age structures of the population in Luxembourg and Singapore have converged slightly; however the dependency ratio remains higher in Luxembourg (46.17%) than in Singapore (35.89%)²⁴. The population aged 15-64 represents 68% of the population in Luxembourg and 74% in Singapore. If the shares of the population aged 0-14 is now similar in the two countries (17.6% in Luxembourg and 17.4% in Singapore), the share population aged 65 and above is higher in Luxembourg (almost 14%) than in Singapore (9%).

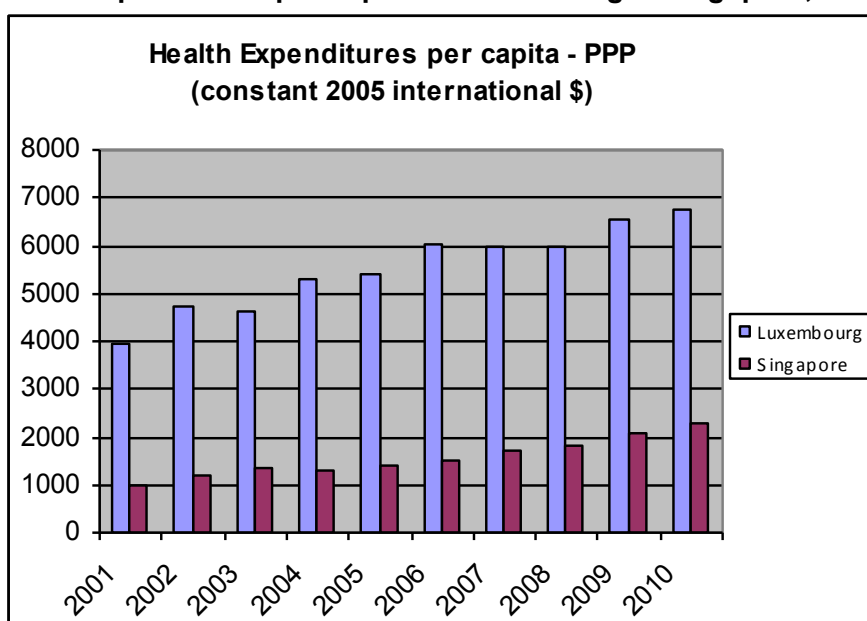
²⁴ Age dependency ratio is the ratio of dependents people -- younger than 15 or older than 64 -- to the working-age population -- those ages 15-64.

Graph 24: Age dependency ratio – Luxembourg & Singapore, 2001-2010

Source: World Bank

Life expectancy is higher in Singapore than in Luxembourg by almost 3 years (78.1 in Luxembourg and 81.7 in Singapore in 2010)²⁵.

Health expenditures per capita have respectively reached a level of 6526.2 and 2073.3 in Purchasing Power Parity (constant 2005 international \$) in Luxembourg and Singapore: in average, a resident of Luxembourg spent three times more than a resident of Singapore in for his/her health. The gap is narrowing as the level of health expenditure per capita has more than doubled in Singapore between 2001 and 2010. In 2001, a resident of Luxembourg spent on average four times more than a resident of Singapore for his/her health.

Graph 25: Health expenditures per capita – Luxembourg & Singapore, 2001-2010

Source: World Bank

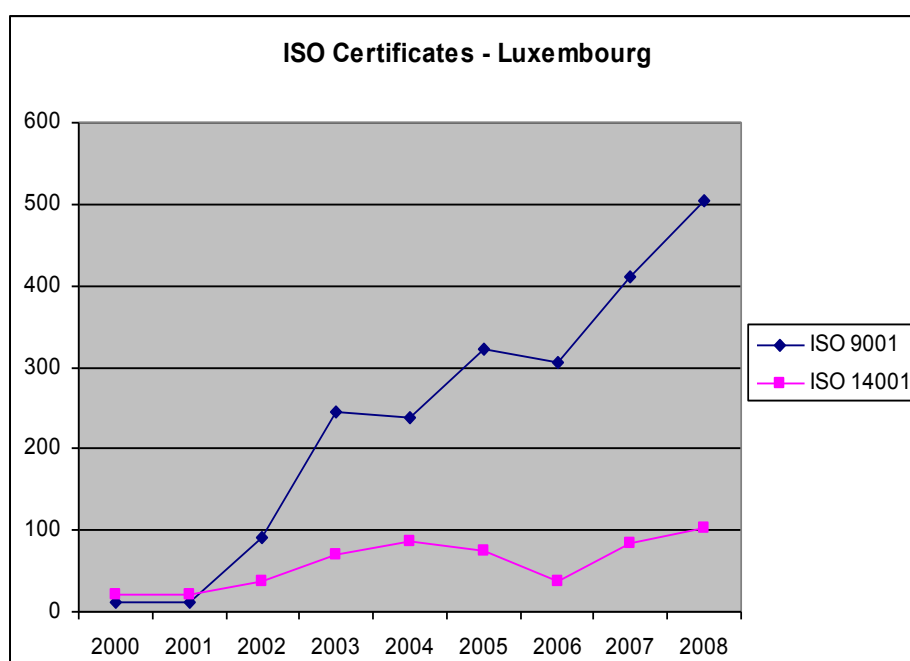
²⁵ See tables 28 and 29 of the statistical annex.

The wage gap between men in women has reached an average of 14.7% in Luxembourg in 2010, almost unchanged from the level it had in 2000 (15%). In Singapore, the gap is the highest with intermediary and technical professions (Craftsmen and related trade workers: 30.95% or Plant and Machine operators and assemblers: 39.06%).²⁶

1.8 Environment

At the end of 2009, the total number of ISO 9001 Certificates issued in Singapore was 4164 and the total number of ISO 14001 Certificates issued was 821. This gives to Singapore ratios per Million inhabitants of 832.8 for ISO 9001 certificates and 164.2 for ISO 14001 certificates. These ratios are both higher than the ones for EU-27 (respectively of 806.2 and 143.6 in 2008) and far higher than the ones for Luxembourg (respectively 503.5 and 102.3 in 2008). As Graph 26 below shows, the situation in Luxembourg improved dramatically since 2000 in this area and the trend is still very positive.

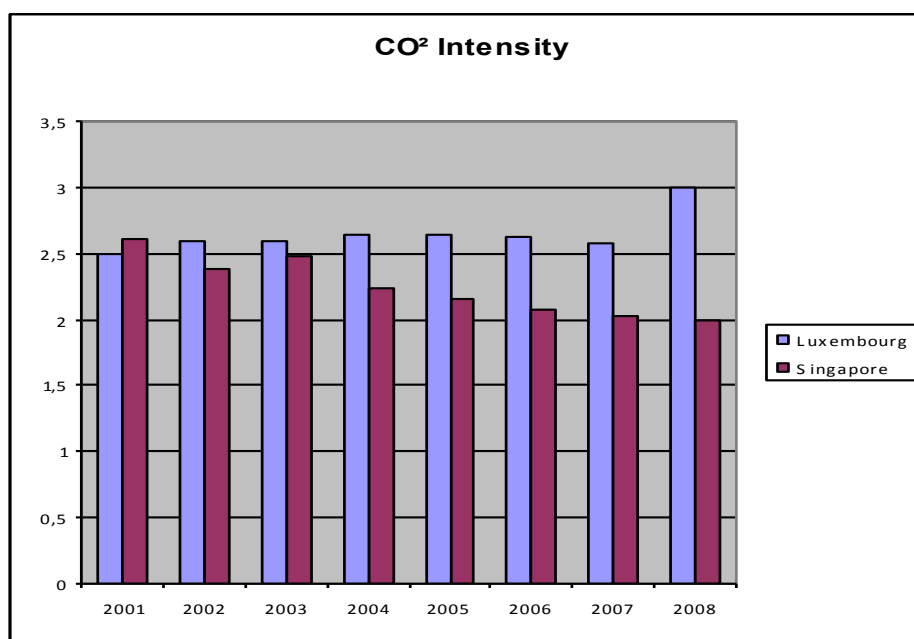
Graph 26 – Number of ISO 9001 & 14001 certificates – Luxembourg, 2000-2008



Source: ISO

Regarding CO₂ emissions, Singapore records very good scores compared to Luxembourg in particular for the last few years. The level of CO₂ emissions per capita measured in metric tons was in Singapore (7.0) a third of what it was in Luxembourg (21.0) in 2008. This level increased in Luxembourg between 2001 and 2008 while it remained pretty stable in Singapore during the same period. The CO₂ intensity (kg emitted per kg of oil equivalent energy used) was lower in Singapore than in Luxembourg in 2009 (respectively 2.0 and 3.0) while it started being higher in 2001 (respectively 2.61 and 2.49).

²⁶ See tables 25 and 26 of the statistical annex.

Graph 27 – CO₂ intensity – Luxembourg & Singapore, 2001-2008

Source: World Bank

In 2009, 349 000 tons of municipal waste were collected in Luxembourg and 6 114 000 tons in Singapore. This translates into a level of municipal waste collected per capita served of 707 in Luxembourg and 1291 in Singapore (almost double). In both countries, 100% of the population is served by the system of municipal waste collection.

1.9 Conclusions

Luxembourg and Singapore are both wealthy countries by international standards and compared to their close neighbors. Both GDPs are growing again in 2010, more rapidly in Singapore. Both economies are opened to the outside and mainly based on services activities. In macro-economic terms, the main differences between the two countries can be found in the saving rate (much higher in Singapore than in Luxembourg) and the Government debt (much lower in Luxembourg than in Singapore). Inflation came back to normal rates in 2010 in both countries.

The employment ratio to population is higher in Singapore than in Luxembourg with a reverse effect on the dependency ratio (around 50% in Luxembourg and below 40% in Singapore). Men participate more than women to the labour force in both countries, the only difference being related to the age group 55-64 (women are more active than men in this age group in Luxembourg). Vulnerable employment is lower in Luxembourg but unemployment higher (6% against only 2% in Singapore). In general, the population in Luxembourg is better educated but the difference is rapidly closing as Singapore records more and more graduates from the secondary and tertiary educations. Expenditures in R&D (mostly financed by the private sector) are higher in Singapore but Luxembourg is catching up.

At this stage of the analysis, there are more similarities than differences between the two countries. The differences are not dramatic and not determinant for major gaps in competitiveness.

2. Compared competitiveness factors

This section builds mainly on the data provided by the main international comparison studies and surveys (World Economic Forum – WEF -, IMD Institute, Heritage Foundation - HF -, Fraser Institute, the World Bank). They mirror the statistical evidences highlighted in the previous section as they show results and information that relate more to perceptions on competitiveness factors. These perceptions are gathered through surveys on business leaders and executives (WEF, IMD, Fraser Institute) or from qualitative assessments (HF and WB).

The section is organized around key issues and themes that are dealt with in these international comparisons. In the first section, a look is given to the overall rankings that they proposed recently. The following sections address successively the issues of structures for competitiveness (legal and regulatory framework, market, technology), of governance, of policies and incentives for businesses, values and attitudes, the labour market.

2.1 General analysis/benchmarking

There are numerous organisms and institutes that produce regularly benchmarking systems that concern competitiveness in general or some more specific of its dimensions. The Luxembourg Observatory for competitiveness has listed some of them which cover the whole world or only the EU area or another selection of countries, or which compare countries or cities. Among them, this study has only selected a few for this initial general benchmarking of competitiveness, in particular those covering both Singapore and Luxembourg and as countries (as opposed as cities).

The most known and publicized of these rating/scoring systems is the one realized each year by the World Economic Forum: the Global Competitiveness Indicator (GCI). The GCI is a composite indicator that covers 12 different but inter-related pillars²⁷ that are assessed and rated through a mix of available data and responses from a survey on businesses. These pillars are then regrouped into three main components (Innovation and sophistication factors, efficiency enhancers and basic requirements).

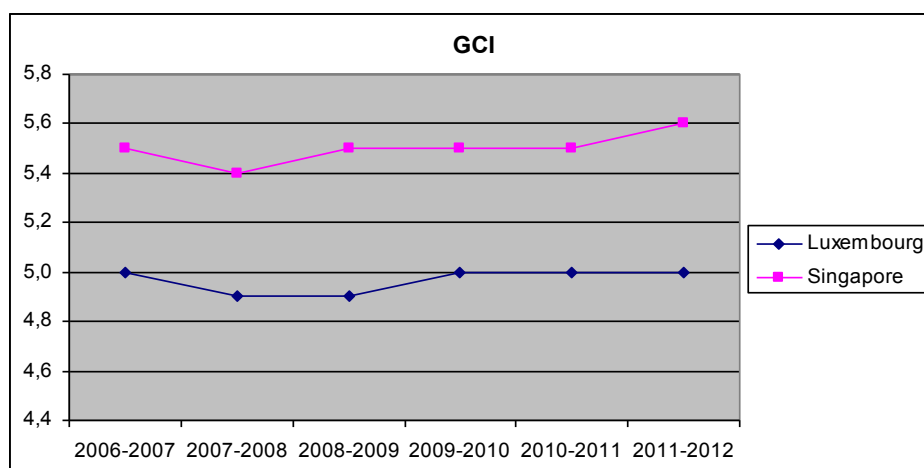
For the 2011-2012 rating, Singapore stands second (an improvement compared to the 2010-2011 3rd rank) and Luxembourg 23rd (a deterioration compared to the 2010-2011 20th rank)²⁸.

Both countries are categorized by the WEF as innovation-driven economies²⁹, this position being shared with only 30 other countries in a ranking that concern 142 countries. The levels of the Global competitiveness Index (GCI) of Luxembourg and Singapore remained pretty stable since 2006 and quite close to each other (around 5.5 for Singapore and 5.0 for Luxembourg on a scale culminating at 7.0), even if their respective rankings may have changed slightly over the period.

²⁷ Institutions, Infrastructure, Macroeconomic environment, Health and primary education, Higher education and training, Goods market efficiency, Labour market efficiency, Financial market development, Technological readiness, Market size, Business sophistication and Innovation.

²⁸ In the 2011-12, Switzerland is 1st and Sweden 3rd.

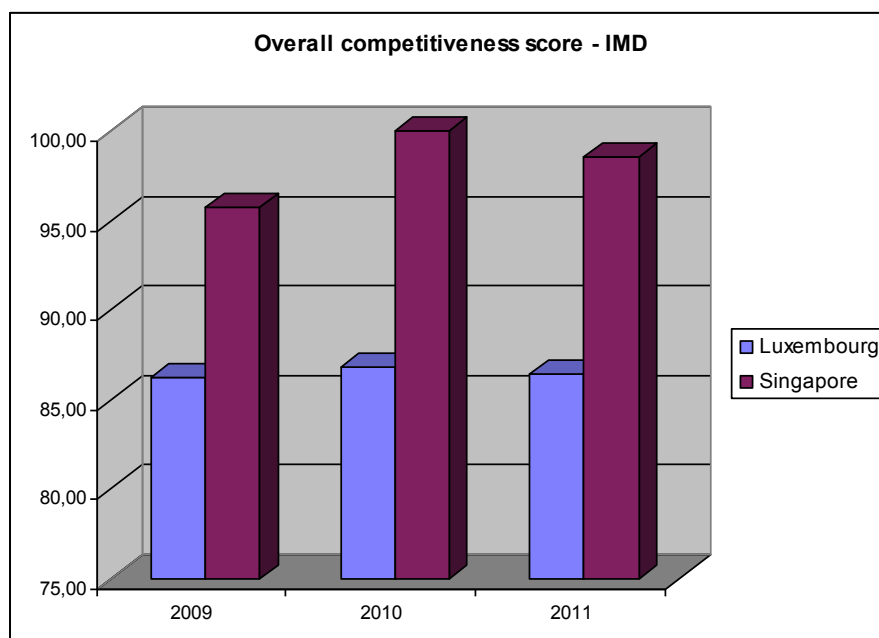
²⁹ This means that on the 12 pillars/dimensions that constitute competitiveness and that are each estimated individually on a 1 to 7 scale, the two countries have received marks that were over 3 for all of them.

Graph 28 – Evolution of the GCI

Source: WEF

Another well known marker for international comparisons in competitiveness is the Global Competitiveness Index (Global CI) that is calculated each year by IMD International. The index covers only 59 countries but is elaborated on the basis of a set of 331 criteria estimated from information gathered through a survey of executives and other variables. The Global CI integrates several dimensions of competitiveness which are presented in table 34 of the statistical annex.

In the latest ranking (2011), Singapore is 3rd and Luxembourg is 11th³⁰. Singapore overrates Luxembourg for most of the 331 criteria of the Index, the main differences being noted in the areas of labour market regulations and unemployment regulations, education, efficiency of the Government and of the bureaucracy and, Research and Development.

Graph 29: IMD scores – Luxembourg & Singapore, 2009, 2010 and 2011

Source: IMD³¹

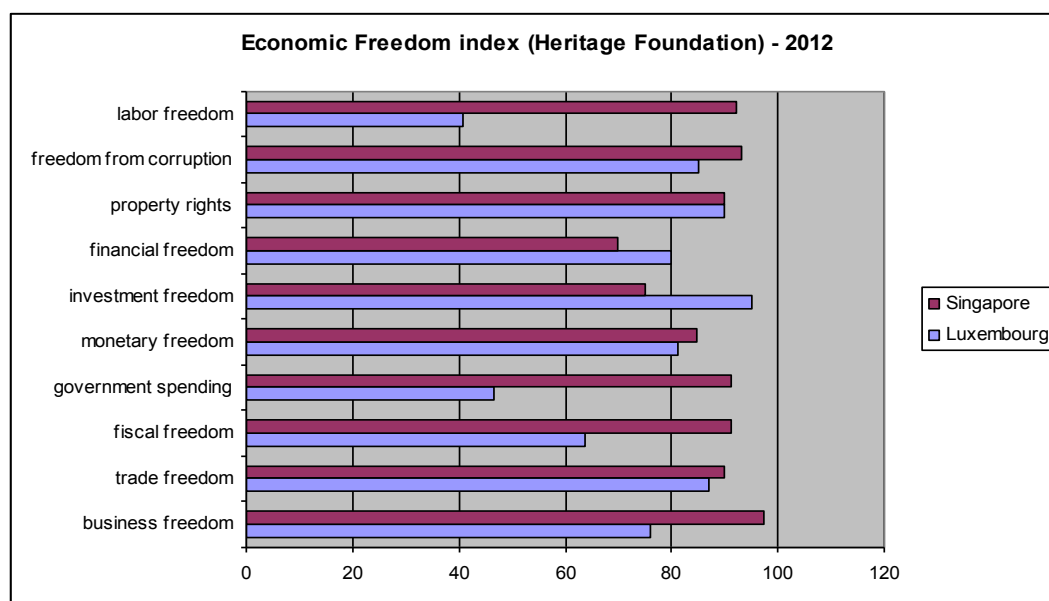
³⁰ Compared to 2010, Singapore was downgraded from a 1st rank while Luxembourg ranking was unchanged. To be noted that Luxembourg was ranked by the IMD 2nd in 2001 and 2002 and 4th in 2007.

³¹ IMD ranking goes on a scale from 0 to 10

In addition to these two global competitiveness indexes, more specific benchmarking initiatives are also made that emphasize more the economic freedom.

The first one is carried out by the Heritage foundation. Each year, the foundation publishes an Economic Freedom Index (EFI) that builds on 10 main freedoms: Labour freedom, Freedom from corruption, Property rights, Financial freedom, Investment freedom, Monetary freedom, Government spending, Fiscal freedom, Trade freedom and Business freedom. It covers 179 countries.

Graph 30: Economic Freedom Index (Heritage Foundation) – Luxembourg & Singapore, 2012



Source: Heritage foundation

For the 2012 edition of the index³², the Heritage foundation ranks Singapore 2nd and Luxembourg 13th (unchanged from 2011). Graph 30 above shows that Singapore performs better than Luxembourg for 7 of the 10 freedoms (and far better for what concerns Labour freedom, Government spending, Fiscal freedom and Business freedom) while Luxembourg do better than Singapore only for Investment freedom and Financial freedom.

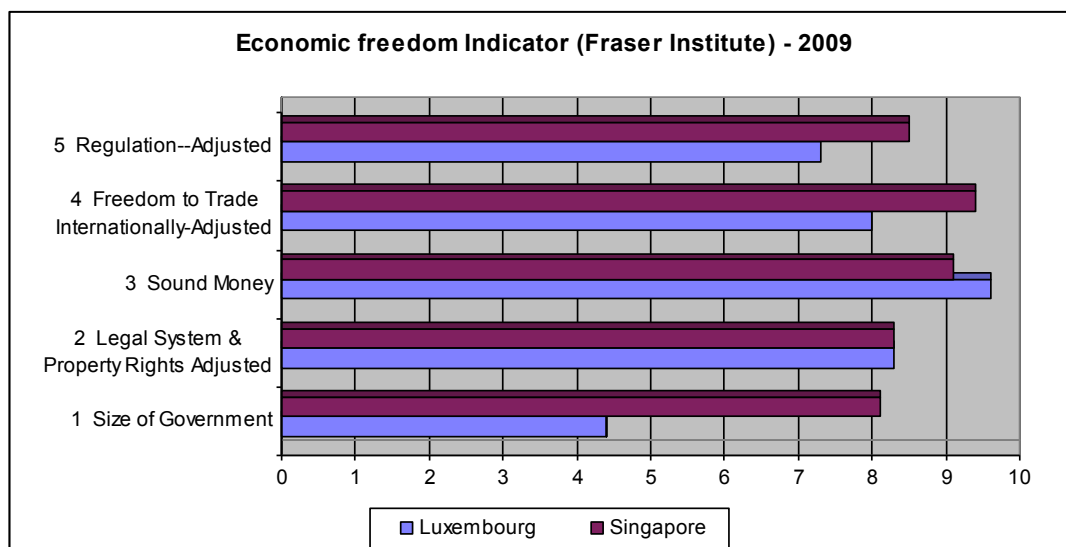
The second benchmarking exercise that focuses on economic freedom is the one carried out by the Fraser Institute and the Economic Freedom Network. The indicator that is produced by the Institute regularly covers 141 countries and is based on 42 variables regrouped in 5 main categories (areas of economic freedom): The size of the Government, the legal system and property rights, Sound money, Freedom to trade internationally and Regulation. Adjusted values are given to each variable and indexes are calculated for each area and globally. The values of the indexes for each area (2008 and 2009) are given in table 36 of the statistical annex for reference.

In the 2009 edition of exercise, Singapore is rated 2nd by the Fraser Institute and Luxembourg only 20th³³.

³² In 2011 and 2012, Honk Kong was rated 1st.

³³ Between 2008 and 2009, Luxembourg lost ranks while the rank for Singapore remained unchanged. Honk Kong was ranked 1st.

Graph 31: Economic Freedom of the World Indicator (Fraser Institute) – Luxembourg & Singapore, 2009



Source: Fraser Institute

For the 2009 exercise, Singapore did better than Luxembourg in 3 of the 5 areas (and far better for the area “size of the Government”) and Luxembourg did better than Singapore only for the area “Sound money”.

The analysis of all these rankings converges to the conclusion that Singapore is far better placed for competing in today’s global world than Luxembourg.

Table 4 – Compared International rankings

	Luxembourg	Singapore	Number of countries
WEF – GCI 2011/12	23	2	142
IMD – Global CI 2011	11	3	59
Heritage Foundation – EFI 2012	13	2	179
Fraser Institute – EFW 2009	20	2	141

As shown in table 4 above, the good ranking of Singapore is consistent among the studies as is the difference in ranking with Luxembourg.

2.2 Regulatory framework and structures

The first dimension of competitiveness that is addressed by the international rankings concerns the regulatory and institutional structures as well as the infrastructures. This dimension sets the ground for rating the country as a good or poor hosting structure for businesses.

In the WEF-GCI rating, Luxembourg records lower scores in both the infrastructures needed for business³⁴ and the regulatory framework (institutions). The differences have been narrowing in the last few years but they are still pretty substantial particularly for the infrastructures.

