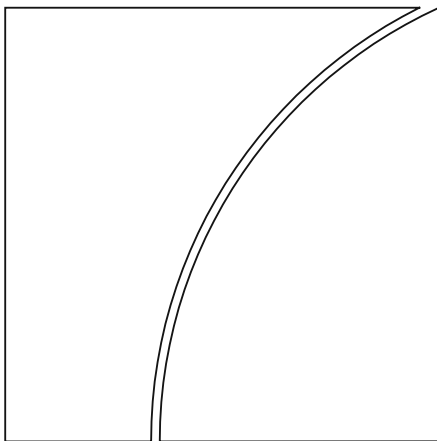


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An examination of initial experience with the global systemically important bank framework

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Contents

Abstract	1
1. Introduction.....	1
2. G-SIB framework	3
3. Analysis of initial experience with the G-SIB framework.....	5
3.1 Analysis of the numerator of the indicators.....	8
3.2 Analysis of the denominator of the indicators.....	13
3.3 Regional analysis of the indicators	16
4. Conclusion	25
Appendix.....	26

List of graphs and tables

Graph 1 – Skewness, average and median of final score and indicators.....	8
Graph 2 – Numerators of the indicators	10
Graph 3 – Growth rate of the numerators of indicators	11
Graph 4 – Median growth rate of the numerator of indicators.....	13
Graph 5 – Denominator of the indicators	15
Graph 6 – Contribution of G-SIBs and non-G-SIBs to the denominator of the categories	16
Graph 7 – Contribution of G-SIBs and non-G-SIBs to the denominator of the indicators.....	16
Graph 8 – Composition of scores by country/region	20
Graph 9 – Numerators of indicators by country/region – G-SIBs	22
Graph 10 – Numerators of indicators by country/region – non-G-SIBs.....	23
Graph 11 – Growth rate of the numerators of indicators by country/region – G-SIBs.....	25
Graph 12 – Growth rate of the numerators of indicators by country/region – non-G-SIBs	26
Table 1 – Summary statistics – All banks.....	30
Table 2 – Summary statistics – G-SIBs and non-G-SIBs	31

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An examination of initial experience with the global systemically important bank framework

Abstract

This paper presents a first analysis of the experience to date with the global systemically important bank (G-SIB) framework, the methodology for assessing the systemic importance of G-SIBs. Several issues are examined. First, we investigate whether G-SIBs and non-G-SIBs have behaved differently since the implementation of the G-SIB framework and if observed differences in behaviour are in accordance with the framework's aims. Next, we ask whether there are regional differences in the behaviour of G-SIBs and non-G-SIBs.

The analysis reveals that G-SIBs and non-G-SIBs behave differently; however, both groups are heterogeneous, so that the indicator outcomes are often highly influenced by a few banks. Nevertheless, most G-SIBs have reduced their G-SIB scores during the period assessed, changing their balance sheets in ways that are consistent with the G-SIB framework's aims. In contrast, non-G-SIBs have increased their relative G-SIB scores during the same period. Finally, the regional analysis indicates that trends in banks' G-SIB indicators, and the indicators that contribute most to the final G-SIB score, are heterogeneous across countries and regions. While G-SIBs from the euro area, Great Britain (GB) and the United States (US) have reduced their systemic importance for most indicators, Chinese and Japanese G-SIBs have shown relatively positive growth rates for all indicators, and particularly high ones for indicators in the substitutability category.

1. Introduction

During the 2007–09 financial crisis, the failure or impairment of a number of large, globally active financial institutions sent shocks through the financial system, jeopardising the real economy. To prevent problems at individual firms from spreading and thus undermining financial stability, authorities had to intervene on a massive scale. The financial and economic costs of these interventions, as well as the associated increase in moral hazard, meant that additional measures were necessary to reduce the likelihood and severity of problems that emanate from the failure of G-SIBs.

The rationale for adopting additional policy measures for G-SIBs is based on the cross-border negative externalities created by systemically important banks, which current regulatory policies do not fully address. The negative externalities associated with institutions that are perceived as too important to be allowed to fail due to their size, interconnectedness, complexity, lack of substitutability or global scope are well recognised. Yet, in maximising their private benefits, individual financial institutions may rationally choose outcomes that, on a system-wide level, are suboptimal because they do not take into account these externalities. Moreover, the moral hazard costs associated with implicit guarantees derived from the perceived expectation of government support may amplify risk-taking, erode market discipline and create competitive distortions, further increasing the probability of distress in the future. As a result, the costs associated with moral hazard can compound any direct costs of support that may be borne by taxpayers.

There is no single solution to the externalities posed by G-SIBs. Hence, authorities are addressing the issues through a multipronged approach. The broad aim is to (i) reduce G-SIBs' probability of failure by increasing their going-concern loss absorbency; and (ii) mitigate the scale and impact of G-SIB failures by improving global recovery and resolution frameworks.

The measures adopted by the Basel Committee on Banking Supervision (the Committee) address the first objective of requiring additional going-concern loss absorbency for G-SIBs, thus reducing the probability of failure. Referred to in this report as the “G-SIB framework”, these measures also aim to incentivise banks to shrink their systemically important activities and discourage excessive concentration in such activities.^{1, 2}

The Committee first developed the G-SIB framework in 2011 in line with the Financial Stability Board’s (FSB) recommendations to establish a methodology comprising both quantitative and qualitative indicators to assess the systemic importance of G-SIBs.³ This methodology, which underpins the additional capital buffer requirements for G-SIBs (“G-SIB methodology”), relies on an indicator-based measurement approach. The indicators are chosen to reflect the different factors that generate negative externalities, making a bank significant for the stability of the financial system. The advantage of the multiple indicator-based measurement approach is that it may encompass many dimensions of systemic importance, may be relatively simple, and may be more robust than currently available model-based measurement approaches and methodologies that rely on only a small set of indicators or market variables.

The purpose of this report is to offer a first analysis of the experience to date with the G-SIB framework.⁴ The aim is to assess whether the behaviour of G-SIBs over the years is consistent with the incentives provided by the G-SIB framework to become less systemically important. In this sense, the G-SIB framework is expected to incentivise banks to reduce their indicators.⁵

The analysis is performed as follows. First, we investigate whether the balance sheets of G-SIBs and other banks with a Basel III leverage ratio exposure measure greater than EUR 200 billion (henceforth referred to as “non-G-SIBs” in this report) have changed differently over time and whether observed changes are consistent with the objectives of the G-SIB framework. In particular, the work evaluates whether banks have reduced their G-SIB scores over time, if G-SIBs and non-G-SIBs behave homogeneously, and if the exchange rate used to convert local currencies into euros affects the results of the analysis. Finally, we assess whether there are regional differences in the behaviour of G-SIBs and non-G-SIBs. We examine, for each country/region, the indicators with the greatest importance in determining

¹ The G-SIB framework gives firms the choice of holding more capital consistent with a firm’s G-SIB score or reducing its G-SIB indicators (consistent with the calibration of the methodology). Thus, the framework is designed to provide incentives (ie higher capital requirements) to become less systemically important.

² The G-SIB framework forms part of a broader effort by the Financial Stability Board (FSB) to reduce the moral hazard of global systemically important financial institutions (G-SIFIs). Additional measures by the FSB on recovery and resolution address the second broad objective, which is to reduce the impact of failure of a G-SIB. (See FSB, “Key Attributes of Effective Resolution Regimes for Financial Institutions”, October 2011, www.fsb.org/2011/11/r_111104cc/. These policies serve to reduce the impact of a G-SIB’s failure and also help level the playing field by reducing too-big-to-fail (TBTF) competitive advantages in funding markets. These policies have been developed in close coordination with the Committee.

³ See FSB, “Reducing the moral hazard posed by systemically important financial institutions: FSB Recommendations and Time Lines”, October 2010, paragraph 48, www.fsb.org/2010/11/r_101111a/.

⁴ In order to assess the effectiveness of SIB frameworks, it would be desirable to undertake an econometric exercise to test hypotheses about SIB behaviour and to connect any behavioural change to a SIB policy. However, the exercise would require a sufficiently long period. Yet, assessing the impact of SIB frameworks on banks will be particularly challenging, given the number of new policies that have been put in place simultaneously in the context of Basel III. This raises the question as to whether it could ever be possible to separately identify the effects of SIB policies from those of policies not aimed at SIBs but with a disproportionate impact on them. Nevertheless, in the meantime, it is possible to investigate if SIB’s and non-SIB’s balance sheets have changed differently over the years and if this change is consistent with the objective of the G-SIB framework.

⁵ In particular, it would be expected that banks reduce final scores, indicators and numerators of indicators, whether or not exchange rate effects are taken into account.

the scores of G-SIBs and non-G-SIBs, and the trajectory and the growth rate of the G-SIB indicators over time.

The analysis is based on the annual publicly disclosed data on G-SIB indicators provided by 104 banks that had a Basel III leverage ratio exposure measure greater than EUR 200 billion in the 2013–17 period. The sample includes the banks identified as G-SIBs and the non-G-SIBs that comprised part of the sample of banks used to designate G-SIBs, as well as additional reporting banks that were not part of the sample used to undertake the G-SIB assessment exercise.⁶

The following section presents the main features of the G-SIB framework: the indicators, the sample of banks used in the G-SIB methodology and the bucketing approach. Section 3 presents the analysis of the experience with the G-SIB framework, and concluding remarks are provided in the last section.

2. G-SIB framework⁷

The Committee is of the view that global systemic importance should be measured in terms of the expected impact that a bank's failure can have on the global financial system and wider economy, rather than the risk that a failure could occur. This approach combines a global, system-wide, loss-given-default (LGD) concept with a probability of default (PD) concept, where a higher measured LGD is offset with a lower PD using capital surcharges

The Committee's G-SIB methodology relies on an indicator-based measurement approach. The selected indicators reflect the size of banks, their interconnectedness, the lack of readily available substitutes or financial institution infrastructure for the services they provide, their global (cross-jurisdictional) activity and their complexity. The size, interconnectedness and substitutability/financial institution infrastructure categories are consistent with IMF-BIS-FSB (2009).⁸ Since this assessment methodology aims to identify G-SIBs that are subject to internationally harmonised higher loss absorbency requirements, the Committee also deems it appropriate to include a category that measures the degree of global (cross-jurisdictional) activity. A measure of complexity is also included, since more complex G-SIBs are likely to be more difficult to resolve, therefore causing significantly greater disruption to the wider financial system and economic activity.

The five categories of systemic importance drivers used in the assessment methodology are briefly described below. The precise definitions of the indicators can be found in the reporting template and instructions that the sample banks use to supply their indicator data to the Committee's data hub.⁹

- **Cross-jurisdictional activity:** given the focus on G-SIBs, the objective of this indicator is to capture banks' global footprint. Two indicators in this category measure the importance of the bank's activities outside its home (headquarter) jurisdiction relative to the overall activity of other banks in the sample: (i) cross-jurisdictional claims; and (ii) cross-jurisdictional liabilities. The idea

⁶ It is important to mention that only banks with a Basel III leverage ratio exposure measure greater than EUR 200 billion are required to calculate and publicly disclose the data on the 12 G-SIB indicators. Therefore, due to data availability, it was not possible to include all non-G-SIBs in the non-G-SIB sample. In fact, contingent on the definition of domestic systemically important financial banks (D-SIBs) chosen by each jurisdiction, it is highly likely that the non-G-SIB sample is composed mainly of D-SIBs.

⁷ This section follows BCBS, "Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement", July 2013, www.bis.org/publ/bcbs255.htm.

⁸ See IMF, BIS and FSB, "Guidance to assess the systemic importance of financial institutions, markets and instruments: initial considerations", October 2009, www.imf.org/external/np/g20/pdf/100109.pdf.

⁹ The template and reporting instructions can be found at www.bis.org/bcbs/gsib/.

is that the international impact of a bank's distress or failure would vary in line with its share of cross-jurisdictional assets and liabilities. The greater a bank's global reach, the more difficult it is to coordinate its resolution and the more widespread the spillover effects from its failure.

- **Size:** a bank's distress or failure is more likely to damage the global economy or financial markets if its activities comprise a large share of global activity. The larger the bank, the more difficult it is for its activities to be quickly replaced by other banks and therefore the greater the chance that its distress or failure would cause disruption to the financial markets in which it operates. The distress or failure of a large bank is also more likely to damage confidence in the financial system as a whole. Size is therefore a key measure of systemic importance. One indicator is used to measure size: the measure of total exposures used in the Basel III leverage ratio.
- **Interconnectedness:** financial distress at one institution can materially increase the likelihood of distress at other institutions, given the network of contractual obligations in which these firms operate. A bank's systemic impact is likely to be positively related to its interconnectedness vis-à-vis other financial institutions. Three indicators are used to measure interconnectedness: (i) intra-financial system assets; (ii) intra-financial system liabilities; and (iii) securities outstanding.
- **Substitutability/financial institution infrastructure:** the systemic impact of a bank's distress or failure is expected to be negatively related to its degree of substitutability as both a market participant and client service provider, ie it is expected to be positively related to the extent to which the bank provides financial institution infrastructure. For example, the greater a bank's role in a particular business line, or as a service provider in underlying market infrastructure (eg payment systems), the larger the probable disruption following its failure, in terms of both service gaps and reduced flow of market and infrastructure liquidity. At the same time, the cost to the failed bank's customers in having to seek the same service from another institution is likely to be higher for a failed bank with relatively greater market share in providing the service. Three indicators are used to measure substitutability/financial institution infrastructure: (i) assets under custody; (ii) payments activity; and (iii) underwritten transactions in debt and equity markets.¹⁰
- **Complexity:** the systemic impact of a bank's distress or failure is expected to be positively related to its overall complexity – that is, its business, structural and operational complexity. The more complex a bank is, the greater are the costs and time needed to resolve the bank. Three indicators are used to measure complexity: (i) notional amount of over-the-counter (OTC) derivatives; (ii) Level 3 assets; and (iii) trading and available-for-sale securities.

