# Annex 1
# The role of the insurance sector in the economy

1. This note focuses on the economic roles played by the insurance undertakings (IUs) that make up the insurance sector, and the specific contribution of the insurance sector, to the functioning of the EU economy.[1] The emphasis is on the importance of the insurance sector, rather than that of individual IUs. Other material prepared by the Insurance Expert Group will identify and assess the risks that the sector may be subject to, create, or channel elsewhere.

2. IUs are special, not only because they form a legally defined and licensed class of financial institutions, but because they are providers of protection against insurance risks, and therefore share certain characteristics. These characteristics themselves help determine the role of insurance in the economy. What an insurable risk is, and the scope of the insurance sector in any one country, is strongly influenced by the institutional features of that country and the availability of substitute products supplied by other sectors (see the chapter "Substitutes for insurance sector products").

3. The various functions and products of IUs can usefully be organised as follows:

    - protection from risks through their transfer or pooling;
    - collection, analysis, and distribution of related information;
    - provision of savings vehicles and other non-insurance products; and
    - asset accumulation and management.

The first function, in particular, may improve welfare directly through reduced uncertainty of consumption and investment. At an aggregate, macroeconomic level, a well-functioning insurance sector contributes to the appropriate allocation of risks domestically and internationally. As detailed below, the availability of insurance may enhance efficiency elsewhere in the economy, an effect which may feed back more or less strongly into demand for certain kinds of insurance, and also contribute to the level of economic activity and growth. The last two points imply that the insurance sector can be a very important source and channel of long-term financing of investment, and can even contribute to financial market efficiency.

## 1. Core insurance function: risk protection

4. Protection from risks through pooling or transfer is the most basic role of insurance (OECD, 2013). Individuals, companies, institutions or the public sector seek protection against financial losses or adverse events. The scope of protection and the associated conditions and financial commitments are normally defined in a non-negotiable (i.e. non-tradable) contract between an IU and a policy holder, transacted on an over-the-counter basis (possibly through a network of agents or brokers). By signing the contract and paying the insurance premium, the risk is transferred from the insured to the IU. Should the defined insurance event be realised, the IU has to meet its contractual obligation to compensate the policy holder for (an agreed part) of losses incurred. To be insurable, a risk must have estimable probabilities of occurrence of various levels of damages, the maximum loss must be contained, realisations must be measurable, and operational costs must be modest relative to the possible losses.

[1] The use of the general term "insurance undertaking" reflects the diversity of legal and governance structures found in the insurance sector, where mutualism, for example, has a long tradition. Such institutional features are likely to affect IUs' business models and behaviour.

Last but not least, individual risks must be idiosyncratic so that they can be diversified. The policy holder must be exposed to the covered risks, but does not have, or is prevented from having, a decisive influence over the realisation of those risks.

5. Examples of property and casualty insurance are: protection against fires, car accidents, homeowner and liability insurance, and protection against natural disasters (earthquakes, flooding and droughts). In health insurance, the focus is on protection against biometric risks such as morbidity, or occupational disability.[2] Some IUs provide financial insurance, where the trigger for a payout is a financial event such as default by a counterparty, rather than a physical event such as a hailstorm. Many life insurers cover not only pure term life risks – what is traditionally termed "assurance", and which may be of most interest to those with dependents – but also risks associated with longevity, which gives rise to the need for more pension income, and may also lead to a long period where costly care is needed.[3]

6. IUs are able to provide such coverage because they can pool policies into more or less homogeneous groups, for which probability of loss and level of loss, and therefore premiums, can be estimated. Through pooling, idiosyncratic risks are evened out; the law of large numbers implies that, for many risks, aggregate losses can be predicted very accurately. Alternatively, IUs can transfer risks to those who are more able to bear them, e.g. because the seller of protection has income that is positively correlated with the realisation of the risk. IUs therefore undertake or facilitate a form of portfolio diversification. Thus, a central feature of core insurance functions is the dampening of shocks that are severe for individuals, without thereby creating large immediate costs to others.