³⁴ This includes elements linked to communication and transport but also to the size of the market and the availability of a qualified work force.

Table 5 – CGI pillars Institutions and Infrastructures – Luxembourg & Singapore, 2010/2011, 2011/2012

GCI		2011/2012		2010/2011	
		Luxembourg	Singapore	Luxembourg	Singapore
1st pillar	Institutions	5.7	6.1	5.7	6.1
2nd pillar	Infrastructure	5.6	6.3	5.6	6.2

Source: WEF

The diagnostic made by the WEF is confirmed by the one of the IMD Institute. On two questions, concerning the business orientation of the overall regulatory framework and the more specific technological regulation, the perception for Luxembourg are below the ones of Singapore. As with the WEF rating, the difference has narrowed in the last few years, particularly for what concerns technological regulation.

Table 6 – IMD questions on the regulatory framework and technological regulation – Luxembourg & Singapore, 2009-2011

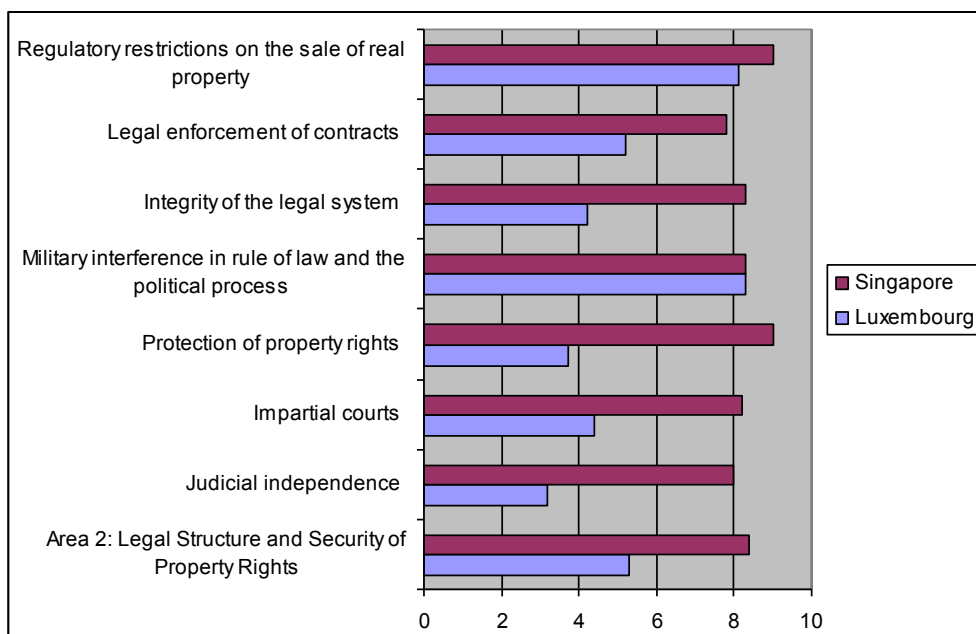
	2009	2010	2011
Legal and regulatory framework			
The legal and regulatory framework encourages the competitiveness of enterprises			
Luxembourg	4,59	5,76	6,23
Singapore	7,09	7,67	7,70
Technological regulation			
Technological regulation supports business development and innovation			
Luxembourg	6,44	6,78	7,15
Singapore	7,85	8,05	7,58

Source: IMD

Luxembourg records lower scores than Singapore in all the components of the area 2 of the Economic Freedom Index of the Fraser Institute. The differences are the most pronounced for the categories “protection of property rights”, the “judicial independence”, the “integrity of the legal system” and the “impartiality of courts”. These results are surprising but reflect a mix of indicators built on the basis of several sources: selected questions from the GCI of the WEF, data from the World Bank “doing business report” and measurements from the International Country Risk Guide³⁵.

³⁵ The Political Risk Services (PRS) group is established in the New York state since 1979 and monitors the risk for international business in 161 countries. It has a large data base of risk indicators and publishes regular country reports.

Graph 32 – Area 2 of the Economic Freedom of the world Index of the Fraser Institute – Luxembourg & Singapore, 2009



Source: Fraser Institute

2.3 Governance

The second dimension “Governance” addresses the capacities of Governments and bureaucracies to provide to international businesses an environment that makes their operations easier to perform and manage. This dimension covers the effectiveness of Governments and bureaucracies, the transparency and the accountability of the political system, this including corruption.

Looking first at the World Bank governance indicators³⁶, similar patterns are followed by both Luxembourg and Singapore for most of the components during the period 2004-2009. The two countries score very high and similarly for four of the indicators: the effectiveness of the Government (in particular the quality of the public services, its independence from the politicians, the quality of policy formulation and credibility, the quality of the regulatory framework (ability to formulate and implement sound policies), the rule of law and the control of corruption.

Regarding the first indicator (voice and accountability), Singapore is rated far below Luxembourg this reflecting differences in the perception of freedom of expression, freedom of association, free media and the ability to participate in selecting Government. The score of Singapore for this indicator decreased dramatically in 2005 and has remained since at a very low level, comparable to the ones of Kenya, Nicaragua, Lebanon or Thailand.

³⁶ Worldwide Governance indicators (WGI) project – 2010.

Table 7 – World Bank Governance indicators – Luxembourg & Singapore, 2004-2010

	2004	2005	2006	2007	2008	2009	2010
Voice and accountability							
LUXEMBOURG	96	96	98	99	98	98	98
SINGAPORE	49	52	36	34	35	35	37
Political stability							
LUXEMBOURG	95	95	99	100	100	96	95
SINGAPORE	87	85	93	88	97	90	90
Government Effectiveness							
LUXEMBOURG	95	96	92	92	94	96	94
SINGAPORE	96	99	99	100	100	100	100
Regulatory Qual.							
LUXEMBOURG	99	99	97	97	96	96	96
SINGAPORE	100	100	98	100	100	100	99
Rule of law							
LUXEMBOURG	98	97	95	96	97	98	98
SINGAPORE	94	96	92	92	93	92	93
Control of Corruption							
LUXEMBOURG	93	93	94	95	96	95	95
SINGAPORE	99	98	98	98	99	99	99

Source: World Bank

The answers to the questions of the IMD Institute survey on business executives give a more unbalanced picture. According to the surveys, business executives trust better the Government of Singapore than the one of Luxembourg for its capacity to improve the management of public finances, to adapt to changes in the economy and to effectively implement its decisions. Even if the gaps have narrowed between 2009 and 2011, the scores for Singapore for these two questions are far higher than the ones of Luxembourg.

Table 8a – IMD questions on governance – Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Management of public finances			
Management of public finances over the next two years is likely to improve			
Luxembourg	4,11	4,42	5,59
Singapore	6,60	7,38	7,43
Adaptability of Government policy			
Adaptability of Government policy to changes in the economy is high			
Luxembourg	5,64	5,91	6,36
Singapore	8,18	8,30	8,04
Government decisions			
Government decisions are effectively implemented			
Luxembourg	6,00	5,94	6,35
Singapore	8,10	8,28	8,50

Source: IMD

The gap is lower for the question related to the transparency of the Government. However, in both countries, very low levels are recorded on the question regarding the bureaucracy and its capacity to hinder business. Singapore remains with higher scores than Luxembourg.

Table 8b – IMD questions on governance – Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Transparency			
Transparency of Government policy is satisfactory			
Luxembourg	5,89	6,45	6,64
Singapore	7,09	7,59	7,85
Bureaucracy			
Bureaucracy does not hinder business activity			
Luxembourg	3,67	4,12	4,13
Singapore	5,83	6,05	5,90

Source: IMD

Corruption affects economic freedom through insecurity and uncertainty that it introduces in the relations between economic actors, businesses and Governments. The Heritage Foundation calculates an indicator for freedom from corruption on the basis of the Corruption Perception index that is published by “Transparency International”. Singapore gets a better score than Luxembourg this reflecting the efforts made by the Government in fighting against corruption and enforcing severe laws on the issue.

Table 9a – Freedom from Corruption index – Luxembourg & Singapore, 2012

	Freedom from Corruption
Luxembourg	85,0
Singapore	93,0

Source: Heritage foundation

The score established by the Heritage Foundation is confirmed by the perception of the Business executives surveyed by the IMD Institute. To be noted that since 2009, the score of Luxembourg is on the rise while the one of Singapore remained stable.

Table 9b – IMD question on corruption – Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Bribing and corruption			
Level of bribing and corruption			
Luxembourg	6,91	7,31	7,59
Singapore	8,02	7,75	7,99

Source: IMD

2.4 Policies and incentives to businesses

The third dimension of competitiveness that is considered here is the ease of doing business and the incentives that are given by the Government to attract investors and businesses.

The World Bank recently published a report called “doing business” that present a series of key indicators related to the establishment and the running of a business. In its overall ranking, Singapore is number 1 and Luxembourg only at the 50th rank. The major problems that Luxembourg faces concern the two following indicators: “getting credit”³⁷, “registering property”³⁸ and “protecting investors”³⁹.

³⁷ The World Bank specifies two important aspects within this dimension: the protection of legal rights for borrowers and lenders and the sharing of credit information. Sharing credit information should help the regulators

There is only one indicator for which Luxembourg gets the highest ranking (far above Singapore): “enforcing contracts”. This is contrary to what was recorded by the Fraser Institute (see above graph 32 section 2.2) regarding the legal enforcement of contracts.⁴⁰

Table 10 - Doing business – Luxembourg & Singapore, 2011

2011	Luxembourg	Singapore
Overall rank	50	1
Starting a business	81	4
Dealing with construction permits	33	3
Getting electricity	63	5
Registering property	134	14
Getting credit	150	8
Protecting investors	122	2
Paying taxes	17	4
Trading across borders	31	1
Enforcing contracts	1	12
Resolving insolvency	49	2

Source: World Bank

The results given by the IMD Institute converge with the diagnostic made by the World Bank. More business executives think that the legislation supports more the creation of firms in Singapore than in Luxembourg and that regulations are more supportive to easing the doing of Business in Singapore than in Luxembourg. The differences in scoring between the two countries on these questions have been pretty unchanged between 2009 and 2011.

The IMD Institute also notes that more procedures are needed in Luxembourg than in Singapore to start a business.

Table 11 – IMD questions on doing business - Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Ease of doing business			
Ease of doing business is supported by regulations			
Luxembourg	5,93	5,82	6,38
Singapore	7,85	7,95	7,90
Creation of firms			
Creation of firms is supported by legislation			
Luxembourg	6,36	6,51	6,58
Singapore	8,08	8,45	8,24
Start-up procedures			
Number of procedures to start a business			
Luxembourg	6,00	6,00	-
Singapore	3,00	3,00	-

Source: IMD

in better monitoring the demand and supply of credit to the economy with a particular advantage to small and medium size enterprises.

³⁸ Issues of taxes, procedures time limits and administrative efficiency.

³⁹ Minority investors protection, access to corporate documents, liability of Directors. For this dimension, Singapore is ranked second globally (New-Zealand is 1st, Honk Kong and Malaysia respectively 3rd and 4th).

⁴⁰ The World Bank indicator is built on the time, the cost and the procedural complexity of resolving a commercial lawsuit between two domestic businesses. Singapore records the fastest procedure while the advantage of Luxembourg is on the cost. The two countries records both more than 20 procedures (21 for Singapore and 26 for Luxembourg)

The indicators from the Fraser Institute synthesizes the estimations above mixing information originated from the World Bank Doing business report, the Global Competitiveness report of the WEF and the World Competitiveness yearbook of the IMD Institute. The indicators give a large advantage to Singapore compared to Luxembourg for its bureaucracy costs, its fighting against corruption, its very low level of restrictions for licenses and the administrative requirements for businesses.

Table 12 – Business regulations - Luxembourg & Singapore, 2009

	Luxembourg	Singapore
Business Regulations	6,1	8
Price controls	6	8
Administrative requirements	4	7,6
Bureaucracy costs	6,7	2,2
Starting a business	9,7	9,9
Extra payments/Bribes	4,3	9,3
Licensing restrictions	4,8	10
Cost of tax compliance	7,3	9,1

Source: Fraser Institute

The tax burden is an important element in the decision to create a business in a country. The Heritage Foundation measures this burden under its Fiscal freedom indicator. The indicator includes the rate of tax on individual income, the rate of tax on corporate income and the total tax revenue as a percentage of GDP. The large difference of scores between the two countries reflects the respective taxation systems and levels.

Table 13a – Fiscal Freedom and Government spending - Luxembourg & Singapore, 2012

	Fiscal Freedom	Government spending
Luxembourg	63.6	46.6
Singapore	91,3	91.3

Source: Heritage Foundation

These different systems and levels of taxes between the two countries are also acknowledged by the business community who perceived Luxembourg as a country where the rate of personal taxes can discourage people from working or seeking advancement. This is certainly linked with the high level of social protection that exists in Luxembourg for the unemployed or job seekers but also to attitudes and aspirations of the people. The business community also perceived the rate of corporate tax as too high and potentially discouraging entrepreneurship activities.

Table 13b – IMD questions on Taxes - Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Real personal taxes			
Real personal taxes do not discourage people from working or seeking advancement			
Luxembourg	6,00	6,06	5,94
Singapore	7,62	7,47	7,54
Real corporate taxes			
Real corporate taxes do not discourage entrepreneurial activity			
Luxembourg	5,38	5,76	6,04
Singapore	7,24	7,20	7,14

Source: IMD

2.5 Values and attitudes

The IMD Institute focuses a lot of its questions to business executives on values and attitudes towards changes and competitiveness, be the attitudes of the businesses or be the attitudes of the people/society.

With this particular component, the performances of the two countries are perceived more balanced, and sometimes in favor of Luxembourg. And if there are differences, they have narrowed considerably in the last few years. Regarding the practices within the businesses, the adaptability to changes is perceived as having improved recently in Luxembourg while staying stable in Singapore. The same evolution is also noted for two other questions: the implementation of ethical practices and the credibility of managers in society.

Table 14a – IMD questions on Values in Businesses (practices) – Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Adaptability of companies			
Adaptability of companies to market changes is high			
Luxembourg	5,71	6,51	6,33
Singapore	6,79	7,03	6,86
Ethical practices			
Ethical practices are implemented in companies			
Luxembourg	6,33	7,43	7,07
Singapore	7,23	7,51	7,26
Credibility of managers			
Credibility of managers in society is strong			
Luxembourg	6,69	6,96	7,14
Singapore	7,19	7,58	7,39

Source: IMD

Regarding social and environmental responsibilities in businesses, the performance of Luxembourg are getting better, even if still under the ones of Singapore for most of them. Social responsibility of the business leaders, and particularly the way health, safety and environmental concerns are addressed, is perceived to be higher in Luxembourg than in Singapore while performances are matching for the perception concerning the priority given to sustainable development and the inclusion of the values of employees in corporate values.

Table 14b – IMD questions on Values in Businesses (responsibility) – Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Social responsibility			
Social responsibility of business leaders is high			
Luxembourg	5,78	7,01	6,85
Singapore	6,13	6,08	6,17
Health, safety & environmental concerns			
Health, safety & environmental concerns are adequately addressed by management			
Luxembourg	-	7,19	7,56
Singapore	-	6,63	6,99
Corporate values			
Corporate values take into account the values of employees			
Luxembourg	6,36	6,90	6,87
Singapore	7,43	6,80	6,93
Sustainable development			
Sustainable development is a priority in companies			
Luxembourg	6,69	6,15	6,31
Singapore	6,93	6,73	6,74

Source: IMD

The perceptions that the business leaders have of Luxembourg regarding the values in society are less positive and Singapore overtakes Luxembourg in most of the related questions that were asked to them by the IMD Institute.

The business leaders think that there is in Luxembourg a general attitude towards globalization that is less positive than in Singapore. This is strongly related with the perception that the need for economic and social changes and reforms is not shared and understood as it is in Singapore. In general, the value system of the Luxembourg society would be less supportive to competitiveness than the one of Singapore⁴¹.

The national culture of Singapore is perceived as being much opened to foreign ideas as is the one of Luxembourg (even if at a lower level). This is certainly linked with the large share of foreigners being residents in both countries and the large share of non-residents in the work force (trans-border workers). Even if the various ethnic or national groups composing both societies remain much attached to their own values systems, they are constantly confronted to others and must live with them. Both societies are perceived as having the potential to be flexible and adaptable to new challenges.

⁴¹ To be noted that this perception for the value system of Luxembourg stayed very stable in the last few years.

Table 14c – IMD questions on Values in Society – Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Attitudes toward globalization			
Attitudes toward globalization are generally positive in your society			
Luxembourg	6,18	6,78	6,29
Singapore	7,75	7,70	7,82
National culture			
The national culture is open to foreign ideas			
Luxembourg	7,20	7,73	7,46
Singapore	7,85	8,08	8,00
Flexibility and adaptability			
Flexibility and adaptability of people are high when faced with new challenges			
Luxembourg	5,42	6,12	6,04
Singapore	7,08	7,03	6,77
Need for economic and social reforms			
The need for economic and social reforms is generally well understood			
Luxembourg	5,42	5,16	5,22
Singapore	7,60	7,24	7,03
Value system			
The value system in your society supports competitiveness			
Luxembourg	6,33	6,09	6,33
Singapore	7,92	8,08	7,61

Source: IMD

2.6 The labour market

The last dimension of competitiveness analyzed here is the one concerning the work force, its quality, its availability, its relevance vis-à-vis the needs of the businesses, its adaptability and flexibility.

The Heritage Foundation considers six factors for calculating its labour freedom index: the ratio of minimum wage to the average value added per worker, the hindrance to hiring additional workers, the rigidity of hours, the difficulty of firing redundant employees, the legally mandated notice period and the mandatory severance pay. The resulting index is more than double in Singapore than in Luxembourg. On the 10 freedoms that the HF distinguishes, this one is where the gap between Luxembourg and Singapore is the highest.

Table 15 – Labour Freedom index – Luxembourg & Singapore, 2012

	Labour Freedom
Luxembourg	40.9
Singapore	92.1

Source: Heritage Foundation

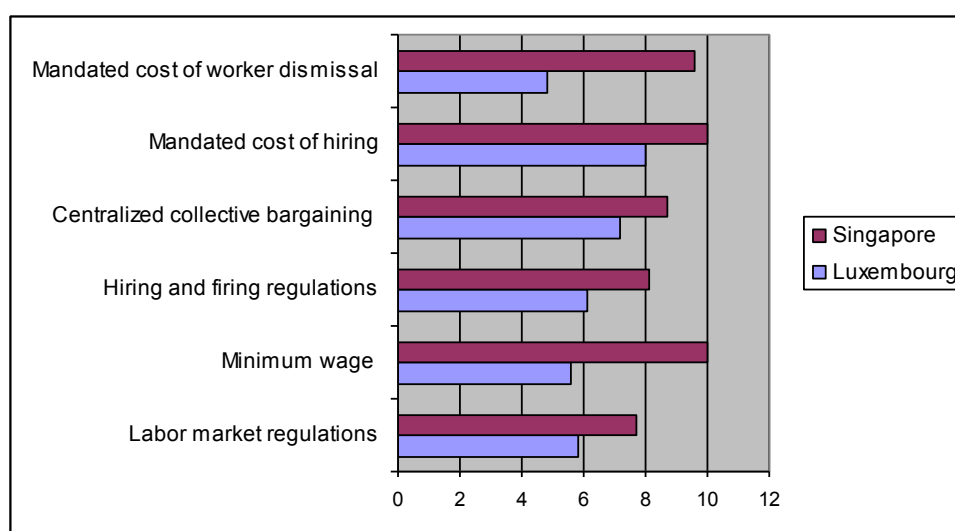
This result converges with the one from the 7th pillar (labour market efficiency) of the WEF-GCI which gives more than one point difference between the scores of the two countries regarding the efficiency of the labour market.

Table 16 – 5th and 7th pillars of the GCI

GCI		2011-2012		2010-2011	
		Luxembourg	Singapore	Luxembourg	Singapore
5th pillar	Higher education and training	4,7	5,8	4,7	5,8
7th pillar	Labour market efficiency	4,6	5,9	4,7	5,9

Source: WEF

Globally, the Fraser Institute gives better scores to Singapore than Luxembourg to section B: labour regulations of its 5th area for economic freedom. The difference between the two countries is the highest for the level of the minimum wage and for the mandated cost of worker dismissal, two key aspects of social protection in Luxembourg and for which there are systematic and institutionalized conventions and negotiations between the Government, the employers and the employees.

Graph 35 – Labour market regulations – Luxembourg & Singapore, 2009

Source: Fraser Institute

The IMD Institute also records perceptions on the poor flexibility of the labour market in Luxembourg compared to the one in Singapore (with differences of similar proportion than the ones estimated by the Heritage foundation). The unemployment legislation is also seen as too protective in Luxembourg and as not being an incentive to look for work.

This must be put in parallel with some of the perceptions on values and attitudes developed in section 2.5 above, in particular the ones related to flexibility and adaptability to changes and to the priorities given to sustainable development, social support and health.

In all, the IMD presents an index of the rigidity of employment that is very high.

Table 17a – IMD questions on labour regulations - Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Labour regulations			
Labour regulations (hiring/firing practices, minimum wages, etc.) do not hinder business activities			
Luxembourg	4,04	4,63	4,23
Singapore	7,40	7,45	7,05
Unemployment legislation			
Unemployment legislation provides an incentive to look for work			
Luxembourg	4,73	4,54	4,48
Singapore	6,93	7,41	7,14
Labour market flexibility			
Index on rigidity of employment			
Luxembourg	56,00	-	-
Singapore	0,00	-	-

Source: IMD

The differences between the two countries are lower when considering the quality of the work force. It must first be noted that the perceptions of Luxembourg have improved in the last few years for all the questions of the table below and are closing by with the ones on Singapore. Skilled labour, qualified engineers and competent managers are thought to be more available in Luxembourg than 2 years ago. However, the perceptions are still better for Singapore except for the significance of the international experience of senior managers.

Table 17b – IMD questions on the Quality of the work force - Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Remuneration spread			
Ratio of CEO to personal assistant remuneration			
Luxembourg	10,38	-	-
Singapore	21,35	-	-
Skilled labour			
Skilled labour is readily available			
Luxembourg	4,47	5,64	5,31
Singapore	6,72	6,41	6,46
International experience			
International experience of senior managers is generally significant			
Luxembourg	6,33	7,10	7,38
Singapore	6,81	7,00	7,01
Competent senior managers			
Competent senior managers are readily available			
Luxembourg	4,58	5,67	6,08
Singapore	6,62	6,33	6,23
Qualified engineers			
Qualified engineers are available in your labour market			
Luxembourg	5,37	6,51	6,17
Singapore	7,58	7,67	7,48

Source: IMD

The remuneration spread (ratio of remuneration of a CEO to the one of a personal assistant) is far higher in Singapore than in Luxembourg, this being convergent with the levels of inequalities analyzed in section 1.7 above.

The educational assessments made through the results of the Programme for International Student Assessment (PISA)⁴² shows that students in Singapore master better mathematics and Sciences than students in Luxembourg. There is the perception among the business community that science is not sufficiently emphasized in Luxembourg compared to Singapore.