The methodology gives an equal weight of 20% to each of the five categories of systemic importance (size, cross-jurisdictional activity, interconnectedness, substitutability/financial institution infrastructure and complexity). With the exception of the size category, the Committee has identified multiple indicators in each of the categories, with each indicator equally weighted within its category.

For each bank, the score for a particular indicator is calculated by dividing the individual bank amount¹¹ (expressed in euros) by the aggregate amount for the indicator summed across all banks in the sample. This amount is then multiplied by 10,000 to express the indicator score in terms of basis points.

The indicator-based measurement approach uses a large sample of banks as its proxy for the global banking sector. Banks fulfilling any of the following criteria are included in the sample: (i) banks that the Committee identifies as the 75 largest global banks, based on the financial year-end Basel III leverage ratio exposure measure; (ii) banks that were designated as G-SIBs in the previous year (unless

¹⁰ A new indicator (trading volume) was added to the substitutability/financial institution infrastructure category in 2018. See BCBS, "Global systemically important banks: revised assessment methodology and the higher loss absorbency requirement", July 2018, www.bis.org/bcbs/publ/d445.pdf.

¹¹ The amounts are based on consolidated data, ie the unit of analysis is the consolidated group.

supervisors agree that there is a compelling reason to exclude them); and (iii) banks that have been added to the sample by national supervisors using supervisory judgment (subject to certain criteria).

In 2013, the Committee found that, relative to the other categories that make up the G-SIB framework, the substitutability category had a greater impact on the assessment of systemic importance than the Committee intended for banks that are dominant in the provision of payment, underwriting and asset custody services. Therefore, the Committee decided to apply a cap to the substitutability category by limiting the maximum score to 500 basis points (bp).

Banks with a score produced by the indicator-based measurement approach that exceeds a cutoff level¹² set by the Committee are classified as G-SIBs. Supervisory judgment may also be used to add banks with scores below the cutoff to the list of G-SIBs.

The Committee runs the assessment annually and, if necessary, reallocates G-SIBs into different categories of systemic importance based on their scores. G-SIBs are allocated into equally sized buckets¹³ based on their scores of systemic importance, with varying levels of HLA requirements applied to the different buckets.¹⁴ The cutoff score and bucket thresholds have been fixed and disclosed since November 2013.¹⁵

3. Analysis of initial experience with the G-SIB framework

For the analysis, we have used publicly disclosed data from banks with a Basel III leverage ratio exposure measure greater than EUR 200 billion. The data set consists of the 12 indicators specified in the G-SIB methodology and disclosed from 2013 to 2017.¹⁶ The G-SIBs sample comprises banks identified as G-SIBs by the FSB. The non-G-SIB sample encompasses all banks with a Basel III leverage ratio exposure measure greater than EUR 200 billion that are not classified as G-SIBs, ie banks that are part of the main sample and of the additional sample, according to the G-SIB framework, with the exception of the ones identified as G-SIBs.^{17, 18}

In order to investigate whether G-SIBs and non-G-SIBs have reduced their systemic importance over time, we analyse the mean, the median and the skewness of the indicator scores. The mean and the median show the average behaviour of banks for each indicator, while the skewness captures the existence of outliers. Graph 1 items (a) and (b) report, respectively, data from the G-SIBs and the non-G-SIBs for the

¹² The current cutoff is set at 130 bp.

¹³ The current bucket size is set at 100 bp.

¹⁴ The current HLA requirement for the first bucket is 1% of risk-weighted assets. Up to the fourth bucket, each subsequent bucket has an increase of 0.5% HLA, from the fifth bucket onwards there is an increment of 1% HLA.

¹⁵ It should be noted that the number of G-SIBs, and their bucket allocation, evolve over time as banks change their behaviour in response to the incentives of the G-SIB framework as well as other aspects of Basel III and country-specific regulations. Moreover, if a bank's score increases such that it exceeds the top threshold of the fourth bucket, new buckets will be added to accommodate the bank. New buckets will be equal in size in terms of scores to each of the initial five buckets, and will have incremental HLA requirements to provide incentives for banks to avoid becoming more systemically important.

¹⁶ The indicators are based on year-end figures, which could be subject to window-dressing.

¹⁷ See the summary statistics for the whole data set (Table 1), the G-SIB sample and the non-G-SIB sample (Table 2).

¹⁸ The sample of G-SIBs has varied slightly over time, ie China Construction Bank became a G-SIB from 2014 onwards, BPCE was excluded from the G-SIB list in 2016, RBS and Nordea were removed from the G-SIB sample in 2017, BBVA was included in the G-SIB sample in 2013, only, and RBC became part of the sample from 2016 onwards.

period 2013–17. The score of each indicator is calculated based on the individual data disclosed by each bank, which was converted to euros at the year-end exchange rate, as in the current G-SIB methodology.¹⁹

Graph 1 reveals that, in the 2013–17 period, the average final score of the G-SIBs and non-G-SIBs remained stable. In addition, Graph 1 shows that while the average scores of the indicators for the size, cross-jurisdictional activity and substitutability categories remained stable for G-SIBs, the average scores of the indicators for the complexity and interconnectedness categories fell significantly.²⁰ Moreover, the average of most indicators for non-G-SIBs was stable. The exceptions are the averages for the underwriting activity and level 3 assets indicators, which showed a small reduction and a significant increase, respectively.

In addition, Graph 1 item (a) also shows that for G-SIBs the medians of the final score (with and without cap) and of the indicators of the size and interconnectedness categories are close to their respective average throughout the time period. However, the median of the indicators of the substitutability, complexity and cross-jurisdictional (CJ) activity categories differs from the average, which suggests heterogeneous behaviours among the G-SIBs. In particular, we observe a significant distance between the average and the median in payments activity, assets under custody and OTC derivatives.²¹ Moreover, the distance between the average and the median for underwriting activity, trading and AFS securities and level 3 assets decreased significantly over time, while for CJ claims and CJ liabilities this distance has consistently increased. In turn, for the non-G-SIBs' final score and 12 indicators, the median is close to the respective averages and presents similar trends over time (see Graph 1 item (b)).

However, when inferring the skewness of the final score and of the indicators of non-G-SIBs from Graph 1, there is greater skewness in the indicators for non-G-SIBs than for G-SIBs, revealing a greater heterogeneity in the non-G-SIB sample. This heterogeneity of non-G-SIBs was not identified in the previous analysis of the average and the median because the scores of indicators of non-G-SIBs are concentrated in a narrower range than that of G-SIBs.

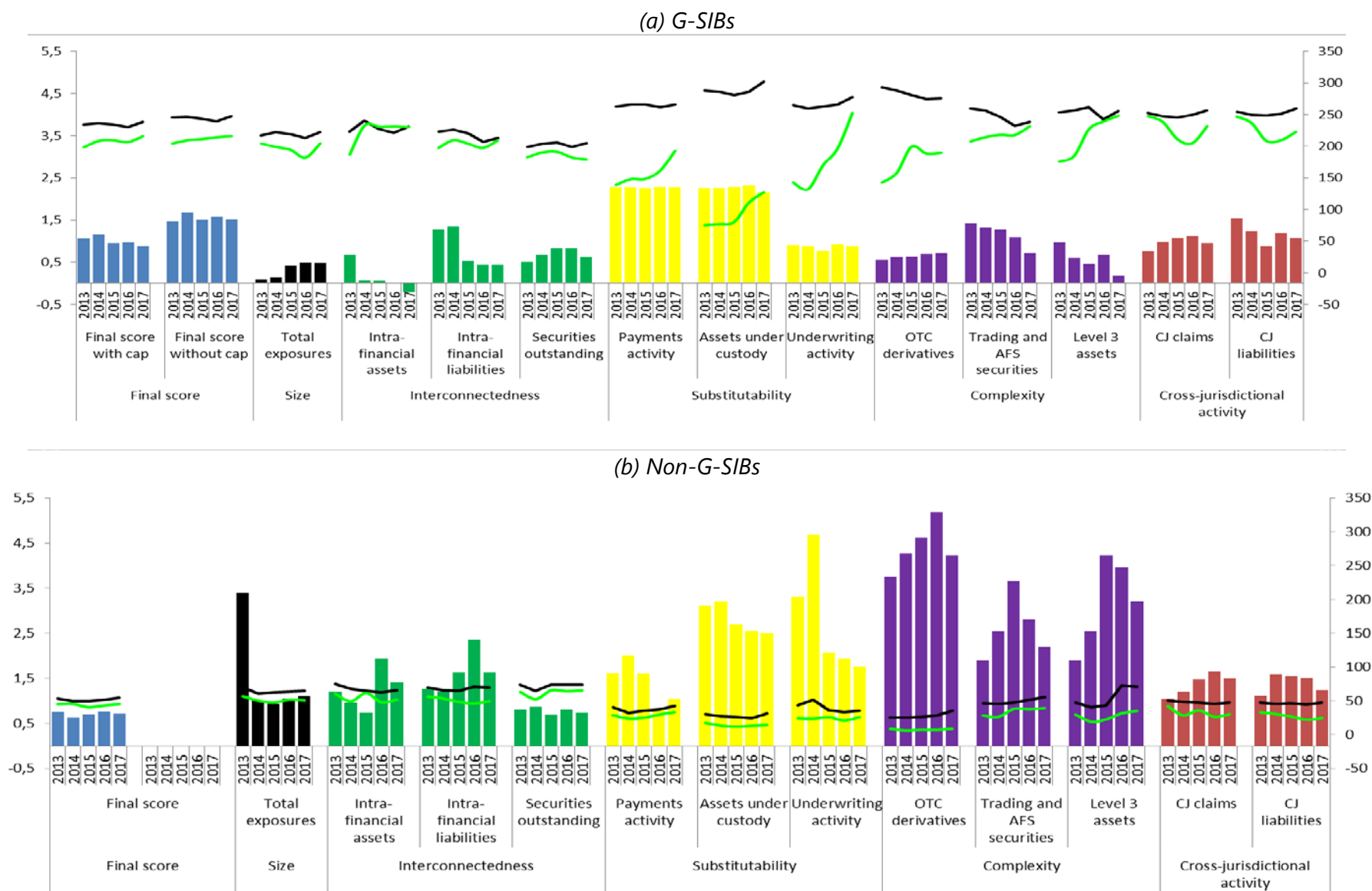
Overall, for the G-SIBs, skewness is relatively low and has not changed significantly over the years. Payments activity and assets under custody (both under the substitutability category) are the only indicators that are highly skewed. In contrast, for the non-G-SIBs, while the skewness of the final score has remained at a constant low figure, the skewness of individual indicators has changed over the years. Indicators from the substitutability category have become less skewed, while indicators from the other categories have become more skewed. The indicators with greater skewness are assets under custody and underwriting activity, both from the substitutability category, and OTC derivatives, trading and AFS securities, and level 3 assets, all from the complexity category.

¹⁹ The scores of the non-G-SIBs of the additional sample were calculated using the denominators obtained from the main sample.

²⁰ Except the securities outstanding indicator that remained stable.

²¹ The average of these indicators has been highly influenced by outliers: 20% of the G-SIB sample banks represent around 50% of their total value.

Graph 1 – Skewness (LHS bars), average (RHS black lines) and median (RHS green lines) of final score and of indicators



3.1 Analysis of the numerator of the indicators

One possible way to investigate the consistency of banks' behaviour with the intended objectives of the G-SIB framework is by analysing the numerators of the indicators; ie the individual bank values for the indicators. If the numerators of the G-SIBs' indicators are falling, then the behaviour can be said to be consistent with the G-SIB framework objective. By analysing the numerators separately, we can eliminate any effect of the changes in denominators and capture the changes that the bank itself has made to its balance sheet.

Graph 2 shows the behaviour of the aggregate values of the numerators of the indicators of the G-SIBs and non-G-SIBs for the 2013–17 period. The aggregate values in euros correspond to the sum of the individual values of each G-SIBs and non-G-SIBs for the numerators of each indicator. Therefore, denominators are not taken into account. Graph 3 describes the growth rates of the numbers presented in Graph 2 in relation to 2013.²² The difference between items (a) and (b) of the Graphs 2 and 3 is the exchange rate used to convert the amounts to euros. In item (a), data were converted based on the year-end exchange rate, as in the current G-SIB methodology. In item (b), data were converted based on the end-2013 exchange rate. The rate was fixed over the years to eliminate²³ the effect of exchange rate fluctuations on the indicators.

