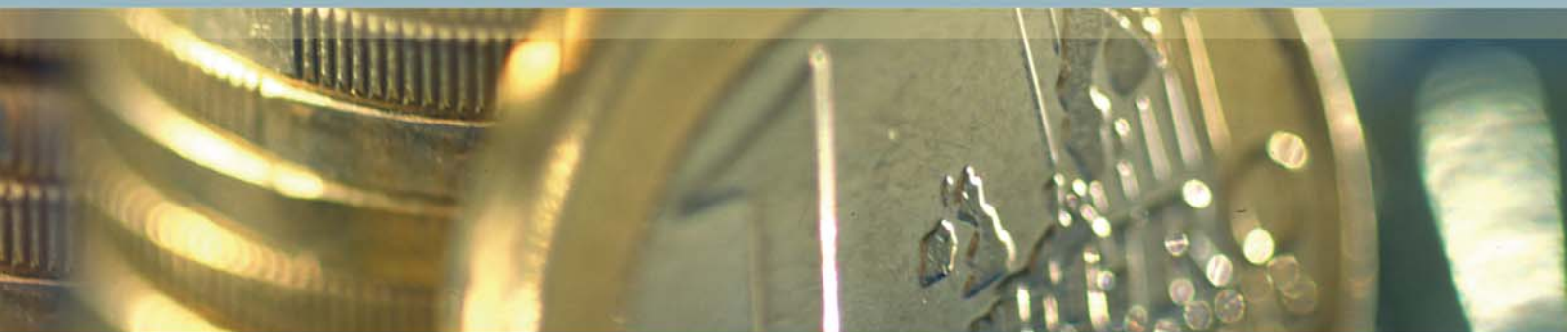




# EUROPEAN ECONOMY

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Scoreboard for the surveillance  
of macroeconomic imbalances

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# **SCOREBOARD FOR THE SURVEILLANCE OF MACROECONOMIC IMBALANCES<sup>1</sup>**

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## 1. INTRODUCTION

The recent economic and financial crisis revealed weaknesses in the governance framework underlying the functioning of EMU. As part of the response to this challenge, the EU institutions adopted several legislative proposals, the so-called 'six pack', to enhance the enhanced economic governance in the EU. The legislation entered into force on 13 December 2011, i.e. in time for the 2012 European semester.

This legislative package introduced a new surveillance procedure for the prevention and correction of macroeconomic imbalances (hereafter called the Macroeconomic Imbalance Procedure – MIP) and a regulation to reinforce the MIP application.<sup>2</sup> Under its preventive arm, the MIP aims at detecting the emergence of imbalances early-on. In case of existing serious imbalances, the corrective arm of the procedure requires the Member State to put in place a detailed policy plan to achieve their correction and provides means to effectively enforce it. The MIP is built around a "two-step" approach. The first step is an alert mechanism which works as a filter.<sup>3</sup> The objective of the alert mechanism is to focus attention to observed risks early on and identify the countries for which, in the second step, more in-depth analysis appears warranted so as to assess their vulnerability and substantiate policy recommendations if appropriate.

The alert mechanism consists of an economic reading of a scoreboard with early warning indicators put in place by the Commission. The design of the initial scoreboard is presented in the first Alert Mechanism Report (AMR) issued by the Commission on 14 February 2012. This paper adds to the AMR by describing in more detail the rationale of the different indicators, the choices made in the selection process and how they should be economically understood in the context of the MIP. It should be emphasised that the scoreboard indicators are neither policy targets nor policy instruments. Moreover, the reading of the scoreboard results is not mechanical but takes into account other relevant information as well as the broad economic context.<sup>4</sup>

The design of the scoreboard is based on the relevant provisions in the legislation.<sup>5</sup> The technical work took place in parallel with the negotiations with the (ECOFIN) Council and the European Parliament on the draft MIP legislation, hence the scoreboard design incorporates the outcome of the trilogue discussions, and in particular, the agreement on Article 4 of the Regulation which describes the scoreboard (see annex 1). It takes into account comments from the European Parliament<sup>6</sup>, the ECOFIN Council<sup>7</sup> and the ESRB<sup>8</sup> on an initial proposal. At a technical level, the work to identify the indicators benefitted from extensive input from national authorities in the LIME working group and the Economic Policy Committee (EPC) as well as inputs from the European Central Bank (ECB).

The remainder of this paper reviews the design of the scoreboard in detail. Section 2 discusses the overall design of the scoreboard. Section 3 presents the economic rationale underlying the inclusion of each indicator, pointing to relevant economic literature, explains the transformations used, data sources and the determination of threshold values, and discusses factors and additional indicators that need to be taken into account in the economic interpretation of the scoreboard.

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<sup>2</sup> Regulation (EU) No 1176/2011 of the European Parliament and of the Council of 16 November 2011 on the prevention and correction of macroeconomic imbalances and Regulation (EU) No 1174/2011 of the European Parliament and of the Council of 16 November 2011 on enforcement measures to correct excessive macroeconomic imbalances in the euro area.

<sup>3</sup> Chapter II, Article 3, paragraph 1 in Regulation (EU) No 1176/2011.

<sup>4</sup> Chapter II, Article 3, paragraph 2 in Regulation (EU) No 1176/2011.

<sup>5</sup> Chapter II, Article 4 in Regulation (EU) No 1176/2011.

<sup>6</sup> European Parliament resolution of 15 December 2011 on the Scoreboard for the surveillance of macroeconomic imbalances: envisaged initial design, 2011/2926 (RSP).

<sup>7</sup> Council conclusions on an early warning scoreboard for the surveillance of macroeconomic imbalances, 15781/2/11.

<sup>8</sup> Views of the ESRB on the Envisaged Scoreboard Indicators Relevant for Financial Market Stability, 9 December 2011.

## 2. THE DESIGN OF THE SCOREBOARD

Based on a set of four principles, considerable progress was made as regards the design of the initial scoreboard in the course of 2011 and the Commission presented a Staff Working Paper in early November 2011 with a proposal for the initial design of the scoreboard (European Commission, 2011). The proposal contained ten indicators and envisaged that an additional indicator of the banking/financial sector will be developed by the end of 2012, in time for the subsequent European semester.

According to the first principle, the choice of indicators *focuses on the most relevant dimensions of macroeconomic imbalances and competitiveness losses*, with a particular emphasis on the smooth functioning of the euro area. For this reason, the scoreboard consists of indicators which can monitor external imbalances, competitiveness positions and internal imbalances, and encompass variables where both the economic literature and recent experiences suggest associations with economic crises.

Secondly, *the scoreboard (indicators and thresholds) are chosen as to provide a reliable signalling device for potentially harmful imbalances and competitiveness losses at an early stage of their emergence*. This has led to a combination of stock and flow indicators which can capture both shorter-term rapid deteriorations as well as the longer term gradual accumulation of imbalances. Moreover, it has led the Commission to set indicative thresholds at prudent levels, which on the one hand avoid excessive numbers of 'false alarms' but which on the other hand are not set so stringently that they only identify problems once they are entrenched. To this end, thresholds have generally been established *via* a statistical approach based on the distributions of the indicators' values, by identifying the thresholds as the lower and/or upper quartiles of the distributions: such thresholds are generally consistent with the values found in the empirical literature.

Thirdly, the scoreboard has an important *communication role*. For this purpose, the scoreboard consists of a limited number of indicators. Moreover, the choice of indicators and transformations is kept as simple and straightforward as possible. Data transformations are transparent and tractable so that they can be replicated by third parties. The choice of indicators complements indicators/targets used in other EU surveillance exercises. For transparency reasons, the Commission will make the scoreboard indicators publicly available on its website.<sup>9</sup>

The fourth principle requires indicators to be of *high statistical quality* in terms of timeliness and comparability across countries. To this end, they are derived from data compiled according to the principles of the European Statistics Code of Practice of the European Statistical System (ESS). Where available, Eurostat sources are used so that the data comparability and statistical quality can be ensured. Otherwise, when Eurostat data are not available, the highest quality alternative data sources are chosen (e.g. the ECB).

The scoreboard consists of the following ten indicators with indicative thresholds:<sup>10</sup>

- three-year backward moving average of the **current account balance** in percent of GDP, with a threshold of +6% and - 4%;
- **net international investment position** in percent of GDP, with a threshold of -35%;
- five-year percentage change of **export market shares** measured in values, with a threshold of -6%;
- three-year percentage change in **nominal unit labour cost**, with thresholds of +9% for euro-area countries and +12% for non-euro-area countries, respectively;

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<sup>9</sup>[http://ec.europa.eu/economy\\_finance/economic\\_governance/macroeconomic\\_imbalance\\_procedure/mip\\_scoreboard/index\\_en.htm](http://ec.europa.eu/economy_finance/economic_governance/macroeconomic_imbalance_procedure/mip_scoreboard/index_en.htm)

<sup>10</sup> An overview of precise formulas used in the computation of the transformations for each indicator is presented in Annex 3. Annex 4 offers a synthetic list of additional information on every indicator: data source, indicative threshold, period for calculating the threshold, additional indicators used for economic interpretation.

- three-year percentage change of the **real effective exchange rates** based on HICP/CPI deflators, relative to 35 other industrial countries, with thresholds of  $-/+5\%$  for euro-area countries and  $-/+11\%$  for non-euro-area countries, respectively;
- **private sector debt** in percent of GDP with a threshold of 160%;
- **private sector credit flow** in percent of GDP with a threshold of 15%;
- year-on-year **changes in the house price index** relative to a Eurostat consumption deflator, with a threshold of 6%;
- **general government sector debt** in percent of GDP with a threshold of 60%;
- three-year backward moving average of the **unemployment rate**, with a threshold of 10%;

In several instances, a number of indicators/transformations were considered, each having particular strengths and weaknesses. After careful consideration of the pros and cons of these alternative options, the most appropriate indicator was chosen. Nevertheless, recognising the critical importance of taking due account of country-specific circumstances and institutions, the economic reading of the scoreboard is complemented by additional information and indicators. This *inter alia* includes the general macroeconomic situation, such as growth and employment developments, nominal and real convergence inside and outside the euro area and specificities of catching-up economies. Additional indicators are considered that reflect the potential for the emergence of imbalances as well as the adjustment capacity of an economy, including its potential to sustain sound and balanced growth, such as different measures of productivity, inflows of FDI, capacity to innovate and energy dependence. The state of financial markets, which played an important role in the current crisis, will also be covered. Moreover, it is envisaged to develop an indicator on the banking/financial sector to be included in the scoreboard by the end of 2012 and in time for the subsequent European semester.