Table 17c – IMD questions on Education - Luxembourg & Singapore, 2009-2011

	2009	2010	2011
Educational assessment / Mathematics			
PISA survey of 15-year olds			
Luxembourg	489	-	-
Singapore	562	-	-
Educational assessment / Sciences			
PISA survey of 15-year olds			
Luxembourg	484	-	-
Singapore	542	-	-
Science in schools			
Science in schools is sufficiently emphasized			
Luxembourg	5,02	5,43	4,85
Singapore	8,32	8,58	8,01

Source: IMD

2.7 Conclusions

In all the global rankings of competitiveness that have been looked at in this section, Singapore systematically overtakes Luxembourg, sometimes with a very large margin. Perceptions from the business executives (WEF, IMD, Heritage Foundation, Fraser Institute), but also some concrete evidences (World bank), give Singapore a strong advantage in various segments of competitiveness:

- **Regulations and infrastructures are more conducive to economic freedom and competition in Singapore than in Luxembourg.** For the infrastructure, the size of Luxembourg explains certainly partly the difference of appreciation by the business executives even if on some aspects (such as connectivity and communication), the situation in Luxembourg is seen as having improved considerably in the recent years. The regulatory framework in Luxembourg is still perceived as not giving enough attention to the protection of the property rights, the impartiality of the courts and the independence of the judicial system,
- **The Government of Singapore is better trusted than the one of Luxembourg for its capacity to manage the country and to implement its decisions.** This perception has certainly some roots in the EU integration process and its impact on the limited room of maneuver and sovereignty that is left to the Governments of the member states in some economic and social policy issues. Another reason is certainly to be sought in the way the Government of Luxembourg prepares and negotiates decisions that have an

⁴² More analyses are done on the latest PISA results in section 3.2 below.

economic and social impact with the other economic actors in the country, through institutionalized channels,

- **Doing business is by far easier in Singapore than in Luxembourg.** There are concrete evidences that confirm this assessment. It is certainly a question of the time that is required to set-up a business and the cost incurred by the procedures that need to be undertaken. But it is also a question that relates to the way the administration works and the level of its efficiency at providing the services that the business community needs to develop its activities. A key issue is the difficulty to access credit, particularly for the small and medium sizes businesses. The issue of taxes (personal and corporate) is also important,
- **Values and attitudes in Singapore are more positive on Competitiveness and changes than in Luxembourg.** However, this is the area where the differences between the two countries are at their lowest level. In particular, businesses in Luxembourg are very sensitive to issues related to health and safety at work and, more generally, to sustainable development.
- **Labour market in Singapore is more flexible and adaptable to changes than in Luxembourg.** The organization of the labour market is, without doubt, another key factor explaining the differences in competitiveness between the two countries. Through the surveys carried out by the WEF and IMD Institute, business executives finger the rigidities of the labour regulations in Luxembourg that hamper the quick and adequate adaptability of the labour market to changing business opportunities. However, social protection is an important part of the fabric of the Luxembourg society and contributes for a large part to a higher quality of life. Business leaders and executives also note that the need for economic and social reforms is less understood in Luxembourg than in Singapore.

3. Focus on some key sectors and issues

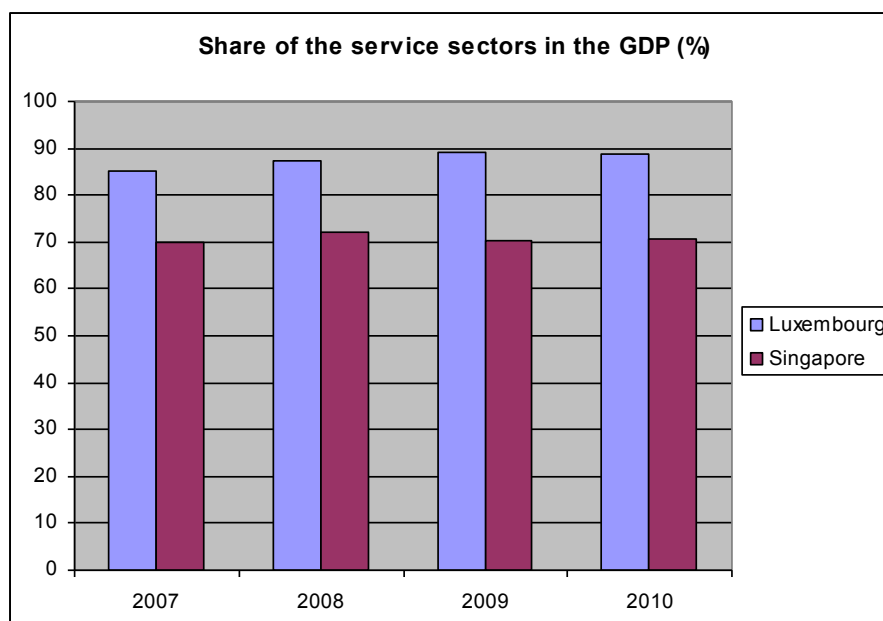
This section will give more light on selected sectors and issues that could contribute to the better understanding of the differences between the two countries and their respective ability to compete in today's global world.

The sectors/issues that have been selected are the following ones: the sector of services (and particularly its contribution to the balance of payment), the education levels as assessed by the latest PISA survey, Foreign Direct Investments, the labour force (its compared structure), gender, the knowledge society and productivity. These are all issues that emerged as important as factors or results of competitiveness. They are discussed successively in the sections below.

3.1 *Services and trade in services*

The services sector is a key sector in both the generation of GDP and employment in Singapore and Luxembourg alike. Their share in the GDP increased constantly in the past decade to reach in 2010 90% in Luxembourg and 70% in Singapore.

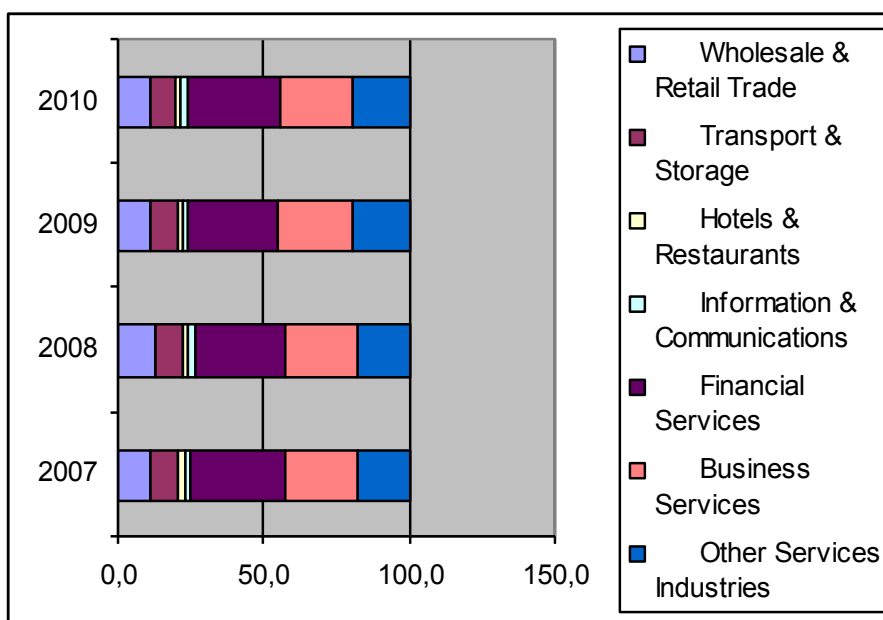
Graph 36: Share of the service sectors in the GDP (%) - Luxembourg & Singapore, 2007-2010



Sources: Statistics Singapore and STATEC

In Luxembourg, Financial and Business services represent in 2010 57.3% of the service activity (a proportion unchanged compared to 2007 with more than 31% for the financial services and more than 25% for the business services). This repartition stayed almost unchanged in the last few years.

Graph 37 - Structure of the service sector – Luxembourg, 2007-2010

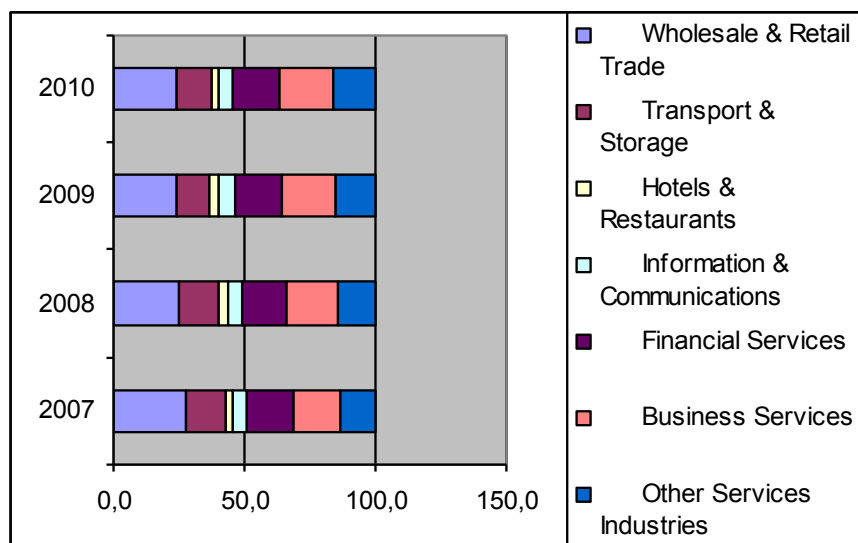


Sources: Statistics Singapore and STATEC

In Singapore for the same year 2010, the financial and the business services represented only 38.4% of the services activity (17.7% for financial services and 20.7% for business services) while the wholesale and retail trade contributed for 24.4%. Between 2007 and

2010, the relative importance of Trade and transport decreased slightly at the benefit of the one of the other services industries.

Graph 38 - Structure of the service sector – Singapore, 2007-2010



Sources: Statistics Singapore and STATEC

Among the services, logistics play a special role in both Singapore and Luxembourg (more recently). The World Bank established regularly a ranking among countries regarding the efficiency of their logistics systems that takes into account several factors: the custom process, the infrastructure available, the competence in the work and the timeliness.

Table 18 – Logistics Performance Index – Germany, Luxembourg & Singapore, 2010

	Luxembourg	Singapore	Germany
Overall LPI			
score	3,98	4,09	4,11
rank	5	2	1
Customs			
score	4,04	4,02	4,00
rank	1	2	
Infrastructure			
score	4,06	4,22	4,34
rank	9	4	
International shipments			
score	3,67	3,86	3,66
rank	7	1	
Logistics competence			
score	3,67	4,12	4,14
rank	21	6	
Tracking & tracing			
score	3,92	4,15	4,18
rank	19	6	
Timeliness			
score	4,58	4,23	4,48
rank	1	1	

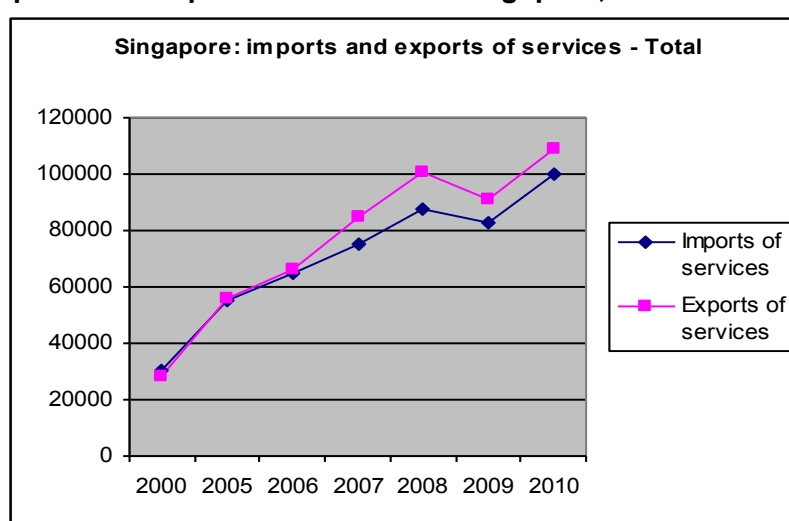
Source: World Bank

In this ranking, Luxembourg is 5th and Singapore is 2nd (behind Germany). Luxembourg receives the highest scores for the custom process and the timeliness but lags far behind Singapore for the competence in logistics and the tracking and tracing system. This is certainly one consequence of the recent development of the activity in Luxembourg compared with the long experience that Singapore has built in this area.

Trade in services is particularly important in the economy of Luxembourg. Exports in services are today more than 3 times higher than exports in merchandises and imports of services 1.5 times higher⁴³; in Singapore, exports and imports of services represent approximately one third of respectively the exports and imports of merchandises.

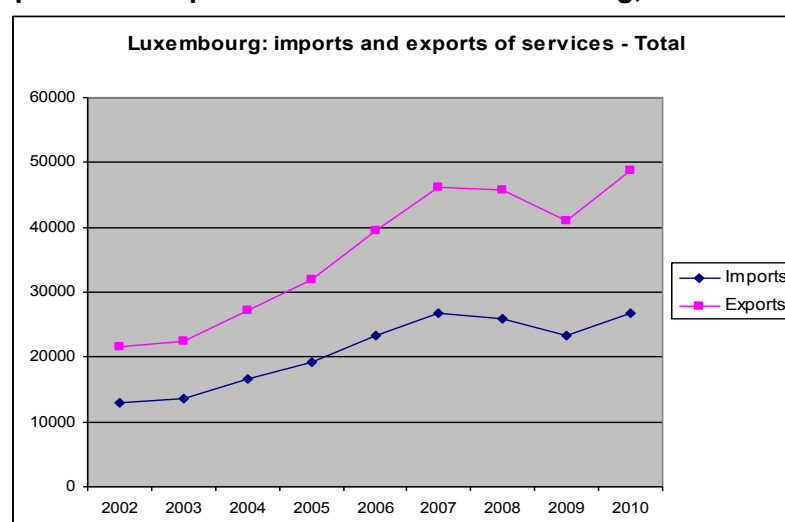
In both countries, exports and imports of services have increased rapidly between 2000 and 2010, more rapidly than the exports and imports of merchandises: in Singapore, exports more than doubled and imports almost tripled; in Luxembourg both exports and imports more than doubled.

Graph 39a – Imports and exports of services – Singapore, 2000-2010



Source: UNCTAD

Graph 39b – Imports and exports of services – Luxembourg, 2002-2010



Source: STATEC

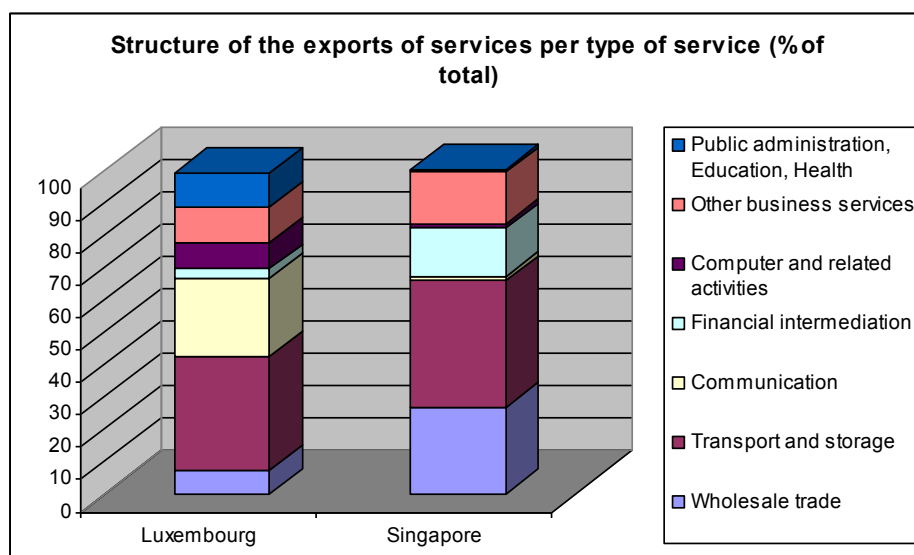
The main trading partners of Luxembourg for both exports and imports of services are the other member states of the EU: in 2009, they absorbed more than 60% of the exports and

⁴³ See tables 37a and 37b of the statistical annex. Source: UNCTAD

provided almost 50% of the imports. Singapore exports more than 40% of its services in other Asian countries and in the Middle East; its imports are shared between the Asian countries, the US and the EU⁴⁴.

Luxembourg and Singapore export mainly transport services, respectively for 35% and 39% of the total exports of services. Luxembourg exports communication services for 24% and Singapore's financial receipts accounted for 14% of total exports⁴⁵.

Graph 40 – Structure of exports of services – Luxembourg & Singapore, 2007



Source: Sources: Statistics Singapore and STATEC⁴⁶

In 2009, Luxembourg recorded a deficit in its trade in services with only 3 of its partners: Singapore, Portugal and Turkey⁴⁷. The same year, Singapore had a trade in services deficit with the EU (mainly France and the Netherlands), the US and most of its partners in South and Central America.

3.2 Education – Additional elements from PISA⁴⁸

An initial look at the available data on education in Luxembourg and Singapore (section 1.5 above and additional elements in section 2.6) showed that, while the overall output indicators of the system (enrolment rates, literacy rates, drop-out rates) were very comparable, there was a large gap in achievements, particularly in mathematics and sciences. This gap is confirmed by the latest survey carried out under the umbrella of the OECD in the framework of PISA.

As shown in the graph below, the students in Singapore records better performances than the Luxembourg students in Mathematics, Science and Reading. The scores reached by the Singapore students are among the higher of the countries surveyed (Singapore is ranked 2nd

⁴⁴ See graph 2a and 2b in the statistical annex

⁴⁵ See Tables 37C and 37d in the statistical annex for more recent data for Singapore.

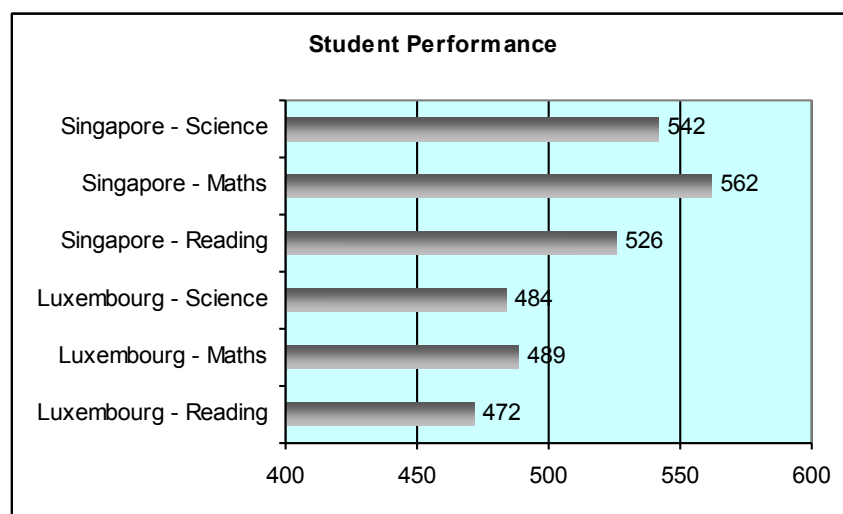
⁴⁶ For Luxembourg estimates are extracted from the study by Giovanni Mangiarotti and Guy Schuller published in the WP 53 of the review "Economie et Statistiques" – STATEC.

⁴⁷ With Portugal, the deficit has been going on for many years while it is more recent for Singapore and Turkey.

⁴⁸ Survey on 2009 and results available 2011

for the performance in Mathematics, 4th for the one in Science and 5th for Reading – Luxembourg is ranked respectively 30th, 38th and 38th⁴⁹)

Graph 41 - Performances in Sciences – grades – Luxembourg & Singapore, 2011



Source PISA 2011

Repetition of grades concern more students in Luxembourg than in Singapore for all the ISCED levels⁵⁰.

Table 19 – Achievement – Luxembourg & Singapore, 2011

"Have you ever repeated a grade?"		(%)		
	ISCED 1	ISCED 2	ISCED 3	
Luxembourg				
No Never	72.47	71.91	71,72	
Yes Once	17.70	17.44	1,13	
Yes, twice or more	3.01	0.72	0,33	
Singapore				
No Never	87.76	87.94	95,92	
Yes Once	7.07	5.87	1,95	
Yes, twice or more	0.74	0.58	0,07	

Source PISA 2011

A reason for these better achievements can be found in the out-of-school support that the students receive. The students in Luxembourg have a slightly better access to both internet and reference books at home than the students in Singapore – Table 20a below -. However, there are far more students in Singapore who attend regularly lessons after school in Science than in Luxembourg. The proportion is almost 34.2 % compared to only 4.7% in Luxembourg – Table 20b below -.

⁴⁹ Among the best performers in both Maths and Science are also Honk-Kong and Korea. The performance of Luxembourg in Maths is similar to the one of Hungary, in Reading to the one of Austria and in Science to the one of Greece.

⁵⁰ ISCED: International standard classification for education.

Table 20a – Out-of-school support to education - Luxembourg & Singapore, 2011

"Which of the following are in your home?" (%)

"A link to the Internet".

	Yes	No
Luxembourg	97,00	2,58
Singapore	95,19	4,61

"Technical reference books"

	Yes	No
Luxembourg	68,42	28,75
Singapore	63,74	35,33

Source PISA 2011

Table 20b - Out-of-school support to education - Luxembourg & Singapore, 2011

"What type of <out-of-school-time lessons> do you attend currently?" (%)

"Enrichment lessons> in <Science>"

	Yes	No
Luxembourg	4,62	93,62
Singapore	33,87	65,25

Source PISA 2011

Students in Singapore spend more time week in attending out of school lessons in science. They are more than 30% spending more than 2 hours per week in out-of-school lessons (against only 5.5% in Luxembourg), and more than 45% to attend any out-of-school lessons in a week (against only 11% in Luxembourg).

Table 20c - Out-of-school support to education - Luxembourg & Singapore, 2011

"How many hours do you typically spend per week attending <out-of-school-time lessons> in the following subjects (at school, at home or somewhere else)? - <Science>". (%)

	Luxembourg	Singapore
Do not attend	57.46	37.26
Less than 2 hours a week	5.59	15.62
2 up to 4 Hours a week	2.53	20.26
4 up to 6 hours per week	1.87	8.93
6 or more hours a week	1.11	4.30

Source PISA 2011

In addition to out-of school activities, the PISA survey reveals that students in Singapore read more than the students in Luxembourg. They are more than 80% to read newspapers (against 70% in Luxembourg), 48% to read novels (against 28% in Luxembourg) and 33% to read non-fiction books (against 20% in Luxembourg). Luxembourg students read more magazines than the students in Singapore.

Table 21a – Enjoyment – reading material

%	Percentage of students who read diverse materials				
	Magazines	Comic books	Fiction (novels, narratives, stories)	Non-fiction books	Newspapers
Luxembourg	68,7	20,3	28,8	19,3	70,7
Singapore	53,9	33,0	48,2	33,1	83,5

Source PISA 2011

The availability of internet access and services is comparable for students in both countries (at school and out-of-school). However, they use the services differently: the use in Luxembourg seems to be more “social-oriented” (reading e-mails, chatting on-line, readings news on-line) and the use in Singapore more “learning-oriented” (using on-line dictionary or encyclopedia, searching information to learn about a practical topic, taking part in discussion groups, searching practical information).

Table 21b – Enjoyment – on-line reading activities

%	Percentage of students doing diverse online reading activities						
	Reading emails	<Chat on line> (e.g. <MSN®>)	Reading online news	Using an online dictionary or encyclopedia (e.g. <Wikipedia®>)	Searching online information to learn about a practical topic	Taking part in online group discussions or forums	Searching for practical information online (e.g. schedules, events, tips, recipes)
Luxembourg	68,9	79,6	58,1	35,3	46,2	17,7	31,3
Singapore	61,8	77,2	45,6	47,7	50,7	21,1	37,8

Source PISA 2011

3.3 Foreign Direct Investments (FDI)

Foreign Direct Investments are an important indicator for both the attractiveness (inflows) of a country and its dynamism (outflows) in the global world. Singapore and Luxembourg are active countries for both FDI Inflows and outflows. In 2010, Singapore outflows of FDI were half the inflows; in Luxembourg FDI outflows and inflows reached similar levels⁵¹.