Graph 2 shows a mixed view for the G-SIBs. Half of the aggregate values of the numerators of the indicators of G-SIB are falling over time and half are either stable or rising, regardless of the exchange rate effect. For the non-G-SIBs, Graph 2 reveals that, regardless of the exchange rate effect, the aggregate value of the numerators of most indicators grew over time. In addition, the difference between the aggregate values of the numerators of the indicators of G-SIBs and non-G-SIBs has fallen consistently over the 2013–17 period for almost all indicators. This difference is further narrowed when the effect of the exchange rate is eliminated. This view is reinforced in Graph 3, which indicates that the non-G-SIBs' indicators have been growing more than those of the G-SIBs. The difference between growth rates becomes even more evident when exchange rate effects are eliminated (see Graph 3 item (b)). Non-G-SIBs not only present positive growth rates for the indicators but also show an upward trend for the growth rates for all indicators. On the other hand, G-SIBs show negative or zero growth rates for the indicators, and the growth rates are either stable or have a downward trend.

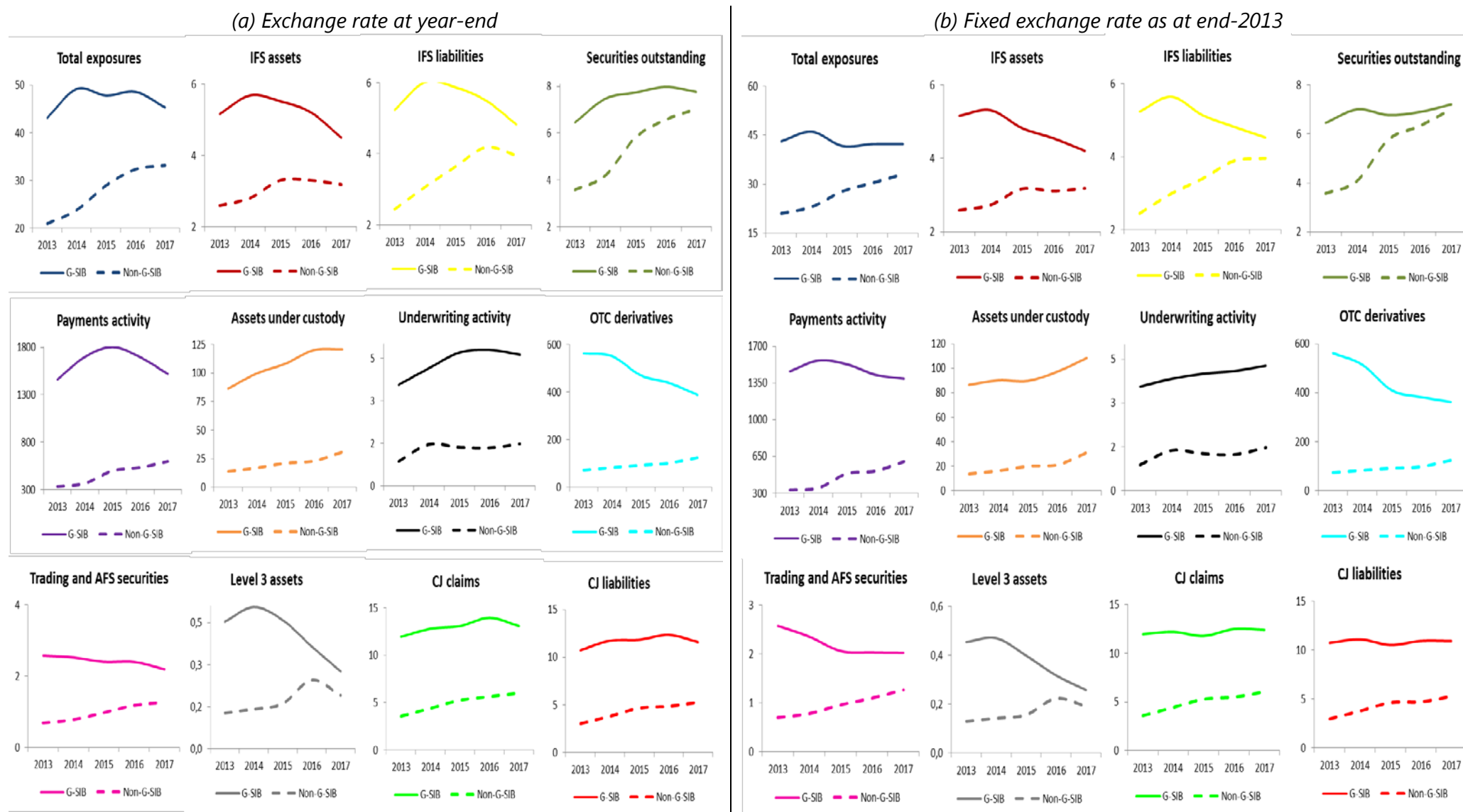
Graphs 2 and 3 thus suggest that G-SIBs and non-G-SIBs have behaved differently over the period, which is consistent with the view that the G-SIB framework has indeed increased incentives for G-SIBs to reduce their systemic importance. However, among the few exceptions are the indicators of the substitutability category (payments activity, assets under custody, and underwriting activity), where a small increase has been observed or the reduction is less evident. One potential explanation for this result is the existence of a cap for the substitutability category, as the cap of 500 bp could be seen as reducing the incentive to lower the indicator values for this category.²⁴

²² For banks that have not publicly disclosed data for the year 2013, this work considers the first year with data publicly disclosed as the basis for comparison.

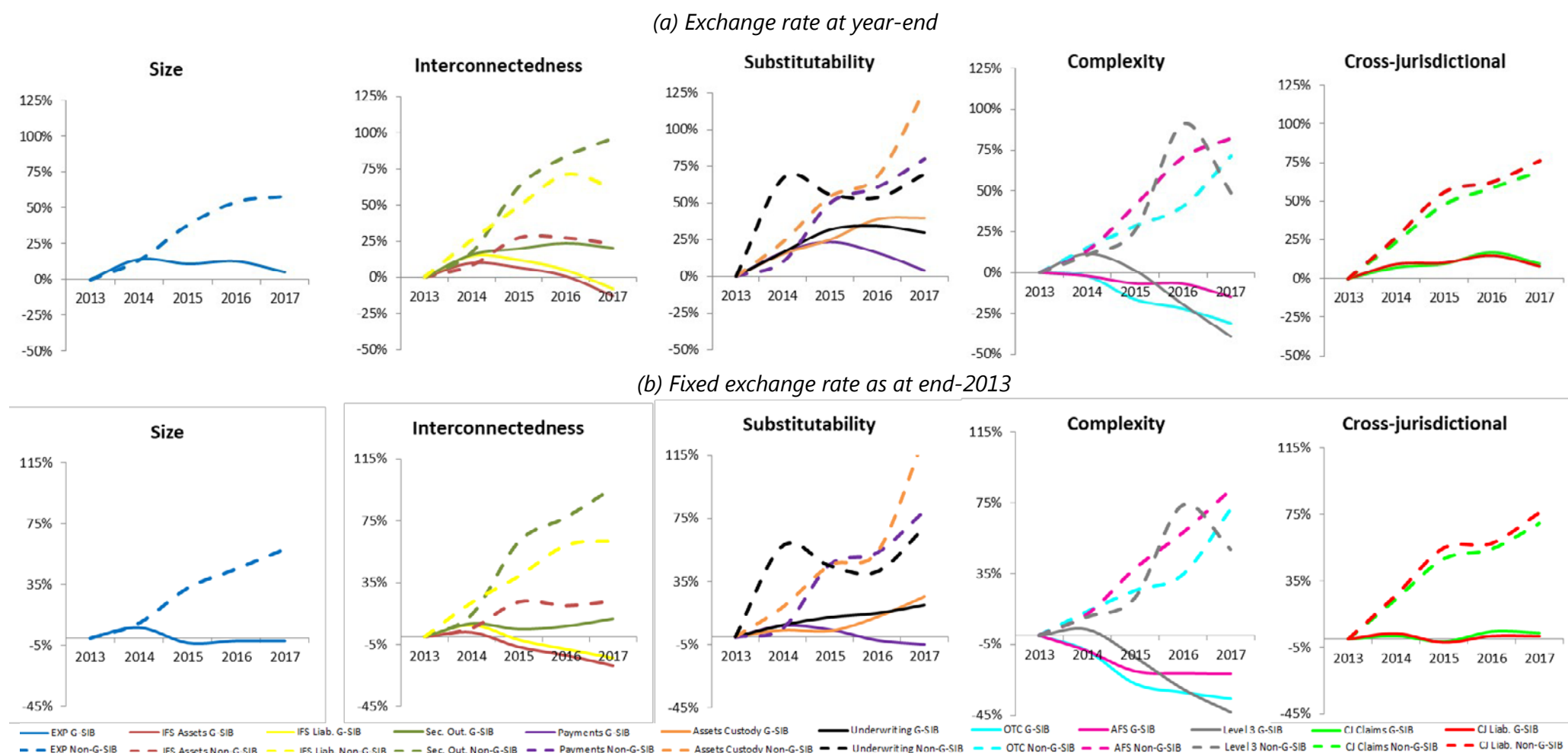
²³ It is worth noting that fixing the exchange rate to 2013 does not fully eliminate the effect of exchange rates fluctuations because the reported value of foreign currency-denominated assets will still be converted using changing exchange rates.

²⁴ Another possible justification for this result would be the large skewness in the sample of the indicators of the substitutability category.

Graph 2 – Numerators of the indicators (in trillions of euros)



Graph 3 – Growth rate of the numerators of indicators



Another way of assessing the consistency of banks' behaviour with the G-SIB framework objectives is by analysing the medians of the numerators of the indicators. Graph 4 presents three different views of the median growth rates of the numerators for the indicators of the G-SIBs and non-G-SIBs for the 2013–17 period.

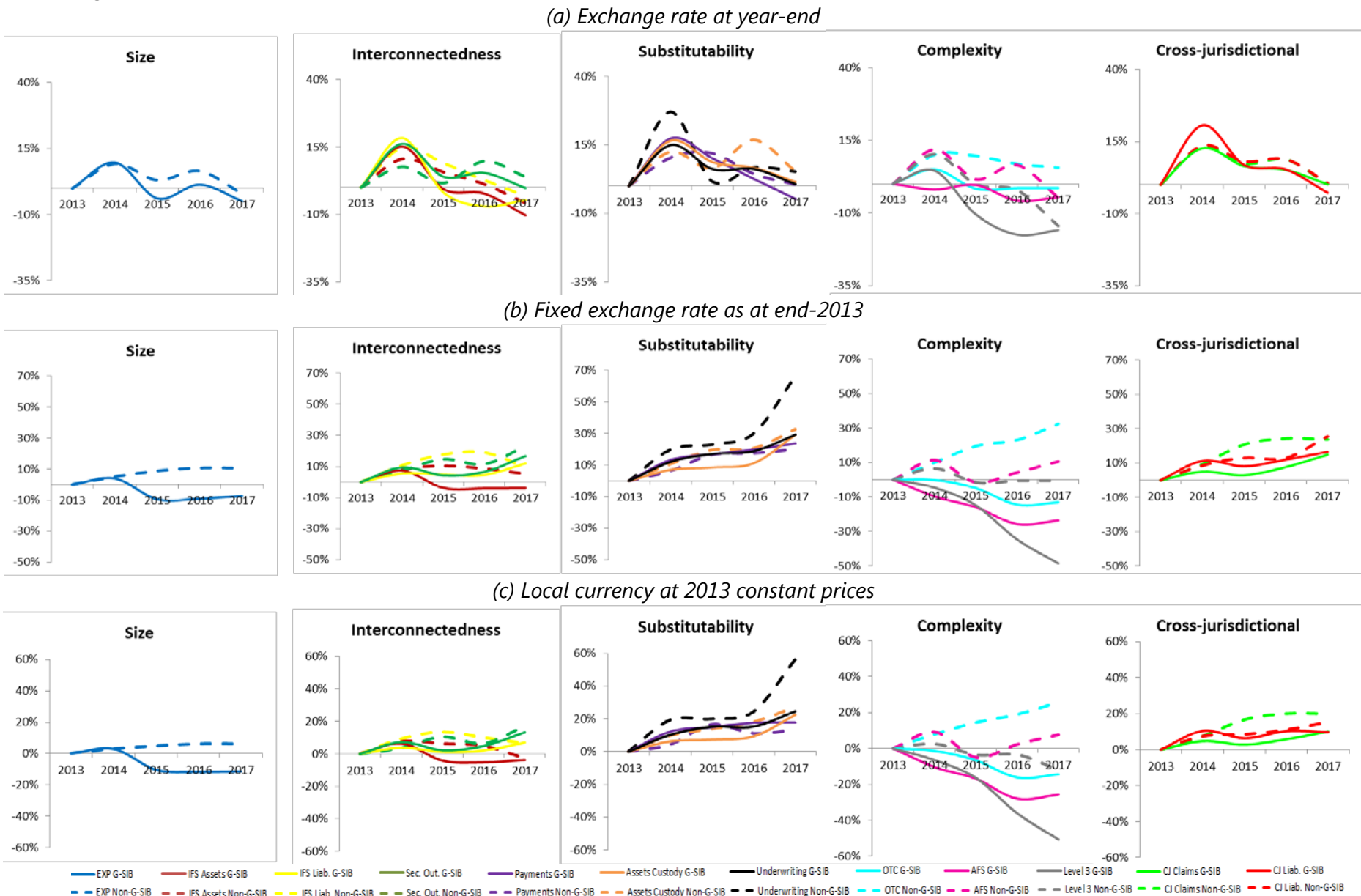
The median growth rate was calculated as follows. First, we calculate the growth rate of the individual values published by banks for each indicator for the 2013–17 period in relation to the base year 2013.²⁵ Second, for each indicator, we separately calculate the median of the individual banks' growth rate for G-SIBs and non-G-SIBs. In Graph 4 item (a), the individual values reported by each bank were converted into euros using the year-end exchange rate, as in the G-SIB methodology. In Graph 4 item (b), the values were converted into euros using the fixed exchange rate as of the end of 2013, in order to eliminate exchange rate effects on the indicators. Finally, in Graph 4 item (c), the individual values reported by each bank were not converted to euros. The individual values reported by each bank were deflated by the consumer price index (CPI) of each country to the 2013 prices.²⁶ Thus, the growth rate was calculated based on data published in local currency at 2013 constant prices.