This paper presents the initial design of the scoreboard. With improvements in data availability or enhancements in the underlying analysis, better-quality and/or new indicators might replace some of the existing indicators or be added to the scoreboard. Moreover, and even more importantly, new sources of potentially harmful macroeconomic imbalances might develop in the future. This will need to be reflected in the MIP and also the scoreboard. The MIP legislation fully recognises the need for flexibility in the design of the scoreboard and entrusts the Commission with a task to regularly assess the appropriateness of the scoreboard, including the composition of indicators, the thresholds set and the methodology used and make the necessary changes.<sup>11</sup>

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<sup>11</sup> Article 4, paragraph 7 in Regulation (EU) No 1176/2011.

### 3. SCOREBOARD INDICATORS IN DETAIL

This section presents each of the scoreboard indicators in detail, outlining the economic rationale behind its inclusion, data issues and the suggested economic interpretation (which implies additional indicators as well as inter-linkages of the indicator with other scoreboard indicators).

#### 3.1. CURRENT ACCOUNT BALANCE

The scoreboard indicator is the three-year backward moving average of the current account balance expressed in percent of GDP, based on Eurostat data from Balance of Payments statistics, with the indicative thresholds of +6% and -4%.

##### Economic rationale

The current external balance/current account balance<sup>12</sup> is the major driver of net lending/borrowing of the economy as a whole and thereby provides important information about the economic relations of the country with the rest of the world.<sup>13</sup> A high current account deficit indicates that the economy is borrowing and typically it is importing in excess of its exports. Based on an extensive literature review of 83 papers, Frankel and Saravelos (2010) point out that the current account balance is one of the most frequent statistically significant indicators in explaining crisis incidence.

Current external imbalances are not necessarily worrisome if deficits/surpluses are natural responses to changes in underlying structural characteristics and the related adjustment in saving and investment decisions of economic agents. For instance, countries in a catching-up phase often run current account deficits as investing in productive activities increases the prospects of future income. Borrowing from abroad allows them to smooth the inter-temporal profile of consumption. Similarly, countries with ageing population may find it opportune to save today, i.e. run current account surpluses, to avoid a drop in consumption in the future. In addition, the sustainability of a current account deficit is a function of the ability of the country to attract foreign capital and of its repayment prospects given the future growth prospects. Hence, high current account deficits can be sustainable as long as there are willing lenders while much smaller deficits may become unsustainable if the willingness to lend reverses.

Current account deficits can be a sign of an excessive imbalance, if, for instance, the volume of borrowing is such that it leads to an unsustainable external debt position. In turn, a high current account surplus may be considered worrisome when it reflects weaknesses in domestic demand. External imbalances often reflect other types of imbalances, e.g. excessive credit expansions in some countries led to rapid asset price increases and fed back into large external imbalances. The current account balance is therefore an important indicator which provides information about the potential existence of macroeconomic imbalances.

Surveillance under the MIP covers both current account surpluses and deficits which, from an economic point of view, pose different types of policy challenges. In particular, unlike current account deficits, large and sustained current account surpluses do not raise the same concerns about the sustainability of external debt and financing capacities, concerns that can affect the smooth functioning of the euro area (which is a key criterion for triggering the corrective arm of the MIP). This means that surveillance under the MIP will encompass all Member States, but that a greater degree of urgency is required in countries with large current account deficits and competitiveness losses.<sup>14</sup>

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<sup>12</sup> These terms reflect the same economic concept but are usually associated with different data sources for this indicator (current external balance refers to National Accounts while current account balance refers to Balance of Payments data).

<sup>13</sup> Net lending/borrowing *versus* the rest of the world comprises both the current and the capital account (the latter recording mainly capital transfers, which in the case of EU Member States may be relatively sizeable due to transfers under EU structural funds).

<sup>14</sup> In this respect, the Task Force set up by President Van Rompuy concluded that policy action "to address macroeconomic imbalances and divergences in competitiveness is required in all Member States, but the nature, importance and urgency of the policy challenges differ significantly depending on the Member States concerned. Given vulnerabilities and the magnitude of the adjustment required, the need for policy action is particularly pressing in Member States showing persistently large current-account deficits and large competitiveness losses. Also, in Member States that have accumulated large current account surpluses, policies should aim to identify



## Data transformation, data sources and indicative threshold

This indicator is calculated as the three-year backward moving average of the current account balance as a percent of GDP. The average over three years is used so as to control for short-term fluctuations of the annual figures and to provide indications of the persistence of a potential imbalance.

Data on the current account balance<sup>15</sup> are derived from the Balance of Payments (BoP) statistics reported by Eurostat. This source is widely used by other international institutions as well as academics. BoP (and International Investment Position) statistics are the statistical tools expressly built to monitor the relations of a country with the rest of the world. An important advantage of this data source is also its quick availability and high frequency. BoP data also allow decomposing external imbalances by counterpart area, hence giving an idea of a possible spill-over of a crisis from a given country to another.

An alternative data source on current transactions balances is the Rest-of-the-World Accounts (RoW) in the National Accounts (NA). This data is consistent with other indicators derived within the NA framework and also with the Commission forecast for the current account balances. However, there are discrepancies between the data derived from the NA and the BoP data. These differences occur despite the fact that "current external balances" from the NA and "current account balances" from the BoP describe the same economic concept. The issue has been closely monitored by Eurostat together with ECB and national statistical institutes and it appeared that the differences stem from compilation practices, methodological reasons, different data vintages and revisions, errors and omissions.<sup>16</sup> BoP data are compiled first, and subsequently incorporated in relevant external account components of NAs. When compiling NAs, data related to the RoW sector have to be reconciled with those related to the domestic economy (the focus for NAs).

A simple statistical distribution analysis provides an indicative threshold for current account deficits of -4%. This indicative threshold was derived from the data sample starting in 1970 for most of the old Member States and in early/mid 1990s for the new Member States, and ending in 2007. It appears reasonable to compute the value of the threshold on the basis of a long period which extends beyond the last decade characterised by increasing divergences in the euro area. The increase in the divergence of external positions in the EU over the past decade together with the inclusion of new Member States with typically high current account deficits would introduce a downward bias in the sample.

This threshold value is also broadly in line with the evidence from the empirical literature on balance of payment crises and sustainability of current account imbalances. There are broadly three strands of this literature, which are relevant for the determination of the threshold:<sup>17</sup>

Firstly, a number of research papers investigate past episodes of significant current account adjustments and attempt to identify some regularities, including the levels of current account deficits at which the adjustment starts. Examinations of past episodes of current account adjustments show that a typical current account reversal starts at around -5% of GDP (Summers, 1996). Freund (2005) found on a sample of industrialised countries that the mean for the current account to GDP ratio at the beginning of large current account adjustments was around -6.3% (median was -4.9%). Similarly, IMF (2007) found on average that past current account reversals in advanced countries started when the current account deficit stood at about 4.1% of GDP. Reversals of persistent current account surpluses typically started at the level of 2.4% of GDP. The corresponding values for an EU sub-sample would be -4.3% and 2.5%, respectively.<sup>18</sup> The results of all these studies, nevertheless, show that there is a very significant variance across countries and the thresholds should be interpreted with caution. Using an alternative approach to examining the

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and implement the structural reforms that help strengthening their domestic demand and growth potential", see *Strengthening Economic Governance in the EU*, Report of the Task Force to the European Council, 21 October 2010.

<sup>15</sup> The current account covers all transactions occurring between resident and non-resident entities, and refers to international trade in goods and services, income and current transfers.

<sup>16</sup> In 2011, the fourth survey on the discrepancies between the BoP/RoW data will be conducted. The past surveys (2009) analysed in detail the reasons for existing discrepancies and formulated recommendations. Some Member States already implemented some of Eurostat's recommendations. The methodological differences will hopefully disappear after 2014, but some discrepancies, due to the different compilation practices, will remain.

<sup>17</sup> It should nevertheless be noted that attempts to identify thresholds beyond which current account imbalances pose a problem are mired with conceptual and methodological difficulties.

<sup>18</sup> On the basis of the AMECO data, the average current account deficit at the onset of a reversal (as defined by the IMF) would be -3.2% for the EU countries.

determinants of past recessions (binary recursive trees), Ghosh and Ghosh (2003) find that countries with current account deficits above 2.5% of GDP have a seven-fold greater probability of a crisis than countries with smaller deficits;

Secondly, current account norms, i.e. current account to GDP ratios as justified by fundamentals are usually computed based on a reduced form of a panel econometric model in the spirit of Chinn and Prasad (2003). The results have to be interpreted with utmost caution as they are subject to numerous conceptual and methodological caveats. Tentative estimations of current account norms for the EU indicate that the average current account deficit should be around -4.7% of GDP (median -3.4% of GDP) and the average "justified" surplus around 3.7% of GDP (median 3.1% of GDP).

Finally, much research has focused on assessing the sustainability of current account imbalances. This strand of literature typically attempts to estimate values of current accounts which would stabilise the external position of a country at the current or a predetermined level (e.g. Milesi-Ferretti and Razin, 1996; Edwards, 2001). These results are typically country-specific and do not deliver a general benchmark.

The upper value of the threshold is set at +6%. The upper quartile of the distribution of the three-year backward average of current account balances corresponds to +2%. To this an additional 4% margin has been added in line with the "intelligent symmetry" approach to current account balances. This allows tackling both current account surpluses and deficits but recognises that the urgency for policy intervention is clearly greater in the case of current account deficits. It also reflects the fact that the risk of negative spillover effects of current account deficits is more prevalent than for current account surpluses due to sustainability considerations.

### Economic interpretation

The current account is typically the key determinant of changes in the net international investment position. Therefore, each deficit/surplus position will be assessed jointly with the level of the outstanding foreign debt/credit of the economy.

As part of negotiations with the Parliament and Council, it was also agreed that the economic interpretation will take due account of additional relevant information, in particular the specificities of catching up economies. The potential risks from external deficits need to be qualified by taking into account capital transfers in the form of EU structural funds, as they can finance in part current account deficits. Similarly, the destination of the capital flows is relevant as strong FDI inflows help to provide a relatively safe financing of current account deficits in many of these Member States.

