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Large-country bias and the limits on sovereign concentration risk

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Summary

With a view to loosening the link between sovereigns' and banks' creditworthiness, some suggest that large-exposure limits be introduced on banks' holdings of sovereign debt. However, this proposal has several drawbacks. In particular, the enforcement of a single threshold for all sovereign bonds, without regard to the size of the country's economy, might lead to a *negative* home bias for banks from large countries.

Introduction and main conclusions

In the aftermath of the euro-area sovereign debt crisis several commentators have claimed that the prudential regulation of sovereign exposures encourages banks to hold excessive amounts of bonds issued by their own government, leading to excessive "home bias". This in turn may be detrimental for financial stability because it may trigger a "perverse loop" during a sovereign crisis: a reduction in sovereign creditworthiness reduces the value of banks' assets, increasing the probability of a public bail-out of the banking sector using public funds, thus reinforcing the initial shock.[1]

On the other side, economists generally acknowledge that home bias is "*a perennial feature of international capital markets*" (Coeurdacier and Rey, 2013) and different theories have shown how some degree of home bias is rational from the point of view of economic agents. Arguments for prioritizing domestic securities lie in asymmetric information[2], demand from the bank's customer basis ("immediacy services")[3], better hedging of assets and liabilities, and the reduction of the costs of using market infrastructures.[4] In the case of sovereign bonds, additional motivations for home bias lie in monetary policy arrangements and liquidity considerations (sovereign bonds are typically among the most liquid securities available in an economy).

One solution proposed to curb the banks' home bias and therefore loosen the "perverse loop" is to introduce a large-exposure limit, similar to the one applied to single-name exposures (see e.g. ESRB, 2015).[5] In its starkest version the proposal would restrict banks from holding domestic sovereigns in excess of a certain threshold (expressed as a percentage of regulatory capital); a milder version would entail non-zero concentration-risk charges on exposures exceeding a certain threshold.

This note tackles one aspect of the broader debate on the pros and cons of regulatory thresholds limiting the home bias. Notably, it shows that the enforcement of a single threshold for all sovereign bonds, irrespective of their outstanding supply and marketability, would lead to a negative home bias for banks from large countries (i.e. an exposure to the domestic sovereign smaller than the one in the neutral portfolio). This is true both in the case of "hard" quantitative limits and in the case of "smarter" capital surcharges. Therefore, introducing concentration limits on sovereign exposures without differentiating for size would be highly questionable, since it would dent the level playing field.

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1) The issue is also discussed in Angelini et al. (2014) and Visco (2016).

2) The economic literature suggests that even in developed financial markets some news may be circulated by word of mouth and lose quality as the distance from the source lengthens. This may explain the finding that traders tend to replicate the choice of other managers operating from the same financial center (Hong, Kubik and Stein, 2005). Even when data are available to any trader, domestic investors may be better equipped to understand the information in local news (Dumas, Lewis and Osambela, 2011).

3) On the increasing role of these services, see BIS-CGFS (2014).

4) An investor may find it cost-effective to manage a portfolio of securities held in accounts with its domestic depository system or with foreign ones if linked by automated procedures to the former. In effect, this narrows down the choice of securities that the investor will actually underwrite.

5) Prudential regulation mandates that such exposures do not exceed 25% of a bank's regulatory capital. ESRB (2015) simulates the introduction of a large exposure limit of 25% on banks' T1 capital, assuming that in this event European banks would real-locate their sovereign bond holdings and reinvest their funds into a GDP-weighted portfolio.

1. Definition of sovereign home bias for euro-area countries[6]

One issue which is often neglected in the debate on the home bias is how to measure the bias itself. Quite often, it is gauged by looking at the ratio of domestic sovereign exposure of a given bank (or banking system) to the bank's (or banking system's) total sovereign exposure. This ratio – which we refer to below also as the 'raw indicator' – stands at 74% in the euro-area average and is below 50% in just 3 out of 19 euro-area countries (see Table).