7. Such pooling and transfer may occur within an IU, or among IUs, including reinsurers. An IU offering both mortality assurance and annuities is, in effect, transferring risk internally. An insurance company can reduce its exposure to loss by passing part of the risk of loss to a reinsurer, which can, in effect, pool risk across a wider range of individuals, risk factors, geographical areas, etc.

8. The risk pool can be expanded internationally to cope with aggregate risks at a national level, i.e. where idiosyncratic risks do not cancel each other out (Ahrend and Moeser, 2011). When a "bad state" materialises, the country receives a transfer from abroad to maintain consumption, finance rebuilding, etc. Reinsurance plays an especially prominent part in this activity – reinsurance companies facilitate the transfer of risks within the insurance sector, even on a global basis and to non-IUs.

9. The risk pool can be expanded inter-temporally as well, and may, in this regard, be of macroeconomic, cyclical relevance. The IU can, on behalf of policy holders, build up various reserves during "good" periods and run them down during "bad" periods. IUs, with their longer time horizons, may be more effective than organised financial markets in offering through-the-cycle smoothing (Allen and Gale, 1997). Moreover, credit insurance may not only help creditors to smooth income over time, but also spread the effects of credit defaults away from

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2 It is convenient to speak in terms of the smoothing of consumption, where consumption is understood to include enjoyment of good health over a prolonged period and other non-market goods. Also, one can say that companies buy insurance to smooth profits and non-profit institutions buy insurance to smooth net funding, but their ultimate objectives relate to market value, the provision of services, etc.

3 See the subsequent chapter "Why is There Not More Insurance?"

a few primary creditors, thus possibly dampening the transmission of adverse shocks.[4] Inter-temporal risk smoothing is intricately linked to international risk smoothing: inter-temporal mitigation of an aggregate shock requires either the depletion of the capital stock, or the importation of resources from abroad. The limit of this smoothing process is reached when a series of bad periods depletes reserves, which is more likely to occur when strong "model risk" applies to the estimated trend rate of occurrence of risk events and the variance around trend.

10. There may be substitutes for insurance that are not much less efficient or effective in providing risk protection, but their presence or absence typically reflects the structural features of an economy, and they cannot be made operational at short notice[5]. As an alternative to formal insurance for many risks in many economies, most economic agents rely on self-insurance. For other risks, society has chosen to provide more or less explicit public sector insurance. In some cases, complementary structures exist: insurance may cover the cost of a local catastrophe, for example, but the government tends to help when there is a widespread, massive catastrophe. It is common in many European countries for the government to provide a minimum level of old age and health insurance, which individuals, if they can afford to do so, "top up" with private insurance.[6]

11. Least easily substitutable are those insurance products that require specialist actuarial knowledge of idiosyncratic risks, and carefully constructed premium schemes designed to limit moral hazard or adverse selection, or to otherwise accommodate individual needs.[7] Products such as insurance of a certain cargo on a certain ship on a certain route are intrinsically unsuited to being delivered through an organised market or a mass scheme. Certain substitutes for insurance offer some aspects of an insurance contract but not others. Government flood protection, for example, compensates those suffering losses without demanding explicit premiums; the building code and flood protection measures serve to limit risks. Organised financial markets can, in principle, offer protection against certain risks, most readily when the trigger for a payoff is easily verifiable (e.g. in the case of a hurricane), a wide class of agents desire protection against/or exposure to the risk, and linkage to an "insurable interest" is not essential. Even when these conditions are met, the development of a liquid market cannot be assured.

## 2. Wider benefits of insurance provision

12. Reduced variability in consumption and reduced ex ante uncertainty through insurance are benefits in themselves, but demand for insurance may be increased by certain additional benefits (Liedtke, 2007). The risk transfer function could encourage innovation, entrepreneurial activity and risk taking. Therefore, an effective transfer of risks could foster

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4 Credit insurance could have other cyclical effects: insofar as premiums reflect current default rates, they will fall during upswings (supporting a credit boom) and rise during downswings (intensifying any credit crunch).

5 See the chapter "Substitutes for insurance sector products".

6 The desirable balance between state and private provision of such insurance is subject to on-going debate, as is the question of what insurance should be mandatory. Economic performance since 2009 and demographic trends have weakened the ability of the public sector to provide such protection, but the accompanying low interest rates have strained long-term insurance plans.