To account for the inflows of EU structural funds, the sum of current account and capital account will be considered for Member States for which this information is relevant. Conceptually, the sum of current account and capital account determines the net lending/borrowing of a country and is thus the flow counterpart of the net foreign financial asset position/net international investment position. The capital account comprises (a) capital transfers receivable and payable between residents and non-residents (e.g. debt forgiveness), and (b) the acquisition and disposal of non-produced, nonfinancial assets between residents and non-residents (e.g. natural resources, licenses, contracts, leases or marketing assets). The net size of the capital account is typically rather small. However, in a number of catching up Member States, capital account can be non-negligible as a part of structural/cohesion funds is recorded here.

## 3.2. NET INTERNATIONAL INVESTMENT POSITION

The scoreboard indicator is the net international investment position expressed in percent of GDP based on Eurostat data from Balance of Payments statistics, with the indicative threshold of -35%.

### Economic rationale

The net international investment position (NIIP) records the net financial position (assets minus liabilities) of the domestic sectors of the economy versus the rest of the world. It provides an aggregate view of the net external position of a country and it is also frequently used in economic analysis and research, focusing

on external vulnerability of countries and the risk of crises (see for example Frankel and Saravelos, 2010; or Furceri *et al.*, 2011a and 2011b)). As it is the stock counterpart to the current account balance,<sup>19</sup> it allows for a stock-flow analysis of external positions. Typically, highly negative NIIPs result from persistently high current account deficits. In this respect, a number of the conceptual issues discussed in the section on the current account balances apply to NIIP as well.

### Data transformation, data sources and indicative threshold

This indicator is calculated as a share of GDP to allow for cross-country comparability. As this is a stock indicator, the value for the last available year is used.

For consistency reasons, data on the NIIP<sup>20</sup> are derived from the Balance of Payments statistics reported by Eurostat, i.e. the same data source used for the current account balance. Like in the case of current account balance, there is an alternative data source – the Rest-of-the-World Accounts (RoW) in the National Accounts (NA). The general considerations entering the selection of the data source are essentially identical to those concerning the indicator on current account balance. In this case, the differences between the two data sources are considerably larger than for current account data. In addition, while Eurostat has extensively analysed the discrepancies between BoP and RoW (NAs) in the current and capital account, little is known about the discrepancies observed between national IIP and NFAs (RoW) data.

The statistical analysis of the NIIP distribution yields -35% of GDP as an indicative threshold. It is difficult to establish a level of net external assets which can be considered as risky and economic literature attempting to do this is rather scarce. This is due to the fact that next to the absolute level of net foreign liabilities, it is in particular the composition of both gross assets and liabilities in terms of types or maturities, which determine the overall vulnerability of the external position of a country.

Unlike large negative NIIP positions, large positive external asset positions are not *a priori* considered to be problematic for a Member State or the functioning of EMU. Therefore, the scoreboard contains an indicative threshold for negative NIIP only.

### Economic interpretation

NIIP is a good starting point in the assessment of external positions of Member States. However, the composition of NIIP is important for a deeper understanding of the degree of vulnerability of a country. Therefore, also in this case, the economic reading of the scoreboard will take account of additional relevant information.

In this sense, it is useful to focus specifically on liabilities that require repayment of principal or interest, separately from non-debt generating liabilities. This provides useful additional information to interpret the overall NIIP as these components have an impact on external solvency of an economy. This distinction is important especially for the specificities of external positions of catching up Member States, which experience strong Foreign Direct Investment (FDI) inflows. It can be argued that FDI constitutes a relatively less risky and more stable form of financing than other alternatives and thus these inflows do not increase country's vulnerability to the same extent.<sup>21</sup>

In this respect, the economic interpretation will consider the indicator on Net External Debt (NED), which, compared to the NIIP, does not contain portfolio FDI<sup>22</sup>, portfolio equity and financial derivatives. By

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<sup>19</sup> Plus the capital account balance. However the current account balance represents in most cases the bulk of the net lending and borrowing position.

<sup>20</sup> Data on the NIIP cover stocks of direct and portfolio investments, financial derivatives and other investment and reserve assets.

<sup>21</sup> FDI is indeed a less risky source of external financing, although it can be argued that high inflows of FDI increase the vulnerability of an economy as FDI can flow out of the country too. This is particularly the case of undistributed profits which are considered as FDI inflows. FDI also generates dividend flows which are reflected in the external position of a country.

<sup>22</sup> It should also be noted that NED only excludes the equity part of FDI but still includes "other capital" FDI which covers borrowing and lending of funds (loans, debt securities) between the direct investor and its subsidiaries abroad.

focusing on external debt liabilities, i.e. those that require payments of principal and/or interest, NED further qualifies the assessment of the riskiness of a country's external asset position.<sup>23</sup>

### 3.3. REAL EFFECTIVE EXCHANGE RATE

The scoreboard indicator is the percentage change over three years of the real effective exchange rate (REER) based on consumer price index deflators,<sup>24</sup> data source DG ECFIN, with the indicative thresholds of +/-5% and +/-11% for euro-area and non-euro-area countries, respectively.

#### Economic rationale

The scoreboard includes a measure of the real effective exchange rate based on consumer prices in order to capture the drivers of persistent changes in price and cost competitiveness of each Member State relative to its major trading partners. In contrast to assessing relative competitiveness through relative production costs,<sup>25</sup> this indicator accounts for broader price developments and thus casts a more comprehensive picture of global 'price' pressure on domestic producers in a medium-term perspective.<sup>26</sup> Since it is closely related to the terms-of-trade concept, this indicator also exemplifies the attractiveness of imports over domestic production.<sup>27</sup>

In the economic literature, the REER has often been found to be a statistically significant predictor of the incidence of economic crises: it is thus frequently considered among early warning indicators (Reinhart *et al.*, 1998). In particular, Frankel and Saravelos (2010) identify the REER as a very important leading indicator in 48 out of 83 studies on crises occurring before 2008. In an empirical analysis on the determinants of the Great Recession, the same authors find that high past REER appreciations are associated with higher incidence of the current crisis. An important strand of literature also asserts that REER appreciations do not need to be considered as harmful in all cases. For instance, a catching-up Member State might experience price level convergence with respect to the Balassa-Samuelson effect (cf. next subsection). However, the years preceding the crisis saw persistent REER divergence among Member States beyond what could be considered as incidence of such convergence effects. Instead, REER and other price developments pointed to economic imbalances that were partly related to an inappropriate response of wages to productivity in the manufacturing and service sectors. Finally, an important caveat is that the REER only assesses price and cost competitiveness developments. While it focuses on exchange rates and prices, it does hardly account for several aspects of competitiveness like product quality, overhead costs, or marketing efficiency. Therefore, the REER is complemented by other scoreboard indicators such as export market shares.

#### Data transformation, data sources and indicative threshold

The REER indicator results from deflating the nominal effective exchange rate (NEER) by the HICP/CPI as price deflator.<sup>28</sup> The NEER is computed as a weighted average of a currency's exchange rates versus several important foreign currencies, and thus aims to measure the global appreciation/depreciation of a currency. In the case of the scoreboard, the NEER is obtained from a weighted average (by double export weights) of the exchange rate versus a panel of the most important trading partners of the euro-area

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<sup>23</sup> Nevertheless, the components of NIIP that are not considered in NED also carry potential risks. The non-debt components of NIIP excluded from NED essentially consist of equity and financial derivatives. While the investments underlying these flows do not generally need to be repaid at a certain point in time, such investments can be rather volatile and generate sudden capital outflows which can complicate macroeconomic management. Furthermore, some of these components can also partially reflect the existing external as well as internal imbalances and ignoring them would mean missing part of the overall picture.

<sup>24</sup> REER are based on the harmonized index of consumer prices (HICP) where available. For (non-EU) trade partners without HICP methodology, the respective headline Consumer Price Index (CPI) is used.

<sup>25</sup> Production cost indicators only capture direct production costs and are more dependent on the definition of productivity than CPI.

<sup>26</sup> Given that this indicator is meant to monitor the global competitiveness of each member state, it is very relevant not to exclude the influence played by the exchange rate developments so to assess the relative price developments conditional on exchange rates. This indicator will not be used as a trigger to discuss exchange rate policy that is outside the scope of the entire exercise.

<sup>27</sup> Terms of trade are country-specific and defined as the ratio of export to import prices, which in principle can be understood as a REER for a particular choice of deflators. In contrast to pure external competitiveness indicators such as export market shares, the REER thus not only embodies price features of exported goods and services to external markets, but also the attractiveness of imports versus domestically produced goods. As a two-sided indicator, it is therefore frequently related to current account developments (cf. Salto and Turrini, 2010, for an overview).

<sup>28</sup> *Ibidem* footnote 24.

(36 industrialised countries: EU-27 plus Australia, Canada, United States, Japan, Norway, New Zealand, Mexico, Switzerland, and Turkey). The exact formula is provided in annex 2.

In order to derive the REER from the NEER, several options were discussed during the design of the scoreboard. The competitiveness of each supplier relative to its trading partners can be measured by the REER expressed either in terms of production costs (ULC), export prices or economy-wide prices (HICP or GDP deflators):

The REER based on broad measures of prices or costs, such as HICP or GDP deflators, provides the most comprehensive picture of price competitiveness of domestic producers in a medium-term perspective. The basket of goods on which these price indexes are calculated includes both tradable and non-tradable goods (excluding capital goods). For example, a rise in the REER based on price deflators may reflect a rise in the price of domestic tradables with respect to foreign tradables. It may also be the result of an increase in the relative price of domestic non-tradables (in terms of tradables) with respect to the relative price of foreign non-tradables. Whereas the former case will lead to direct losses in export market shares, the latter will entail shifts in resources and consumption between the tradable and the non-tradable sectors. Additionally, given that price indexes also include the price of imported goods, countries with different import-dependency will have different relative price effects of nominal exchange rates changes. Such effects need to be accounted for when interpreting the REERs.

The ULC-based REER shifts the focus of the assessment of relative competitiveness in terms of consumer prices to relative production costs. This important notion is also picked up by the ULC scoreboard indicator (see section 3.5). For tightly integrated economies in a monetary union, a ULC-based REER would capture a similar notion as the headline ULC indicator.