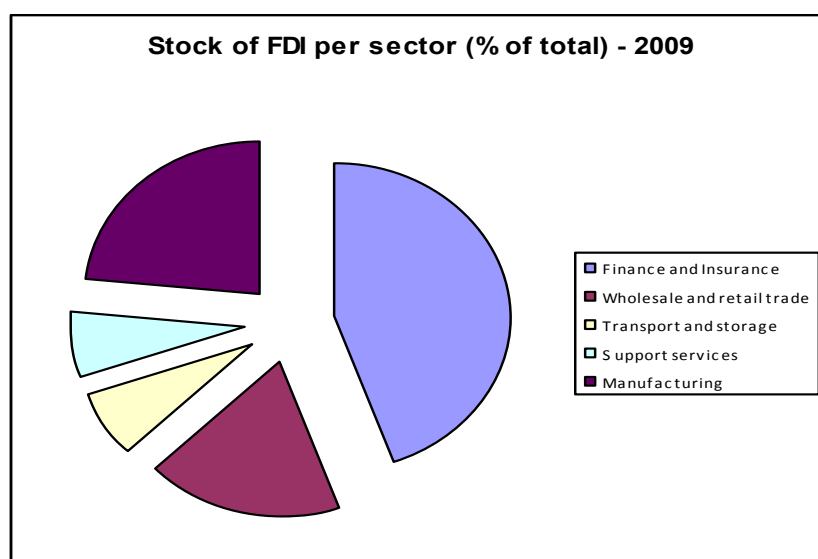
Table 22 - FDI

	2000	2005	2006	2007	2008	2009	2010
Inflows							
Luxembourg	..	6563	31843	-28260	9784	30195	20349
Singapore	16484	15459	29347	37033	8588	15278	38638
Outflows							
Luxembourg	..	9932	7746	73349	10171	18725	18292
Singapore	5915	11218	18809	32701	-256	18464	19739

Mo US\$, current prices and current exchange rates

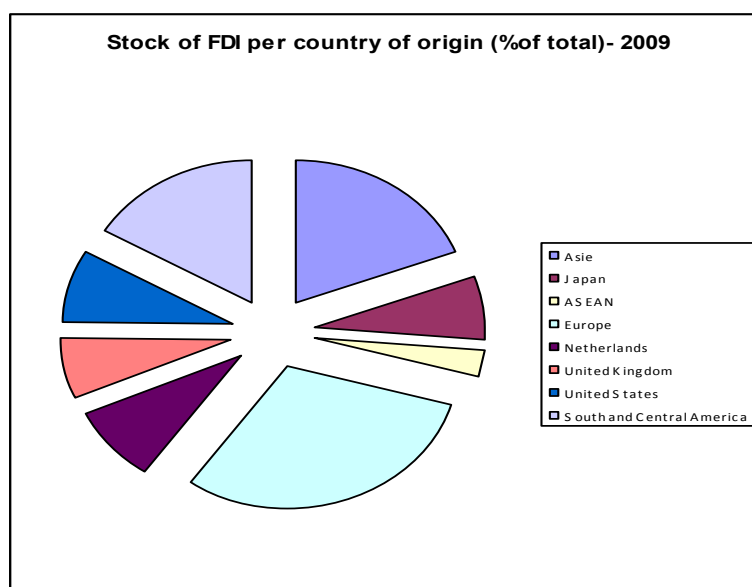
Source: UNCTAD

⁵¹ See table 39a & 39b of the statistical annex. In US\$ (current prices and current exchange rates, FDI inflows were 20349 in Luxembourg and 38638 in Singapore; FDI outflows were 18292 in Luxembourg and 19739 in Singapore – Source: UNCTAD. The latest data for Singapore are given in table 39c of the statistical annex. Source: DOS

Graph 42a – FDI Singapore (Outflows), 2009

Source: Department of statistics Singapore

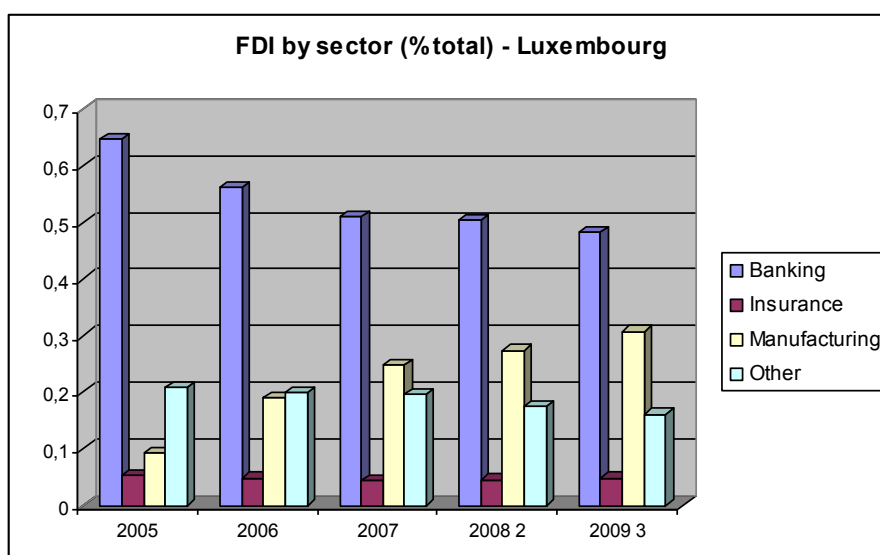
During the last five years (2005-2009), Foreign direct Investments of Singapore (outflows) were mainly directed to the sector of Finance and Insurance) and to a lesser extend to the sector of trade (wholesale and retail trade) and the manufacturing sector. Europe is the main target of these investments, particularly the United Kingdom and the Netherlands, followed by Asian countries and South and Central American countries.

Graph 42b – FDI Singapore (Outflows), 2009

Source: Department of statistics Singapore

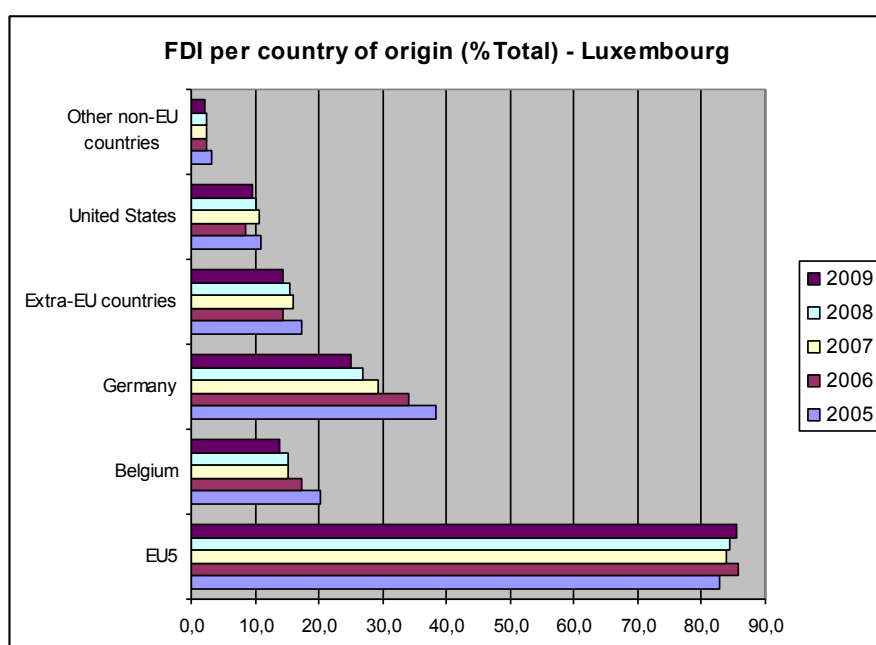
During the same period, FDI from Luxembourg (outflows) were mainly directed to the banking sector (more than 60% in 2005, more than 45% in 2009) and to a lesser extend to the manufacturing sector (almost 30% in 2009). For more than 80%, the Luxembourg FDI went to other European countries, mainly Germany (more than 25% in 2009) and Belgium (more than 15% in 2009). Between 2005 and 2009, the main extra-EU destination of FDI from Luxembourg was the United States (approximately 5% of the total FDI).

Graph 43a – FDI Luxembourg (Outflows), 2005-2009



Source: STATEC – 2: revised data; 3: provisional data

Graph 43b – FDI Luxembourg (Outflows), 2005-2009



Source: STATEC

3.4 Labour force (additional elements)

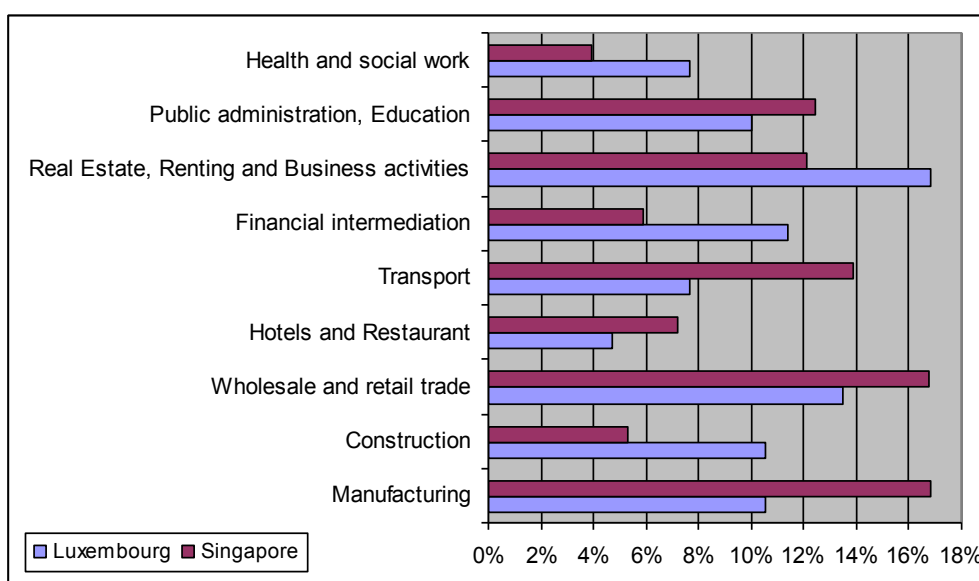
Employment has already been discussed in several previous sections (section 1.2, section 1.7, and section 2.6). Some additional elements are given here to complement the available information on the structure of employment, the levels of education and the participation of foreigners to the work force.

As already said, structural elements of employment can help in better reading the competitive performances of a country.

First, the structure of employment per sector gives indications on the degree of specialization/dependency of the economy as well as on the kind of activities on which employment relies (potential of growth on national market and on international market).

Employment in Singapore relies on 5 sectors that contribute for more than 12% to the total employment: Manufacturing (17%), Trade (17%), Transport (14%), Public Administration and Education (12.5%) and Real Estate, renting and business activities (12%). In Luxembourg, there are only 2 sectors that employ more than 12% of the total employment: Real Estate, renting and business activities (17%) and Trade (13.5%). Immediately after, there are 4 sectors that contribute for between 10% and 11.5% to total employment. In both countries, employment is well structured and is not too much dependent on one or two sectors. The activities that employ the most of persons in Singapore are linked to sectors that have also been very dynamic (transport, trade in particular) and for which there is a clear potential for developing exports. In Luxembourg, this orientation is less clear, real estate and construction being very important contributors to employment but maybe less rich and/or stable in terms of potential for future growth.

Graph 44 - Structure of employment per sector – 2006⁵²

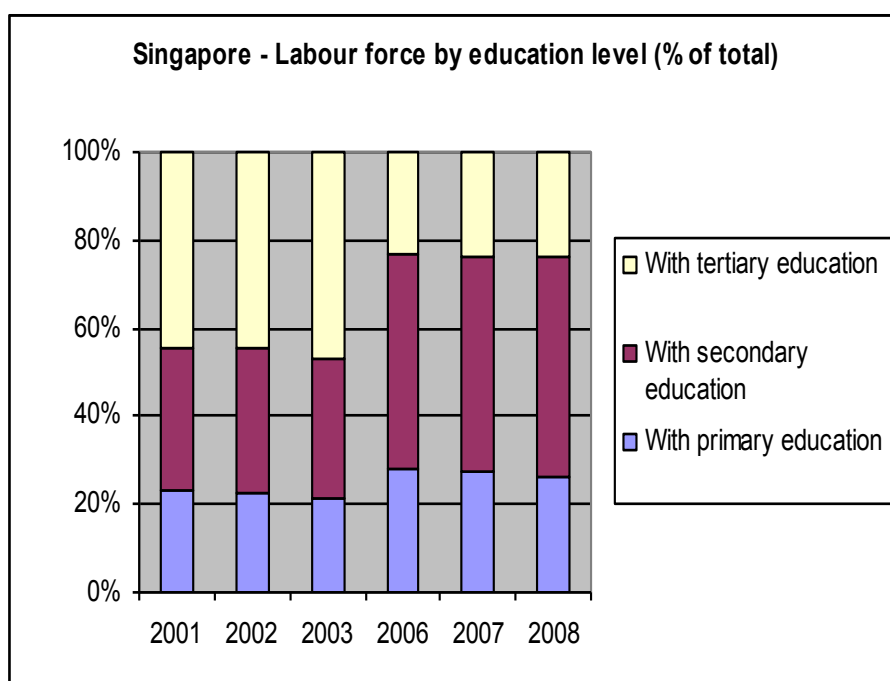


Source: ILO - LABOURTA

Second, the level of education of the work force is an indication on its potential to answer adequately the demand in very innovative and sophisticated sectors requiring high level of understanding and knowledge.

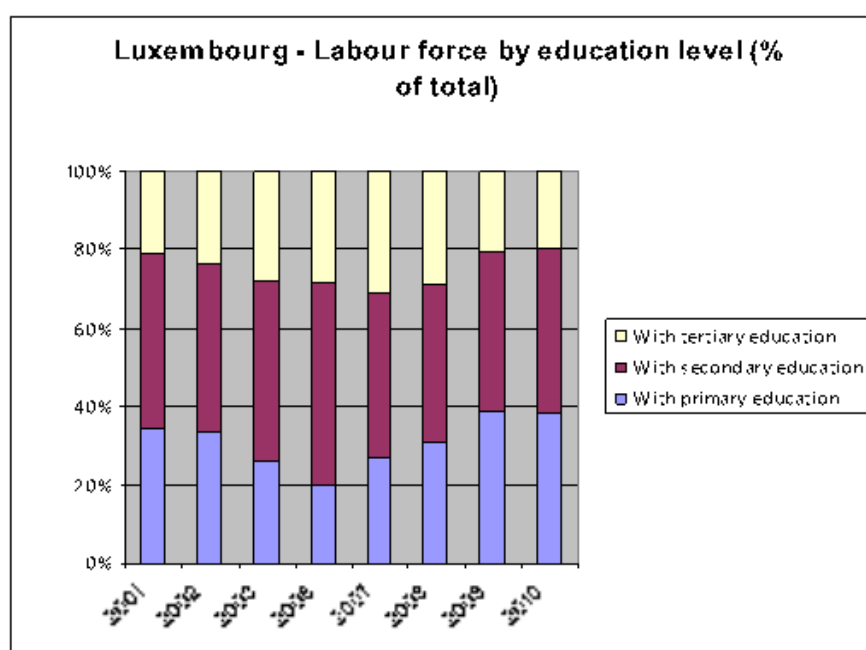
The composition of the labour force according to education level that was comparable in 2006-2007 in Luxembourg and Singapore is today diverging. In 2008 (latest comparable year), people with a secondary education represent 41% of the work force in Luxembourg while the number was 50% in Singapore (a difference of 9 points); people with a primary or a tertiary education represent between 20 and 30 % in both country (see table 8 of the statistical annex). In 2009 and 2010, the structure of the labour force in Luxembourg has showed a regular increase in the share of the tertiary education (up to 37% in 2010) and a parallel decrease of the share of the primary education (down to 19%). In The difference between the two countries is also noticeable in the evolutions that these figures followed since 2001 and that are given in the graphs 45a and 45b below.

⁵² There are data for 2008 available in LABOSTA but not detailed enough for the comparison.

Graph 45a – Labour force by level of education – Singapore, 2001-2008

Source: World Bank

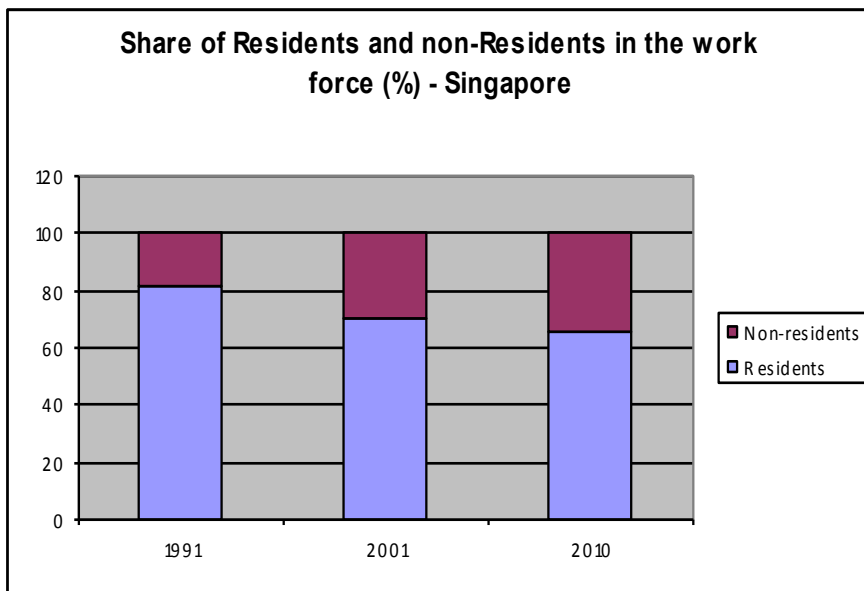
In Singapore, between 2001 and 2008, the share of tertiary education shrunk from 37.9% to 26% while both the share of primary and secondary educations increased (from 14.8% to 24% for the primary education and 28% to 50% for the secondary education). In Luxembourg, between 2001 and 2010, the share of both primary and secondary education decreased (from 34.2% to 19% for the primary education and from 43.3% to 40% for the secondary education) while the share of the tertiary education increased sharply (from 20.6% to 37%).

Graph 45b – Labour force by level of education – Luxembourg, 2001-2010

Source: World Bank

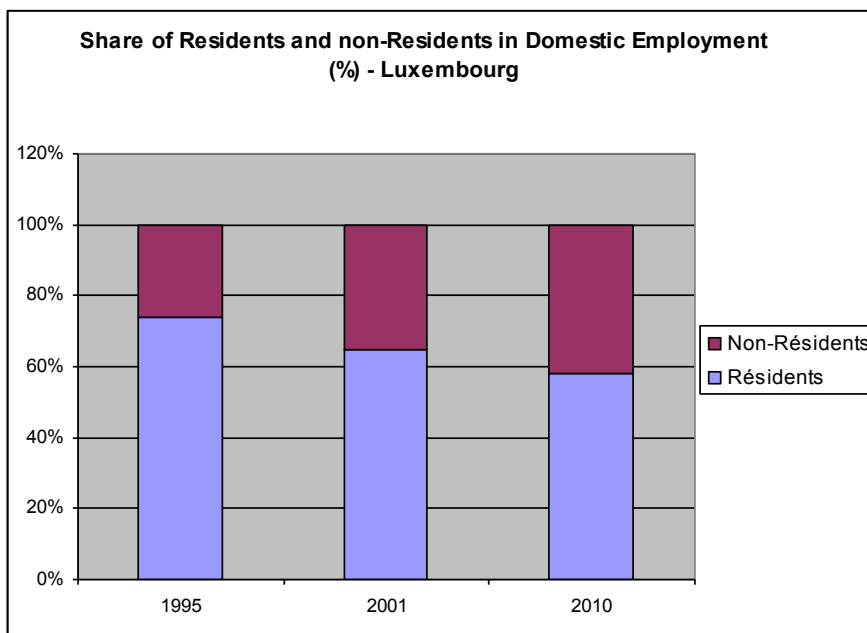
Third, the presence of foreign population in the work force is an indication of the dynamism of an economy within its close environment. In both Singapore and Luxembourg, Foreigners are present in a large proportion in the work force (35% in Singapore and a little more than 40% in Luxembourg in 2010). This presence of foreigners increased dramatically in both countries since the beginning of the 90s: they represented only 20% of the work force in Singapore in 1991 and a little more than 25 % in Luxembourg the same year.

Graph 46a – Residents and non-residents – Singapore, 1991, 2001, 2010



Source: Ministry of Manpower - Singapore

Graph 46b – Residents and non-residents – Luxembourg, 1995, 2001, 2010



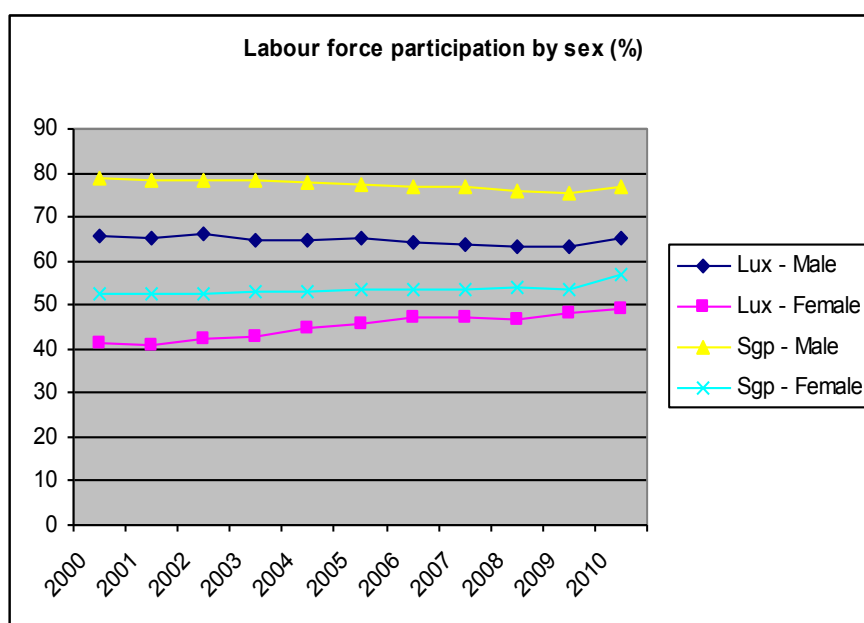
Source: STATEC

3.5 Gender

Gender has not been considered until now in this comparative analysis. This is not a dimension that was taken into account in the various studies and ranking exercises that have been discussed in the previous sections. However, this dimension could bring additional light not only for what concerns values and attitudes towards changes but also for what concern expectations and decision making. Some aspects of the gender dimension are here considered as food for thoughts regarding the labour participation, employment/unemployment, demographic and political issues.

Labour participation is higher in Singapore than in Luxembourg for both men and women. This has been true for the whole period 2000-2009. The differences are narrowing, more rapidly for the women: while the participation rate remained pretty stable in Singapore over the period, it increased steadily in Luxembourg. They are now both close to 50%. Male participation in the labour force is decreasing very slowly in both countries.

Graph 47 – Labour force participation – Luxembourg & Singapore, 2000-2010



Source: World Bank

There are more male employers or self-employed in Luxembourg and Singapore. The gender difference is shrinking in both countries but more rapidly in Luxembourg. The number of male employers decreased dramatically in Luxembourg between 2000 and 2009 (7.5% of employment to 4.0%) and less sharply in Singapore (7.7% of employment in 2000 and 7.0% in 2009). The decrease also affected women employers in Luxembourg but not in Singapore. The proportion of self-employed decreased slightly in Luxembourg between 2000 and 2009 for both male and female workers, but more for men than for women. During the same period in Singapore, the proportion of male self employed increased by almost a half and the proportion of female self employed was close to double.