The results suggest that the median behaviour of the growth rate of the indicators of the G-SIBs and non-G-SIBs is not significantly different when year-end exchange rates are used (see Graph 4 item (a)). However, when the exchange rate effects are eliminated (see Graph 4 items (b) and (c)), the differences in the median behaviour of the growth rate of the indicators of the G-SIBs and non-G-SIBs show up more clearly. In general, Graph 4 items (b) and (c) show that the median growth rate of G-SIBs are not only decreasing or stable for almost all indicators, but also lower than the median growth rates of non-G-SIBs. The exceptions are the indicators of substitutability and cross-jurisdictional categories where the median growth rates for G-SIBs are positive and present a similar behaviour to the non-G-SIBs.

²⁵ For banks that have not publicly disclosed data for the year 2013, this work considers the first year with data publicly disclosed as the basis for comparison.

²⁶ The CPI data were extracted from the Consumer Price Index available at the IMF International Financial Statistics database.

Graph 4 – Median growth rate of the numerator of indicators



3.2 Analysis of the denominator of the indicators

This section aims at analysing the trend of the denominators of the indicators as well as the contribution of G-SIBs and non-G-SIBs as a group to the denominators of the 12 indicators. If the contribution of the G-SIBs to the denominators is decreasing (increasing), this could read as G-SIBs becoming relatively less (more) systemic as a group compared with non-G-SIBs, which would (not) be consistent with the G-SIB framework's aims.²⁷

In Graphs 5–7, the denominators were calculated using the values disclosed by banks that are part of the main sample, as established in the G-SIB methodology. The trend of the denominators of the indicators, with and without the exchange rate effect, is presented in Graph 5. In Graphs 6 and 7, the contributions of the G-SIBs and non-G-SIBs to the denominators of the categories and of the indicators correspond to the ratio between the respective sums of the individual values of the G-SIBs and non-G-SIBs for each category and for each indicator and the denominator of each category and each indicator. Lastly, in Graphs 6 and 7 item (a), data were converted at the year-end exchange rate, as in the current G-SIB methodology. In turn, in Graphs 6 and 7 item (b), data were converted at the end-2013 exchange rate, in order to eliminate the effect of the exchange rate on the denominators.

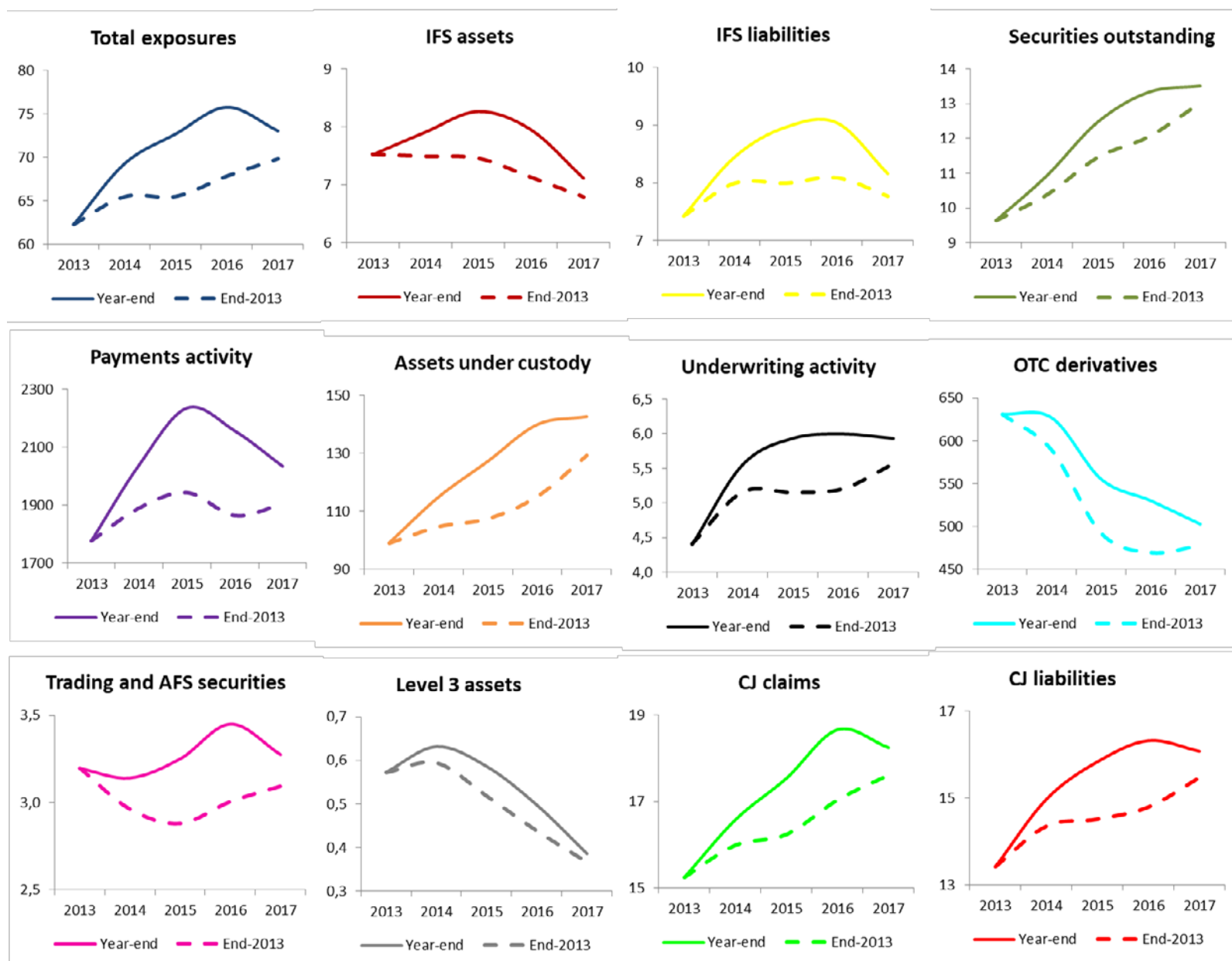
Regardless of the exchange rate used, Graph 5 reveals that the denominators of most indicators increased for the 2013–17 period. The exceptions are intra-financial sector assets and liabilities, payments activity and trading AFS securities, which increased up to 2015 but then declined in the following years. In addition, OTC derivatives and level 3 assets have consistently fallen over time.

Graph 6 shows that the contribution of G-SIBs to the denominators of all categories has continuously decreased over the 2013–17 period. It is important to note that there is no significant difference when the exchange rate effect is eliminated. In addition, Graph 7 also shows a continuous reduction over the 2013–17 period of the contribution of G-SIBs to the denominators of the indicators, including size, even though the aggregate denominators have grown over the period for almost all the 12 indicators.

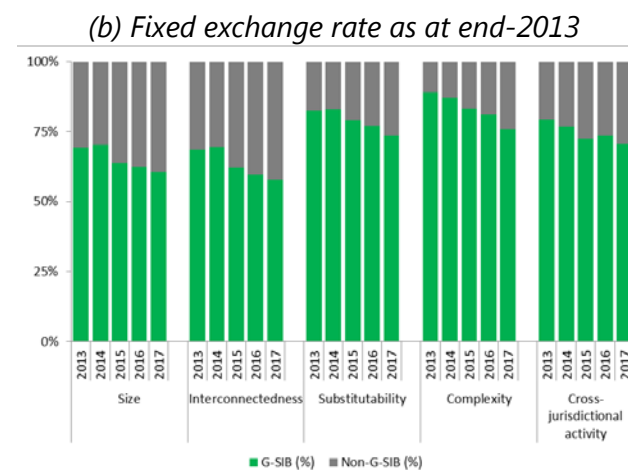
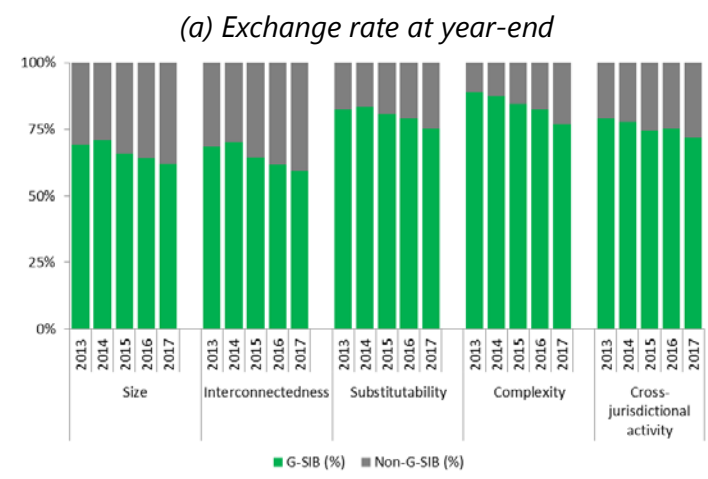
These results suggest that as far as the G-SIB framework denominators are concerned, G-SIBs are becoming relatively less important as a group as compared with non-G-SIBs, which is consistent with the objectives of the G-SIB framework.

²⁷ For this section alone, the non-G-SIBs are restricted to the main sample, ie non-G-SIBs that are part of the additional sample are not included in the analysis.

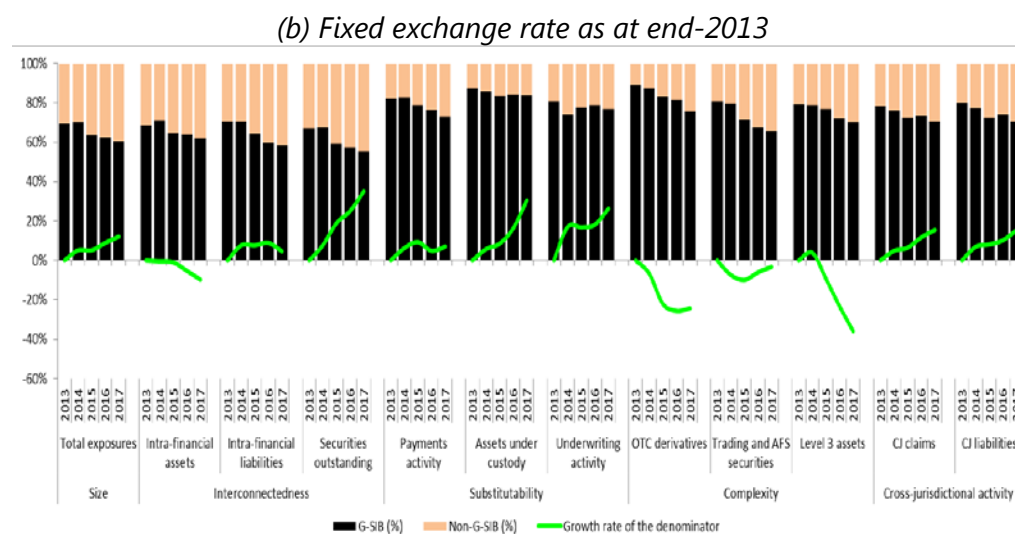
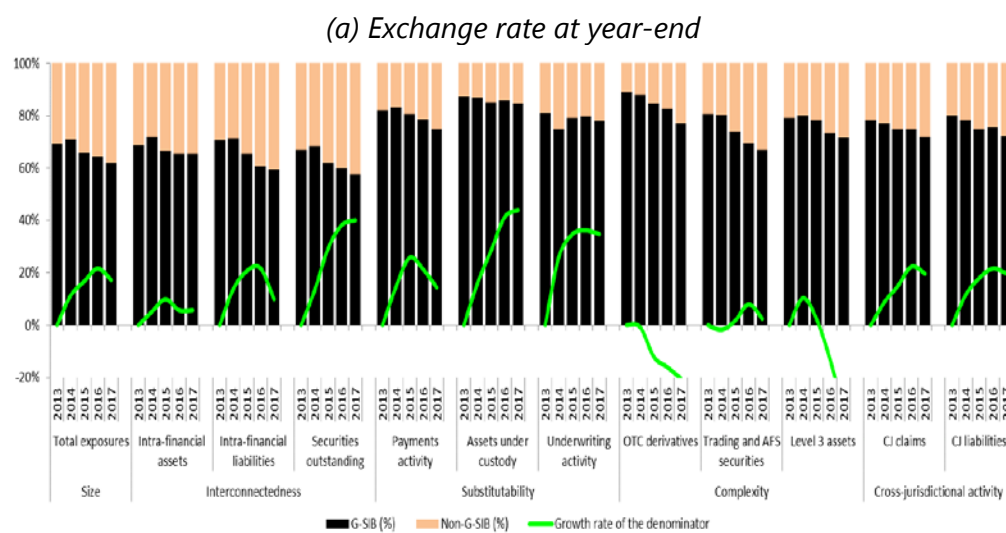
Graph 5 – Denominator of the indicators (in trillions of euros)



Graph 6 – Contribution of G-SIBs and non-G-SIBs to the denominator of the categories



Graph 7 – Contribution of G-SIBs and non-G-SIBs to the denominator of the indicators



3.3 Regional analysis of the indicators

This section analyses the performance of the indicators of G-SIBs and non-G-SIBs when segregated by country/region. The main objective is to verify if G-SIBs and non-G-SIBs present different behaviours according to their country/region in order to check the robustness and deepen the analysis of banks' behaviours. For this purpose, the sample of G-SIBs and non-G-SIBs is divided into six and 10 countries/regions, respectively, in this section.²⁸

G-SIBs were grouped into the following countries/regions:

1. **US** – *United States*: comprises the American G-SIBs;
2. **EA** – *euro area*: comprises the G-SIBs of the euro area (France, Germany, Italy, the Netherlands and Spain);
3. **GB** – *Great Britain*: comprises the British G-SIBs;
4. **N-EA** – *Non-euro area*: comprises the G-SIBs of European countries, except those of the United Kingdom, outside the euro area (Sweden and Switzerland);
5. **CN** – *China*: comprises the Chinese G-SIBs; and
6. **JP** – *Japan*: comprises the Japanese G-SIBs.