The REER based on relative export prices, while being a rather intuitive measure of market competitiveness, suffers from a number of weaknesses. First, the calculation of export prices is strongly influenced by the composition of exports and by the price dynamics of exported goods. Fluctuations in the REER in this case will also reflect changes in the composition of exports, and not only variations in competitiveness. Furthermore, REERs based on export prices convey information on how producers set prices in order to maintain market shares in case of nominal exchange rate variation (pricing to market) even at the expense of profits. In the long run however, costs-side developments will prevail over exchange-rate driven variations in mark-ups. In this view, the REER based on export prices essentially provides a short-term picture that might be out of line with the dynamics of REERs calculated with different deflators.<sup>29</sup>

For all these reasons, the REER based on HICP/CPI appears to be the most appropriate alternative.<sup>30</sup> The scoreboard indicator on REER is thus calculated as the three-year percentage change of the REER relative to a set of 36 industrial countries.<sup>31</sup> Such a data transformation has the advantage that it can be straightforwardly interpreted. Furthermore, this transformation is not heavily biased by the trend appreciation that some catching-up Member States have experienced in the preceding decade. However, this method tends to lose the indicator's memory and a reading of the indicator would therefore have to factor in past developments.

Concerning the indicative thresholds, symmetric thresholds are considered for the REER indicator. The focus is put on detecting harmful imbalances, which may be captured by an unsustainable appreciation meaning a loss of competitiveness, or depreciation signalling potential problems related to domestic demand or the potential of harmful future price convergence. Furthermore, a differentiation of thresholds between euro-area and non-euro-area countries is adopted in line with the Herman Van Rompuy Task Force.<sup>32</sup> Differentiated thresholds reflect nominal exchange rate variability, catering thus for that countries

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<sup>29</sup> High productivity in ITC for example has been reflected in falling prices of ITC goods relative to others. For countries heavily specialised in those goods (see Japan) this kind of price dynamics will tend to limit the increase of REER based on export deflators with respect to the REER based on other deflators.

<sup>30</sup> The REER based on GDP deflators gives very similar results than the REER based on HICP deflators.

<sup>31</sup> Note that the country set for the computation of the REER comprises 36 countries. Thus each REER is computed from real exchange rates versus 35 partner countries.

<sup>32</sup> "Strengthening Economic Governance in the EU", Report of the Task Force to the European Council, 21 October 2010.

with flexible exchange rates may be subject to non-persistent swings in the REER due to nominal exchange rate fluctuations with their most important trading partners.

The differentiation between euro-area and non-euro-area Member States also reflects the trend real appreciation in catching-up countries. This can be explained by increases in wages in the tradable sector due to productivity growth that are transferred to the wages and prices of the non-tradable sector (Balassa-Samuelson effect) where productivity does not increase commensurately. Countries that have undergone economic transitions (e.g. liberalised trade and capital flows), and have been catching-up to the levels of development of the EU-15 countries, typically have experienced a trend appreciation in terms of the REER indicator. If REER appreciation is due to the Balassa-Samuelson effect, with productivity improvements in tradable goods, this should not threaten international competitiveness. The most recent empirical studies find a Balassa-Samuelson effect for new Member States of only 1% per year, on average (Égert *et. al*, 2005). This is a rather modest contribution that is not sufficient to explain the observed REER appreciations in catching-up countries.

Overall, with a REER indicator calculated as a three-year percentage change, the transformation looks at medium-term developments in relative prices. To also cater for exchange rate flexibility, one standard deviation is added to the value of the thresholds derived from the distribution in the sample of euro-area countries. The standard deviation is larger than the value on the Balassa-Samuelson effect estimated in the literature, i.e. 1% change per year. The thresholds corresponding to the lower and upper quartiles of the distribution are  $-/+5\%$  for the three-year percentage change. These thresholds would apply to euro-area countries.<sup>33</sup> For the non-euro area countries, the standard deviation of the distribution is subtracted from the lower quartile and added to the upper quartile. The resulting thresholds for non-euro-area countries are therefore  $-/+11\%$ .

### Economic interpretation

The REER indicator captures persistent price changes in a common reference unit (HICP/CPI) relative to major trading partners and thus illustrates the magnitude of developments in price and cost competitiveness. Significant deviations of the REER based on HICP/CPI from the benchmark indicate that prices have grown out of line with productivity for some time without compensation *via* the nominal exchange rate, i.e. the country has lost or gained labour cost competitiveness with respect to its trading partners.

In particular for euro-area Member States, persistent divergence in price and cost competitiveness versus their EMU peers is a concern as this may hamper the smooth functioning of the monetary union. In order to monitor such structural losses or gains in competitiveness and trade, the additional indicators complement the economic reading with a REER indicator that focuses on euro area trading partners instead of the broader set of 36 countries in the headline REER indicator. Moreover, REER developments are analysed in conjunction with other scoreboard indicators on competitiveness (in particular the development of ULC and export market shares) to gain insight on the cost, price and non-price competitiveness performance of Member States.

### 3.4. EXPORT MARKET SHARES

The scoreboard indicator is the percentage change of export market shares over five years, based on Balance of Payments Eurostat data, with a lower indicative threshold of  $-6\%$ .

### Economic rationale

The current economic crisis has exposed the importance of non-price factors for export developments. To this end, the scoreboard on macroeconomic imbalances includes an indicator on export market shares. This indicator aims at capturing structural losses in competitiveness. A country might lose shares of export market not only if exports decline but most importantly if its exports do not grow at the same rate of world exports and its relative position at the global level deteriorates. Hence, the reasons why countries might not

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<sup>33</sup> The thresholds for non-euro area countries cannot be derived from the distributions of the percentage deviations from the three-year percentage changes for non-EA member states because these distributions are heavily influenced by the strong appreciations occurred in the past 15 years in many transition economies.

have exploited new market opportunities or sharpened comparative advantages in newly traded products warrant investigation.

Export market shares can be driven by the increase/decrease of a country's export volume (numerator effect) but also by the growth of total world exports in goods and services (denominator effect). World exports have almost doubled in the period 1994-2007 (+83%), due to factors such as multilateral trade liberalisation and unilateral trade liberalisation of some emerging countries (e.g. China, India and Brazil among some) but also to the increased trade in services favoured by the development of ICT. Hence, it can also be the case that some countries apparently lose market shares because their exports grow more slowly than total world exports. Although this 'denominator effect' needs to be considered differently from the loss in market shares due to a 'numerator effect', the scoreboard should capture the *overall* position in terms of market shares of each country.

Export performance as measured by export market shares diverged across EU Member States. As the numerator effect shows, some Member States benefited from a surge in exports of goods and services while others recorded a rather dismal export performance. To some extent, this disparity reflects differences in geographical specialisation, with some Member States being better positioned in fast growing export destinations such as East Asia and Eastern Europe. The causes of this divergence in export market shares can be related to both differences in trade openness and in product composition of exports. Small open economies that concentrate on few closely related trade partners tend to be more exposed to external demand shock risks than countries with a variety of export destinations or less trade openness. Similar arguments extend to the concentration in the sectoral composition of exports. In addition, technology-intensive products and services are found to be much less sensitive to changes in relative costs than low-technology sectors. Overall, relative prices only partly explain export performance, while other factors such as product quality and market structure can play an important role (Carlin *et al.*, 2001).

#### Data transformation, data sources and indicator threshold

There are a number of options available as regards the definition of the indicator. Firstly, one aspect to take into account is the time variation to apply: changes over one, three or five years. Given the high volatility of year-on-year changes in view of idiosyncratic trade shocks, this option was excluded in favour of a longer assessment period which would better reflect structural losses/gains in export performance. The percentage change over five years of the value of goods and services exports for each country as share of the world exports of goods and services appears to be the most opportune data transformation to measure long-term competitiveness development. There is an important caveat, though: the short time series available permits to calculate five-year export market shares changes only from 1999 onwards. For each country, the export market shares are computed as the share of the country's export revenues in total world export revenues, in current prices. The indicator thus adds many aspects of competitiveness to the scoreboard that are not captured by price and cost competitiveness alone (that is monitored with the real effective exchange rate based on HICP/CPI and the nominal ULC).

The indicative threshold of the export market share indicator has been obtained from the lower quartile of the data series distribution. This threshold corresponds to cumulative losses of 6% over a period of five years. For this indicator, no upper threshold has been considered because in the context of the MIP, since the focus is on the detection of the harmful imbalances that may jeopardise the healthy functioning of the EMU. In that context, the key concern is the detection of Member States with deteriorating competitiveness positions given by unsustainable losses in export market shares.

#### Economic interpretation

The economic interpretation of the export market shares indicator is performed in conjunction with other long-run scoreboard indicators. In fact, most of the fluctuations and country differences in current accounts are driven by developments in the balance of goods and services, which is usually the largest component of the current account. Losses in competitiveness, the built-up of large current account deficits and the deterioration of the net international position in some Member States can be related to a range of underlying domestic macroeconomic imbalances.

Export market shares could also be computed with trade data in volumes (at constant prices) rather than with data at current prices (using Balance of Payments data on exports) so to avoid biases deriving from

relative prices developments. Such an indicator has the advantage to exclude variations that are due to relative export prices developments. While the indicator calculated at current prices covers data on goods and services, the variation of export market shares in volumes only covers exports of goods, given the lack of reliable deflators for trade in services. The current prices data series for goods and services has therefore been chosen as indicator in the scoreboard for coverage reasons, while export market shares (for goods) in volumes will complement its reading among the additional indicators.<sup>34</sup>

Furthermore, with respect to 'non-price' competitiveness, the scoreboard already includes several indicators that are directly or indirectly related to competitiveness at large, i.e. the change of the REER based on the HICP/CPI deflators, the change in export market shares and the change of ULC. Hence, the dynamics of 'price' and 'cost' competitiveness together with the variation of export market shares offer an indication of 'non-price' competitiveness which in turn can be defined as the "export performance that cannot be explained by price developments".<sup>35</sup> In order to gain more precise insight into such developments, the reading of scoreboard also relies on value-added decompositions and analysis according to sectoral export market shares.

In addition, and as highlighted by the so called "new-new trade theory", in the long run the driver of export is productivity (Melitz, 2003). Only the most productive firms in each country export, and countries' export performance is closely related to changes in average productivity.<sup>36</sup> Therefore by including export market shares, the scoreboard includes not only 'non-price' competitiveness elements but also, indirectly, productivity. In order to disentangle this feature, the scoreboard includes a productivity indicator among the additional indicators used for the economic reading. This indicator is measured as the year-on-year growth of labour productivity expressed as GDP per person employed (at constant prices, 2000). Taking account of productivity developments, in particular during protracted periods of low growth, is relevant as macroeconomic imbalances are often symptomatic for a lack of productive investments. Indicators of productivity growth are thus not read as a direct early warning indicator for emerging imbalances, but used in conjunction with forward-looking scoreboard indicators in order to obtain a better understanding of the potential severity of macroeconomic imbalances (in terms of their likely persistence and the capacity of the economy to adjust).

