

## APPENDIX III

### Home bias in equity and bond markets<sup>23</sup>

In frictionless international financial markets, where financial assets of similar risks are priced similarly, regardless of where they are traded, investors are expected to hold international portfolios<sup>24</sup>. The world market portfolio should generate in fact higher risk/return profiles for domestic investors as the world capital market entails lower systematic risk than any domestic capital market. In reality there is robust evidence showing that domestic investors tend to prefer domestic investments, especially in the bond market, leading to an overweighting of domestic assets in their portfolios, this is the home bias. Schoenmaker and Soeter (2014) have shown that the introduction of the common currency, by eliminating the exchange rate risk, has favoured a decrease in home bias for EU countries, while the 2008 crisis had the opposite effect. Investors have withdrawn their investments from abroad (retrenching) favouring domestic assets.

Following Schoenmaker and Bosch (2008)<sup>25</sup> and Darvas, Hüttl and Schoenmaker (2016)<sup>26</sup> and Schoenmaker and Soeter (2014)<sup>27</sup>, we measure the home bias in equity and bond markets by calculating to which extent domestic equity/bond is overweighed in the domestic investment portfolio. We use domestic portfolio as a synonymous of the portfolio held by residents of a given country likewise we use the term domestic investors to indicate those investors that reside in a given country.

The equity home bias,  $EHB_i$ , of country  $i$  is measured as the difference between the relative weight of domestic equity in the portfolio of country  $i$  and the relative weight of country  $i$  in the total world market portfolio<sup>28</sup>.

$$EHB_i = 1 - \frac{\text{Foreign Equity}_i}{\text{Foreign Equity to Tot Market}_i}$$

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<sup>23</sup> This Appendix has been prepared by the Joint Research Center.

<sup>24</sup> Elton E., Gruber M., Brown S., Goetzmann W, (2007) Modern Portfolio Theory and Investment Analysis, 7th edition, John Wiley & Sons, New York.

<sup>25</sup> Schoenmaker D., and Bosch T., (2008), Is Home Bias in Equities and Bonds Declining in Europe? Investment Management and Financial Innovations, 5(4), 90-102.

<sup>26</sup> Darvas Z., Hüttl P., Schoenmaker D., (2016), Analysis of developments in EU capital flows in the global context, Bruegel.

<sup>27</sup> Schoenmaker D., Soeter C., (2014), New evidence on the Home Bias in European Investments, DSF Policy Briefs, n. 34, September 2014. For alternative ways of constructing an home bias indicator see Vanpée R., De Moor L., (2012), Bond and Equity Home Bias and Foreign Bias: an International Study, working paper Catholic University of Leuven, Fac. Dep. of Accountancy, Finance and Insurance (AFI).

<sup>28</sup> For domestic equities we mean equities issued domestically.

Where  $Foreign\ Equity_i$  is the share of country  $i$ 'th holdings of foreign equity in country  $i$ 'th total portfolio.

Country  $i$ 'th total portfolio is calculated as domestic market capitalisation plus domestic holdings abroad minus domestic liabilities (domestic assets held by foreigners).

The  $Foreign\ Equity\ to\ Tot\ Market_i$  is the share of foreign equities in the world portfolio available to country  $i$  (1-share of country  $i$  in the tot market capitalisation).  $EHB_i$  measures to what extent domestic equities are overweighed (overrepresented) in the domestic portfolio:  $EHB_i$  will be equal to zero if investors show no preference for domestic equities (i.e. there is no home bias). If Domestic investors have a preference for domestic equities then there will be home bias and the indicator  $EHB_i$  will be between 0 and 1, one being the entire domestic portfolio invested in domestic assets. Notice that  $EHB_i < 0$  could in theory happens when a country has a bias for holding foreign assets.

The bond home bias  $BHB_i$  is defined analogously as the share of country  $i$ 'th holdings of foreign debt in country  $i$ 'th total debt portfolio. For the actual calculation of  $EHB_i$  and  $BHB_i$  we use bilateral cross-border holdings of debt and equities coming from the Finflows dataset. For the definition of world portfolio we distinguish two cases:

- For  $BHB_i$  the world portfolio is based on data about 42 countries, market capitalisation is calculated using Bank of International Settlements data.
- For  $EHB_i$  the world portfolio is based on data about 38 countries and data stock market capitalisation (last available year). For comparison purposes we also consider data asset holdings coming from National Accounts (in that case we use ESTAT figures).