Non-G-SIBs were grouped into the following countries/regions:

1. **EA** – *euro area*: comprises the non-G-SIBs of the euro area (Belgium, France, Germany, Italy, the Netherlands and Spain);
2. **N-EA** – *Non-Euro Area*: comprises the non-G-SIBs of European countries, except those of the United Kingdom, outside the euro area (Denmark, Norway and Sweden);
3. **GB** – *Great Britain*: comprises the British non-G-SIBs;
4. **US** – *United States*: comprises the US non-G-SIBs;
5. **CA** – *Canada*: comprises the Canadian non-G-SIBs;
6. **CN** – *China*: comprises the Chinese non-G-SIBs;
AU – *Australia*: comprises the Australian non-G-SIBs;
7. **JP** – *Japan*: comprises the Japanese non-G-SIBs;
8. **KR** – *Korea*: comprises the Korean non-G-SIBs; and
9. **OTHER** – *Other countries*: comprises the non-G-SIBs of the countries not listed above (Brazil, India, Russia and Singapore);

Three different analyses are performed in this section. The first analysis investigates the composition of the scores for G-SIBs and non-G-SIBs in order to identify the most relevant categories for each country/region (see Graph 8). The second analysis evaluates the trajectory of the aggregate values of the numerators of the indicators over time (see Graphs 9 and 10). The third analyses the growth rate of the numerator of the indicators in relation to 2013²⁹ (see Graphs 11 and 12). The findings can be

²⁸ European countries were divided into EA, N-EA and GB for two main reasons. First, we separate EA and N-EA because the local currency influences the results of the indicators due to exchange rate effects. Second, we segregate GB from N-EA because of its relevance among European countries.

²⁹ For banks that have not publicly disclosed data for the year 2013, this work considers the first year with data publicly disclosed as the basis for comparison.

summarised as follows: (i) G-SIBs and non-G-SIBs present a heterogeneous composition of scores across countries/regions; (ii) indicator trends vary across countries/regions; and (iii) G-SIBs and non-G-SIBs behave differently (broadly G-SIBs have reduced the numerators of the indicators while non-G-SIBs have not) for all countries/regions.³⁰

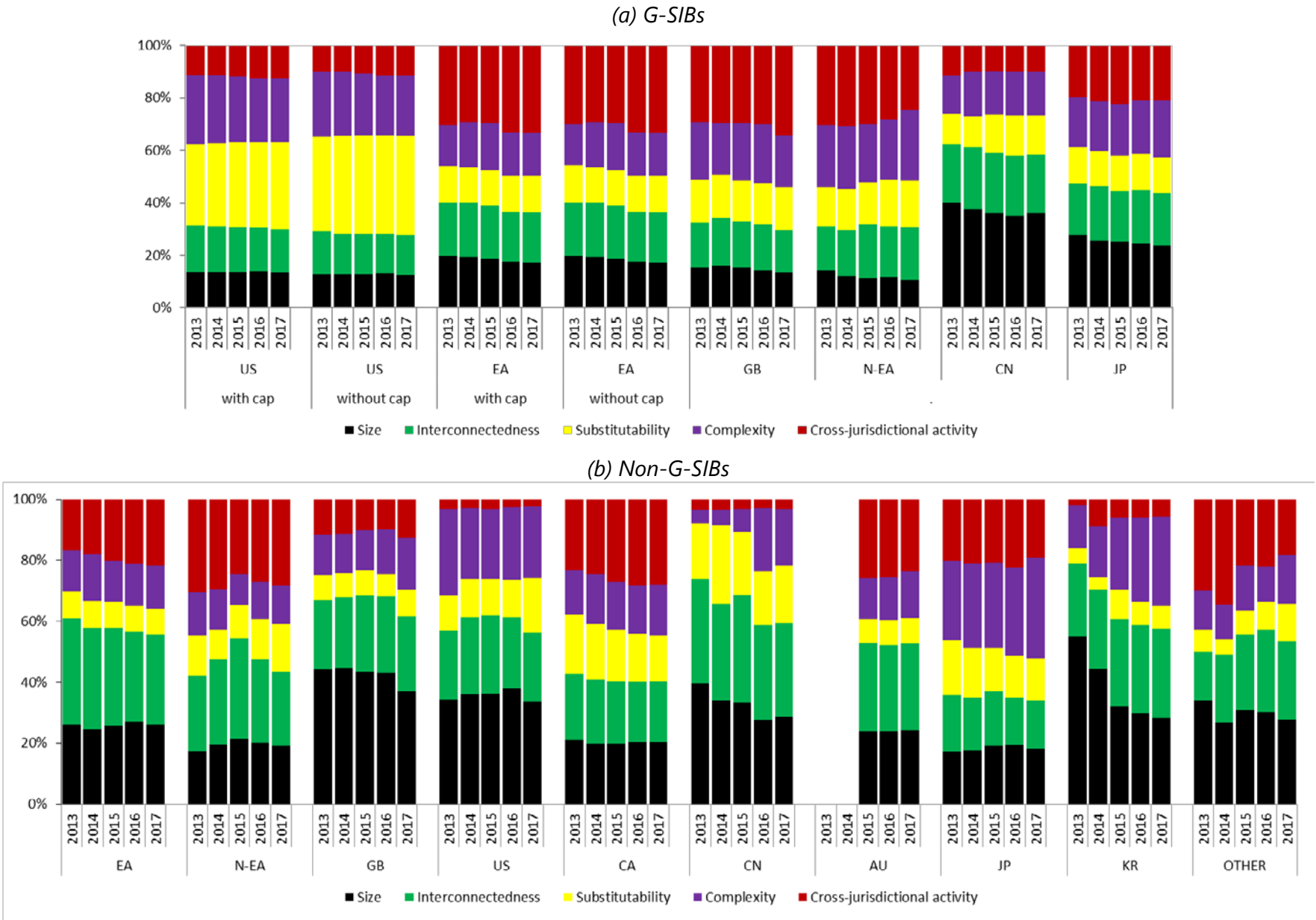
Graph 8 shows the composition of scores of the G-SIBs and non-G-SIBs segregated by country/region. The composition was calculated as follows: for each bank, we divide the category score by the total score and then take the average for banks pertaining to the same country/region. This reveals that the composition of banks' scores (G-SIB and non-G-SIB) differs across countries/regions. The results without the cap on the substitutability category are also presented where the cap changes the final score of the banks (ie only for US and EA G-SIBs). The removal of the cap on the substitutability category does not significantly change the composition of the EA G-SIBs' scores. However, cap removal significantly changes the composition of the US G-SIBs' scores, increasing the relative share of the substitutability category. Additionally, the relative importance of the substitutability category in the G-SIBs' final score is constant for most countries/regions, except for US and CN, where there has been an increase over the period.

Graph 8 item (a) reveals that the most significant categories for US G-SIBs are substitutability and complexity. The composition of scores of EA and GB G-SIBs are similar: cross-jurisdictional activity is the most important category and its relevance increases over time. Cross-jurisdictional activity and complexity have the highest proportions among the N-EA G-SIBs categories. In addition, size stands out as the most significant category for CN G-SIBs (and its percentage is considerably higher when compared with other countries/regions), although its relative share is decreasing over time. Finally, it is noted that the scores composition of JP G-SIBs is more balanced, although the contributions of size and cross-jurisdictional activity categories are slightly higher than those of other indicators.

The composition of the scores for the non-G-SIBs segregated by country/region is reported in Graph 8 item (b). The first notable difference from G-SIBs is that non-G-SIBs differ more across regions than do G-SIBs. In addition, in contrast to G-SIBs, the most significant categories for non-G-SIBs are size, interconnectedness and cross-jurisdictional activity. The relative importance of size for KR, CN, GB and US non-G-SIBs in particular stands out. Interconnectedness is important for CN, AU and EA, while cross-jurisdictional activity is significant for CA, N-EA and OTHER. The substitutability category contributes little for most countries/regions, while complexity is relatively important for JP, KR and US non-G-SIBs.

³⁰ Further work could be pursued to deepen the analysis and understand the drives behind the heterogeneity across regions. It would be desirable to assess if such differences are associated with regional (in terms of structural) differences per se, or with diverging business cycles, or whether they are driven by different business models.

Graph 8 – Composition of scores by country/region



Graphs 9 and 10 show the aggregate values of the numerators of the indicators of the G-SIBs and non-G-SIBs segregated by country/region for the period 2013–17.³¹ The amounts correspond to the sum of the individual values of the numerators of the indicators for each G-SIBs and non-G-SIBs broken down by country/region.³² The difference between items (a) and (b) is the exchange rate used to convert the amounts to euros. In item (a), the data were converted based on the year-end exchange rate, as in the current G-SIB methodology. In item (b), the data were converted based on the end-2013 exchange rate. As in the previous section, the rate is held fixed over the years in order to reveal the behaviour of the indicators independently of exchange rate effects. In general, the results using the year-end and the fixed exchange rates are quite similar.

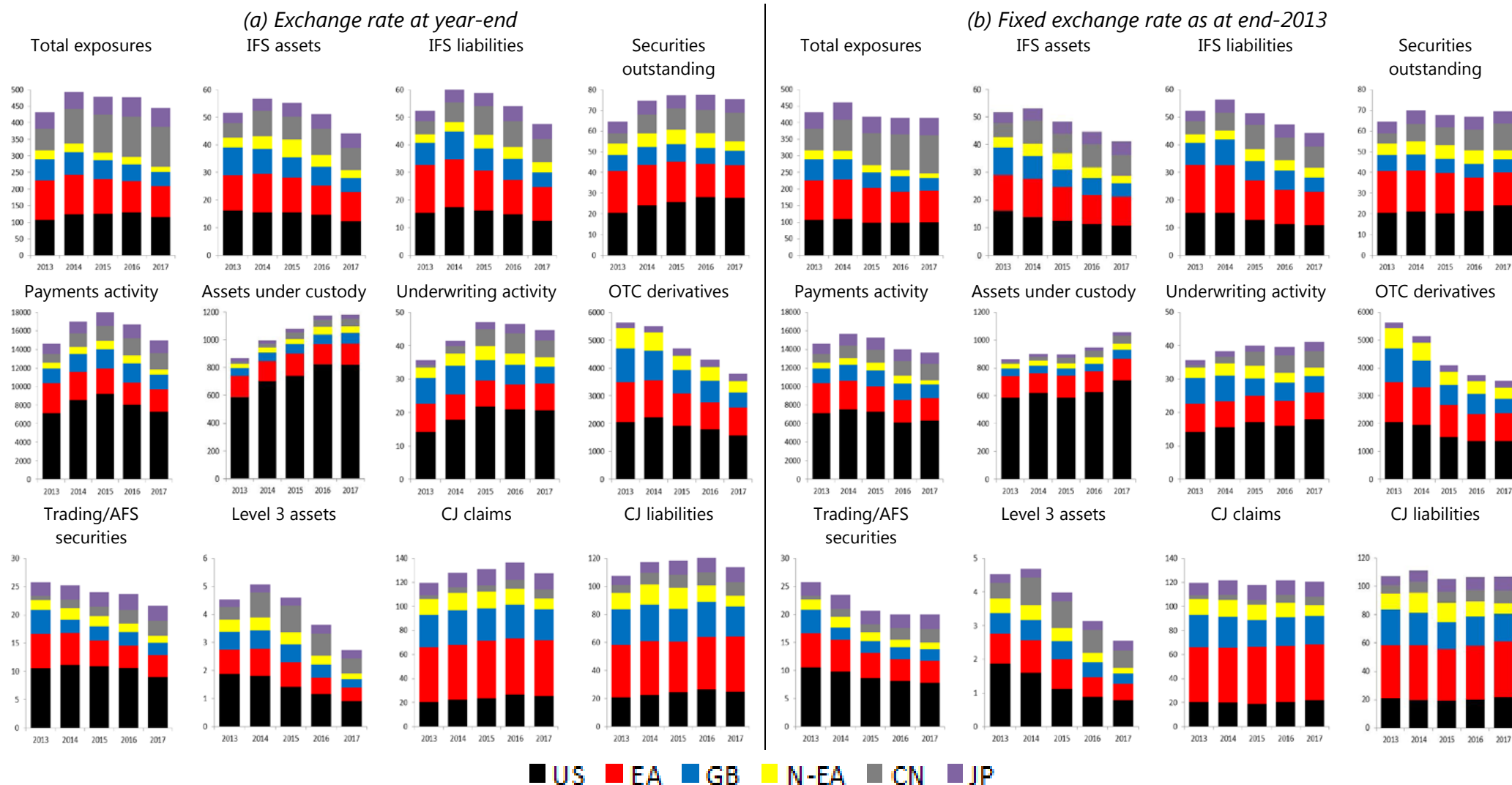
Graph 9 shows the behaviour of the aggregate indicator numerators of the G-SIBs across regions. In this graph, the contributions of US, EA and CN to the size category stand out, as well as the share of CN in the size category, the US in the substitutability category and the EA in the cross-jurisdictional activity. While US and CN G-SIBs have grown since 2013, EA G-SIBs have reduced their size over the years. Regarding interconnectedness, US and EA banks dominate the aggregate amount. In addition, the proportionate contributions of different regions have remained stable over time for almost all indicators. The exceptions are US and CN G-SIBs, which increased the securities outstanding indicator during the period. Graph 9 also reveals that the US G-SIBs are outliers in the substitutability category, representing more than half of the total aggregated value for G-SIBs across all countries/regions. Moreover, while other countries/regions present a stable or a small variation in the proportionate contribution to the aggregate amount, US showed strong growth, mainly in assets under custody. The reductions in the numerators of the indicators of the complexity category can be explained in part by the reduction observed in US, EA and GB G-SIBs. In addition, it is observed that CN G-SIBs make no contribution to the OTC derivatives indicator, but have a significant share in the level 3 assets indicator. Finally, the trajectory of the two indicators of the cross-jurisdictional activity category can be explained by the EA G-SIBs, whose contribution prevails in both indicators.