### 3.5. UNIT LABOUR COSTS

The scoreboard indicator is the percentage change over three years of nominal unit labour cost based on Eurostat data, with the indicative thresholds of +9% and +12% for euro-area and non-euro-area countries, respectively.

#### Economic rationale

The scoreboard incorporates a nominal Unit Labour Costs (ULC) indicator in view of monitoring developments in price and cost competitiveness across EU Member States. The ULC measures the average cost of labour per unit of output. A rise in an economy's nominal unit labour costs corresponds to a rise in labour costs that exceeds the increase in labour productivity. This can potentially be a threat to an economy's cost competitiveness, if other costs (e.g. cost of capital) are not adjusted in compensation.

The rationale for including in the scoreboard an indicator on ULC is that persistent competitiveness divergences across Member States are strongly related to the responses of countries in terms of productivity and labour market policies. For instance, ULC growth accelerated considerably since the beginning of the crisis and displayed a partly reversal of previous divergences. However, the observed convergence in ULC growth seems to mostly reflect heterogeneous Member States responses to the crises

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<sup>34</sup> The volume indicator has therefore been calculated by using for each country export of goods volumes indexes derived from EUROSTAT<sup>34</sup> and for the world, export of goods volume indexes derived from UN-Comtrade. Cf. UN, *2010 International Trade Statistics Yearbook*, Volume II- Trade by Commodity world trade tables covering trade values and indices up to the year 2010 (December 2011) and UN, *2009 International Trade Statistics Yearbook*, Volume II- Trade by Commodity world trade tables covering trade values and indices up to the year 2009 (December 2010); both publications are available at <http://comtrade.un.org/pb/>

<sup>35</sup> With respect to non-price competitiveness, the quality differentiation and the characteristics of exported product are often mentioned; however no aggregate and widely-used measure is available to quantify the concept.

<sup>36</sup> This does not rule out cost competitiveness because the higher the productivity, the more output will be produced for the same amount of inputs, which corresponds to lower marginal costs of production.



in terms of productivity and employment policies, rather than wage adjustment to pre-crisis competitiveness divergence.

### Data transformation, data sources and indicative threshold

The ULC index used in the scoreboard corresponds to the ratio of compensation per employee to real GDP per person employed (labour productivity). The original data on nominal compensation per employee, GDP and employment stem from Eurostat and the index is calculated by DG ECFIN (AMECO database).<sup>37</sup> In order to capture the medium/long term developments of labour costs, the scoreboard indicator for the ULC is calculated as the three-year percentage change, as it dampens cyclical impacts on this indicator and keeps memory of built-up competitiveness losses. Besides the percentage change over three years, the year-on-year percentage change of the ULC index and the deviation from the long term average were also computed. Nonetheless, these latter transformations are either too volatile or heavily influenced by the average trend in ULC in each country.

The threshold corresponding to the upper quartile of the statistical distribution over the sample of euro-area countries is 9%.<sup>38</sup> For non-euro-area countries 3 percentage points have been added to obtain a 12% threshold. This differentiation is not based on the statistical distribution over the non-euro area sample, but was made since historical data reflect the fact that the majority of non-euro area countries have experienced a major trade liberalisation in the period covered by our data (since 1995), which entails a natural process of factor price equalisation towards the levels of the trade partners. These strong adjustments processes due to trade liberalisation should however be considered to weaken over time and in the future. In that respect, catching up transition economies are of particular concern as they can experience a trend increase in ULC because the increases in wages in the tradable sector linked to productivity growth are transferred to the wages and prices of the non-tradable sector (Balassa-Samuelson effect), where productivity does not necessarily increase. However, recent empirical studies gauge this effect to be limited (Égert *et al.*, 2005; European Commission, 2008; and Peters, 2010, cf. discussion in section 3.3). No upper threshold has been considered, because in the context of the MIP, the focus is on the detection of the harmful imbalances that may jeopardise the smooth functioning of the EMU, such as unsustainable increases in the cost of labour.

### Economic interpretation

The interpretation of the medium/long-run ULC indicator will be complemented with the scoreboard indicators on competitiveness and trade. The ULC indicator together with the (HICP-based) REER indicator allows a comprehensive assessment of the cost/price competitiveness developments in each Member State. Large and sustained increases in ULCs may lead to the erosion of competitiveness, especially if combined with a widening current account deficit and declining market shares for exports. For instance, in the years preceding the present crisis, wage growth outstripped productivity improvements in many Member States, inducing sharp increases in ULC. Similarly, the developments in REER, which show price and cost competitiveness relative to the main trading partners, point to increased divergence.<sup>39</sup> This may signal potential structural rigidities in product and labour markets but partly reflects the catching-up process in several Member States. To account for the longer-term losses in cost competitiveness, percent variations over longer time periods (up to ten years) also are considered in the economic reading of the scoreboard.

The interpretation of the scoreboard indicators on competitiveness and trade is complemented by a set of additional indicators. Persistent divergence in price and cost competitiveness among euro-area countries is of particular concern, provided that ensuing external debt problems may hamper the smooth functioning of

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<sup>37</sup> The series used are: compensation of employees (total economy), employees (total economy), gross domestic product at constant market prices, employment (total economy that also includes self-employed). When available, full-time equivalents of employees and employment are used.

<sup>38</sup> Following suggestions by the ECB, thresholds were also calculated with a convergence approach methodology (i.e. for each year the average of the three best performers plus a fixed percentage) however such year-specific thresholds resulted to be very cyclical and heavily influenced by outliers.

<sup>39</sup> In a number of Member States with high external deficits, the increases in labour costs and REER appreciations were concentrated, although not exclusively, in the non-tradable sectors. This, in turn, induced a reallocation of resources towards these sectors, exerting further pressure on external positions.

EMU. For this reason, an effective ULC deflator<sup>40</sup> indicator versus the rest of the euro-area countries is included among the additional indicators. The importance of monitoring effective ULC deflators as an indicator of competitiveness developments was recognised by the Heads of State or Government of the euro area in their Council Conclusions of 11 March 2011. As part of efforts to assess whether wages are evolving in line with productivity developments, the Pact for the Euro Area calls for ULCs to be monitored over a period of time, by comparing developments in other euro-area countries and their main trading partners.

### 3.6. HOUSE PRICE INDEX

The scoreboard indicator is the year-on-year growth rate of the deflated house price index (HPI), data source Eurostat, with an indicative threshold of 6%.

#### Economic rationale

The rationale for including an indicator on housing price developments is that large movements in real asset markets have been traditionally associated with a number of economic crises and have also figured prominently in the recent financial crisis. Monitoring real asset prices is important as booms and busts in housing markets affect the real economy through a variety of channels and can be an important source of macroeconomic imbalances. Some empirical analyses suggest that the impact of a significant fall in real estate prices may be even more important than an equivalent decline in stock prices (Case *et al.*, 2001), though this finding is not unchallenged (Buiter, 2010).

Rising real asset prices can affect household consumption spending through a wealth effect in the form of real estate valuations. Moreover, rising real estate prices relative to construction costs can stimulate housing construction through higher profitability. The reverse is true for falling house prices. A sudden decline in property prices renders investment less attractive and reduces the profitability of the construction sector. As a result, investment may dry up and contribute to an economic slowdown. This process is also often associated with an inter-sectorial substitution effect which leads to a reallocation of resources between the tradable and the non-tradable construction sector. In the boom period, higher returns in the housing sector relative to the tradable sector attract production factors from the tradable sector and thereby may limit the supply of tradable products. In the bust period, economic adjustment towards higher production in the tradable sector is required, and it is often associated with low growth and high unemployment during the transition period. The view of the importance of inter-sectorial substitution effects is supported by analyses of the European Commission (European Commission, 2009).

Real asset prices are generally correlated with large movements in monetary and credit aggregates with possible implications on macroeconomic imbalances and financial stability (Adalid and Detken, 2007). Higher house prices (and therefore higher valued household collateral) reduce the influence of asymmetric information between borrower and lender and improve lending conditions. As lenders' willingness to supply credit increases, so do investment and consumer durable expenditure, often reinforcing the cycle of further rising house prices and stronger credit growth. Over the past decade in the EU, this process was facilitated by international capital flows whereby the private sector in several deficit countries was attracting financial resources from other Member States. Conversely, in the bust period, the drop in house prices reduces household collateral, contributing to writing downs and/or writing offs by banks, and leading to a sharp deceleration of credit growth in the economy.

The link between money and credit growth, on the one hand, and asset prices, on the other hand, goes in both directions (Setzer *et al.*, 2010). Moreover, Gerdesmeier *et al.* (2009) find that credit growth is a good early warning indicator for house price booms. They compute an excess credit indicator (defined as deviations from the trend by a certain amount) which predicts 80% of the crises over a three-year horizon.

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<sup>40</sup> The effective ULC deflator relative to 35 trading partners is calculated by DG ECFIN. Reference countries were selected on the basis of their importance for euro area exports. The effective ULC deflator relative to partners  $i$  is computed as  $\prod_i \left(\frac{D_j}{D_i}\right)^{w_i}$ , where  $w_i$  are

the trade weights (double export weights, 1999=100) and  $D_j, D_i$  are deflators for home country  $j$  and partner country  $i$ . The effective ULC deflator uses "double-export-weighting" The general idea of using the "double-export-weighting" procedure is to reflect (i) competitors' shares in export markets; and (ii) the relative importance of a particular market for the country and industry under consideration.

The study also finds that excess credit of 4% in combination with a similarly defined excess equity price of 60% predicts almost 75% of the crises over a four or five-year horizon.

### Data transformation, data sources and indicator threshold

The scoreboard indicator is the year-on-year change in deflated house prices, more specifically the house price indicator relative to a Eurostat consumption deflator.<sup>41</sup> The consumption deflator is used to reflect the value of house prices relative to the whole consumption basket. This way of computing real house prices is widely used in the literature and by other international organisations (e.g. OECD).