7 An insurance product could be delivered by a company that bears another name, as when a pension fund offers annuities with guarantees and life risk-related features.

additional long-term investment and output. The following are some of the specific claims made for the benefits of being insured, for different classes of policy holders:

- Insurance contributes to the availability of financing to enterprises and households. Providers of financing, be they banks or purchasers of bonds and equity, specialise in the assessment of commercial and financial risks, although they know little about how to quantify and offset other risks such as property and casualty risk, or product liability risk. It is more efficient to have specialists in these areas, i.e. IUs, take on these risks, and also deal with any attendant moral hazard or adverse selection issues. Thus, homeowner insurance is normally a precondition for obtaining a mortgage. A bank making a car loan will require that it be insured, so as to protect itself against exogenous loss of capital and possible fraud on the part of the borrower. Crop insurance, or at least weather insurance, is often needed before a farmer can obtain financing.
- Insurance encourages innovation and longer-term planning. A risk-averse entrepreneur may be more prepared to develop an unproven technology when not subject to major exogenous insurable risks. Moreover, an entrepreneur, or someone investing in human capital, can be more patient with regard to prospective returns when protected against exogenous shocks: taking out insurance reduces the likelihood that the investment will have to be abandoned early due to an exogenous shock, and therefore the effective discount rate is reduced.
- Insurance reduces the need for expensive loan workout and bankruptcy procedures (Brainard, 2013). Dealing with default can be very time consuming and value destroying. An insured company will not be forced into bankruptcy when it suffers large exogenous damages. Therefore, there is a net benefit, which will be in some way shared between the borrower, the financer, and the insurer.

13. Achieving these benefits requires the policy-holder to have an insurable interest, i.e. that the protection is afforded to the agent who bears the risk. The effects therefore depend on the maintenance of true insurance for the agents involved; tradable, market-based protection or self-insurance would be, at best, poor substitutes.

14. Of these benefits, the role of insurance in facilitating credit availability is probably the most time critical in the sense that an agent without availability of insurance cannot make use of other important financial services and may be liquidity-constrained. The other benefits are likely to be of importance mainly in the medium to long run.

15. There may be macroeconomic spill-overs when insurance covers aggregate risks that are large relative to the (domestic) economy[8]. Insurance that provides compensation in the case of a large adverse shock, such as a natural catastrophe, helps stabilise demand, finance reconstruction, and reduce pressure on the budget (Grant, 2012). To do so, the IUs must be able to draw on resources from outside the affected area, so they will help finance the current account deficit that typically follows a catastrophe (Peter, Dahlen, and Saxena, 2012). Few European countries are subject to shocks that are both insurable and large enough to have a major macroeconomic impact, but this mechanism may be of importance at a regional level, e.g. following widespread flooding or drought.

[8] See the chapter “Why is there not more insurance?”

## 3. Collection, analysis and distribution of information

16. A necessary part of the insurance business is the quantification of the distribution of possible risks. An IU collects information on the probability of the occurrence and costs of risky events, and the correlations of these events, as a function of policy holder characteristics and external conditions. The IU's actuaries then calculate and communicate the price to be paid by potential policy holders. Potential policy holders can normally compare offers, from which more precise information about the distribution of possible risks can be inferred.

17. The insurance sector then generates information on risks, and also distributes and aggregates this information (OECD, 2013). Even though there is no organised central market, information generation is incentivised, and informational efficiency is raised. Potential and actual policy holders can better assess the risks that they are taking, and also make better estimates of the risk-adjusted return on possible projects. They may also be able to direct their efforts at risk mitigation where the cost-benefit ratio is most favourable. Ultimately, the allocation of resources is then more efficient. It has been suggested that one of the possible benefits of the new Solvency II framework will be enhanced "informativeness" and transparency of insurance pricing (DG EcFin, 2007).