	Home bias indicators (based on end-2014 stocks)		
	Share of domestic sovereign bonds in total portfolio	Indicator of home bias based on debt size	Indicator adjusted for holdings by euro-area banks (1)
Belgium	0.65	0.60	0.60
Germany	0.69	0.47	0.49
Estonia	0.80	n.a.	n.a.
Ireland	0.28	0.27	0.27
Greece	0.98	0.97	0.97
Spain	0.91	0.79	0.73
France	0.68	0.45	0.51
Italy	0.97	0.73	0.68
Cyprus	0.78	0.78	0.78
Latvia	0.82	0.82	0.82
Lithuania	0.93	0.93	0.93
Luxembourg	0.02	0.02	0.02
Malta	0.78	0.78	0.78
Netherlands	0.47	0.42	0.43
Austria	0.67	0.64	0.65
Portugal	0.79	0.78	0.77
Slovenia	0.81	0.81	0.81
Slovakia	0.96	0.95	0.95
Finland	0.25	0.24	0.25
Euro area (2)	0.74	0.58 (3)	0.46 (3)

Source: Elaboration on the ECB Money and Banking Statistics.
(1) See Manna (2004) for the algebra of this indicator. (2) Weighted average. (3) Excluding Estonia.

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6) Statistics shown in this section are from the ECB data and refer to euro area (unconsolidated) banks' holdings of securities issued by governments from the area.

This simple ratio, however, is not a proper measure of home bias. A more sensible approach is, first, to derive a "neutral" sovereign portfolio, in which country weights are meant to approximate those that would be assigned by a portfolio manager acting irrespective of his/her location, and, second, to measure the bias comparing the actual distribution of a bank's portfolio with the neutral one. It goes beyond the scope of this note a thorough discussion of the design of a neutral portfolio. However, it may be enough to observe that our portfolio manager ought to weigh more those securities which are available in larger supply and are more easily tradable.

Restricting for simplicity the analysis to euro-area sovereigns, this approach can be translated in the following formula, yielding an adjusted indicator $HB_{b,c}$ of the home bias of bank b located in country c:

$$(1) \qquad HB_{b,c} = \frac{D_{b,c}}{D_{b,ea}} - w_c$$

where $D_{b,c}$ is bank b's exposure *vis-à-vis* sovereign c; $D_{b,ea}$ is its total euro-area sovereign exposure and w_c the weight of country c in the neutral portfolio. Based on (1), bank b has positive (negative) home bias if $HB_{b,c} > 0$ ($HB_{b,c} < 0$).

The most direct and less demanding way, in terms of data requirements, to calculate the neutral weights is to rely on the ratio between each country's sovereign debt and the total euro-area amount of debt (in the following we call it the "simple" adjusted measure).[7] In a more advanced approach, one would derive the weights using as inputs only government securities held by euro-area banks, i.e. not including securities held by non-banks or by non-area banks (we call this the "advanced" adjusted measure). This would account for the heterogeneous degree of marketability of the securities.[8] Results are shown in the Table for the raw and the adjusted indicators, the latter being derived both using the simple and the advanced weights.[9]

On average across the whole euro area, the degree of home bias is 58% using the simple adjusted measure and 46% using the advanced one (the raw indicator is 74%). Across countries, the difference is largest in the biggest economies. For Germany the baseline adjusted indicator goes down to 47% (from 69%); for France to 45% (from 68%); for Italy to 73% (from 97%); and for Spain to 79% (from 91%). The adjustment is material also in mid-sized markets: corresponding figures reduce to 42% and 60%, respectively, for the Netherlands and Belgium (from 47% and 65%). Conversely, only minor changes are derived for small-sized economies, reflecting their limited share of overall euro-area sovereign debt (consider e.g. the data for Cyprus and Slovenia).