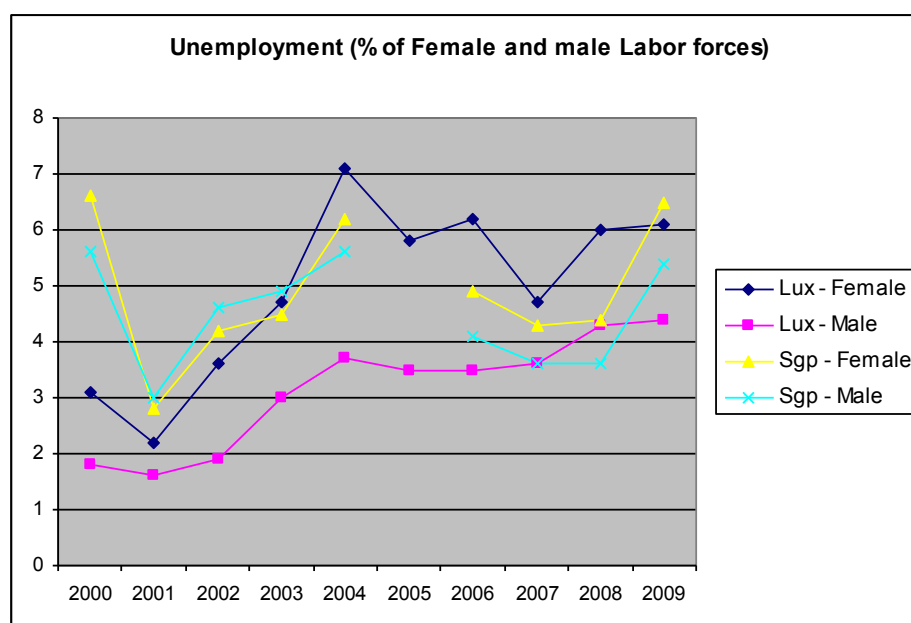
This last evolution certainly reflects differences in dynamism and initiative within the work force, and particularly its female component, between the 2 countries.

Table 23 – Employers and self-employed – Luxembourg & Singapore, 2000, 2004, 2008, 2009 and 2010

	2000	2004	2008	2009	2010
Luxembourg					
Employers, female (% of employment)	3,8	1,7	1,4	1.0	2.0
Employers, male (% of employment)	7,5	3,6	3,2	4.0	4.0
Self-employed, female (% of females employed)	7,3	6,7	6,4	7.0	6.0
Self-employed, male (% of males employed)	10,8	9,2	6,6	10.0	9.0
Singapore					
Employers, female (% of employment)	2,9	2,6	2,9	3.0	
Employers, male (% of employment)	7,7	7,4	6,8	7.0	
Self-employed, female (% of females employed)	5,8	9,6	9,9	10.0	
Self-employed, male (% of males employed)	13,5	19,7	19	18.0	

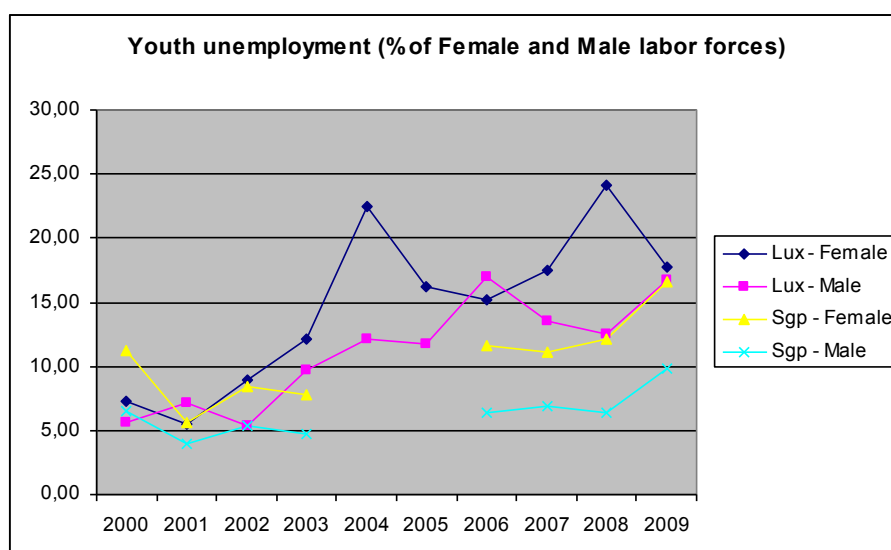
Source: World Bank

In both Luxembourg and Singapore, the rate of unemployment is higher for women than for men. The evolution of unemployment by sex is very parallel in Singapore this illustrating a better integration of women in the work force. This evolution is more hieratic for women in Luxembourg but seems to stabilize today in a parallel trend with men.

Graph 48 – Unemployment by sex – Luxembourg & Singapore, 2000-2009

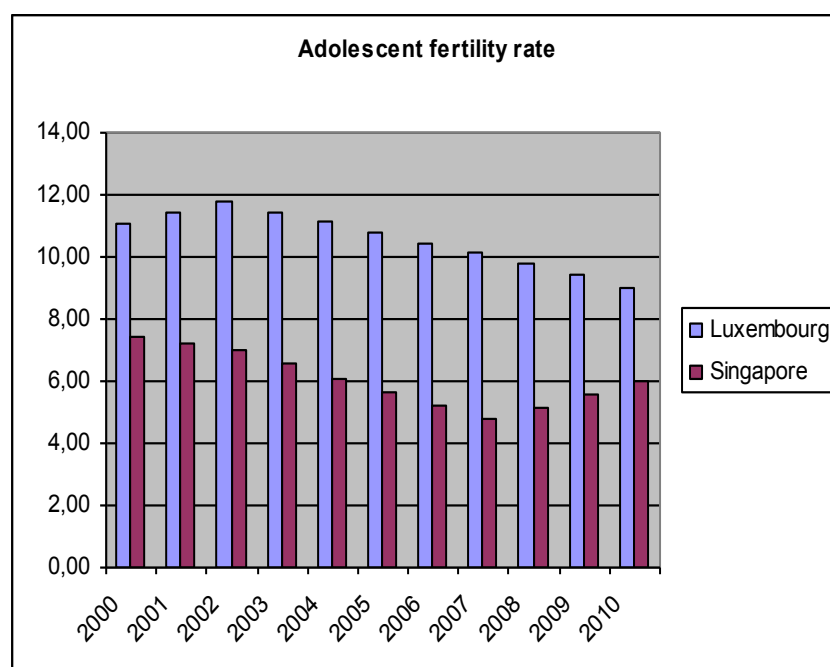
Source: World Bank

Considering youth unemployment brings similar comments than for the total unemployment. Unemployment rates have been lower in Singapore than in Luxembourg between 2000 and 2009. In 2009, the rates are converging for men and women in Luxembourg and for women in Singapore.

Graph 49 – Youth unemployment by sex – Luxembourg & Singapore, 2000-2009

Source: World Bank

The adolescent fertility rate has been far higher in Luxembourg than in Singapore since 2000. In 2002, a pick year for Luxembourg, the rates started to decline in both countries. While they continue to decline in Luxembourg they went up in Singapore since 2008 (the rate was almost divided by two in Singapore between 2000 and 2007). Today the differential between the two countries is similar to the one they had in 2000 but it stands at a lower level⁵³.

Graph 50 – Adolescent fertility rate – Luxembourg & Singapore, 2000-2010

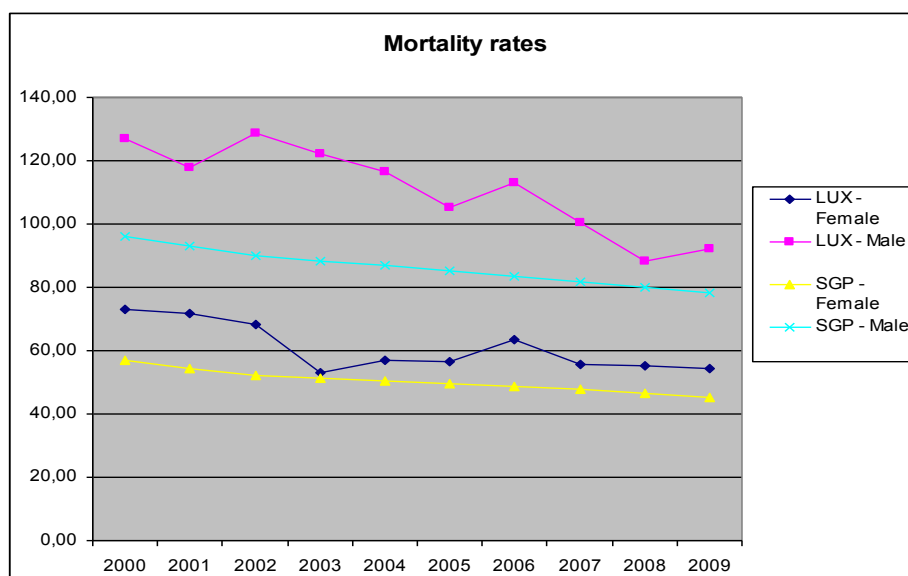
Source: World Bank

⁵³ See table 42 in the statistical annex for more detailed data from the DOS on fertility by age.

Mortality rates have been on the decrease in both countries since 2000 and for both sexes (in 2009, there was a slight increase of the mortality rate for men in Luxembourg). They remain lower in Singapore than in Luxembourg.

The rates are higher for men than for women in both countries and the gender gap persists at a constant level all along the period.

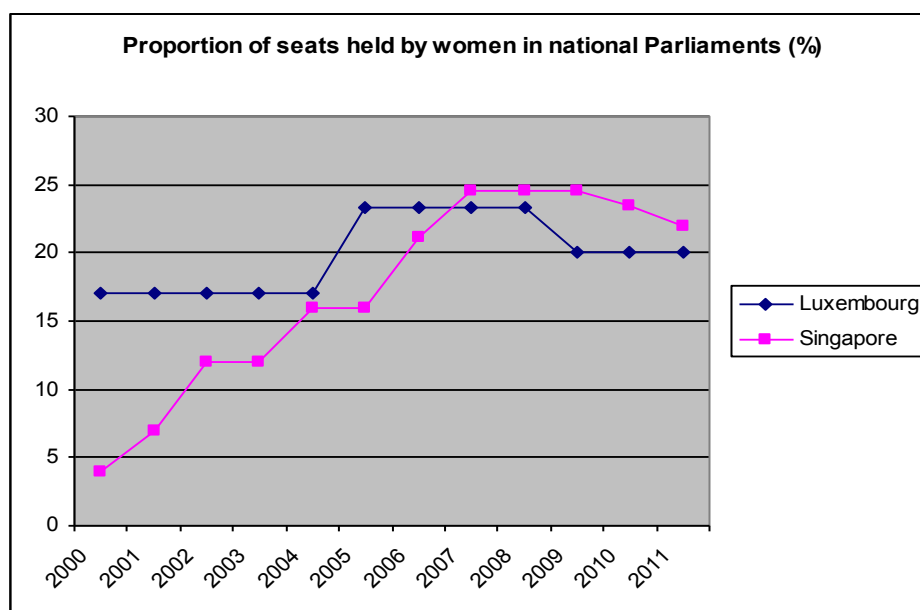
Graph 51 – Mortality rates - Luxembourg & Singapore, 2000-2009



Source: World Bank

The proportion of women in Parliament is close to 25% in Singapore and to 20% in Luxembourg. These proportions have been stable in the last few years. It is to be noted that the situation in Singapore evolved greatly compared to 2000 (a proportion less than 5%) and only slightly in Luxembourg (a little more than 15%).

Graph 52 – Seats held by women in parliaments, 2000-2011



Source: World Bank

It is difficult to identify if more gender equality is the consequence of economic development and dynamism or a factor that reinforces the strengths of a country in the global competition. The comparable elements that have been discussed in this section don't bring enough light to get an articulated answer.

However, it is certain that a better and more balanced involvement of men and women in the drive of the economy at all levels (working contribution, participation in the formulation of policies and strategies and in the decision making) is a guarantee that complementary human and cultural perspectives are effectively considered thus making progress a more harmonious process. Looking at the data that we have suggests that a more balanced involvement of men and women in the work force at all ages and with all the qualifications is conducive to greater adaptability and flexibility.

3.6 Knowledge society

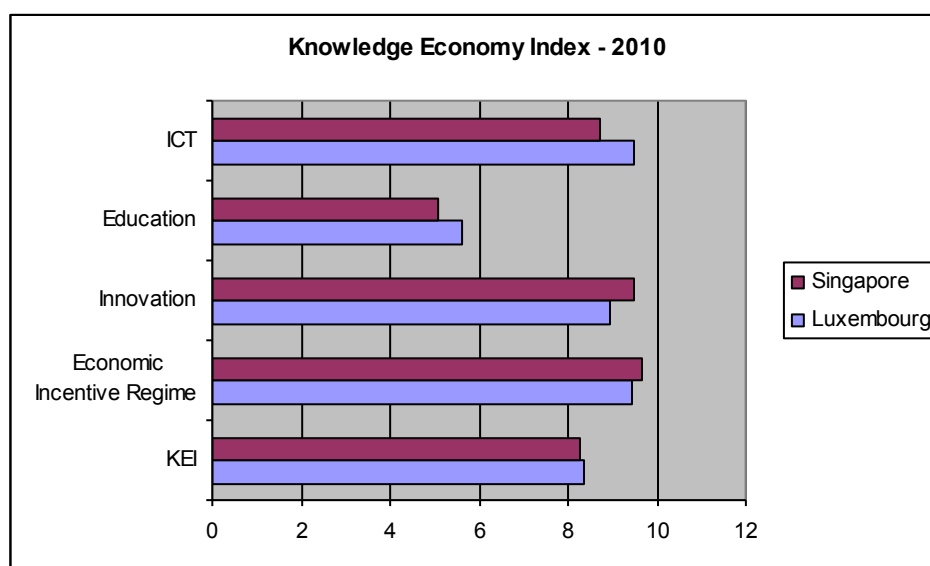
Knowledge Economy is a chapter of the annual Luxembourg report on competitiveness and knowledge-related data have already been discussed in section 1.6 of the paper. This section showed that, except for the issue of the patent applications, Singapore and Luxembourg were on parallel and converging tracks.

A global initiative has been recently developed in the framework of the Knowledge Assessment Methodology (KAM) under the auspices of the World Bank. The central topic is not Competitiveness but the knowledge society. However, the acquisition, the use and the valorization of knowledge (know-how, know-what, know-when, know-where and know-who) is a key aspect in modern competition. As such, the Knowledge Economy Index (KEI) can also bring relevant information to explain not only key aspects of competitiveness but also to identify the factors that are linked to its enhancement. The index has been calculated for 146 countries and builds on 109 comparable variables that are organized along 4 main groups: Economic incentive regime, Innovation, Education and ICT. The index has been calculated for key reference years (1995, 2009).

Contrary to the other global indexes that have been discussed in section 2.1 above, the KEI presents a comparison that is very balanced between Luxembourg and Singapore.

Within the KEI, Luxembourg scores better for half of the dimensions that have been considered: ICT (based on indicators produced by the ITU⁵⁴ - Telephones per 1,000 people, Computers per 1,000 people and Internet Users per 1,000 people -) and Education (based on adult literacy rate and gross enrollment ratios for secondary and tertiary education). Singapore scores better for the two other dimensions: innovation (based on Royalty and License Fees Payments and Receipts – inputs –, Patent Applications Granted by the US Patent and Trademark Office, and Scientific and Technical Journal Articles – outputs -) and the regime of economic incentives (based on indicators from the governance project of the world bank and from the Heritage Foundation - Rule of Law, Regulatory Quality and Tariff & Non-tariff Barriers -).

⁵⁴ International Telecommunication Union

Graph 53 – Knowledge Economy Index – Luxembourg & Singapore, 2010

Source: World Bank

The results validate some of the comparative advantages of Luxembourg and Singapore that have been identified earlier: the degree of connectivity for Luxembourg and the favorable legal and regulatory framework for Singapore.

In its latest report on measuring the information society, the ITU also elaborated composite indexes reflecting the level of infrastructures for innovation as well as their accessibility. The ITU published two indicators for 165 countries: the ICT Development Index (IDI) and the ICT price basket. For the infrastructure, Luxembourg was ranked 7th in 2010 (immediately behind Korea, Sweden, Denmark, Finland and Honk-Kong) and Singapore 19th. This confirms the diagnostic proposed by the World Bank with its KEI. However, Singapore overtook Luxembourg with the ICT price basket measuring the costs and the affordability of the services offered: for 2010 Singapore ranked 6th and Luxembourg 7th.

3.7 Addressing the issue of productivity

As a measure of the efficiency of the productive process, productivity is a key indicator for analyzing economic growth and competitiveness. Comparable data on labour productivity, total factor productivity and labour costs have been discussed in section 1.3 of the paper.

Both Singapore and Luxembourg are eager to improve their performance with productivity but they differ in the way they tackle the issue.

Following the other EU member states, Luxembourg established in 1957 the “Office Luxembourgeois pour l’Accroissement de la Productivité” (OLAP). After several years of sensitization and promotion of productivity gains in selected industries, the Office specialized progressively in networking and organizing training courses (mainly on the job and development training for businesses). If the attention of the Government for productivity is still there, there is not anymore an articulated public approach in this area. Considering the recent performances that have been realized by Luxembourg terms of labour productivity in the past years⁵⁵, there is a sense that the country doesn’t need any public intervention and that businesses have the capacities to carry the load by themselves.

⁵⁵ In the latest rankings of the Conference Board for 2010 and 2011, the performance of Luxembourg was particularly praised.

Singapore took another direction very recently with the setting-up in February 2009 of an Inter-Agency Productivity Taskforce⁵⁶. Productivity in the service sector declined in the few past years and there was a willingness to better understand and fight the reasons that led to this evolution. Some services have been selected that are the primary targets of the taskforce

In addition to the Task-force, a high-level National Productivity and Continuing Education Council (NPCEC)⁵⁷, has also been established to provide support to businesses through a comprehensive system for continuing education and training.

The NPCEC, with representatives from the Government, business community and labour movement, will oversee the work of the different Government agencies and promote close collaboration amongst the business sector, workers and unions, and the public sector.

The institutional setting is accompanied by financial facilities taking two forms: tax deductions for investments in innovative activities⁵⁸ (the Productivity and Innovation Credit – PIC -) and grants to support initiatives from businesses in sectors where there is potential for large gains in productivity (the National Productivity Fund – NPF -).

3.8 Values

Luxembourg was part of the 1994-1999 wave of the World Value Survey, data being collected in 1999, and Singapore part of the 1994-2004 wave, data being collected in 2002. Luxembourg participated also in more recent European Values surveys. Some key questions of the WVS are compared below for the two countries.

Table 24 – Family values

		Luxembourg	Singapore
Family important in life	Very important	87.9 %	91.8 %
	Rather important	10.5 %	7.7 %
	Not very important	1.3 %	0.5 %
	Not at all important	0.3 %	*
	Total	1209 (100%)	1512 (100%)

In both Luxembourg and Singapore, family is an important aspect of life. The total of the respondents for the categories “very important” and “rather important” is respectively of 98.4% and 99.5%.

⁵⁶ It is jointly chaired by the Ministry of Manpower and Ministry of Trade and Industry, with members from SPRING Singapore, Singapore Tourism Board, and other government agencies

⁵⁷ The NPCEC is composed with representatives from the Government, business community and labour movement.

⁵⁸ Research & Development, acquisition and Registration of intellectual property – including patents, trademarks, and designs -, Design activities, Automation through technology or software and Training of employees

Table 25 - Work

		Luxembourg	Singapore
Work important in life	Very important	52.7 %	52.7 %
	Rather important	39.7 %	39.0 %
	Not very important	5.0 %	6.5 %
	Not at all important	2.6 %	1.8 %
	Total	1191 (100%)	1503 (100%)

Work is also felt as being an important aspect of life in both countries, with very similar proportions.

Table 26 - Religion

		Luxembourg	Singapore
Religion important in life	Very important	15.5 %	35.9 %
	Rather important	29.6 %	35.0 %
	Not very important	30.5 %	22.3 %
	Not at all important	24.4 %	6.7 %
	Total	1194 (100%)	1511 (100%)

A notable difference exists regarding religion, an issue that more people in Singapore than in Luxembourg consider important in life. The total of the respondents for the categories “very important” and “rather important” is respectively of 70.9% in Singapore and 45.1% in Luxembourg.

Table 27 – Satisfaction in life

		Luxembourg	Singapore
Satisfaction with your life	Dissatisfied	0.7 %	0.6 %
	2	0.8 %	0.6 %
	3	1.3 %	2.5 %
	4	2.7 %	3.7 %
	5	6.5 %	9.7 %
	6	6.1 %	12.3 %
	7	16.2 %	22.7 %
	8	26.2 %	30.7 %
	9	17.2 %	9.8 %
	Satisfied	22.3 %	7.4 %
	Total	1203 (100%)	1512 (100%)

In general, people in Luxembourg are more satisfied with their life than people in Singapore. 65.7% of the Luxembourgish people set themselves in the three highest categories against only 47.9% of the Singapore people. Only 2.8% of the Luxembourg people are the three lowest categories against 3.7% for Singapore.

Table 28 - Marriage

		Luxembourg	Singapore
Marriage is an out-dated institution	Disagree	67.2 %	79.2 %
	Agree	32.8 %	20.8 %
	Total	1087 (100%)	1485 (100%)

Marriage is seen as an out-dated institution by a third of the Luxembourg people and only by a fifth of the Singapore people.

Table 29 – Cheating on taxes

		Luxembourg	Singapore
Justifiable: cheating on taxes	Never justifiable	40.8 %	67.5 %
	2	11.6 %	14.3 %
	3	9.8 %	5.8 %
	4	6.4 %	3.0 %
	5	9.4 %	3.9 %
	6	5.9 %	1.2 %
	7	4.2 %	1.5 %
	8	5.1 %	1.1 %
	9	1.5 %	0.1 %
	Always justifiable	5.3 %	1.6 %
	Total	1167 (100%)	1506 (100%)

Another difference between the two countries stands with cheating on taxes. The Three highest categories rally 11.9% in Luxembourg and only 2.8% in Singapore. The three lowest categories total 62.2% in Luxembourg and 87.6% in Singapore.

Table 30 – Religious Organization

		Luxembourg	Singapore
Belong to religious organization	Not mentioned	90.5 %	80.3 %
	Belong	9.5 %	19.7 %
	Total	1211 (100%)	1512 (100%)

There are less people from Luxembourg involved in religious organizations than people from Singapore (9.5% against 19.7%).

Table 31 – Welfare service for elderly

		Luxembourg	Singapore
Belong to social welfare service for elderly	Not mentioned	85.8 %	92.9 %
	Belong	14.2 %	7.1 %
	Total	1211 (100%)	1512 (100%)

In contrary, more people from Luxembourg are involved in social welfare services for elderly than people from Singapore (14.2% against 7.1%).

Table 32 - Job

		Luxembourg	Singapore
Important in a job: good pay	Not mentioned	34.4 %	21.5 %
	Mentioned	65.6 %	78.5 %
	Total	1211 (100%)	1512 (100%)
Important in a job: not too much pressure	Not mentioned	64.2 %	52.9 %
	Mentioned	35.8 %	47.1 %
	Total	1211 (100%)	1512 (100%)
Important in a job: good job security	Not mentioned	40.9 %	34.4 %
	Mentioned	59.1 %	65.6 %
	Total	1211 (100%)	1512 (100%)

A large majority of people in both Singapore and Luxembourg thinks that a good pay and a good job security are important aspects in a job. It must be noted that the proportion of people that mentioned the three characteristics of job above as being important is higher for each of them in Singapore than in Luxembourg (the highest difference is with the characteristic “good pay”).

Table 33 – Child qualities

		Luxembourg	Singapore
Important child qualities: independence	Not mentioned	51.3 %	25.3 %
	Important	48.7 %	74.7 %
	Total	1209 (100%)	1512 (100%)
Important child qualities: hard work	Not mentioned	42.3 %	36.3 %
	Important	57.7 %	63.7 %
	Total	1209 (100%)	1512 (100%)

Regarding the qualities that are important for children, both independence and hard work get higher scores in Singapore than in Luxembourg. The difference of value is particularly important for the independence of Children.