18. A by-product of the deep understanding of risks that IUs must attain is expertise in how to reduce the probability of damages occurring and the extent of those damages (Grant, 2012). IUs have incentives to disseminate this information and enforce the implementation of risk mitigation measures, in order, if possible, to reduce moral hazard and adverse selection. IUs, acting individually or through their associations, may therefore reduce the underlying risk in the economy.[9]

## 4. Provision of savings vehicles and other non-insurance products

19. IUs normally offer products that contain an insurance element, although some may serve predominantly other purposes. Most importantly, many "insurance" products also have the characteristic of – often long-term – savings schemes. For example, a policy might require the regular payment of a premium for a period during which mortality risk is covered, and survivors receive back accumulated premiums plus a return.[10]

20. There may be an underlying reason to bundle products that offer protection against certain insurable risks, such as mortality or longevity, with a savings product offering a certain mean rate of return and certain financial risk characteristics. Transaction costs may be reduced, but such bundling may primarily be a way of offering well-targeted products with less concern over adverse selection. For example, if conscientious savers are also typically careful about their health, then a product that requires substantial regular contributions can be combined with relatively cheap life assurance but expensive longevity coverage.

21. IUs, and especially those offering long-term insurance products, may be attractive suppliers of savings products precisely because of their long investment horizon. IUs tend to be rather long-lived and, when one fails, policy holders tend to be safeguarded by explicit protection

[9] For example, various shipping registers, which developed out of the maritime insurance industry, verify the Plimsoll mark on ships, indicating maximum loading.

[10] In the jargon, the product has an insurance "wrapper."

schemes (up to a certain limit) or by a take-over. Moreover, an IU may be subject to less pressure to generate short-term returns, and is not normally subject to high frequency liquidity risk, which may be a major determinant of bank behaviour during stress periods. Therefore, a saver with a long horizon may see the advantage of placing wealth with an IU. Furthermore, by suitably combining market risk with insurance risk, an IU may be able to offer a "low β" savings product, i.e. one with returns that have a low or even negative correlation with those of other investment classes.[11] The availability from IUs of attractive longer-term savings instruments may facilitate intertemporal smoothing of consumption – saving more in the good times, and drawing down savings in the bad times – that should dampen macroeconomic shocks.

22. At least in some jurisdictions, the prevalence of such non-insurance elements may reflect institutional restrictions or features of the tax system. Where life insurance premiums are tax deductible but payouts are taxed at a relatively low rate, whereas other savings products are not favoured in this way either at the accumulation or the payout stage, much (household) saving will be channelled into insurance. For example, in some countries it is advantageous to take out a mortgage with a "balloon" repayment at the end of a fixed period (i.e. without amortisation during the loan period) backed by a non-term life insurance policy that requires the accumulation of a matching sum. The insurance element in the product may be minimal.

23. Insofar as IUs enter the funding market, they may offer attractive "low β" instruments such as catastrophe bonds. In this way they help complete markets and ensure an adequate supply of investments that, while not risk free, offer at least low market risk, international diversification and, potentially, availability in large quantities.

## 5. Asset accumulation and management

24. An IU must hold assets to match its liabilities to policy holders, plus a margin, and must therefore often hold substantial assets. This asset accumulation and management function is distinct from, but still connected to, the provision of insurance services: optimal asset management will take the distribution of liability-side risks fully into account but must also consider asset-side risks and returns (Dickinson, 1998).

25. The amount of assets accumulated can be very large, especially for life insurers and other providers of "long tail" business where premiums are paid in and provisions build up long before most risks are realised. Asset holdings are also large for IUs that offer savings schemes. Even those IUs that are engaged mainly in "short tail" business, such as motor insurance, need to hold provisions against period-to-period fluctuations in premium income and damages payouts. Nonetheless, the insurance sector is not unique in its roles in accumulating assets and in managing those assets[12].

26. IUs play a major role in financial markets and the financing of investments, not least because of the sheer size of the sector. Large IUs in particular, including reinsurers, have the investment volumes needed to justify the dedication of resources of careful research, full

[11] Admittedly, in some cases the diversification benefit could be obtained otherwise, e.g. through the purchase of shares in IUs.