## 1. Home bias for (portfolio) equity investments

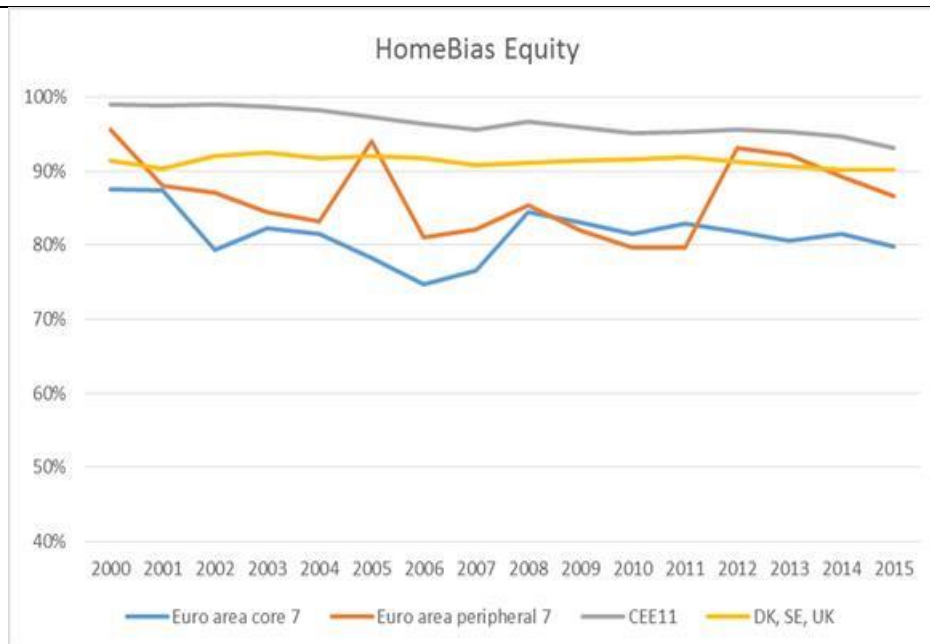
Figure 1 shows that EU membership is driving for equities<sup>29</sup>: equity home bias in the Euro area and in UK, DK and SE is lower than in the newer Member States (result in line with the literature, Beakert et al. 2013). There is little sign of influence of the crisis on home bias for equity, pointing to a rebalancing of portfolios rather than to an increasing the home bias as confirmed by Wynter (2012)<sup>30</sup> at the world level. Less cross-border investments due to the crisis were compensated by the change in the value of these investments (due to exchange rates differentials) and the change in evaluation of existing stocks. Between 2008 and 2011, we notice an increase in home bias Euro area peripheral countries diversifying their portfolio equities mainly towards other Euro area countries (also found in Darvas et al., 2016). This trend dramatically reverses with the sovereign crisis with home bias increasing from 80 to 95 per cent. DK, SE and the UK and CEE11 countries exhibit rather stable level of home bias showing lesser financial integration than Euro area.

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<sup>29</sup> Sharp decline in home bias from 1997-2004, see Darvas, Hüttl, Schoenmaker (2016) and Schoenmaker-Soeter (2014).

<sup>30</sup> Wynter M., (2012), Why did the equity home Bia Fall During the Financial Panic of 2008? Mimeo Ohio State University.

**Figure 1: Home bias in equity market**



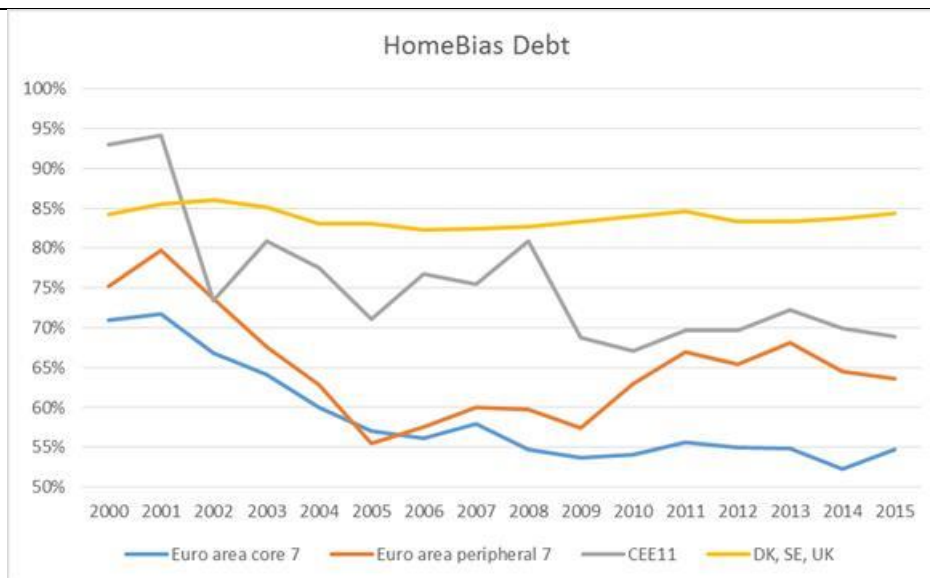
Source: Finflows, JRC computations. Aggregate values are computed making a simple average over each individual countries. Euro area core includes Austria, Belgium, Finland, France, Germany, Luxembourg and the Netherlands. Euro area peripheral includes Cyprus, Malta, Greece, Spain, Portugal, Italy and Ireland. CEE11 includes all the Eastern European countries, including the Baltics. Data are partially available for Ireland, Luxembourg, Latvia, Malta and Poland.

## 2. Home bias for (portfolio) debt investments

From Figure 2 we observe downward trends in debt home bias for all Euro area countries after the introduction of the euro, confirming the literature (see Darvas, Hüttl, Schoenmaker, 2016 and Schoenmaker-Soeter, 2014 among others). In 2005, both euro aggregate (core or peripheral countries) show similar level of home bias between 55 and 60 per cent, however after the financial crisis, their evolution diverges. We observe a slight increase in home bias in the euro area peripheral countries hit harder by the crisis: foreign investors left these countries' debt while core euro area countries' home bias almost remains stable to pre-crisis level. For the hit countries, home bias stabilises between 2011 and 2013 and slightly decreases after 2013. CEE11 countries invested in core Euro area debt to decrease their risk after the crisis, hereby decreasing the home bias down from around 75 to 70 per cent and improving their diversification of investment.

For the main non-euro countries (DK, SE, UK) home bias remains very high, above 80 per cent showing a lesser integration with EU countries.

**Figure 2, Home bias in bond market**



Source: Finflows, JRC computations. Aggregate values are computed making a simple average over each individual countries. Euro area core includes Austria, Belgium, Finland, France, Germany, Luxembourg and the Netherlands. Euro area peripheral includes Cyprus, Malta, Greece, Spain, Portugal, Italy, and Ireland. CEE11 includes all the Eastern European countries, including the Baltics. No data is available for Bulgaria, Croatia and Romania. Data are partially available for Czech Republic, Estonia, Ireland, Luxembourg, Latvia and Poland.