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7) In Brunnermeier et al. (2011), the neutral portfolio is defined as the one in which the weight of each sovereign bond is equal to the weight of the country's GDP. Formally: $w_c = GDP_c / GDP_e$

8) As an example, consider two almost identical countries (in terms of GDP, public debt and size of the banking system), differing only because in one country the Treasury issues mostly securities aimed at the retail market while in the other country the Treasury issues mostly securities quoted and traded in wholesale markets. Intuitively, banks from both countries will tend to hold more securities of the second type, implying a much higher (unadjusted) home bias for banks from the latter country.

9) The advanced type of adjusted indicator follows Manna (2004).

2. Concentration limits and diversification: an empirical application

In this section we examine the impact of a concentration limit using data for 90 euro-area banks from the EBA transparency exercise, which refer to end-June 2015. The limit requires each bank to fulfill the constraint:

$$(2) \qquad \frac{D_{b,c}}{K_b} < \text{CL} \qquad \text{for any } c,$$

where $D_{b,c}$ is (as above) bank b's exposure *vis-à-vis* sovereign c, K_b is bank b's regulatory capital and CL is the concentration limit threshold (in percent). Under the assumption that each bank holds the neutral portfolio according to the "simple" adjusted method, i.e. $D_{b,c} / D_{b,ea} = w_c$, equation (2) becomes:

$$(3) \qquad \frac{D_{b,ea}}{K_b} * w_c < CL \qquad \text{for any } c.$$

Since w_c is the ratio of country c's public debt to total euro-area public debt, it is possible to rewrite equation (3) as:

$$(4) \qquad \frac{D_{b,ea}}{K_b} * \frac{d_c}{d_{ea}} * \frac{GDP_c}{GDP_{ea}} < CL \qquad \text{for any } c,$$

where d_c and d_{ea} are the public-debt-to-GDP ratios of country c and the euro area, respectively. Equation (4) highlights that, coeteris paribus, respecting a concentration limit and at the same time holding the neutral portfolio is more difficult for exposures vis-à-vis large countries; this implies that banks incorporated in large countries are more likely to have a negative home bias.[10]

Below we plot, for each bank in the EBA sample, the left hand side of equation (4) for domestic sovereign holdings.[11] The horizontal lines correspond to different levels of CL thresholds, set hypothetically at 25, 50, 75% and 100% of banks' eligible capital.[12] On the x-axis we report the nationality of each bank. Imposing a 25% concentration limit threshold would force around half of the banks to have a negative home bias as defined here, if they want to keep the overall size of their sovereign portfolio unchanged. It is apparent that almost all banks whose indicator exceeds the threshold are from one of the four largest euro-area countries, while out of the 10 banks with the lowest indicator

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10) Qualitatively, this would be true even if one adopted the definition of neutral weights mentioned in footnote 8, in which case equation 4 would become: $(D_{b,ea} / K_b) \times (GDP_c / GDP_{ea}) < CL$. Noteworthy, some aspects of the Brunnermeier et al. (2011) proposal - the creation of an European Debt Agency which would buy sovereign bonds according the neutral weights and would issue bonds which could be held by banks - could reduce the problems faced by large countries' banks (which do not depend on the particular set of weights chosen).

11) I.e., the figure is plotted for $c=$ {domestic country}. Further details are in the note to the figure.

12) Eligible capital is the sum of Tier1 and Tier2 capital. As a measure of sovereign exposures we take Net Direct Sovereign exposure *vis-à-vis* 16 euro-area countries (excluding Slovakia, Lithuania and Estonia).

just one is from a big economy. Even higher concentration thresholds would imply a negative home bias for a non-negligible share of banks: about 25% if *CL* = 50%, 9% if *CL* = 75% and 3% if CL = 100%. [13)]