Data on house price indices are provided by various institutions. The only harmonised index is, however, the Eurostat experimental house price index (HPI).<sup>42</sup> It aims at measuring price developments of all residential properties purchased by households (flats, detached houses, terraced houses, etc.), both new and existing, independently of their final use and their previous owners. Only market prices are considered (mirroring the practice of the HICP), self-built dwellings are therefore excluded. The land component is included in the HPI.

Since 2005, Eurostat has been collecting HPI data from several Member States in the framework of the Owner Occupied Housing project. When the process of selecting the scoreboard indicators started, HPI data were available for 17 Member States for the period 2005-Q1 to 2010-Q1. As of the data extraction date for the Alert Mechanism Report<sup>43</sup>, important progress has been made and data have been collected for all 27 Member States, at least for 2010 and 2011. The publication of HPI quarterly data as from 2005 started in December 2010 and the most recent release was in January 2012. The data published by the ECB in the Residential Property Price Indicator database are being used to complement the missing data. In the medium-run, Eurostat will work on providing longer time series for the HPI, starting possibly in the mid-1990s.

For time series analyses, a longer time sample is needed. To this end, other data sources such as the ECB and the OECD could be used, given that, for the period 2005-2010, the correlation between the growth rates of Eurostat HPI and of the ECB and OECD house price indicators is very high for a large majority of Member States. However, for some new EU non-euro-area Member States, only the data from the Bank for International Settlements database (BIS) are available. BIS data are the least harmonised, as they use a variety of prices, such as price per square meter, per standard flat, etc.

Given the scarcity of time series data, it is difficult to derive a threshold based on the statistical distribution. Using the OECD dataset of 19 OECD countries on a long series of historical data (1970-2007) gives a lower upper quartile of the distribution of 6%. This compares with the threshold derived based on the information provided by the house price cycle. For instance, a recent study by Agnello and Schuknecht (2009) looks into house price cycles and identifies phases of booms and busts in 18 industrialised countries. The 25 most severe booms are characterised by an average expansion of real house prices of 40% over an average period of 7 years. (The severity is judged based on an index which gives an equal weight to the magnitude and the duration of the house price in the boom phase.) This translates into an annual increase of close to 6%. Given that only the top 25 most severe booms over the period 1970-2007 are selected amongst the total of 100 identified booms, the associated 6% threshold could be seen to be at the high end.

### Economic interpretation

As part of the economic reading of this scoreboard indicator, real house price growth over longer time periods will also be considered, as a complement to the short-run indicator. To this end, three-year average price growth rates are used as an additional indicator. Moreover, the analysis of the house price cycle proves to be very informative. The cumulated house price growth from the latest trough to the latest peak and the average annual pace of growth can illustrate the scale of house price developments. Coupled with information on house price determinants, such as credit growth, cost of credit and demographic factors, these could provide indications on future house prices developments.

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<sup>41</sup> Household and NPISH final consumption expenditure (P31\_S14\_S15).

<sup>42</sup> At the same time, Eurostat is working also on the Owner Occupied Housing (OOH) index. Unlike the HPI, it measures the cost of owner occupiers in a HICP framework. For details on the differences between the two, see Eurostat (2010a) and Eurostat (2010b).

<sup>43</sup> 30 January 2012.

During the process of designing the scoreboard, the nominal house price index was also discussed; this indicator is likewise used in the economic reading. For instance, if nominal house price inflation occurs at the time of final consumption inflation, and thereby the real house price growth does not pick up the acceleration in nominal house price inflation, potential risks of a house price bubble will be grasped through economic judgement. In order to put house prices into perspective, it is useful to assess them against households' capacity to repay and alternative options such as rental markets. In this vein, affordability (price-to-per capita disposable income) and dividend (price-to-rent) ratios will also be assessed. Although their findings have to be considered with caution due to their simplifying assumptions and their crude approach, they provide a useful qualifier.

Volume indicators, in particular residential construction and value-added in construction (as percent of GDP), are a useful complement to assess house prices. The responsiveness of supply to changes in prices plays an important role in shaping housing markets. A responsive housing supply reduces house price volatility but at the potential cost of greater fluctuations in residential investment, with the net impact on overall economic activity being unclear (Andrews *et al.*, 2011). Thus, it seems that during boom periods, inelastic housing supply reinforces house price overvaluation while high supply elasticity coupled with expectations of future housing price rises may lead to overshooting in construction activity.

### 3.7. PRIVATE SECTOR DEBT

The scoreboard indicator is the stock of private sector<sup>44</sup> debt in percent of GDP, defined as the sum of loans and securities other than shares, non-consolidated. The threshold of private sector debt is 160%.

#### Economic rationale

The latest financial crisis pointed to the fact that excessively high private sector debt implies risks for growth and financial stability and increases the vulnerability to economic shocks. While there is no firm evidence from the literature on an optimal level of debt in the economy, high debt levels represent a vulnerability *per se*. Countries with high private sector debt overhang are more prone to strong deleveraging forces.

Private debt developments allow for an assessment of the private sector vulnerability to changes in the business cycle, inflation and the interest rate. Berkmen *et al.* (2009) conclude that countries with a more leveraged financial system and higher credit growth suffered more during the crisis. Private sector debt depends on structural characteristics, such as the demographic structure or the pension system, which may blur a short-term diagnosis on the vulnerability of the private indebtedness. Moreover, financial development contributed to a global trend towards an increase in the level of private sector debt.

#### Data transformation, data sources and indicative threshold

Private sector debt is a stock variable defined as the sum of loans and securities other than shares and is expressed in percentage of GDP. The data stem from the annual financial accounts and balance sheets (AFA) collected by Eurostat and the quarterly financial accounts (QFA) collected by the ECB.<sup>45</sup>

The selection process of the indicator finally dismissed the category "other accounts: payable" at this stage. Although it is a non-negligible subcategory for several Member States, it exhibits high volatility and may therefore introduce noise in the data that is difficult to justify. The item reflects valuation effects as well as volume effects (mainly reclassifications), but the two are difficult to disentangle. This item is therefore potentially interesting to consider as an additional indicator to qualify debt developments.

The envisaged indicator is currently based on non-consolidated data, i.e. including intra-sector liabilities such as intra-enterprise loans. The reason is threefold: Firstly, only non-consolidated data are available for

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<sup>44</sup> Private sector is defined as non-financial corporations, households, and non-profit institutions serving households. The non-financial corporations sector includes both private and public corporations. Referring to the proposed indicator as private sector debt may, therefore, be partly misleading as it also includes public non-financial corporations (which are market producers). However, in the absence of a more refined indicator, the current definition will have to be used.

<sup>45</sup> Both data sets deliver fairly consistent data, as QFA is broadly the quarterly equivalent of the AFA data series.

all Member States, and thus the use of non-consolidated data ensures cross-country comparability. Secondly, quarterly data provided by the ECB are non-consolidated and these are used to complement annual data with the latest developments. Thirdly, non-consolidated data include important information about the total indebtedness of the private sector. By including intra-sector debt, the use of non-consolidated data acknowledges that apart from bank loans, an increasingly important source of financing may be intra-sector.

One drawback of non-consolidated data is that it is not known to which extent intra-sector liabilities are dominated by intra-group transactions. If intra-group loans form the bulk of intra-sector credit, non-consolidated data may be biased due to national and multinational (non-financial) corporate accounting practices. High amounts of intra-enterprise loans issued for fiscal reasons do not reflect an imbalance, as they are purely driven by accountancy practices. For example, in Member States where each unit/branch of an enterprise-group reports on its credit/debt, the non-consolidated data would probably show higher figures than in Member States where the headquarter reports on total group consolidated credit/debt.

The threshold of private sector debt is 160% of GDP, as derived from the upper quartile of the statistical distribution of the indicator. Annual data for the period 1995-2007 were used to establish the threshold.

### Economic interpretation

Further work is envisaged to assess how consolidation practices compare across Member States. Meanwhile, consolidated data will be used as an additional reading indicator. When large differences between consolidated and non-consolidated data exist, the Commission services will examine the reasons behind. The Commission will examine, jointly with Eurostat, whether intra-enterprise loans dominate intra-group liabilities for non-financial corporations or whether there are other reasons in order to shed more light on the consolidation practises across Member States. Once availability of consolidated data is improved in the future, the relative merits of consolidated versus non-consolidated data can be reassessed.

Two subcategories enter in the definition of debt/credit without controversy: loans, and securities other than shares. Consideration is to be given in the economic reading to the third subcategory mentioned above: "other accounts: payable". Other payable includes: "trade credits" and "other payable excluding trade credits and advances". The latter consists of financial claims which arise from timing differences between distributive transactions or financial transactions on the secondary market and the corresponding payment, for example: (a) taxes; (b) social contributions; (c) wages and salaries; (d) rents on land and subsoil assets; (e) dividends; (f) interest; (g) transactions in financial assets on the secondary market. The inclusion of "other payable" generally leads to higher debt level figures. This is particularly the case when using non-consolidated data as there are large differences between consolidated and non-consolidated data for "other payable", which risk capturing intra-group accounting practices, such as practices of short-term invoicing, the use of checks as means of payment, etc.

Moreover, Monetary and Financial Institutions (MFI) data on loans, collected by the ECB, will also be considered as part of the subsequent economic analysis. The advantage of using MFI loans consists in their widely spread use, both by academics and international organisations. As a disadvantage, securities which are also a source of financing for non-financial corporations, are not included, overlooking thus country heterogeneity with respect to firm liabilities' structure. Also intra-sector credit, which may be an increasingly important source of financing, is not captured when using MFI loans data.

### 3.8. PRIVATE SECTOR CREDIT FLOW (TRANSACTIONS)

The scoreboard indicator is private sector<sup>46</sup> credit flows (transactions) expressed in percent of GDP, and it includes loans and securities other than shares, non-consolidated data. It is the flow counterpart of private sector debt (which is a stock indicator). The indicative threshold of private sector credit is 15%.

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<sup>46</sup> *Ibidem* 44.

## Economic rationale

Empirically, high credit growth is found to be associated with higher crisis incidence (Frankel and Saravelos, 2010). A wide body of economic literature identifies quickly expanding credit as one of the best predictors of financial or banking crises, both in emerging and advanced economies. Among the first contributions, Sachs *et al.* (1996) argue that credit growth<sup>47</sup> is a good proxy of banking system vulnerability, as rapid credit expansion is likely associated with a decline in lending standards. Similarly, Jordá *et al.* (2011) and Gourinchas and Obstfeld (2011) find a significant and economically large impact of credit booms on the probability of banking crises, currency crises and sovereign defaults.