Graph 10 shows the behaviour of the indicator numerators aggregated for the non-G-SIBs across regions. Noteworthy is the share of CN in all categories, except in the cross-jurisdictional activity category. The EA non-G-SIBs contribute significantly in the interconnectedness and cross-jurisdictional activity categories, and the N-EA, CA and AU non-G-SIBs also contribute noticeably in the cross-jurisdictional activity category. The CN and EA non-G-SIBs both stand out in explaining the behaviour of indicators of the size and interconnectedness categories. In particular, the CN non-G-SIBs presented significant growth in the IFS liabilities indicators. Moreover, CN non-G-SIBs are outliers in the substitutability category and this category has grown significantly over time, mainly in assets under custody and underwriting activity. The JP, CA and EA non-G-SIBs have relatively large shares in the indicators of the complexity category, especially OTC derivatives. It is also important to note the significant growth of the CN non-G-SIBs' contribution to the trading/AFS securities indicator. Finally, the EA, N-EA, CA and AU non-G-SIBs account to a large extent for the variations of the indicators of the cross-jurisdictional activity category.

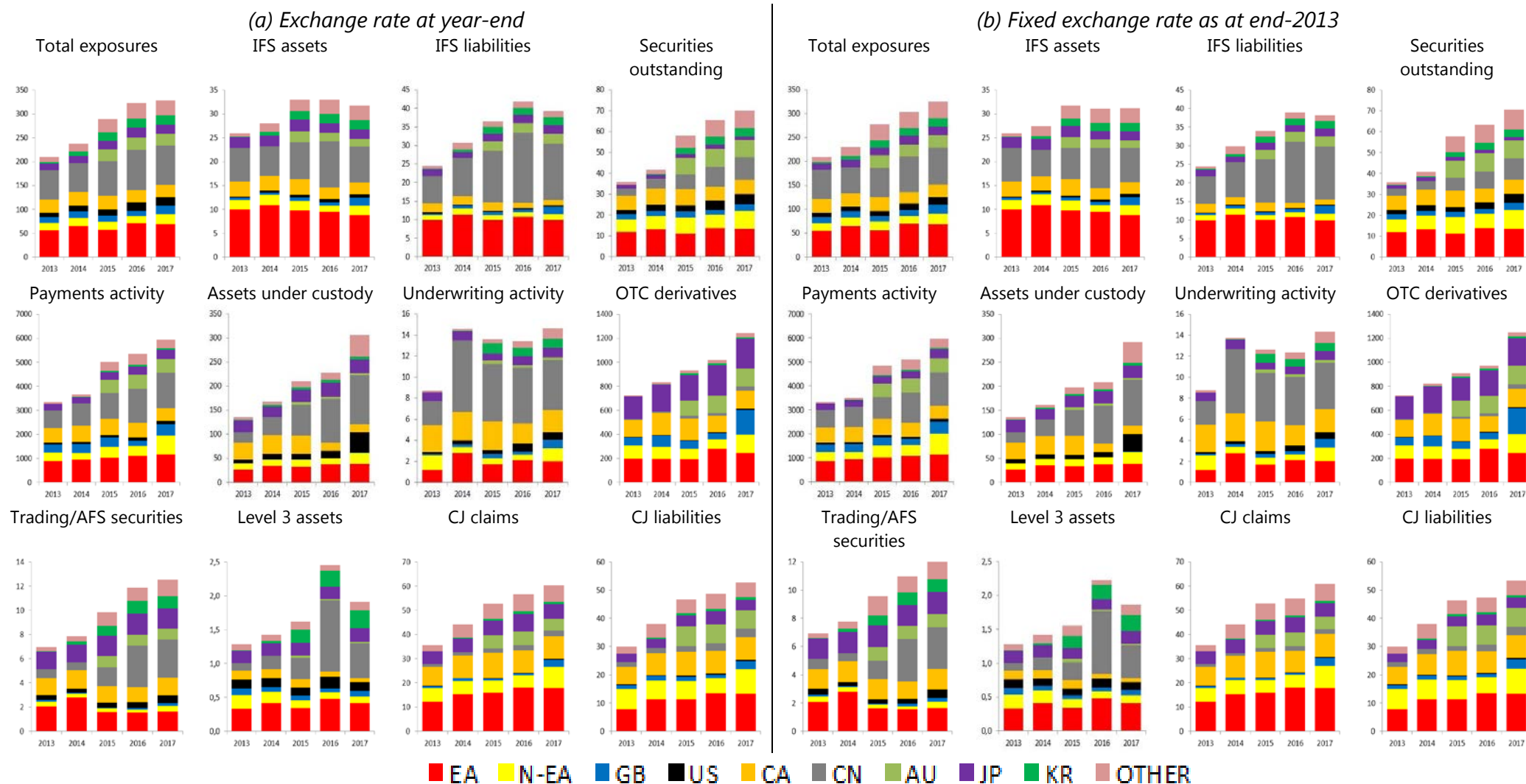
³¹ Except for the Australian non-G-SIBs, for which data are available from 2015 onwards.

³² Note that the sum of the numerators of each indicator across all banks would represent the denominator which is used in calculating each bank's indicator score.

Graph 9 – Numerators of indicators by country/region – G-SIBs (in 0.1 trillions of euros)



Graph 10 – Numerators of indicators by country/region – Non-G-SIBs (in 0.1 trillions of euros)



In the previous section, Graph 3 showed that the numerators of the indicators of the non-G-SIBs have growth rates higher than those of the G-SIBs and that this difference is more evident when the effects of the exchange rate on the indicators are eliminated. In this section, the same analysis broken down by country/region is presented in Graphs 11 and 12. The percentages in Graphs 11 and 12 correspond to the growth rates of the numbers presented in Graphs 9 and 10 in relation to 2013.^{33 34} The difference between items (a) and (b) is the exchange rate used to convert the amounts to euros. In item (a), data were converted based on the year-end exchange rate, as in the current G-SIB methodology. In item (b), data were converted based on the end-2013 exchange rate. As in the previous exercise, the exchange rate was fixed over the years to eliminate the effect of exchange rate fluctuations on the indicators.

Graph 11 shows the behaviour of the growth rate of the numerator of G-SIBs indicators across regions. Taking into account the exchange rate used by the current G-SIB methodology (see Graph 11 item (a)), EA G-SIBs have consistently reduced the numerators of the indicators. The same can be said for GB banks with two exceptions: payments activity and assets under custody. For other countries/regions, most indicators had a positive growth rate of the numerators, which is not an underlying intention of the G-SIB framework. One possible explanation is the effect of the exchange rate on the G-SIBs' indicators for the non-euro area countries/regions.³⁵ Thus, it would be desirable to perform the same analysis after neutralising exchange rate effects (see Graph 11 item (b)).

Graph 11 item (b) shows the behaviour of the growth rate of the numerator of G-SIBs indicators across regions but abstracts to a large extent the effects of the exchange rate on the numerators of the indicators. The graph shows that US, GB and EA G-SIBs had negative growth rates for most of the indicators compared with 2013. The main exceptions are the positive growth rates observed in the indicators of the substitutability category for the US G-SIBs. On the other hand, CN and JP G-SIBs showed relatively positive growth rates for all indicators, with particularly high growth rates for the substitutability category indicators. For their part, the N-EA G-SIBs indicators showed mixed growth rates. In addition, the G-SIBs of almost all countries/regions showed positive growth rates for the substitutability category indicators.

Graph 12 shows the behaviour of the numerator growth rate of non-G-SIBs' indicators across regions. Considering the current methodology of the G-SIB framework, which uses the exchange rate year-end to convert amounts to euros, it is possible to observe in Graph 12 item (a) that most countries/regions show positive growth rates for the numerator of the indicators. The exceptions are CA and AU non-G-SIBs, which showed negative growth rates for the great majority of the indicators. However, as it was observed in the analysis for the G-SIBs, the exchange rate also influences the results for non-G-SIBs. When the effects of the exchange rate on the numerator of the indicators are eliminated (see Graph 12 item (b)), it is possible to distinguish three types of behaviour: (i) countries/regions where non-G-SIBs showed positive growth rates for most indicators (EA, GB, US, CN, KR and OTHER³⁶); (ii) countries/regions where the growth rate of the non-G-SIBs' indicators is mixed (N-EA and JP); and (iii) countries/regions where non-G-SIBs presented negative growth rates for most indicators (CA and AU). Graph 12 provides additional indications that non-G-SIBs behaved differently to G-SIBs. Given that G-SIBs in all regions except CN and JP reduced the nominal values of most indicators, one could argue that this result accords with the incentives created by the G-SIB framework. Given that most non-G-SIBs are far from reaching the 130 bp cutoff threshold that would make them a G-SIB, one could expect the framework to have less impact on non-G-SIBs, if any.

³³ For banks that have not publicly disclosed data for the year 2013, this work considers the first year with data publicly disclosed as the basis for comparison

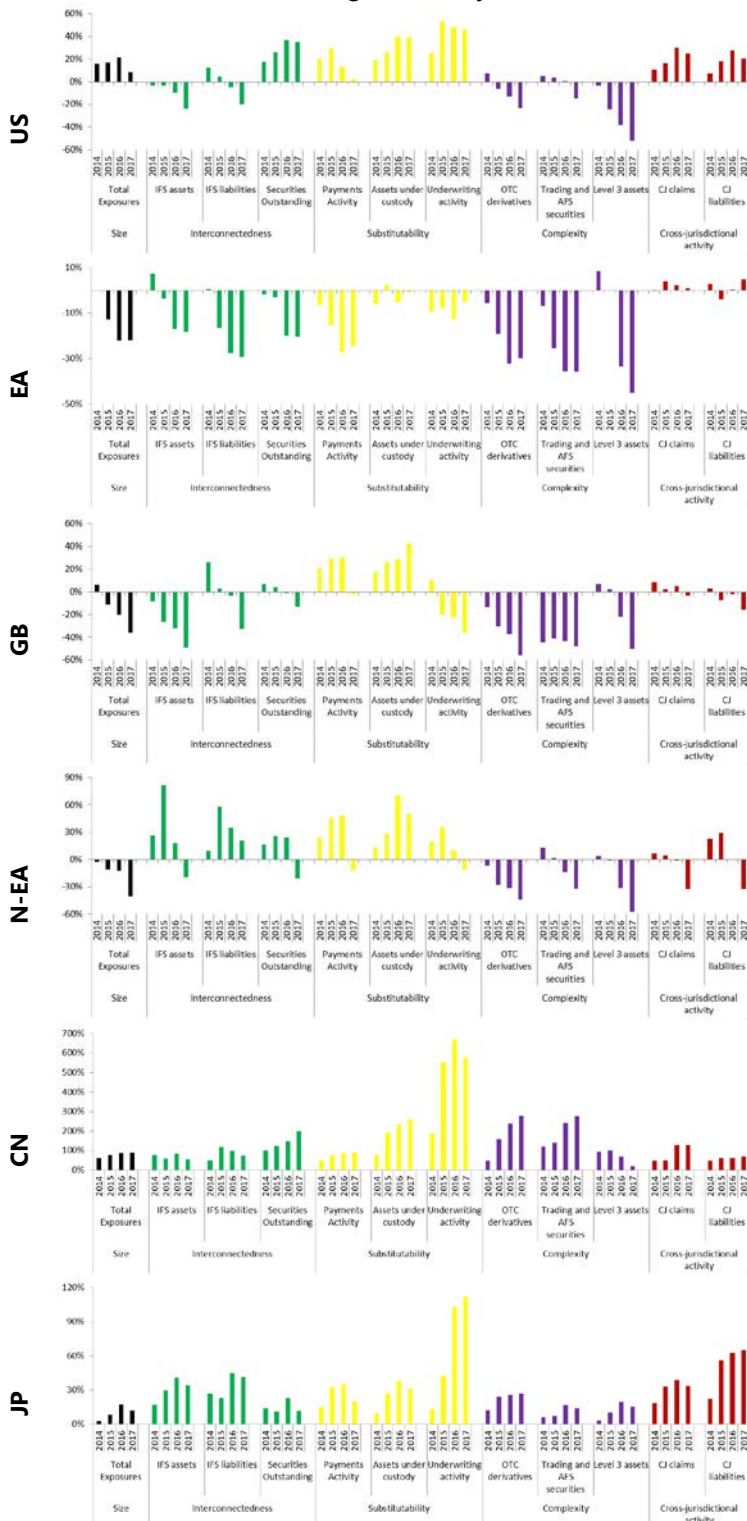
³⁴ In order to calculate the numerator growth rate, we sum the numerators of the indicators for all banks in the same country/region and calculate the change with respect to the 2013 value.