Table 34 – Future changes

		Luxembourg	Singapore
Future changes: Less emphasis on money and material possessions	Good thing	70.7 %	37.9 %
	Don't mind	11.9 %	46.0 %
	Bad thing	17.4 %	16.2 %
	Total	1153 (100%)	1511 (100%)
Future changes: Less importance placed on work	Good thing	47.1 %	28.7 %
	Don't mind	12.7 %	37.5 %
	Bad thing	40.2 %	33.8 %
	Total	1151 (100%)	1508 (100%)
Future changes: More emphasis on family life	Good thing	88.2 %	93.1 %
	Don't mind	8.9 %	4.6 %
	Bad thing	2.9 %	2.3 %
	Total	1169 (100%)	1506 (100%)

Aspirations for the future are slightly different between Singapore and Luxembourg. In Luxembourg, there is an aspiration to put less emphasis on money and material possessions (70.7%) and, to a lesser extend, to give less importance to work (47.1%). The proportions are far lower in Singapore for these two aspirations (37.9% and 28.7% respectively). The two countries are getting closer regarding more emphasis given to family in the future (respectively 88.2% for Luxembourg and 93.1% for Singapore).

3.9 Trade unions and social dialogue

Below is a comparative table on the organization of the representation of employees and of trade unions as well as on the structure of the social dialogue.

Table 35 – Social organization

	Singapore	Luxembourg
Workers' representation	Employees only represented if members of Trade Unions.	The representation of workers is set at two levels: Compulsory (professional chambers) and voluntary (trade-Unions)
Trade Union organisation	With the exception of five unions, the rest of the country's 60 unions are affiliated with the National Trades Union Congress (NTUC)	There are two main confederations: OGB-L and LCGB around which are associated unions. In addition, there is a trade union grouping for the banking sector (ALEBA/UEP, NGL and SNEP) and two public sectors unions (CGFP and FGFC).
Comment	Current Singaporean laws and policies on freedom of expression, assembly and association sharply limit peaceful criticism of the government. Of particular concern is the 2009 Public Order Act.	

Latest development	In October 2011, Singapore ratified ILO International Labour Tripartite Consultation (International Labour Standards) Convention, 1976 (No. 144).	In 2004, rules for collective bargaining and the representative status of Unions have been reformed
Migrants workers	Migrant workers' rights at work are still not fully regulated and foreign domestic workers remain particularly open to abuse.	Trans-border workers have no restriction to be affiliated to Trade Unions. They are also members of the professional chambers.
ILO Core Conventions Ratified	Twenty ILO Conventions (including five of the eight so-called core conventions) have been ratified covering a wide range of topics, among them forced labour, the worst forms of child labour, the right to organize and collective bargaining. More than 70 other instruments are under consideration with a view to ratification.	All conventions ratified
Reported violations	None	None
Social dialogue	Tripartite logic Several institutions: National Wage Council (NWC – 1972), Workforce Development Agency (WDA – 2003), Employment and employability Institute (e2i - 2008), Tripartite Alliance for Fair Employment Practices (TAFEP – 2006)	Tripartite logic Several institutions: Conseil économique et social, Comité de Conjoncture, Commission nationale de l'Emploi, Comité National de coordination tripartite, Comité du travail féminin, Comité Permanent de l'Emploi, l'Observatoire des relations professionnelles et de l'emploi, l'Observatoire de la Compétitivité.
Collective bargaining	All collective agreements must be certified by the tripartite Industrial Arbitration Court	The most important levels for negotiations in Luxembourg are at industry and company level. There are 280 agreements that cover an estimate of 60% of employees in the private sector.
Strikes	The government's tight rein on industrial action, the tradition of non-confrontational industrial relations and the adequate dispute resolution mechanisms have meant that there have been only two officially recorded days of strike action since 1978.	The system of negotiation is designed to encourage consensus and agreement. Employers are obliged to begin negotiations if asked, either individually or through their employers' associations. If they refuse to do so or if the negotiations break down without agreement, the issue is referred to the national conciliation machinery.
Conditions to call a strike	50% plus one of all the trade union's members must vote in favour, and there is no specific legal protection for striking workers.	

Sources:

ILO: Study mission in Singapore – January 2010

ILO: NATLEX, ILOLEX

2011 survey on violation of Trade Unions rights – ITUC
 European Industrial Relations Observatory – EIRO
 Ministry of Manpower – MOM
 Luxembourg-Public.lu
 AIAS: Amsterdam Institute for Advanced labour Study

3.10 Some conclusions

Does this additional information bring more light to the analysis?

There are certainly sectors that open more opportunities for increasing the competitiveness than others. There are certainly issues that should be more explored to facilitate the understanding the factors of competitiveness.

In the first category, the services (and particularly those with a high content in ICT) are the most promising. Both countries rely greatly on services for their economic growth and their employment. Being competitive in these sectors is certainly more difficult as there are no more comparative advantages that can be preserved. It takes time to get the acknowledgement of competences that will help making a difference with the other countries.

In the second category, different issues remain to be clarified among which:

- The relation between the level of education and the adaptability/relevance of the work force. There are evidences that show that students in Singapore have better performances in Maths and Science than the students in Luxembourg; But, does that really matter when they enter the labour market? The mechanisms through which more science-educated students will become more productive technicians in businesses are not totally linear and need more exploration⁵⁹,
- The relation between a better gender balance in the labour force and its dynamism and openness to changes and innovation.

4. Lessons learned and some conclusions

The review that has been made in the previous sections covered different rationalities. The first one builds around statistical evidences (section 1 and part of section 3). It is a snapshot of the main socio-economic performances of the two countries as assessed through official statistics. The second one is more qualitative (section 2 and part of section 3) and builds mainly on the perceptions of the business community regarding the ability of each country to promote and accompany the economy towards more competitiveness. These two rationalities converge naturally: on the one hand, the perceptions of the business community are influenced by the economic performance and, on the other hand, the economic performances are partly the result of the dynamism of the business sector.

However, these two rationalities may diverge in some cases, this potentially reflecting a lack in information and communication.

In its latest competitiveness report, the World Economic Forum asked the business executives to rank what they thought were the main problematic factors for the improvement

⁵⁹ The interest of the work may not reach the expectations raised by the high level of education.

of competitiveness. The answers given for Luxembourg and Singapore are given in the table below:

Table 36 – Problematic factors for competitiveness – Luxembourg & Singapore, 2001-2012

	Luxembourg	Singapore
1 st problematic factor	Restrictive labour regulations	Inflation
2 nd problematic factor	Inefficient Government bureaucracy	Restrictive labour regulations
3 rd problematic factor	Inadequately educated workforce	Inadequately educated workforce
4 th problematic factor	Inflation	Poor ethic in national labour force

Source: World Economic forum – Competitiveness report 2011-2012

For both countries, among the four major problematic factors encountered were the “inflation” and the “inadequately educated workforce”. Evidences gathered from various sources show that the inflation rates, even if they have increased slightly in the recent years, remained very reasonable compared to the ones of their main neighbors and competitors. Evidences from other sources also show that the education levels, even if better in Singapore, remained above or around averages. Noting “poor ethic in national labour force” as a problematic factor in Singapore denies all the efforts made in fighting corruption and in training and valorizing human resources.

The business rationality that is expressed here must be sometimes questioned particularly for the reason that “better is expected from the ones that do better”. As they are in the club of the most competitive nations, Luxembourg and Singapore must do better than the others and confirm on a permanent basis their status.

Being more competitive is a moving target: most countries have a similar objective and take measure and open incentives to this aim, this in turn lifting the level of the competition among countries. The room of maneuver is becoming narrower for Governments as they also have to answer other expectations that are more linked to the social and cultural fabric of their countries. There are thus “natural” limits to the efforts that can be made for competitiveness.

Beyond this limitation with the available data, the review has helped identifying several factors on which competitiveness is mainly based:

- The state of readiness and development of the physical infrastructures allowing the rapid circulation and exchange of information and the fast integration of technical progress in the production process. In this area, Luxembourg, despite its size⁶⁰, has made important efforts in the recent years for increasing the connectivity of its economy. These efforts are acknowledged and transpire from several recent studies on the development of the knowledge society. Important efforts remain to be done, particularly to integrate Government services in this global information system. Singapore has also been improving its potential in this area, particularly for the circulation of innovation,
- The modernization of a legal and regulatory framework that is more conducive to attracting and developing business activities. Singapore has certainly done better than Luxembourg in this area as investors are better protected and doing business is easier

⁶⁰ An obstacle to the development of economy of scale, that is important in this particular area where the investment costs are high.

and less costly. A particular attention should be given in Luxembourg to mobilizing the banking sector as an effective partner for business,

- The ability of the Government to act quickly and wisely for taking benefit from opportunities and adapting to changes. Here too, the businesses trust more the ability of the Government of Singapore than the one of the Government of Luxembourg. It is certain that this assessment is linked to the institutional commitments that the Government of Luxembourg has taken internally, in the context of the social and economic dialogue, and externally, with its partners of the European Union. In comparison, the Government of Singapore has more room of maneuver to act,
- There are issues linked to factors of competitiveness that require an articulated approach involving all the social and economic forces in a country. Within this approach, the Government should play a coordinating role and should support innovative initiatives. Examples of these key issues for competitiveness are productivity and the relation between education and the labour market,
- Values and attitudes, in Government and the bureaucracy, in businesses and within the population, which are cohesive and shared. They should help addressing the future with confidence.

COMPARATIVE STUDY ON THE FACTORS OF COMPETITIVENESS: LUXEMBOURG-SINGAPORE

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A. Lists of Indicators

	Directly comparable indicator
	Proxy
	No comparison possible at this stage

A Macroeconomic Performance

A1	Gross National Income per inhabitant	Yes - section 1.7
A2	Real Growth Rate of GDP	Yes - section 1.1
A3	Growth in domestic employment	Yes - section 1.2
A4	Unemployment Rate	Yes - section 1.2
A5	Inflation Rate	Yes - section 1.1
A6	Public Balance	No
A7	Public Debt	Yes - section 1.1
A8	Gross Fixed Capital Formation	Proxy- Investment - Section 1.1
A9	Terms of Trade	Proxy - evolution of trade in Volume - section 1.1
A10	Real Effective Exchange Rate	No
A11	Diversification	Proxy - GDP per branch - section 1.1
A12	FDI inflows and outflows	Yes - Section 3.4 - per country, per industry

B Employment

B1	Employment Rate (Total)	Yes - section 1.2
B2	Employment Rate (Male)	Labor force participation - section 1.2
B3	Employment Rate (Female)	Labor force participation - section 1.2
B4	Employment Rate of persons aged 55-64 (Total)	Labor force participation - section 1.2
B5	Employment Rate of persons aged 55-64 (Male)	Labor force participation - section 1.2
B6	Employment Rate of persons aged 55-64 (Female)	Labor force participation - section 1.2
B7	Unemployment rate of persons under 25	Yes- under 30 - section 1.2
B8	Long term unemployment rate	Yes - section 1.2
B9	Persons holding a part time job	Yes - section 1.2

C Productivity and labor costs

C1	Trends in total factor productivity	Multifactor productivity - section 1.3
C2	Trends in apparent work productivity	Value added per worker - section 1.3
C3	Productivity per hour worked as a % of US figures	No
C4	Changes in unit labour costs	Yes - section 1.3
C5	Costs/Revenue ratio in the banking sector	No

D Market Operations

D1	% of full-time workers on minimum age	No
D2	Price of electricity for industrial users	No
D3	Price of gas for industrial users	No
D4	Market share of the primary operator in the cellular telephone market	No
D5	Composite basket of fixed and cellular telecommunications (with VAT)	No
D6	Composite basket of fixed and cellular telecommunications (without VAT)	No
D7	Broadband internet access rates in US\$ PPP/MB	No
D8	Basket of doestic royalties for 2MBbit leased lines	No
D9	Value of public contracts using open procedure procurement	No
D10	Total State aid excluding horizontal objectives	No
D11	Market share of the former primary operator in the fixed telephone market	No

E Institutional and regulatory framework

E1	Corporate taxes	Yes - section 1.3
E2	Taxes on physical persons	Yes - section 1.3
E3	Value added tax	Proxy - detailed Government tax revenue - section 1,3
E4	Tax wedge (unmarried, no children; married, two children, one wage earner)	No
E5		No
E6	Administration efficiency index	No
E7	Rule of Law Index	No
E8	Regulation quality index	No
E9	Degree of sophistication of online public services	Yes - section 1.3
E10	Public services fully available online	Yes - section 1.3
E11	Public sector payroll costs	No

F Entrepreneurship

F1	Propensity for entrepreneurship	No
F2	Self-employed jobs as a % of total employment	No
F3	Net change in the number of companies	No
F4	Volatility among companies	No

G Education and Training

G1	Annual cost per student in public educational facilities	Yes - section 1.5
G2	Portion of the population aged 25-64 with a secondary education	Yes - section 1.5
G3	Portion of the population aged 25-34 with a tertiary education	Yes - section 1.5
G4	% of human resources in scientific and technological fields in the labour force	No
G5	Life-long learning	No
G6	Secondary school dropout	Proxy - survival rate to grade 5 - section 1.5
G7	% of foreign nationals in scientific and technological fields	No

H Knowledge Economy

H1	Internal R&D Expenditure	Yes (% GDP) - section 1.6
H2	Public R&D budget credits	Yes -) R&D expenditures by source of funding - section 1.6
H3	Portion of public research financed by the private sector	Yes - section 1.6
H4	% of sales allocated to the introduction of new products on the market	Sales revenue from commercialized products/processes attributed to R&D performed in Singapore
H5	No of researchers per 1000 employed persons	Yes - section 1.6
H6	Scientific publications per million inhabitants	No
H7	No of patent applications and patents awarded per million inhabitants	Yes -Section 1.6
H8	No of patent applications at the EPO per million inhabitants	Not applicable
H9	Use of broadband internet by companies	No
H10	Investment in public communications as a % of GFCF	No
H11	% of households that have internet access at home	Proxy - Internet users - section 1.6
H12	No of cell phones per 100 inhabitants	Yes - section 1.6
H13	% of households that have broadband internet access	Yes - section 1.6
H14	Number of secure web servers	No
H15	% of total employment in medium or high technology sectors	Total employment by industry

I Social Cohesion

I1	Gini Coefficient	Yes - section 1.7
I2	At risk of poverty rate after social transfers	No
I3	At persistent risk of poverty rate	No
I4	Life expectancy of a child less than 1 year old	Yes - section 1.7
I5	Wage gap between men and women	Yes - section 1.7
I6	Serious work accidents	No

J Environment

J1	No of ISO 14001 and 90001 certificates per million inhabitants	Yes - section 1.8
J2	Total greenhouse gas emissions	Yes - section 1.8
J3	% of renewable energy sources	No
J4	Volume of municipal waste collected per person per year	Yes - section 1.8
J5	Energy Intensity of the economy	No
J6	Modal Split in transportation choice - % of car users as transportation method	No

B. Indicators**1. Socio-economic structures and trends****Table 1: GDP real growth rate**

GDP real growth rate						
	2006	2007	2008	2009	2010	2011
Singapore						
GDP at 2005 Market Prices and Real Economic Growth						
Bn S\$	227,1	247,2	251,4	248,9	285,7	299,6
Annual growth rate (%)	8,8	8,9	1,7	-1,0	14,8	4,9
Luxembourg						
GDP at 2000 Market Prices						
Bn Euro	27,5	29,4	29,8	28,7	29,7	n.d.
Annual growth rate (%)	5,0	6,9	1,4	-3,7	3,5	2,0 (*)
(*) = Forecast						

Sources: Statistics Singapore and Statec

Table 2: GDP at current market prices

GDP AT CURRENT MARKET PRICES				
per branch in % total	2007	2008	2009	2010

Luxembourg

Goods Producing Industries	16,6	14,5	12,7	13,1
Manufacturing	9,1	7,8	5,5	6,1
Construction	5,6	5,4	5,8	5,5
Utilities	1,4	1	1,1	1,1
Other Goods Industries ¹	0,5	0,4	0,4	0,4
Services Producing Industries	85	87,4	89,1	88,7
Wholesale & Retail Trade	9,3	11	9,7	9,8
Transport & Storage	8,5	8,4	8,5	8
Hotels & Restaurants	1,6	1,5	1,6	1,5
Information & Communications	1,6	2	1,7	1,7
Financial Services	28	27,3	27,2	28,3
Business Services	20,7	21,9	23,2	22,5
Other Services Industries	15,3	15,3	17,2	16,9

Singapore

Goods Producing Industries	30,0	27,9	29,7	29,5
Manufacturing	25,1	21,6	22,4	23,2
Construction	3,2	4,6	5,7	4,7
Utilities	1,6	1,6	1,6	1,6
Other Goods Industries ¹	0,0	0,0	0,0	0,0
Services Producing Industries	70,0	72,1	70,3	70,5
Wholesale & Retail Trade	19,5	18,3	17,2	17,2
Transport & Storage	10,3	10,5	8,8	8,9
Hotels & Restaurants	2,2	2,5	2,3	2,3
Information & Communications	3,7	4,0	4,1	3,8
Financial Services	12,5	12,6	12,9	12,5
Business Services	12,3	14,2	14,5	14,6
Other Services Industries	9,5	10,1	10,5	11,2

Sources: Statistics Singapore and Statec

Table 3a: GDP, Total investment, Gross national savings and General government gross debt

Luxembourg		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Gross domestic product based on purchasing-power-parity (PPP) per capita		55 587	57 674	60 294	61 767	65 751	70 629	75 337	81 359	82 927	79 258	81 466	80 119
Total investment	Percent of GDP	23,15	24,43	22,02	22,17	21,77	22,54	20,32	20,92	20,28	16,35	18,67	21,17
Gross national savings	Percent of GDP	36,38	33,19	32,56	30,31	33,62	34,08	30,69	31,02	25,55	23,21	26,37	28,05
General government gross debt	Percent of GDP	6,17	6,31	6,32	6,21	6,35	6,07	6,68	6,67	13,61	14,55	19,05	20,85
Singapore													
Gross domestic product based on purchasing-power-parity (PPP) per capita		32 266	32 296	34 719	36 618	40 330	43 976	47 334	50 236	50 565	49 815	56 694	59 711
Total investment	Percent of GDP	33,18	26,77	23,77	16,12	21,75	19,98	21,03	21,07	30,20	26,36	22,12	22,44
Gross national savings	Percent of GDP	44,04	39,65	36,66	38,82	38,71	41,09	45,85	48,41	44,78	45,40	46,54	44,37
General government gross debt	Percent of GDP	81,18	95,38	95,51	98,74	96,05	93,42	86,76	85,85	97,21	105,01	101,23	100,79

Source: IMF

Table 3b: Government debt - Singapore

As at end of FY	Govt Dom Debt \$m	% of GDP	Nominal GDP (FY) \$m
2005	202016,2	94,39	214018,0
2006	211055,7	88,31	238987,7
2007	243920,1	89,37	272935,1
2008	264210,4	100,24	263573,9
2009	300468,4	106,53	282053,1
2010	331163,0	104,38	317272,6
2011	367172,5	111,43	329510,2

Source: DOS

Table 3c: Saving and Investment as % of GDP - Singapore

	Total Investment	Gross national saving
2000	33,18	43,99
2001	26,77	39,55
2002	23,77	36,84
2003	16,12	38,99
2004	21,75	38,88
2005	19,97	41,40
2006	21,15	45,61
2007	22,31	48,12
2008	29,40	43,26
2009	25,55	41,78
2010	22,13	46,54
2011	22,44	44,37

Source: DOS

Table 4a: Volume of imports/exports of goods and services

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Luxembourg													
Volume of imports of goods and services	Percent change	10,5	6,0	0,8	6,9	11,8	4,2	12,8	9,3	8,5	-10,2	4,6	5,6
Volume of exports of goods and services	Percent change	12,6	4,5	2,1	6,8	11,1	4,5	13,0	9,1	6,6	-8,2	2,8	3,6
Singapore													
Volume of imports of goods and services	Percent change	20,0	-5,9	5,8	9,6	22,9	11,3	11,1	7,8	9,4	-11,0	16,2	0,0
Volume of exports of goods and services	Percent change	14,5	-3,5	7,6	14,2	19,1	12,4	11,0	9,3	3,9	-8,1	19,1	2,6

Source: IMF

Table 4b: Volume of imports/exports of goods and services - Singapore

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Volume of imports of goods and services	% change	24.5	-7.2	2.7	8.0	22.9	13.4	13.0	5.9	14.2	-17.4	17.4	7.5
Volume of exports of goods and services	% change	20.6	-5.6	3.8	13.2	20.5	14.8	12.7	7.8	7.6	-14.4	19.8	6.3

Sources: DOS

Table 5a: CPI, Inflation rate

		CPI	Inflation rate			CPI	Inflation rate
Singapore	2000	87,6	1.3	Luxembourg	2000	89,3	3,2
2009=100	2001	88,4	1.0	2005=100	2001	91,6	2,7
	2002	88,1	-0.4		2002	93,5	2,1
	2003	88,5	0.5		2003	95,4	2,0
	2004	90,0	1.7		2004	97,6	2,2
	2005	90,4	0.5		2005	100,0	2,5
	2006	91,3	1.0		2006	102,7	2,7
	2007	93,2	2.1		2007	105,0	2,3
	2008	99,4	6.6		2008	108,6	3,4
	2009	100,0	0.6		2009	109,0	0,4
	2010	102,8	2.8		2010	111,5	2,3
	2011	108,2	5,2		2011		3,4

Sources: Statistics Singapore and Statec

Table 5b: Singapore CPI – All items less accommodation

		CPI for All Items Less Accommodation	Inflation Rates- All items less Accommodation
2009=100	2005	92.4	0.6
	2006	93.4	1.0
	2007	95.4	2.2
	2008	100.5	5.4
	2009	100.0	-0.5
	2010	103.3	3.3
	2011	107.6	4.2

Sources: DOS

Table 6a: Employment to population ratio, 15+**Employment to population ratio, 15+, total (%)**

	Luxembourg	Singapore
2001	51,9	63,6
2002	52,5	62,6
2003	51,5	62,4
2004	51,7	61,7
2005	52,9	61,7
2006	53,0	62,3
2007	53,0	62,5
2008	52,2	62,5
2009	52,8	60,8
2010	55.0	63.0

Source: World bank

Table 6b: Luxembourg Employment rate 15-64 and 55-64

	2005	2006	2007	2008	2009	2010
Employment rate 15-64						
Total	63,6	63,6	64,2	63,4	65,2	65,2
Male	73,3	72,6	72,3	71,5	73,2	73,1
Female	53,7	54,6	56,1	55,1	57	57,2
Employment rate 55-64						
Total	31,7	33,2	32	34,1	38,2	39,6
Male	24,9	27,8	28,6	29,3	29,4	31,3
Female	38,3	38,7	35,6	38,7	46,5	47,7

Source: Eurostat

Table 6c : Singapore labour force participation

Labour force participation			
	Total	Male	Female
Total	63,50	73,50	54,00
15-19	13,80	16,60	10,80
20-24	59,30	60,70	57,80
25-29	84,40	87,80	81,10
30-34	85,90	94,40	78,20
35-39	83,70	95,10	73,20
40-44	81,60	94,00	69,90
45-49	79,90	93,30	66,80
50-54	75,80	89,10	62,90
55-59	66,20	82,10	50,30
60-64	49,40	65,10	34,40
64-69	30,00	42,40	18,60
70 and +	10,70	17,30	5,90

Source: Ministry of Manpower - Singapore

Table 7a : Civilian employment

Total civilian employment (000)		
	Luxembourg	Singapore
2000	184,4	2171,1
2001	189,0	2171,0
2002	192,8	2148,1
2003	194,6	2135,2
2004	196,4	2206,6
2005	198,8	2319,9
2006	201,9	2495,9
2007	207,1	2730,8
2008	213,4	2952,4
2009	215,5	2990,0
2010	218,5	3105,9

Sources: Statistics Singapore and Statec

Table 7b: Part-time employment

Part-time employment (% of total)				
2006	2007	2008	2009	2010
Luxembourg (source: Eurostat)				
17,1	17,8	18,0	18,2	17,9
Singapore (source: Ministry of Manpower)				
0,1	0,1	0,1	0,1	0,1