There is also consensus in the literature that boom and bust cycles in asset markets have been historically associated with large movements in monetary and credit aggregates (Adalid and Detken, 2007). The link between money and credit growth, on the one hand, and asset prices, on the other hand, goes in both directions (Setzer *et al.* 2010). Gerdesmeier *et al.* (2009) find that credit growth is a good early warning indicator for house price booms. They compute an excess credit indicator which predicts 80% of the crises over a three-year horizon. The study also finds that excess credit of 4% in combination with a similarly defined excess equity price of 60% predicts almost 75% of the crises over a four or five-year horizon. Alessi and Detken (2010) argue that the excess of global private credit is the best crisis indicator for a policy maker who is only slightly more averse to false alarms than missed crises. In terms of absolute performance, the threshold derived from the optimal 70% percentile across countries predicted on average 95% of high-cost booms by issuing a signal in at least one of the six preceding quarters.<sup>48</sup>

Moreover, there is a potentially important link between credit growth and external imbalances. Stronger relative demand pressures in some Member States fuelled import demand, triggered capital inflows and contributed to the widening of current accounts deficits. Excessive credit dynamics matched these domestic demand pressures, leading to the rise in household and corporate debt (European Commission, 2010). Looking at catching up economies, Coricelli *et al.* (2006) find that a credit boom seems to be associated with the deterioration of the trade balance *via* the import channel. Furthermore, Duenwald *et al.* (2005) argue that credit booms have contributed to the widening of macroeconomic imbalances and heightened external vulnerability. Some non-euro-area Member States experienced significant rises in credit flows denominated in foreign currencies, contributing to a build-up of balance sheet vulnerabilities. Commission Services also point to the fact that credit growth to the non-tradable, in particular housing, sector crowded out resources from the tradable sector.

## Data transformation, data sources and indicative threshold

The indicator private sector credit flows (transactions) is expressed in percent of GDP, and it includes loans and securities other than shares. The scoreboard indicator chosen is currently based on non-consolidated data. The sources of data are the annual financial accounts and balance sheets (AFA) collected by Eurostat and the quarterly financial accounts (QFA) collected by the ECB. The source data used for debt and credit flows is the same. Therefore, data, methodological and technical issues pertaining to these two indicators largely overlap.

As in the case of private sector debt, the subcategory "other accounts: payable" is not included. Although it is a non-negligible subcategory for several countries, it exhibits high volatility and may therefore introduce difficult to justify noise in the data. The item reflects valuation effects as well as volume effects (mainly reclassifications), but the two are difficult to disentangle. This item is potentially interesting to consider as an additional indicator to qualify debt developments.

Again, as discussed for the private debt indicator, an important issue is the choice between consolidated or non-consolidated data for the scoreboard indicator. The envisaged indicators are currently based on non-consolidated data, i.e. including intra-sector liabilities such as intra-enterprise loans. The reason is threefold. First, only non-consolidated data are available for all Member States, and thus the use of non-consolidated data ensures cross-country comparability. Second, quarterly data provided by the ECB are non-consolidated and these are used when annual data are non-available for the latest developments.

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<sup>47</sup> Credit growth in the quoted literature refers to outstanding credit growth, i.e. at the growth in the stock variable which represents the flow plus valuation effects.

<sup>48</sup> Pragmatic approach of optimizing *ex post* the percentile of the distribution beyond which a warning signal is issued.

Third, non-consolidated data include important information about the total indebtedness of the private sector. By including intra-sector debt, the use of non-consolidated data acknowledges that apart from bank loans, an increasingly important source of financing may be intra-sector.

One drawback of non-consolidated data is that it is not known to which extent intra-sector liabilities are dominated by intra-group transactions. If intra-group credit forms the bulk of intra-sector credit, non-consolidated data may be biased due to national and multinational (non-financial) companies' corporate figures. High amounts of intra-enterprise loans issued for fiscal reasons do not reflect an imbalance, as they are purely driven by accountancy practices. For example, in Member States where each unit/branch of an enterprise-group reports on its credit/debt, the non-consolidated data would probably show higher figures than in Member States where the headquarter reports on total group consolidated credit/debt.

The indicative threshold of private sector credit is 15% of GDP, as derived from the upper quartile of its historical distribution. Annual data for the period 1995-2007 are used to establish the value of the threshold.

### Economic interpretation

Two other indicators were considered and discarded. Firstly, initial considerations aimed at an indicator measuring the year-on-year percentage change in credit flow. The rationale behind this choice of data transformation was that it can detect rapid increases in credit flows that could be associated with credit bubbles, which in turn may contribute to crisis situations. However, interpretation difficulties arise since credit flows typically evolve in a cycle. This induces a risk that by using this indicator the gradual built up of a credit bubble is concealed when credit flows remain high but steady ("high speed but no acceleration") and thus its early-warning properties are jeopardised. Secondly, the year-on-year change in private sector debt as percent of GDP was considered, as it represents the most straightforward flow counterpart of the indicator on private sector debt. Notwithstanding its consistency with the stock variable, this indicator is heavily influenced by Other Economic Flows (OEF), which is a non-directly interpretable residual. OEF consists in nominal holding gains and losses (changes in prices) and other changes in volume (mainly reclassifications). However, distinguishing between changes in prices and changes in volumes is difficult, and it seems that OEF is heavily influenced by reclassifications.

Further work is envisaged to assess how consolidation takes place in various Member States. Meanwhile, consolidated data will be used as an additional reading indicator. For instance, the Commission services will examine whether large differences between consolidated and non-consolidated data exist for Member States, and the reasons will be carefully analysed. It will examine, jointly with Eurostat, whether intra-enterprise loans dominate intra-group liabilities for non-financial corporations or whether there are other reasons in order to shed more light on the consolidation practises across Member States. Once availability of consolidated data is improved in the future, the relative merits of consolidated versus non-consolidated data can be reassessed.

Two subcategories enter without controversy in the definition of debt/credit: loans, and securities other than shares. Consideration is to be given in the economic reading to a third subcategory mentioned above: "other accounts: payable". Other payable includes: "trade credits" and "other payable excluding trade credits and advances". The latter consists of financial claims which arise from timing differences between distributive transactions or financial transactions on the secondary market and the corresponding payment. It includes also financial claims due to income accruing over time, for example: (a) taxes; (b) social contributions; (c) wages and salaries; (d) rents on land and subsoil assets; (e) dividends; (f) interest; (g) transactions in financial assets on the secondary market. The inclusion of "other payable" generally shifts the level of debt upwards. This is particularly the case when using non-consolidated data as there are large differences between consolidated and non-consolidated data for "other payable", which risk capturing intra-group accounting practices, such as practices of short-term invoicing, the use of checks as means of payment, etc.

Moreover, Monetary and Financial Institutions (MFI) data on loans, collected by the ECB, will also be considered for the economic analysis. The advantage of using MFI loans is that they are a very widely used data source, both by academics and international organisations (e.g. the ESRB). The disadvantage is that securities, which are also a source of financing for non-financial corporations, especially in some Member States, are not included. Also intra-sector credit, which may be an increasingly important financing source is not captured when using MFI loans data.

Another important element to be addressed in 2012 is the potential inclusion of a scoreboard indicator covering the financial sector, since this sector has been at the root of the recent financial and economic crisis. While the European Systemic Risk board (ESRB) will monitor financial stability risks, the MIP will look at the financial sector from the point of view of macroeconomic imbalances. Existent scoreboard indicators, such as credit transactions and housing price developments, already provide information on the financial sector's efficiency of allocating resources and potential imbalances. For example, strong credit growth coupled with excessive increases of housing prices indicate a possible misallocation of credit and the built up of an asset bubble. However, indicators capturing the change in size of financial sectors' balance sheets, leverage indicators or soundness indicators also provide meaningful information.

### 3.9. GENERAL GOVERNMENT SECTOR DEBT

The scoreboard indicator is general government debt in percent of GDP, defined under the Excessive Deficit Procedure (EDP) as the total gross debt at nominal value outstanding at the end of the year and consolidated between and within the sectors of general government. The threshold is 60%.

#### Economic rationale

Beyond private sector developments, recent market tensions have shown that the overall indebtedness of a Member State is very important and that there are important linkages between private sector and general government debt. Perceived sovereign and financial sector risks are closely tight together. In the course of the financial crisis, governments have taken on large contingent liabilities that, even if do not immediately impact on debt levels, affect their perceived creditworthiness.<sup>49</sup> There are also feedback effects from banks to the government as banks are large creditors to sovereigns, making them vulnerable to fiscal woes. Moreover, a high level of general government debt increases the vulnerability of a Member State and weakens its room of manoeuvre to deal with crisis situations. An indicator for general government debt is therefore included in the scoreboard not to monitor risks of unsustainable public finances, which are covered by the Stability and Growth Pact, but to be considered together with the indicator on private debt and thereby to offer a broader picture of Member States' indebtedness.

During the selection process of the indicators, consideration was given to dropping the public debt altogether and instead having an indicator on the total level of indebtedness, with a cumulated threshold of 160% plus 60%. However, this could be wrongly interpreted in that a high level of government sector debt can be in some way compensated by a low level of the non-financial private sector debt (and *vice versa*). Moreover, for technical reasons related to differences in consolidation practices, private and general government sector debt cannot be directly summed up. In light of these considerations, it has been decided to include two separate indicators for private and general government debt in the scoreboard.

#### Data transformation, data sources and indicative threshold

The definition of general government consolidated gross debt is the one used for the purpose of the Excessive Deficit Procedure (EDP) as well as for the Stability and Growth and Stability Pact (SGP). The Maastricht Treaty, together with Council Regulation (EC) No 3605/93 define the general government debt as the total gross debt at nominal value outstanding at the end of the year and consolidated between and within the sectors of general government. Other accounts payable and financial derivatives are not included in the definition, mainly for measurement reasons.

As regards the threshold for the general government's indebtedness, the Treaty reference value of 60% of GDP will be used (as a separate indicative threshold for public debt under the MIP would be confusing).