³⁵ For countries/regions outside the euro area, the exchange rate influences the behaviour of their indicators since they are converted to euros based on the end-year exchange rate, as in the current G-SIB methodology.

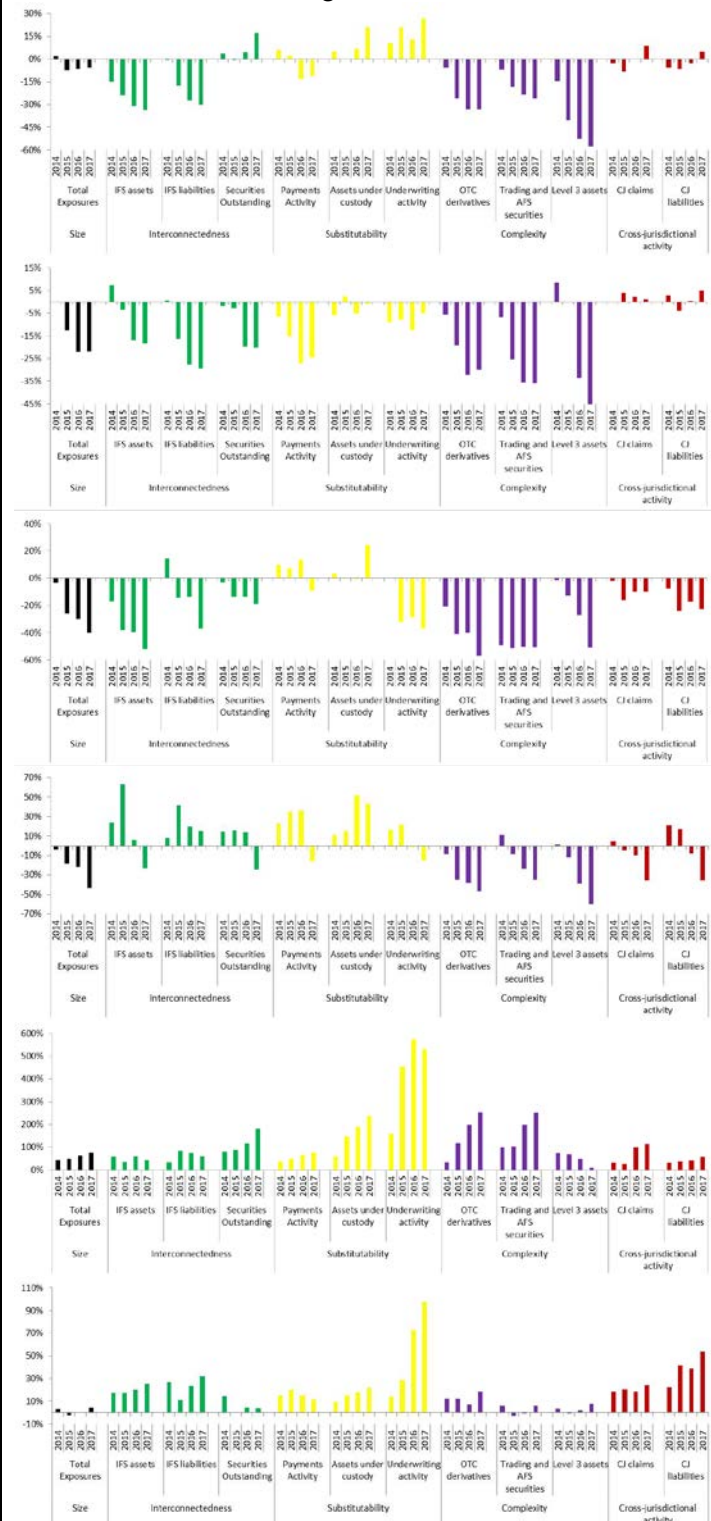
³⁶ Korean non-G-SIBs showed a growth rate higher than 10,000% for the underwriting activity indicator.

Graph 11 – Growth rate of the numerators of indicators by country/region – G-SIBs

(a) Exchange rate at year-end

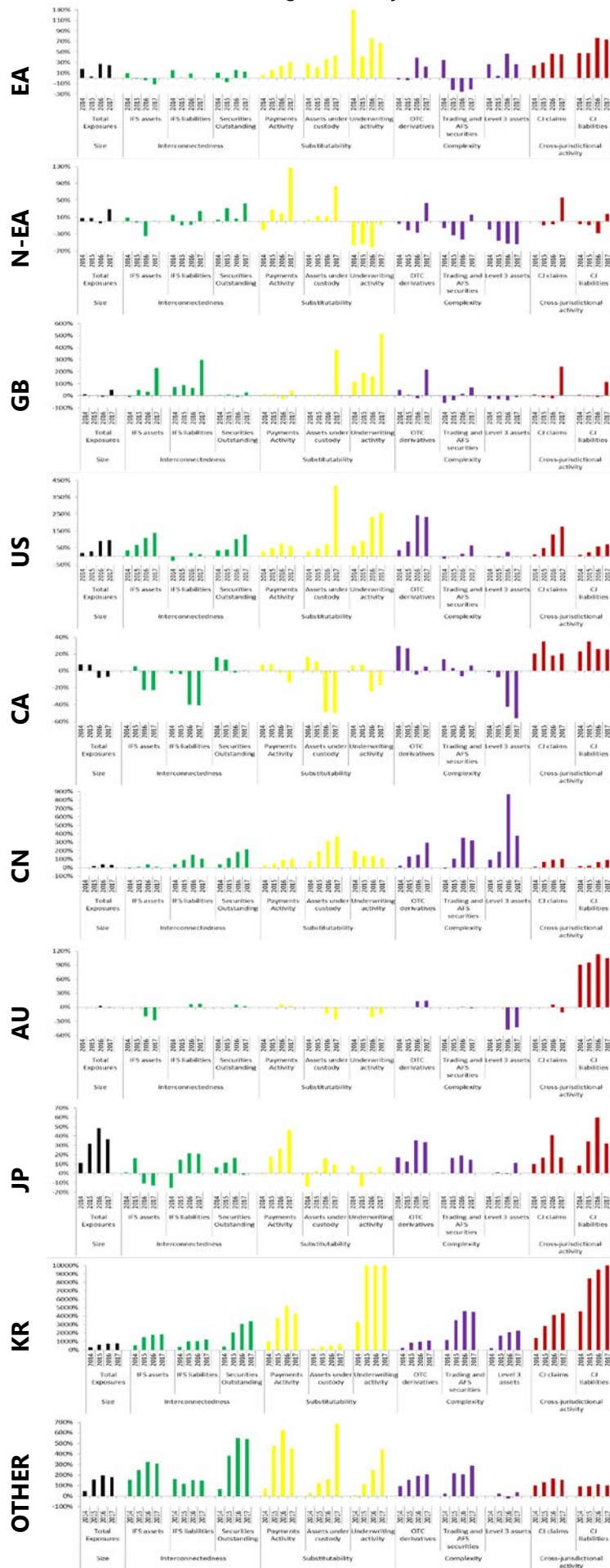


(b) Fixed exchange rate as at end-2013

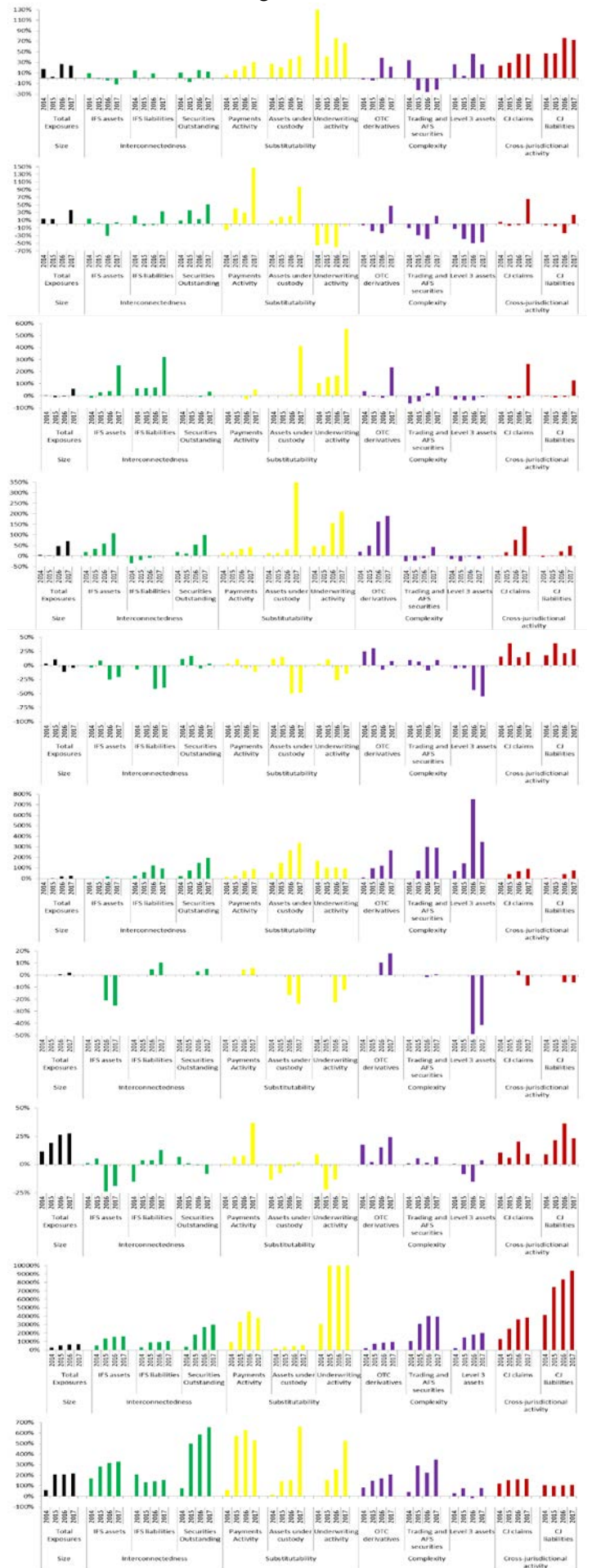


Graph 12 – Growth rate of the numerators of indicators by country/region – non-G-SIBs³⁷

(a) Exchange rate at year-end



(b) Fixed exchange rate as at end-2013



4. Conclusion

This paper presents an analysis of experience to date with the G-SIB framework. The aim has been to investigate whether the behaviour of the indicators for the G-SIBs and non-G-SIBs with a Basel III leverage ratio exposure measure greater than EUR 200 billion since the framework's implementation has been consistent with its objectives. The banks assessed include the G-SIBs and the non-G-SIBs that were part of the sample of banks used to designate G-SIBs, as well as the additional sample of banks that complete the G-SIB template but do not rank among the 75 largest banks. The analysis has made use of data publicly disclosed by 104 banks with a Basel III leverage ratio exposure measure greater than EUR 200 billion euros in the 2013–17 period.

Several elements have been assessed. First, the numerators and denominators of the 12 G-SIB indicators were analysed separately. Then, the extent of regional differences in the behaviour of the G-SIBs and non-G-SIBs were assessed.

The analysis of indicator numerators and denominators has revealed that both the group of G-SIBs and that of non-G-SIBs are heterogeneous, with the implication that some central tendency measures within each group are highly influenced by a few banks. With regard to G-SIBs, the results suggest a general reduction in G-SIB scores over time for most indicators and for the final score. These developments are consistent with the objectives of the G-SIB framework. The observed reduction in scores becomes more evident when exchange rates and denominators are fixed. Exceptions to the observation of a reduction in indicator scores nevertheless occur with the indicators of the substitutability category, where a small increase has been observed or where the reduction is less evident. Finally, movements in exchange rates appear to have had a significant effect on the results.

The analysis reveals that non-G-SIBs behave differently from G-SIBs as a group. Non-G-SIBs have increased all of their G-SIB indicators as well as their final G-SIB score. This finding is once again consistent with the idea that the G-SIB framework may provide additional incentives to G-SIBs to reduce their G-SIB scores.

While the analysis finds that G-SIBs as a group have reduced their G-SIB scores, the regional analysis indicates heterogeneity across countries and regions. Euro area, GB and US G-SIBs have reduced their systemic importance, especially when exchange rate effects are removed. On the other hand, Chinese and Japanese G-SIBs have exhibited relatively positive growth rates for all indicators, and particularly high growth rates for the substitutability category indicators. At the same time, the regional analysis shows an increase in the relative importance of non-G-SIBs in all countries and regions.