Table 8: Labour force by education levels

Labour Force - Education levels (% of total)		2001	2002	2003	2006	2007	2008
Luxembourg	With primary education	34,2	33	25,8	18,7	25,9	29.0
	With secondary education	43,3	42,3	46,5	49,7	40,1	41.0
	With tertiary education	20,6	23,4	27,6	26,9	29,2	31.0
		2001	2002	2003	2006	2007	
Singapore	With primary education	19,8	19,6	18,6	28,3	27,7	24.0
	With secondary education	28	28,2	27,2	48,3	48,6	50.0
	With tertiary education	37,9	38,8	41	23,4	23,7	26.0

Source: World Bank

Table 9: Singapore Employment per sector

Singapore - Employment per sector (% of total)						
	2005	2006	2007	2008	2009	2010
Manufacturing	20,5	20,7	20,8	19,9	18,1	17,3
Construction	10,1	10,2	10,8	12,2	12,9	12,7
Services	68,7	68,4	67,7	67,3	68,3	69,3
Others	0,7	0,7	0,7	0,7	0,7	0,6

Source: Statistics Singapore

Table 10a: Unemployment rate

Unemployment rate	(annual average)	
	Luxembourg	Singapore
2000	2,5	2,7
2001	2,3	2,7
2002	2,6	3,6
2003	3,5	4
2004	3,9	3,4
2005	4,3	3,1
2006	4,5	2,7
2007	4,4	2,1
2008	4,4	2,2
2009	5,8	3
2010	6,2	2,2
2011	6,0	2,0

Source: IMF

Table 10b: Unemployment (long-term unemployment & youth unemployment)**Luxembourg**

2005	2006	2007	2008	2009	2010
------	------	------	------	------	------

Unemployment rate - Below 25 years old

14,3	15,8	15,6	17,3	16,5	16,1
------	------	------	------	------	------

Long term unemployment

1,2	1,4	1,2	1,6	1,2	1,3
-----	-----	-----	-----	-----	-----

Source: Eurostat

Singapore

2005	2006	2007	2008	2009	2010
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Below 30 unemployment rate (residents)

6,2	5,4	4,5	5,2	6,7	5,5
-----	-----	-----	-----	-----	-----

Resident Long-Term Unemployment - Annual average

1.0	0.7	0.5	0.5	0.9	0.7
-----	-----	-----	-----	-----	-----

Source: Ministry of Manpower

Table 11: Unemployment with tertiary education

	2006	2007	2008	2009
Luxembourg				
Unemployment with tertiary education (% of total unemployment)	14,9	17,1	16,1	12,8
Unemployment with tertiary education, female (% of female unemployment)	15	16,4	15,1	12,3
Unemployment with tertiary education, male (% of male unemployment)	14,9	17,6	16,9	13,2
	2006	2007	2008	2009
Singapore				
Unemployment with tertiary education (% of total unemployment)	40,8	38,7	34,4	32,1
Unemployment with tertiary education, female (% of female unemployment)	47,4	45,2	41,8	36,6
Unemployment with tertiary education, male (% of male unemployment)	35,6	33,9	29,1	28,6

Source: World Bank

Table 12: Total Factor Productivity Growth

(In difference, percent)

	Luxembourg	Singapore
1995	-1,66	7,55
1996	-0,11	-6,67
1997	2,19	0,82
1998	1,27	-6,19
1999	1,84	3,55
2000	2,91	6,52
2001	-1,94	-7,66
2002	1,51	4,42
2003	-0,58	4,24
2004	0,80	6,77
2005	1,21	4,73
2006	0,55	0,37
2007	1,09	3,01
2008	-3,86	-6,49
2009	-5,50	-3,60
2010	0,10	8,10
2011	-1,70	1,50

Source: Conference Board

Table 13: Labour costs

	2007	2008	2009	2010
Real unit labour costs: total economy (Percentage change from the preceding year)				
Luxembourg	1,60	5,20	6,30	-0,70
Unit labor cost index of overall economy (% change over corresponding period of previous year)				
Singapore	6.2	4,1	0,8	-2,2

Source : Ameco for Luxembourg, Statistics Singapore

Table 14: Government Operating revenue, Singapore

Government Operating revenue	(Mo S\$)			% of total		
	2008	2009	2010	2008	2009	2010
Total	41419.4	37918.8	44581,2	100,00%	100,00%	100,00%
Tax revenue	37518,6	35272,4	40662,2	90,58%	93,02%	91,21%
Income tax	18559.0	16884,2	18276,8	44,81%	44,53%	40,99%
Assets tax	2891,3	2003,7	2598,3	6,98%	5,28%	5,83%
Taxes on motor vehicles	2003,3	1787	1892,8	4,84%	4,71%	4,25%
Custom duties	2082,5	2079,7	2089,7	5,03%	5,49%	4,69%
Betting taxes	1776,6	1726,2	2119,6	4,29%	4,55%	4,75%
Stamp duties	1837,8	1989,1	3096,9	4,44%	5,25%	6,95%
Goods and services taxes	6632,1	6632,5	7699,3	16,01%	17,49%	17,27%
Others	1736.0	2170	2888,9	4,19%	5,72%	6,48%

Table 15 : Key education indicators

Pourcentage de la population âgée de 25 à 64 ans ayant terminé au moins le niveau d'enseignement secondaire supérieur

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
LUX	60,9	59,2	61,6	59,1	63,2	65,9	65,5	65,7	67,9	77,3	77,7
UE-27	64,4	64,9	65,8	67,2	68,4	69,4	69,9	70,7	71,4	72,0	72,7

Niveau de scolarité supérieur par sexe, pour la tranche d'âge 30-34 ans; Diplômés de l'enseignement supérieur - total

LUX	21,2	23,9	23,6	17,3	31,4	37,6	35,5	35,3	39,8	46,6	46,1
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Jeunes ayant quitté prématurément l'école (%) - total

LUX	16,8	18,1	17	12,3	12,7	13,3	14	12,5	13,4	7,7	7,1
UE27	17,6	17,2	17	16,6	16,1	15,8	15,5	15,1	14,9	14,4	14,1

Source: Eurostat

Table 16a: R& D expenditures, Researchers in R&D**Research and development expenditure (% of GDP)**

	2002	2003	2004	2005	2006	2007	2008	2009
LUX	1,74	1,62	1,66	1,56	1,63	1,65	1,56	1,68
SGP		2,52	2,27	2,28	2,19	2,11	2,66	

Researchers in R&D (per million people)

	2002	2003	2004	2005	2006	2007	2008
LUX	4747,57	4632,44	4375,17	4799,23	4428,17	4300,21	4699,44
SGP	4493.86	4900.54	5134.23	5576.49	5676.57	5954.64	5833.98

Source: World bank

Table 16b: Singapore R&D expenditures**R&D expenditures (Mo S\$)**

	Private	Total
2000	1865,902	3009,52
2001	2044,67	3232,68
2002	2091,483	3404,66
2003	2081,05	3424,47
2004	2589,867	4061,9
2005	3031,132	4582,21
2006	3292,876	5009,7
2007	4235,146	6339,09
2008	5120,121	7128,11
2009	3724,196	6042,83

Source: Agency for Science, Technology and Research - Singapore

Table 16c: Singapore R&D Manpower

2009	Nbr	FTE	Sources of funding
R&D Manpower			
Private sector	20880	19308,7	3724,49
Government sector	3792	2812,4	683,12
Higher Education sector	12830	10232,7	854,29
Public Research Institutes	3886	3542,4	780,92
Total	41388	35896,2	6042,82

Source: Agency for Science, Technology and Research – Singapore

Table 16d: Singapore R&D expenditures by source of funding**R&D expenditures by source of funding - 2009**

	MoS\$	%
Total	6042,83	100,00%
Private sector	3724,49	61,63%
Government sector	683,12	11,30%
Higher Education sector	854,29	14,14%
Public research institutes	780,92	12,92%

Source: Agency for Science, Technology and Research - Singapore

Table 17a: Patents applications

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Patent applications, nonresidents										
LUX	24	23	25	26	64	18	8	42	70	91
SGP	7986	8899	9255	8537	8036	7944	7280	7575	8133	7720
Patent applications, residents										
LUX	60	48	15	26	24	23	16	41	51	85
SGP	750	793	696	626	569	641	626	624	523	516
Ratio patents applications nonresidents/residents										
LUX	0,40	0,48	1,67	1,00	2,67	0,78	0,50	1,02	1,37	1,07
SGP	10,65	11,22	13,30	13,64	14,12	12,39	11,63	12,14	15,55	14,96

Source: World Bank

Table 17b: High-technology exports

	High-technology exports (% of manufactured exports)									
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
LUX	9,03	6,61	8,85	11,54	11,81	10,48	11,97	15,43	19,13	16,50
SGP	49,06	50,77	46,40	57,79	56,58	56,59	56,27	60,32	60,66	62,56

Source: World bank

Table 18: Mobile cellular subscriptions, Internet users and Fixed broadband internet subscribers

	2001	2005	2009	2010
Mobile cellular subscriptions (per 100 people)				
Luxembourg	93.07	111.55	144.68	143.27
Singapore	75.15	102.78	139.21	145.18
Internet users (per 100 people)				
Luxembourg	36.16	70.00	87.31	90.00
Singapore	41.67	61.00	69.00	71.00
Fixed broadband Internet subscribers (per 100 people)				
Luxembourg	0.28	15.33	31.37	33.18
Singapore	3.79	15.38	23.67	24.94

Source: World bank

Table 19: Human Development Index

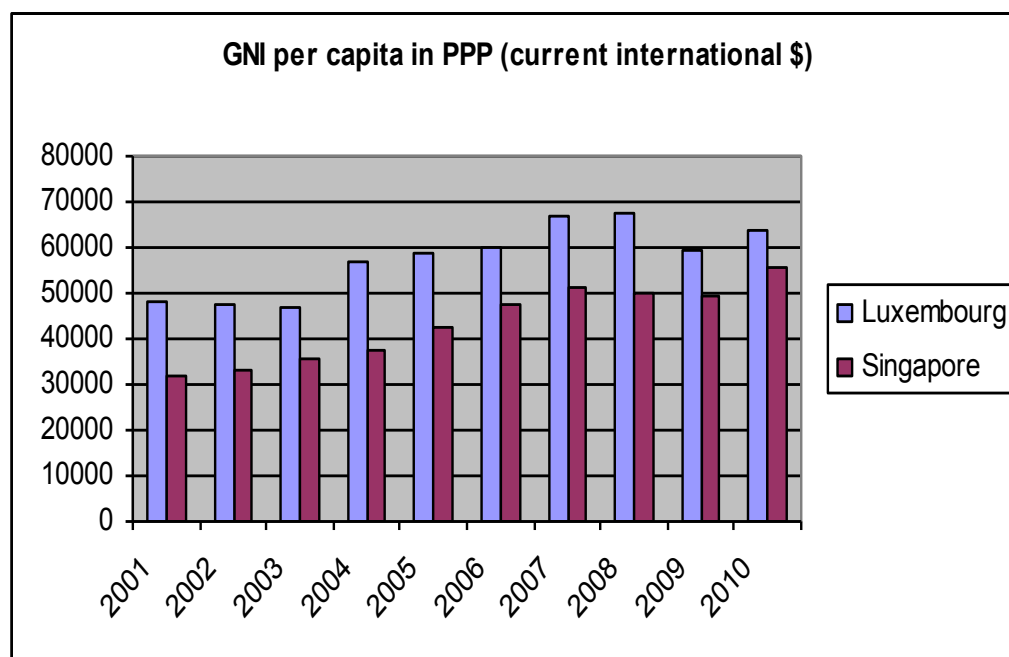
	Value of the Human Development Index							Latest ranking
	2005	2006	2007	2008	2009	2010	2011	2011
Norway	0,932	0,934	0,937	0,937	0,937	0,938	0.943	1
Luxembourg	0,856	0,853	0,861	0,851	0,85	0,852	0.867	25
Singapore	0,826	0,832	0,836	0,839	0,841	0,846	0.866	26
Cambodia	0,466	0,475	0,484	0,489	0,489	0,494	0.523	139

Source UNDP

Table 20: GNI per capita, PPP**GNI per capita, PPP (current international \$)**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Luxembourg	47880	47730	47060	56770	58670	60210	66950	67200	59590	63950
Singapore	32080	33070	35360	37800	42220	47570	51310	49840	49430	55380

Source: World bank

Graph 1: GNI per capita PPP

Source: World bank

Table 21: GNI per capita, PPP – Selected countries**GNI per capita, PPP (000 current international \$)**

	2006	2007	2008	2009	2010
Belgium	34,45	35,93	37,42	36,61	37,8
Denmark	36,7	38,13	40	38,36	40,29
Corea	24,32	26,24	27,08	27,25	29,01
Luxembourg	60,21	66,95	67,2	59,59	63,95
Malaysia	12,01	13,05	13,59	13,41	14,11
Norway	53,33	54,83	60,37	55,39	57,1
Singapore	47,57	51,31	49,84	49,43	55,38
Thailand	6,89	7,42	7,73	7,54	8,12

Source: World bank

Table 22: Average monthly household income, Handphones, PC, internet access - Singapore

Average monthly household income			
	97/98	2002/03	2007/08
1st quintile	1309	1104	1274
2nd quintile	2778	2730	3476
3rd quintile	4207	4193	5480
4th quintile	6225	6361	8495
5th quintile	12091	13288	18472
5th/1st	9,2	12,0	14,5
	97/98	2002/03	2007/08
Handphones	51	88,8	94,5
PC	47,9	69,7	77
Internet access	23,5	55,3	70

Source: Department of Statistics Singapore

Table 23: Population by age groups**Population by age groups - % of total**

Luxembourg	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Population ages 0-14	18,96	18,93	18,86	18,76	18,61	18,44	18,23	18,02	17,83	17,66
Population ages 15-64	67,00	66,94	66,91	66,95	67,08	67,31	67,61	67,92	68,21	68,41
Population ages 65 and above	14,04	14,14	14,23	14,29	14,30	14,25	14,16	14,05	13,97	13,92
Singapore	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Population ages 0-14	21,15	20,80	20,42	20,00	19,56	19,14	18,73	18,32	17,89	17,40
Population ages 15-64	71,24	71,33	71,47	71,67	71,95	72,29	72,66	73,02	73,34	73,59
Population ages 65 and above	7,61	7,86	8,12	8,33	8,49	8,57	8,61	8,65	8,77	9,01

Source: World Bank

Table 24: Age dependency ratio, health expenditure per capita**Age dependency ratio (% of working-age population)**

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Luxembourg	49,25	49,40	49,46	49,37	49,07	48,57	47,92	47,22	46,62	46,17
Singapore	40,37	40,19	39,93	39,53	38,99	38,33	37,63	36,94	36,35	35,89

Health expenditure per capita, PPP (constant 2005 international \$)

Luxembourg	3968,5	4731,6	4617,7	5291,9	5380,7	6034,8	5974,8	5995,9	6526,1	6743,0
Singapore	975,7	1169,7	1347,9	1291,5	1379,0	1499,3	1725,0	1832,5	2073,2	2273,0

Source: World Bank

Table 25: Basic Wage, Mean, Singapore

Singapore				
Basic wage - Mean				
	Male	Female	Difference	Gap (%)
MANAGERS	8 513	6882	1 631	19,16%
PROFESSIONALS	4 824	4192	632	13,10%
ASSOCIATE PROFESSIONALS AND TECHNICIANS	3 250	2884	366	11,26%
CLERICAL SUPPORT WORKERS	1 925	2007	-82	-4,26%
SERVICE AND SALES WORKERS	1 488	1370	118	7,93%
AGRICULTURAL AND FISHERY WORKERS	1 504	1290	214	14,23%
CRAFTSMEN AND RELATED TRADES WORKERS	1 961	1354	607	30,95%
PLANT AND MACHINE OPERATORS AND ASSEMBLERS	1 728	1053	675	39,06%
CLEANERS, LABOURERS AND RELATED WORKERS	1 066	880	186	17,45%

Source: Ministry of Manpower – Singapore

Table 26 : Ecart de la rémunération horaire brute moyenne entre hommes et femmes

Ecart de la rémunération horaire brute moyenne entre hommes et femmes en pourcentage de la rémunération horaire brute moyenne des hommes

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Estonie	25	24	24	24	24	25	25	30,5	30,5	30,5	30,5
Luxembourg	15	16	17	15	14	14	14	14,9	14,7	14,7	14,7
Slovénie	12	11	9	7	8	8	8	14,1	14,3	10,3	10,3
UE-27	16	16	16	15	15	15	15	21,7	21,7	21,7	21,7

Source: Eurostat

Table 27: Singapore - Life expectancy at birth

Singapore			
Life expectancy at birth			
	All	Male	Female
2005	80,1	77,6	82,5
2006	80,3	77,8	82,6
2007	80,6	78,1	82,9
2008	80,9	78,4	83,3
2009	81,4	79,0	83,7
2010	81,7	79,2	84,0
2011p	82,0	79,6	84,3

Source: Department of statistics Singapore

Table 28: Life expectancy in selected EU countries

Life expectancy

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Lituania	66,80	65,90	66,20	66,40	66,30	65,30	65,30	64,80	66,30	67,50	67,50
Luxembourg	74,60	75,10	74,60	74,80	76,00	76,70	76,80	76,70	78,10	78,10	78,10
Sweden	77,40	77,60	77,70	78,00	78,40	78,50	78,80	79,00	79,20	79,40	79,40
UE-27	74,50	74,50	74,50	74,60	75,20	75,40	75,80	76,10	76,40	76,40	76,40

Source: Eurostat

Table 29: Vulnerable employment

Vulnerable employment, total (% of total employment)

	2006	2007	2008	2009
Luxembourg	5,2	4,3	4,1	5,9
Singapore	10,0	10,3	10,0	9,8

Source: World bank

Table 30: ISO 9001, ISO 14001 2000-2008, Luxembourg**Luxembourg**

	ISO 90001	ISO 14001
2000	11,4	20,4
2001	11,3	20,4
2002	91,9	38,1
2003	244,4	71,1
2004	238,3	86
2005	321,5	74,4
2006	306,8	38,1
2007	410,4	83,3
2008	503,5	102,3

Source: ISO

Table 31a: CO2 emissions**CO2 emissions (kg per 2000 US\$ of GDP)**

	Luxembourg	Singapore
2001	0,41	0,58
2002	0,44	0,54
2003	0,45	0,5
2004	0,48	0,48
2005	0,47	0,49
2006	0,45	0,43
2007	0,40	0,38

CO2 emissions (metric tons per capita)

	Luxembourg	Singapore
2001	19,42	12,69
2002	21,1	12,24
2003	21,94	11,93
2004	24,14	12,21
2005	24,33	13,95
2006	23,92	12,76
2007	22,57	11,80
2008	21.00	7.00

Table 31b: CO2 intensity**CO2 intensity (kg per kg of oil equivalent energy use)**

	Luxembourg	Singapore
2001	2,49	2,61
2002	2,6	2,38
2003	2,6	2,48
2004	2,64	2,24
2005	2,64	2,15
2006	2,62	2,07
2007	2,57	2,02
2008	3.00	2.00

Source: World bank

Table 32: Municipal waste

2009	Luxembourg	Singapore
Municipal waste collected (000 tons)	349	6114
% population served by municipal waste collection	100	100
Municipal waste collected per capita served (kg)	707	1291

Source: UNSD

2. Comparable indicators of competitiveness

Table 33a: Global Competitiveness Index, 2011-2012, 2010-2011

	2011-2012			2010-2011		
	Luxembourg	Singapore	Diff	Luxembourg	Singapore	Diff
GCI	5,0	5,6	0,6	5,0	5,5	0,5
Basic requirements	5,9	6,3	0,4	5,8	6,1	0,3
Institutions	5,7	6,1	0,4	5,7	6,1	0,4
Infrastructure	5,6	6,3	0,7	5,6	6,2	0,6
Macroeconomic environment	6,0	6,2	0,2	5,7	5,2	0,5
Health and primary education	6,3	6,6	0,3	6,3	6,7	0,4
Efficiency enhancers	4,9	5,6	0,7	4,9	5,5	0,6
Higher education and training	4,7	5,8	1,1	4,7	5,8	1,1
Goods market efficiency	5,4	5,6	0,2	5,5	5,7	0,2
Labor market efficiency	4,6	5,9	1,3	4,7	5,9	1,2
Financial market development	5,3	5,8	0,5	5,3	5,8	0,5
Technological readiness	6,0	5,9	-0,1	6,1	5,3	0,8
Market size	3,0	4,6	1,6	3,2	4,5	1,3
Innovation and sophistication factors	4,8	5,2	0,4	4,8	5,1	0,3
Business sophistication	5,0	5,1	0,1	5,0	5,1	0,1
Innovation	4,5	5,3	0,8	4,5	5,0	0,5

Source: WEF

Table 33b: Global Competitiveness Index, 2009-2010, 2008-2009

	2009-2010			2008-2009		
	Luxembourg	Singapore	Diff	Luxembourg	Singapore	Diff
GCI	5	5,5	0,5	4,9	5,5	0,6
Basic requirements	5,8	6	0,2	5,8	6,1	0,3
Institutions	5,9	6,1	0,2	5,7	6,2	0,5
Infrastructure	5,6	6,4	0,8	5,4	6,4	1,0
Macroeconomic environment	5,9	5,2	-0,7	6	5,7	0,3
Health and primary education	6	6,2	0,2	6	6,2	0,2
Efficiency enhancers	4,8	5,6	0,8	4,7	5,5	0,8
Higher education and training	4,5	5,6	1,1	4,4	5,6	1,2
Goods market efficiency	5,4	5,8	0,4	5,2	5,8	0,6
Labor market efficiency	4,7	5,9	1,2	4,5	5,7	1,2
Financial market development	5,3	5,9	0,6	5,4	5,9	0,5
Technological readiness	5,9	5,9	0,0	5,5	5,6	0,1
Market size	3,3	4,5	1,2	3,1	4,4	1,3
Innovation and sophistication factors	4,6	5,1	0,5	4,5	5,2	0,7
Business sophistication	4,9	5,2	0,3	4,9	5,3	0,4
Innovation	4,3	5,1	0,8	4,2	5,1	0,9

Source: WEF

Table 34: IMD detailed scoring 2009-2011

IMD detailed scoring

	2009	2010	2011
Overall Competitiveness (Scores)			
Luxembourg	86,27	86,87	86,47
Singapore	95,74	100,00	98,56
Economic Performance (Scores)			
Luxembourg	70,39	62,76	68,64
Singapore	54,44	73,14	79,80
Management of public finances			
Management of public finances over the next two years is likely to improve			
Luxembourg	4,11	4,42	5,59
Singapore	6,60	7,38	7,43
General government expenditure (%)			
Percentage of GDP			
Luxembourg	42,22	43,88	-
Singapore	15,71	15,28	-
Real personal taxes			
Real personal taxes do not discourage people from working or seeking advancement			
Luxembourg	6,00	6,06	5,94
Singapore	7,62	7,47	7,54
Real corporate taxes			
Real corporate taxes do not discourage entrepreneurial activity			
Luxembourg	5,38	5,76	6,04
Singapore	7,24	7,20	7,14
Legal and regulatory framework			
The legal and regulatory framework encourages the competitiveness of enterprises			
Luxembourg	4,59	5,76	6,23
Singapore	7,09	7,67	7,70
Adaptability of government policy			
Adaptability of government policy to changes in the economy is high			
Luxembourg	5,64	5,91	6,36
Singapore	8,18	8,30	8,04
Government decisions			
Government decisions are effectively implemented			
Luxembourg	6,00	5,94	6,35
Singapore	8,10	8,28	8,50
Transparency			
Transparency of government policy is satisfactory			
Luxembourg	5,89	6,45	6,64
Singapore	7,09	7,59	7,85
Bureaucracy			
Bureaucracy does not hinder business activity			
Luxembourg	3,67	4,12	4,13
Singapore	5,83	6,05	5,90
Bribing and corruption			
Level of bribing and corruption			
Luxembourg	6,91	7,31	7,59
Singapore	8,02	7,75	7,99