#### Economic interpretation

General government debt is assessed for its contribution to the general indebtedness of a Member State, being thus looked at together with private sector debt. A high level of general government debt is more worrying when it accompanies large private sector debt. Nevertheless, high general government debt

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<sup>49</sup> The most prominent example is Ireland where the banking support induced a sharp deterioration in public finances with a fiscal deficit exceeding 30% of GDP in 2010 (nearly two thirds of it related to banking support) and a public debt level rising from 25% in 2007 to close to 100% in 2010.



represents a vulnerability *per se*. A high level of government sector debt cannot in any way compensate for a low level of the non-financial private sector debt (and *vice versa*).

### 3.10. UNEMPLOYMENT RATE

The scoreboard indicator is the three-year backward moving average of the unemployment rate, based on Labour Force Survey from Eurostat, with an indicative threshold of 10%.

#### Economic rationale

This indicator is intended to monitor high and persistent rates of unemployment. It points towards a potential misallocation of resources (mismatch) and general lack of adjustment capacity in the economy. It was added to the scoreboard following the trilogue discussions and reflects the text of the legislation calling for an indicator monitoring the evolution of unemployment to be included in the scoreboard.

An alternative indicator has been considered, namely the share of long-term unemployment on overall unemployment (from the Labour Forces Surveys, Annual data, Eurostat), which focuses on structural features of the labour market. However, it appears less intuitive as regards the overall misallocation of resources and the medium term adjustment capacity of an economy.

#### Data transformation, data sources and indicative threshold

The indicator is defined as the three-year backward average over of the unemployment rate (unemployed persons as a percentage of the labour force<sup>50</sup>) from annual data provided by Eurostat. Given the focus on the adjustment capacity of the economy and the ability of labour markets to reallocate labour resources, the average over last three years is preferred to yearly figures which are strongly influenced by short term volatility. In this sense, the selected indicator can be seen as a proxy of the structural unemployment rate, which is, however, an unobservable variable and the estimates of which are subject to numerous caveats. Similarly, the indicator considers levels of unemployment rather than changes, as increases/drops in unemployment tend to be highly correlated with GDP growth.

The statistical approach delivers an indicative upper threshold of 10% based on the upper quartile of the historical distribution. Due to the focus on adjustment in labour markets and not on cyclical fluctuations, only an upper threshold was considered in the scoreboard.

#### Economic interpretation

This indicator should be read in conjunction with forward-looking scoreboard indicators, as its purpose is not to make unemployment as such an objective for MIP surveillance. It helps to better understand the potential severity of macroeconomic imbalances in terms of their likely persistence and the capacity of the economy to adjust.

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<sup>50</sup> The unemployment rate is expressed conforming to International Labour Office definitions: the labour force is the total number of people employed and unemployed. Unemployed persons comprise persons aged 15 to 74 who are without work during the reference week, are available to start work within the next two weeks, and have been actively seeking work in the past four weeks or had already found a job to start within the next three months.

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## ANNEXES

### **Annex 1: Extract from the draft Regulation on the prevention and correction of macroeconomic imbalances**

EN L 306/28 Official Journal of the European Union, Article 4

#### *Scoreboard*

1. The scoreboard comprising the set of indicators, shall be used as a tool to facilitate early identification and monitoring of imbalances.
2. The scoreboard shall comprise a small number of relevant, practical, simple, measurable and available macroeconomic and macrofinancial indicators for Member States. It shall allow for the early identification of macroeconomic imbalances that emerge in the short-term and imbalances that arise due to structural and long-term trends.
3. The scoreboard shall, inter alia, encompass indicators which are useful in the early identification of:
  - (a) internal imbalances, including those that can arise from public and private indebtedness; financial and asset market developments, including housing; the evolution of private sector credit flow; and the evolution of unemployment;
  - (b) external imbalances, including those that can arise from the evolution of current account and net investment positions of Member States; real effective exchange rates; export market shares; changes in price and cost developments; and non-price competitiveness, taking into account the different components of productivity.
4. In undertaking its economic reading of the scoreboard in the alert mechanism, the Commission shall pay close attention to developments in the real economy, including economic growth, employment and unemployment performance, nominal and real convergence inside and outside the euro area, productivity developments and its relevant drivers such as research and development and foreign and domestic investment, as well as sectoral developments including energy, which affect GDP and current account performance.

The scoreboard shall also include indicative thresholds for the indicators, to serve as alert levels. The choice of indicators and thresholds shall be conducive towards promoting competitiveness in the Union.

The scoreboard of indicators shall have upper and lower alert thresholds unless inappropriate, which shall be differentiated for euro and non-euro area Member States if justified by specific features of the monetary union and relevant economic circumstances. In developing the scoreboard, due consideration shall be given to catering for heterogeneous economic circumstances, including catching-up effects.
5. The work of the ESRB shall be taken into due consideration in the drafting of indicators relevant to financial market stability. The Commission shall invite the ESRB to provide its views regarding draft indicators, relevant to financial market stability.
6. The Commission shall make the set of indicators and the thresholds in the scoreboard public.
7. The Commission shall assess on a regular basis the appropriateness of the scoreboard, including the composition of indicators, the thresholds set and the methodology used, and it shall adjust or modify them where necessary. The Commission shall make changes in the underlying methodology and composition of the scoreboard and the associated thresholds public.
8. The Commission shall update the values for the indicators on the scoreboard at least on an annual basis.

**Annex 2: Formulas for the indicators' transformations**

Indicators	Formulas for data transformation
<b>3 year backward moving average of CURRENT ACCOUNT BALANCE as % of GDP</b>	$\frac{\left(\frac{CA}{GDP}\right)_t + \left(\frac{CA}{GDP}\right)_{t-1} + \left(\frac{CA}{GDP}\right)_{t-2}}{3} * 100$
<b>NET INTERNATIONAL INVESTMENT POSITION as % of GDP</b>	$\frac{NIIP_t}{GDP_t} * 100$
<b>% change (3 years) of REAL EFFECTIVE EXCHANGE RATE with HICP deflators relative to 35 other industrial countries <sup>(a)</sup></b>	$\frac{(REER\_HICP\_35)_t - (REER\_HICP\_35)_{t-3}}{(REER\_HICP\_35)_{t-3}} * 100$
<b>% change (5 years) in EXPORT MARKET SHARES</b>	$\frac{\left(\frac{EXP_c}{EXP_{world}}\right)_t - \left(\frac{EXP_c}{EXP_{world}}\right)_{t-5}}{\left(\frac{EXP_c}{EXP_{world}}\right)_{t-5}} * 100$
<b>% change (3 years) in NOMINAL UNIT LABOUR COST <sup>(b)</sup></b>	$\frac{(ULC)_t - (ULC)_{t-3}}{(ULC)_{t-3}} * 100$
<b>y-o-y % change in DEFLATED HOUSE PRICES <sup>(c)</sup></b>	$\left( \frac{\frac{HPI_t - HPI_{t-1}}{DEFL_t \ DEFL_{t-1}}}{\frac{HPI_{t-1}}{DEFL_{t-1}}} \right) * 100$
<b>PRIVATE SECTOR CREDIT FLOW as % of GDP <sup>(d) (e)</sup></b>	$\frac{PSCF_t}{GDP_t} * 100$
<b>PRIVATE SECTOR DEBT as % of GDP <sup>(d) (e)</sup></b>	$\frac{PSD_t}{GDP_t} * 100$
<b>GENERAL GOVERNMENT DEBT as % of GDP</b>	$\frac{GGD_t}{GDP_t} * 100$
<b>3 year backward moving average of UNEMPLOYMENT RATE</b>	$\frac{(UR)_t + (UR)_{t-1} + (UR)_{t-2}}{3}$

**Notes:** a) For EU trading partners HICP is used while for non-EU trading partners, the deflator will be based on a CPI close to the HICP in methodology ; (b) index providing ratio of nominal compensation per employee to real GDP per person employed; (c) changes in house prices relative to the consumption deflator of Eurostat; (d) private sector is defined as non-financial corporations; households and non-profit institutions serving households; (e) sum of Loans, and Securities other than shares ; liabilities, non-consolidated.

Annex 3: Indicators and indicative thresholds

	External imbalances and competitiveness					Internal imbalances				
Headline Indicators	3-year average of current account balance as a % of GDP	Net International Investment Position as a % of GDP	3-year % change of Real Effective Exchange Rate, HICP deflators relative to 35 industrial countries	5-year % change of export market shares	3-year % change of nominal unit labour cost	y-o-y % change in deflated house prices	private sector credit flow as % of GDP	private sector debt as % of GDP	general government debt as % of GDP	3-year average of unemployment rate
Data source	Balance of Payments statistics EUROSTAT.	Balance of Payments Statistics, EUROSTAT.	DG ECFIN indicator data base on Price and Cost competitiveness.	Balance of Payments statistics, EUROSTAT, IMF.	EUROSTAT.	Harmonised house price index by EUROSTAT, completed with ECB, OECD and BIS data.	Transactions AFA, EUROSTAT for annual data and QSA, ECB for quarterly data.	Balance Sheet AFA, EUROSTAT for annual data and QSA, ECB for quarterly data.	EUROSTAT (EDP – treaty definition).	EUROSTAT LFS data.
Indicative thresholds	+6/-4%	-35% Lower quartile	+/-5% for EA +/-11% non-EA Lower and Upper Quartiles of EA - /+ s.d. of EA	-6% Lower quartile	+9% EA +12% non-EA Upper Quartile EA3 p.p	+6% Upper quartile	+15% Upper Quartile	160% Upper Quartile	+60%	+10%
Period for calculating thresholds	1970-2007	First available year (mid-1990s)-2007	1995-2007	1995-2007	1995-2007		1995-2007	1995-2007		1995-2007
Additional indicators	<i>Current Account balance as % of GDP, BoP data; Net lending/borrowing vs ROW as % of GDP); Net Trade Balance of energy products as % GDP</i>	<i>Net External Debt as % GDP; FDI Inflows as % GDP</i>	<i>3-year % change REER vs rest of the euro area</i>	<i>% y-o-y change in export market shares based on volumes of goods; % y-o-y growth Labour productivity;</i>	<i>10-year % change in Nominal ULC; % Change (10 years) in Effective ULC vs. EA (17)</i>	<i>3-year % change in Nominal house Prices; Residential Construction as % GDP</i>	<i>% change in financial liabilities of the non-consolidated financial sector</i>	<i>Private sector debt based on consolidated data; y-o-y growth of financial Liabilities of financial sector, non-consolidated</i>		<i>% y-o-y growth of Employment</i>