While this paper makes a first attempt to analyse experience to date with the G-SIB framework, it is important to note that a number of potentially important factors have not been taken into account. We have not been able to assess the effect of business cycles in different countries, of market views on the effectiveness of the G-SIB framework, or the degree to which capital requirements may or may not be binding for banks in the sample. In addition, it was not possible at this juncture to disentangle the effects of other measures that have been put in place during the analysed period and which were aimed at G-SIBs or non-G-SIBs with a Basel III leverage ratio exposure measure greater than EUR 200 billion. Finally, it was not possible at the current juncture to undertake an econometric exercise which could test hypotheses relating to G-SIB behaviour or to establish relationships between the G-SIB framework and observed behaviour. All of these factors are potentially relevant for assessing how far the G-SIB framework has achieved the intended objectives.

Appendix

Table 1 – Summary statistics – All banks

	Mean					Median					Std Dev.					Skewness					Minimum					Maximum				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Systemic risk score																														
FSB score	126	117	109	107	107	88	78	70	71	71	117	111	104	101	99	1,6	1,5	1,5	1,5	1,5	13	11	14	12	12	504	495	464	467	441
FSB score (without a cap on substitutability)	130	121	112	110	109	88	78	70	71	71	128	120	112	108	105	1,9	1,9	1,8	1,9	1,8	13	11	14	12	12	646	628	582	588	557
Systemic risk categories																														
Size	129	119	113	110	110	91	88	80	74	73	102	102	100	99	99	1,1	1,4	1,7	1,8	1,9	31	24	26	26	27	390	421	463	466	493
Interconnectedness	129	123	116	112	112	103	89	96	90	89	98	96	86	85	84	1,4	1,3	1,1	1,1	1,1	9	12	13	14	14	434	482	401	411	407
Substitutability (with a cap = 500)	111	104	94	93	95	55	53	45	42	46	137	133	125	124	122	1,9	1,9	2,0	2,1	2,1	2	1	1	1	1	500	500	500	500	500
Substitutability	131	121	109	106	106	55	53	45	42	46	211	201	183	176	171	3,1	3,3	3,4	3,4	3,4	2	1	1	1	1	1.209	1.168	1.091	1.104	1.082
Complexity	131	120	112	113	112	61	48	45	54	57	178	164	150	141	134	2,0	2,0	2,0	1,8	1,9	1	1	1	4	3	864	762	709	654	624
Cross-jurisdictional activity	130	120	111	108	107	74	68	61	58	59	149	143	138	137	136	1,9	2,0	2,0	2,1	2,1	0	1	0	0	0	790	771	735	763	732
Indicators																														
Total exposures	129	119	113	110	110	91	88	80	74	73	102	102	100	99	99	1,1	1,4	1,7	1,8	1,9	31	24	26	26	27	390	421	463	466	493
Intra-financial system assets	134	130	117	112	113	101	97	83	80	76	117	110	98	97	98	1,4	1,1	1,1	1,1	1,0	4	5	5	2	0	513	483	451	393	372
Intra-financial system liabilities	131	124	115	113	111	101	89	85	80	80	118	109	101	102	95	1,7	1,5	1,0	1,1	0,9	2	2	2	1	0	556	530	415	430	432
Securities outstanding	123	115	117	112	112	99	83	93	88	86	92	94	89	87	87	1,1	1,2	1,3	1,4	1,5	9	2	10	4	9	401	433	425	426	417
Payments activity	129	117	109	107	106	57	45	46	50	50	229	211	195	176	168	3,7	3,7	3,9	3,8	3,8	0	0	0	0	0	1.259	1.248	1.160	1.201	1.175
Assets under custody	133	121	108	105	108	24	21	18	20	20	323	313	287	273	266	3,9	4,1	4,4	4,5	4,4	0	0	0	0	0	1.710	1.746	1.686	1.650	1.554
Underwriting activity	132	127	109	105	105	56	50	47	42	41	196	191	169	162	159	2,0	2,0	2,2	2,4	2,4	0	0	0	0	0	820	760	730	774	775
OTC derivatives	132	120	109	105	104	22	17	21	20	19	226	214	192	185	181	1,9	2,1	2,2	2,2	2,3	0	0	0	0	0	775	844	798	797	833
Trading and AFS securities	132	122	112	107	108	65	58	55	54	63	180	163	148	135	126	2,4	2,4	2,5	2,2	1,9	2	2	1	2	2	978	812	839	724	621
Level 3 assets	130	119	114	125	123	54	48	39	47	54	175	166	165	177	158	2,0	1,9	1,9	2,0	1,6	0	0	0	0	0	844	632	680	860	625
Cross-jurisdictional claims	131	120	111	108	107	74	66	56	54	51	148	146	142	138	137	1,6	1,9	2,1	2,1	2,0	0	0	0	0	0	702	742	766	754	737
Cross-jurisdictional liabilities	130	119	112	108	108	78	74	71	65	68	153	144	138	138	136	2,2	2,0	1,9	2,2	2,1	0	0	0	0	0	879	800	705	771	728

Table 2 – Summary statistics – G-SIBs and non-G-SIBs

G-SIBs

	Mean					Median					Std Dev.					Skewness					Minimum					Maximum				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Systemic risk score																														
FSB score	235	236	234	231	239	198	208	209	207	216	115	102	95	92	85	1,1	1,2	1,0	1,0	0,9	92	129	123	115	131	504	495	464	467	441
FSB score (without a cap on substitutability)	245	246	243	239	247	204	209	211	214	216	132	118	110	106	98	1,5	1,7	1,5	1,6	1,5	92	129	123	115	131	646	628	582	588	557
Systemic risk categories																														
Size	217	222	219	214	222	204	199	194	182	205	99	104	113	118	118	0,1	0,2	0,4	0,5	0,5	38	33	32	32	28	390	421	463	466	493
Interconnectedness	215	224	218	209	217	197	215	212	214	207	97	85	71	69	67	0,9	1,1	0,6	0,7	0,8	81	93	91	96	93	434	482	401	411	407
Substitutability (with a cap =500)	220	221	224	230	241	173	174	188	195	203	159	155	147	145	143	0,8	0,9	0,8	0,9	0,8	49	53	47	63	64	500	500	500	500	500
Substitutability	272	270	270	271	282	173	174	188	195	203	278	273	256	245	241	2,0	2,0	1,9	2,0	1,9	49	53	47	63	64	1.209	1.168	1.091	1.104	1.082
Complexity	269	267	263	250	256	174	210	219	212	248	215	197	181	170	164	0,9	0,8	0,7	0,6	0,5	33	26	31	26	25	864	762	709	654	624
Cross-jurisdictional activity	253	249	247	250	258	243	244	225	215	237	166	165	165	163	163	1,2	1,1	1,0	1,2	1,0	18	24	27	31	36	790	771	735	763	732
Indicators																														
Total exposures	217	222	219	214	222	204	199	194	182	205	99	104	113	118	118	0,1	0,2	0,4	0,5	0,5	38	33	32	32	28	390	421	463	466	493
Intra-financial system assets	223	241	227	222	232	187	233	231	231	230	129	102	91	86	85	0,7	0,1	0,1	0,0	-0,2	29	40	34	43	38	513	483	451	393	372
Intra-financial system liabilities	223	226	220	207	213	197	210	204	197	209	129	108	87	86	79	1,3	1,3	0,5	0,4	0,4	60	68	57	47	50	556	530	415	413	432
Securities outstanding	199	204	206	199	205	183	190	191	183	179	91	90	90	94	98	0,5	0,7	0,8	0,8	0,6	29	41	50	55	55	401	433	425	426	417
Payments activity	263	266	266	262	266	139	148	149	162	193	317	297	284	252	246	2,3	2,3	2,3	2,3	2,3	33	44	41	45	48	1.259	1.248	1.160	1.201	1.175
Assets under custody	288	286	281	286	302	75	77	80	111	127	472	480	461	443	441	2,3	2,3	2,3	2,3	2,2	1	6	7	2	7	1.710	1.746	1.686	1.650	1.554
Underwriting activity	265	260	263	266	278	143	132	170	197	253	247	234	225	212	208	0,9	0,9	0,8	0,9	0,9	0	0	0	0	0	820	760	730	774	775
OTC derivatives	293	288	281	275	276	143	158	199	189	190	287	281	258	248	249	0,6	0,6	0,6	0,7	0,7	2	2	4	4	6	775	844	798	797	833
Trading and AFS securities	259	256	246	232	239	208	214	218	218	232	225	203	191	170	154	1,4	1,3	1,3	1,1	0,7	16	30	23	24	24	978	812	839	724	621
Level 3 assets	254	256	261	243	255	176	185	227	239	248	216	205	206	196	180	1,0	0,6	0,5	0,7	0,2	2	1	0	0	0	844	632	680	770	625
Cross-jurisdictional claims	252	248	246	249	257	248	238	211	205	232	164	170	173	164	165	0,8	1,0	1,1	1,1	0,9	11	15	10	26	29	702	742	766	754	737
Cross-jurisdictional liabilities	254	250	248	251	259	247	237	209	210	223	174	166	161	165	163	1,5	1,2	0,9	1,2	1,1	24	34	30	36	44	879	800	705	771	728

Non-G-SIBs

	Mean					Median					Std Dev.					Skewness					Minimum					Maximum				
	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017	2013	2014	2015	2016	2017
Systemic risk score																														
FSB score	54	50	50	52	54	45	45	41	43	45	30	28	29	31	31	0,8	0,6	0,7	0,8	0,7	13	11	14	12	12	124	122	117	128	441
FSB score (without a cap on substitutability)	54	50	50	52	54	45	45	41	43	45	30	28	29	31	31	0,8	0,6	0,7	0,8	0,7	13	11	14	12	12	124	122	117	128	557
Systemic risk categories																														
Size	70	61	63	63	65	57	50	47	52	51	48	31	31	34	34	3,4	1,0	0,9	1,0	1,1	31	24	26	26	27	319	150	155	165	493
Interconnectedness	72	66	68	69	70	70	62	61	54	54	41	36	36	46	42	0,8	0,5	0,5	1,7	1,1	9	12	13	14	14	199	163	173	269	407
Substitutability (with a cap =500)	38	37	32	32	36	34	26	26	27	28	38	46	30	27	29	3,2	3,0	1,6	1,1	0,9	2	1	1	1	1	232	251	155	108	500
Substitutability	38	37	32	32	36	34	26	26	27	28	38	46	30	27	29	3,2	3,0	1,6	1,1	0,9	2	1	1	1	1	232	251	155	108	1.082
Complexity	40	37	39	51	54	30	26	28	35	37	37	37	42	59	52	1,4	1,7	2,5	2,4	1,8	1	1	1	4	3	162	166	215	287	624
Cross-jurisdictional activity	49	47	47	45	47	32	32	30	29	32	44	47	50	49	51	0,7	1,2	1,4	1,5	1,3	0	1	0	0	0	157	192	224	216	732
Indicators																														
Total exposures	70	61	63	63	65	57	50	47	52	51	48	31	31	34	34	3,4	1,0	0,9	1,0	1,1	31	24	26	26	27	319	150	155	165	493
Intra-financial system assets	75	67	65	63	66	60	49	62	48	52	57	47	43	51	52	1,2	1,0	0,7	1,9	1,4	4	5	5	2	0	254	207	170	292	372
Intra-financial system liabilities	69	65	65	71	70	57	53	49	46	49	53	52	60	78	66	1,3	1,2	1,6	2,4	1,6	2	2	2	1	0	253	217	296	430	432
Securities outstanding	73	65	74	74	74	63	53	65	64	65	49	46	47	47	44	0,8	0,9	0,7	0,8	0,7	9	2	10	4	9	194	177	195	210	417
Payments activity	40	32	35	37	42	29	24	25	30	33	40	34	33	32	38	1,6	2,0	1,6	0,8	1,0	0	0	0	0	0	174	170	168	118	1.175
Assets under custody	30	27	26	24	31	17	13	12	13	14	41	39	37	33	45	3,1	3,2	2,7	2,6	2,5	0	0	0	0	0	213	216	182	189	1.554
Underwriting activity	43	52	36	33	36	24	24	26	21	26	67	105	45	40	40	3,3	4,7	2,1	1,9	1,8	0	0	0	0	0	367	684	208	186	775
OTC derivatives	25	25	27	29	35	9	6	7	7	9	47	51	51	61	71	3,7	4,3	4,6	5,2	4,2	0	0	0	0	0	270	321	350	442	833
Trading and AFS securities	47	45	48	51	55	28	26	38	38	39	51	50	52	59	58	1,9	2,5	3,6	2,8	2,2	2	2	1	2	2	251	283	358	321	621
Level 3 assets	48	41	44	73	70	30	19	23	32	35	57	55	72	141	113	1,9	2,5	4,2	4,0	3,2	0	0	0	0	0	269	295	487	860	625
Cross-jurisdictional claims	50	48	47	45	47	42	29	36	26	30	50	51	52	52	54	1,0	1,2	1,5	1,6	1,5	0	0	0	0	0	187	198	211	233	737
Cross-jurisdictional liabilities	47	46	47	44	47	33	30	27	22	24	45	48	52	48	51	1,1	1,6	1,6	1,5	1,2	0	0	0	0	0	200	209	236	232	728