Large-country bias indicator
(Euro-area banks from EBA Transparency Exercise, as of June 2015)
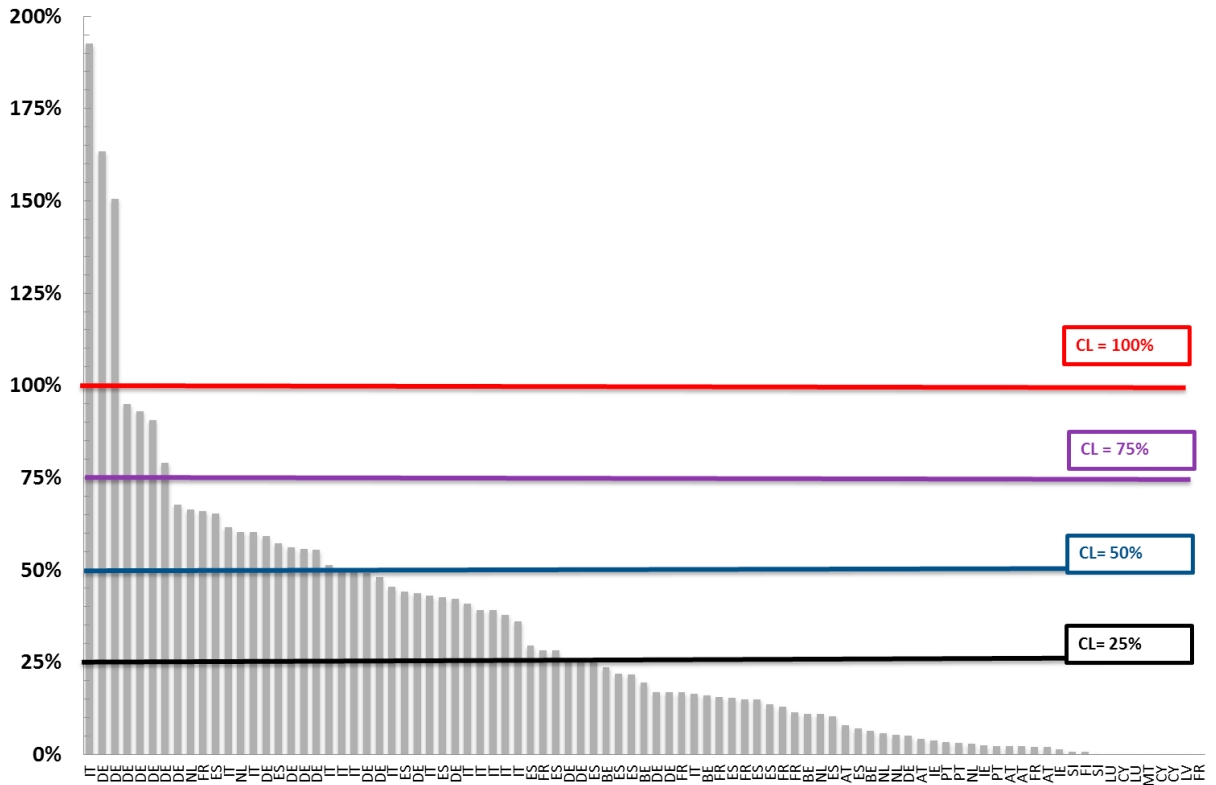
Note: Bank-level data. For each bank, the indicator is equal to the left hand side of eq. (4), computed for c= {domestic sovereign of bank b}. The Sovereign exposure ($D_{b,ea}$) is Net Direct Sovereign exposures vis-à-vis 16 euro-area countries (excluding Slovakia, Lithuania and Estonia). Eligible capital (K_b) is the sum of Tier1 and Tier2 capital. Neutral weights (w_c) are the ratios of country *c*'s public debt to total euro-area public debt. The horizontal axis reports the nationality of the bank. One (French) bank, with a value of the indicator of 742%, is not plotted.

13) In terms of total assets, banks with a negative home bias would account for 33, 16, 3 and 1%, respectively, with CL of 25, 50, 75 and 100%.

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