Investment incentives

Investment incentives are attractive to foreign investors

Luxembourg	6,81	7,15	7,29
Singapore	7,85	7,88	7,77

Ease of doing business

Ease of doing business is supported by regulations

Luxembourg	5,93	5,82	6,38
Singapore	7,85	7,95	7,90

Creation of firms

Creation of firms is supported by legislation

Luxembourg	6,36	6,51	6,58
Singapore	8,08	8,45	8,24

Start-up procedures

Number of procedures to start a business

Luxembourg	6,00	6,00	-
Singapore	3,00	3,00	-

Labor regulations

Labor regulations (hiring/firing practices, minimum wages, etc.) do not hinder business activities

Luxembourg	4,04	4,63	4,23
Singapore	7,40	7,45	7,05

Unemployment legislation

Unemployment legislation provides an incentive to look for work

Luxembourg	4,73	4,54	4,48
Singapore	6,93	7,41	7,14

Labor market flexibility

Index on rigidity of employment

Luxembourg	56,00	-	-
Singapore	0,00	-	-

Overall productivity (PPP)

Estimates: GDP (PPP) per person employed, US\$

Luxembourg	117220,03	119311,86	-
Singapore	84460,26	93098,28	-

Labor productivity (PPP)

Estimates: GDP (PPP) per person employed per hour, US\$

Luxembourg	65,45	66,62	-
Singapore	40,45	44,59	-

Remuneration spread

Ratio of CEO to personal assistant remuneration

Luxembourg	10,38	-	-
Singapore	21,35	-	-

Skilled labor

Skilled labor is readily available (Updated: MAY 2011, IMD WCY executive survey based on an index from 0 to 10)

Luxembourg	4,47	5,64	5,31
Singapore	6,72	6,41	6,46

Attracting and retaining talents

Attracting and retaining talents is a priority in companies

Luxembourg	6,33	7,16	7,18
Singapore	7,58	7,92	7,67

International experience

International experience of senior managers is generally significant

Luxembourg	6,33	7,10	7,38
Singapore	6,81	7,00	7,01

Competent senior managers

Competent senior managers are readily available

Luxembourg	4,58	5,67	6,08
Singapore	6,62	6,33	6,23

Financial risk factor

The risk factor in the financial system (new financial instruments, non-performing loans, etc.) is adequately addressed

Luxembourg	4,59	6,79	6,67
Singapore	7,06	7,48	7,51

Stock market index (%)

Percentage change on index in national currency

Luxembourg	39,80	8,70	-
Singapore	64,50	10,10	-

Adaptability of companies

Adaptability of companies to market changes is high

Luxembourg	5,71	6,51	6,33
Singapore	6,79	7,03	6,86

Ethical practices

Ethical practices are implemented in companies

Luxembourg	6,33	7,43	7,07
Singapore	7,23	7,51	7,26

Credibility of managers

Credibility of managers in society is strong

Luxembourg	6,69	6,96	7,14
Singapore	7,19	7,58	7,39

Social responsibility

Social responsibility of business leaders is high

Luxembourg	5,78	7,01	6,85
Singapore	6,13	6,08	6,17

Health, safety & environmental concerns

Health, safety & environmental concerns are adequately addressed by management

Luxembourg	-	7,19	7,56
Singapore	-	6,63	6,99

Attitudes toward globalization

Attitudes toward globalization are generally positive in your society

Luxembourg	6,18	6,78	6,29
Singapore	7,75	7,70	7,82

National culture

The national culture is open to foreign ideas

Luxembourg	7,20	7,73	7,46
Singapore	7,85	8,08	8,00

Flexibility and adaptability

Flexibility and adaptability of people are high when faced with new challenges

Luxembourg	5,42	6,12	6,04
Singapore	7,08	7,03	6,77

Need for economic and social reforms

The need for economic and social reforms is generally well understood

Luxembourg	5,42	5,16	5,22
Singapore	7,60	7,24	7,03

Value system

The value system in your society supports competitiveness

Luxembourg	6,33	6,09	6,33
Singapore	7,92	8,08	7,61

Corporate values

Corporate values take into account the values of employees

Luxembourg	6,36	6,90	6,87
Singapore	7,43	6,80	6,93

Urbanization

Urbanization of cities supports business development

Luxembourg	7,60	8,21	8,10
Singapore	8,69	8,98	8,61

Dependency ratio

Population under 15 and over 64 years old, divided by active population (15 to 64 years)

Luxembourg	46,67	46,33	-
Singapore	36,50	35,87	-

Connectivity

Connectivity of people and firms (telecom, IT, etc.) is highly extensive

Luxembourg	-	8,30	8,19
Singapore	-	9,22	8,65

Qualified engineers

Qualified engineers are available in your labor market

Luxembourg	5,37	6,51	6,17
Singapore	7,58	7,67	7,48

Development and application of technology

Development and application of technology are supported by the legal environment

Luxembourg	6,76	7,12	7,20
Singapore	8,30	8,33	7,93

Technological regulation

Technological regulation supports business development and innovation

Luxembourg	6,44	6,78	7,15
Singapore	7,85	8,05	7,58

Cyber security

Cyber security is being adequately addressed by corporations

Luxembourg	6,73	-	7,13
Singapore	7,46	-	7,35

Total expenditure on R&D (%)

Percentage of GDP

Luxembourg	1,63	-	-
Singapore	2,27	-	-

Patent applications per capita

Number of applications filed per 100,000 inhabitants

Luxembourg	17,04	-	-
Singapore	175,15	-	-

Researchers and scientists

Researchers and scientists are attracted to your country

Luxembourg	-	5,31	5,98
Singapore	-	7,46	7,34

Scientific research legislation

Laws relating to scientific research do encourage innovation

Luxembourg	7,05	6,61	6,91
Singapore	8,28	7,82	7,79

Knowledge transfer

Knowledge transfer is highly developed between companies and universities

Luxembourg	5,07	5,28	5,83
Singapore	6,84	6,89	6,87

Innovative capacity

Innovative capacity of firms to generate new products, processes and/or services is high in your economy

Luxembourg	-	6,15	6,49
Singapore	-	6,48	6,38

Green technologies

Green technologies are quickly turned into competitive advantages

Luxembourg	-	5,76	5,24
Singapore	-	5,95	5,93

Sustainable development

Sustainable development is a priority in companies

Luxembourg	6,69	6,15	6,31
Singapore	6,93	6,73	6,74

Quality of life

Quality of life is high

Luxembourg	9,13	9,24	9,09
Singapore	8,45	8,23	8,04

Educational assessment / Mathematics

PISA survey of 15-year olds

Luxembourg	489,07	-	-
Singapore	562,02	-	-

Educational assessment / Sciences

PISA survey of 15-year olds

Luxembourg	483,93	-	-
Singapore	541,70	-	-

Science in schools

Science in schools is sufficiently emphasized

Luxembourg	5,02	5,43	4,85
Singapore	8,32	8,58	8,01

Source: IMD

Table 35: Heritage Foundation scores and rankings

	World Rank	2012 Overall Score	Business Freedom	Trade Freedom	Fiscal Freedom	Gov't Spending
Luxembourg	13	74,5	75,9	87,1	63,6	46,6
Singapore	2	87,5	97,2	90	91,3	91,3

	Monetary Freedom	Investment Freedom	Financial Freedom	Property Rights	Freedom from Corruption	Labor Freedom
Luxembourg	81,3	95	80	90	85	40,9
Singapore	84,8	75	70	90	93	92,1

Source: Heritage foundation

Table 36: Economic Freedom - Fraser Institute

	2008		2009	
	Luxembourg	Singapore	Luxembourg	Singapore
1 Size of Government	4,8	8,2	4,4	8,1
2 Legal System & Property Rights Adjusted	8,4	8,4	8,3	8,3
3 Sound Money	9,4	9,1	9,6	9,1
4 Freedom to Trade Internationally- Adjusted	8,1	9,3	8,0	9,4
5 Regulation--Adjusted	7,3	8,5	7,3	8,5

Source: Fraser Institute

3. Indicators for specific sectors

Table 37a: Exports (merchandises and services)

	2000	2005	2006	2007	2008	2009	2010
Exports of services							
Luxembourg	20301	40834	50697	65618	71312	61150	67555
Singapore	28539	55674	66353	84889	100965	90920	109094
Exports of merchandises							
Luxembourg	8357	18789	22882	22360	25433	21134	19591
Singapore	137804	229649	271807	299272	338176	269832	351867

Mo US\$, current prices and current exchange rates

Source: UNCTAD

Table 37b: Imports (merchandises and services)

	2000	2005	2006	2007	2008	2009	2010
Imports of services							
Luxembourg	13581	24590	29861	37970	41319	36056	37378
Singapore	30095	55233	65147	74979	87361	82425	100045
Imports of merchandises							
Luxembourg	11250	21884	26548	27529	31889	24800	23960
Singapore	134545	200047	238710	263155	319780	245785	310791

Mo US\$, current prices and current exchange rates

Source: UNCTAD

Table 37c: Imports of services per partner country/region

		(million US\$)			
Trading Partners	2009	(%)	2010	(%)	
Asia	19,542.8	33.0%	24,376.8	34.8%	
United States of America	15,689.6	26.5%	17,042.4	24.4%	
South and Central America and the Caribbean	3,030.8	5.1%	3,820.3	5.5%	
European Union	12,932.6	21.9%	16,275.7	23.3%	

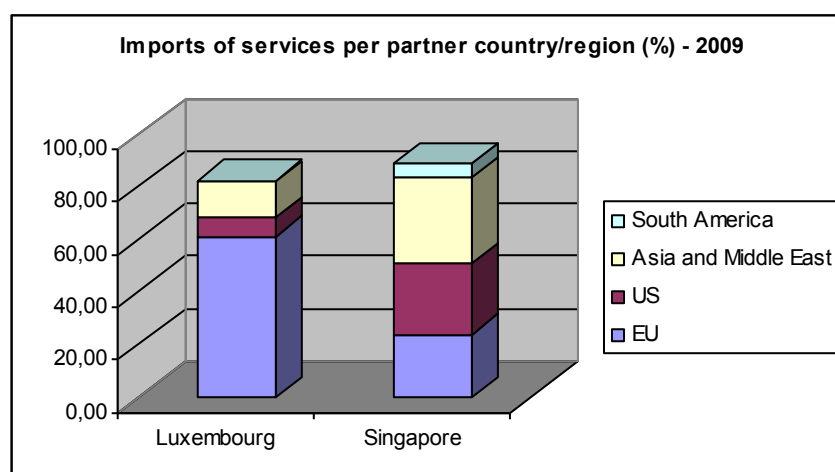
Source: DOS

Table 37d: Structure of the exports of services per type of service

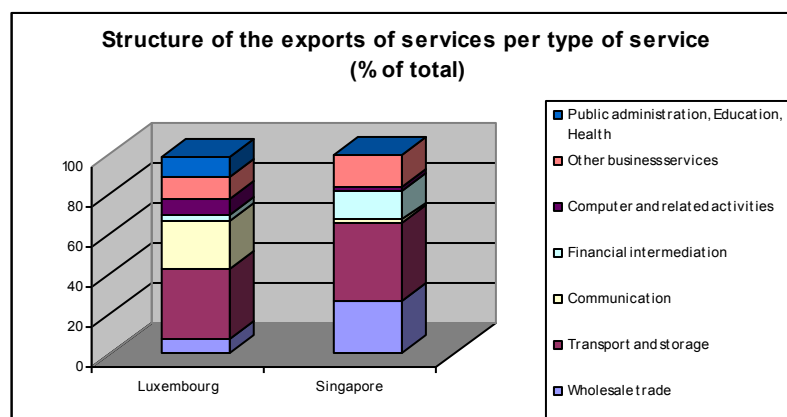
		(million US\$)			
Services	2009	(%)	2010	(%)	
Total	80,186.0		100,012.9		
Maintenance and Repair Services	6,155.6	7.7%	6,219.2	6.2%	
Transport	28,775.2	35.9%	38,114.9	38.1%	
Travel	9,368.4	11.7%	14,133.0	14.1%	
Insurance	2,574.5	3.2%	3,233.5	3.2%	
Government Goods and Services	233.1	0.3%	256.5	0.3%	
Construction	1,061.9	1.3%	1,214.7	1.2%	

Financial	10,385.4	13.0%	12,043.9	12.0%
Telecommunications, Computer & Information	2,599.2	3.2%	3,442.6	3.4%
Charges for the Use of Intellectual Property	787.8	1.0%	1,052.1	1.1%
Personal, Cultural and Recreational	524.2	0.7%	503.5	0.5%
Other Business Services	17,720.7	22.1%	19,799.0	19.8%

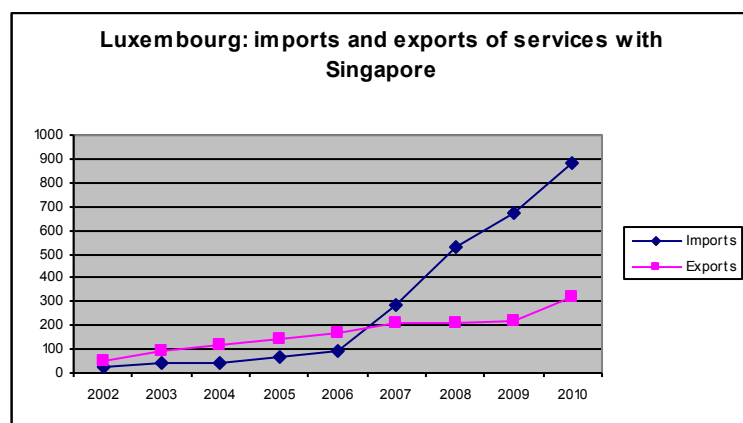
Source: DOS

Graph 2a: Imports of services per partner country/region

Source: Department of Statistics – Singapore and STATEC

Graph 2b: Structure of the exports of services per type of service

Source: Department of Statistics – Singapore and STATEC

Graph 3: Trade in services

Source: STATEC

Table 38: Selected results from PISA**Student performance**

		All	Boys	Girls
Reading	Belgium	506	493	520
	Luxembourg	472	453	492
	OECD			
	Average	493	474	513
	Honk Kong	533	518	550
	Singapore	526	511	542
	Thailand	421	400	438
Maths		All	Boys	Girls
	Belgium	515	526	504
	Luxembourg	489	499	479
	OECD			
	Average	496	501	490
	Honk Kong	555	561	547
	Singapore	562	565	559
	Thailand	419	421	417
Science		All	Boys	Girls
	Belgium	507	510	503
	Luxembourg	484	487	480
	OECD			
	Average	501	501	501
	Honk Kong	549	550	548
	Singapore	542	541	542
	Thailand	425	418	431

Source: PISA survey 2011

Table 39a: FDI Singapore per partner country/region**FOREIGN DIRECT INVESTMENT BY COUNTRY/REGION - Singapore**

Mo S\$

Country/Region	Total 2009	Total 2008	Total 2007	Total 2006	Total 2005
Total	552 275,9	508 318,3	465 475,6	370 494,7	323 821,1
Asia	136 091,5	117 925,6	104 591,6	82 485,0	78 253,9
Brunei Darussalam	304,6	297,0	283,7	309,1	380,7
China	9 354,6	4 423,7	2 314,1	1 689,5	910,0
Hong Kong	15 414,3	11 495,4	6 454,9	6 317,5	4 701,5
India	20 771,9	16 861,4	13 025,7	2 577,6	1 303,1
Indonesia	3 613,1	2 169,7	1 712,7	1 015,0	683,7
Israel	4 970,4	5 060,8	5 124,9	4 656,3	4 982,7
Japan	50 212,4	50 163,0	47 540,2	44 970,5	44 812,5
Korea, Republic of	2 632,3	3 250,3	3 040,2	780,6	1 267,5
Malaysia	15 495,0	12 585,1	11 378,0	8 412,4	8 159,4
Myanmar	89,0	94,7	94,0	17,6	14,8
Philippines	91,4	310,6	984,5	871,1	739,8
Taiwan	6 150,1	6 553,2	7 703,7	7 541,3	7 211,2
Thailand	2 047,1	1 814,3	1 527,5	1 479,7	1 369,4
Vietnam	26,9	28,9	26,1	11,5	21,1
Europe	215 189,9	203 866,3	197 976,8	174 058,3	139 987,4
France	8 005,7	9 507,2	10 961,0	8 090,6	7 003,7
Germany	11 045,5	11 227,0	9 226,9	7 591,6	8 189,2
Netherlands	61 592,1	61 001,4	51 418,6	48 631,0	32 142,1
Norway	22 164,6	21 267,0	17 079,5	15 216,6	8 565,6
Switzerland	23 068,1	23 504,9	27 453,4	27 113,7	22 273,1
United Kingdom	48 629,5	50 072,0	62 527,3	55 263,7	49 593,0
United States	57 113,9	52 970,4	51 550,8	38 325,0	40 574,4
Canada	3 144,2	3 022,1	3 126,0	2 736,4	2 588,7
Australia	5 667,1	4 572,7	4 615,2	3 318,7	2 846,9
New Zealand	2 433,9	1 902,6	1 618,8	1 704,7	1 482,0
South and Central America and the Caribbean	118 337,5	108 764,1	90 983,2	60 876,4	50 141,6
Other Countries nec	14 297,8	15 294,5	11 013,1	6 990,2	7 946,2
ASEAN	21 670,1	17 303,3	16 009,9	12 116,9	11 369,9
European Union	165 393,7	155 914,1	151 919,5	131 405,6	108 947,3

Source: Department of Statistics Singapore

Table 39b: FDI Singapore – per type of activities

Source: Department of Statistics Singapore

Mo S\$	TOTAL	Manufacturing	Construction	Wholesale and retail Trade	Accommodation and food service activities	Transport and Storage	Information and communication	Financial and insurance services	Real Estate activities	Professional, Scientific and technical support services	Others
2009	552 275,9	120 655,3	2 215,8	95 169,2	3 600,2	36 546,3	5 278,7	230 830,1	14 591,3	35 968,4	7 420,6
2008	508 318,3	104 486,4	1 915,8	92 537,0	3 355,6	36 328,9	5 131,7	209 136,8	14 697,8	35 568,9	5 159,3
2007	465 475,6	116 483,2	1 517,8	76 613,2	3 012,7	30 525,4	4 885,5	194 725,0	12 895,5	22 605,3	2 212,0
2006	370 494,7	107 756,1	758,8	62 917,4	2 795,2	23 225,3	3 565,8	146 890,5	8 197,7	13 407,1	980,7
2005	323 821,1	103 666,0	924,8	54 548,1	2 043,9	17 651,5	3 692,6	121 659,3	6 680,3	12 532,8	421,8

Table 39c: FDI inflows and outflows for Singapore (latest estimates)

	USD mil							
	2000	2005	2006	2007	2008	2009	2010	2011
FDI inflows	15,515	18,089	36,700	46,930	11,798	24,418	48,636	63,997
FDI outflows	6,650	11,588	18,637	36,897	6,812	17,704	21,215	25,225

Source: Department of Statistics Singapore

Table 40a: FDI Luxembourg – per partner country/region

FDI - Luxembourg

	2005	2006	2007	2008	2009
EU ⁵	82,8	85,7	84,0	84,5	85,5
Belgium	20,3	17,3	15,3	15,2	13,9
Germany	38,3	34,1	29,4	26,8	25,0
Extra-EU countries	17,2	14,3	16,0	15,5	14,5
United States	10,9	8,5	10,6	10,0	9,5
Other non-EU countries	3,1	2,5	2,4	2,3	2,2

Source: STATEC

Table 40b: FDI Luxembourg – per type of activities

	2005	2006	2007	2008 ²	2009 ³
Mo Euro					
Banking	23 918,0	25 488,9	28 169,2	30 261,5	34 020,5
Insurance	1 937,4	2 185,2	2 487,4	2 746,0	3 426,6
Manufacturing	3 416,7	8 651,4	13 749,2	16 440,6	21 672,6
			10	10	11
Other	7 729,1	9 039,4	911,9	530,8	349,4
Total	37 001,2	45 365,0	55 317,6	59 978,9	70 469,1

Source: STATEC

Table 41: FDI Luxembourg – Employment per activity

Employment in foreign-owned affiliates in Luxembourg					
<u>Industrial activities</u> ¹	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u> ²	<u>2009</u> ³
Total	75 272	82 343	84 534	88 224	89 296
Banking	21 182	22 643	23 618	24 657	23 885
Insurance	2 039	2 105	2 256	2 521	2 477
Other activities	52 051	57 595	58 660	61 046	62 934
of which: Manufacturing (excl. construction)	19 423	24 064	24 181	24 811	24 113
<i>Share (in %) in total domestic employment excl.non-merchant services</i>	<i>33,01%</i>	<i>34,58%</i>	<i>33,73%</i>	<i>33,48%</i>	<i>33,77%</i>
Share (in %) in total employment of individual sectors					
Banking	86,81%	88,11%	86,83%	84,73%	81,52%
Insurance	78,42%	77,96%	80,57%	84,03%	79,90%
Other activities	25,90%	27,47%	26,59%	26,38%	27,13%
of which: Manufacturing (excl. construction)	55,49%	68,75%	69,69%	70,29%	70,51%

¹ by industrial activity of the investment object (NaceRev2 from 2008 onwards)

² Revised data

³ Provisional data

Source: STATEC

Table 42: Resident Age-Specific Fertility Rates, 2000 - 2010

Per Thousand Females							
Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
2000	8,8	42,2	110,1	107,9	43,3	7,6	0,2
2001	8,4	35,7	96,2	94,9	39,5	6,8	0,2
2002	8,0	34,6	91,6	96,2	38,2	5,8	0,2
2003	6,7	32,4	82,2	90,0	36,3	6,1	0,2
2004	6,6	32,2	80,6	89,9	35,6	6,3	0,2
2005	7,2	32,5	80,7	89,2	36,8	6,2	0,2
2006	6,6	30,6	79,6	93,1	38,7	6,4	0,2
2007	6,1	31,2	78,7	94,4	41,5	6,4	0,2
2008	6,1	29,1	78,9	94,6	41,5	6,6	0,2
2009	5,0	25,4	74,2	90,1	42,6	7,0	0,3
2010	4,8	23,3	68,1	86,0	42,2	6,1	0,3

Source: DOS

Table 43: Knowledge Economy Index

Latest year available	Luxembourg		Singapore	
	actual	normalized	actual	normalized
Knowledge Economy Index (KEI)		8,64		8,44
Knowledge Index (KI)		8,37		8,03
Additional variables				
Annual GDP Growth (%)	4.00	8.00	7.20	7.06
Human Development Index	0.944	2.67	0.922	8.13
Economic Incentive Regime				
Tariff & Nontariff Barriers	85.80	8.67	90.00	9.38
Regulatory Quality	1.89	9.33	1.87	9.41
Rule of Law	1.85	5.33	1.79	9.41
Innovation				
Royalty Payments and receipts(US\$/pop.)	1.656.94	9.23	2.544.63	10.00
S&E Journal Articles / Mil. People	128.72	1.33	846.34	10.00
Patents Granted by USPTO / Mil. People	117.73	8.00	104.28	8.82
Education				
Adult Literacy Rate (% age 15 and above)	100.00	10.00	94.43	6.47
Gross Secondary Enrollment rate	96.31	1.33	63.18	2.35
Gross Tertiary Enrollment rate	10.21	0.67	55.90	7.50
ICT				
Total Telephones per 1000 People	1.780.00	10.00	1.700.00	9.41
Computers per 1000 People	670.00	8.00	740.00	9.41
Internet Users per 1000 People	760.00	6.67	660.00	8.24

Source: World Bank