[12] See the chapter "Substitutes for insurance sector products".

diversification, careful hedging of financial risks, and the exercise of market discipline on the management of firms in which they are invested (Delle Croce, Stewart, and Yermo, 2001). Moreover, it is a characteristic of IUs and their regulatory environment that they invest mainly for the long term, albeit relatively conservatively and with little leverage (Shirakawa, 2011).[13]

27. Especially for long tail business, IUs' business models involve collecting premiums in advance and payout (much) later under defined conditions. Therefore, IUs can be suppliers of liquidity and associated instruments, e.g. through securities lending (OECD, 2013). Especially when banks face the prospect of tough net stable funding requirements, IUs could be important sources of longer-term funding. Indeed, some have suggested that IUs and pension funds have a strong comparative advantage relative to banks or even bond markets, in the funding of longer-term projects such as major infrastructure projects with little cyclicality in returns or credit risk, but large funding risk (Warwick Commission, 2009; Persaud, 2004). The main elements of the business models of IUs differ substantially from, and perhaps complement, those of banks (Box 1).

Box 1.

**Business models of insurance and banking**[14]

| Area | Insurance | Banking |
|---|---|---|
| Business scope | Risk pooling and risk transfer<br>Long-term savings | Payment services<br>Short-term savings<br>Lending |
| Funding | Liability-driven<br>Up-front premiums<br>Limited issuance of securities<br>Limited use of inter-company borrowing/lending<br>Assets and liabilities mostly linked | Liability and market funding-driven<br>Mostly short-term funding<br>Issuance of securities<br>Interbank borrowing/lending significant<br>Assets and liabilities not closely linked |
| Balance sheet cyclicality | Business cycle influences balance sheet to a limited extent<br>Possible insurance cycles | Assets and liabilities exposed to business cycle |
| Risks | Substantial interest rate risk<br>Low liquidity risk<br>Low interconnectedness among primary insurers<br>Assumed risk can be transferred through reinsurance | Substantial credit risk<br>High liquidity and funding risk<br>Substantial exposures among institutions (interbank and repo)<br>Assumed risk can be transferred through securitisation |
| ALM and investment | Relatively stable funding<br>Liability-driven investment | Short-term and market-based funding<br>Asset-driven investment |

## 6. Empirical evidence

### 6.1. The insurance sector in the economy

28. The following table provides an indication of the order of magnitude of the insurance sector relative to the overall economy, on a flow basis.

[13] The importance of preserving the insurance sector's role as a long-term institutional investor is recognised in the debate on regulatory reform, including with regard to the design of Solvency II and the Long-Term Guarantee package (EIOPA, 2013a, European Commission, 2014).

[14] Committee on the Global Financial System, "Fixed income strategies of insurance companies and pension funds", CGFS Papers No 44, July 2011.

Table 1
Premium volumes 2012

| | Total | Life | Non-Life |
|---|---|---|---|
| | | (millions of euro) | |
| Euro area | 753,476 | 420,515 | 332,961 |
| EU | 1,069,950 | 626,542 | 443,407 |
| | | (percent of GDP) | |
| Euro area | 7.9 | 4.4 | 3.5 |
| EU | 8.3 | 4.8 | 3.4 |

Source: Sigma, Eurostat.

29. The breakdown of non-life (direct) business suggests that much of the protection is provided to the household sector (e.g. much of third-party motor liability and fire protection is presumably bought by households). The most important classes of insurance for the corporate sector probably comprise marine aviation and transport, general liability, credit and suretyship, and other motor and other non-life.[15]

Table 2
Non-Life insurance Premiums and Claims, by Risk Type

(2012, in millions of Euro, direct business only)

| | EEA | | EU | | Euro area | |
|---|---|---|---|---|---|---|
| | Gross direct premiums earned | Gross claims incurred | Gross direct premiums earned | Gross claims incurred | Gross direct premiums earned | Gross claims incurred |
| Accident and health | 131,869 | 98,128 | 130,947 | 97,712 | 120,962 | 91,146 |
| Credit and suretyship | 14,151 | 7,337 | 14,102 | 7,325 | 7,510 | 4,156 |
| Fire and other damage to property | 73,856 | 44,805 | 71,836 | 43,333 | 45,836 | 29,140 |
| General liability | … | … | … | … | … | … |
| Marine, aviation and transport | 11,848 | 7,346 | 11,262 | 6,893 | 6,025 | 4,067 |
| Motor vehicle third party liability | 79,567 | 62,893 | 78,628 | 62,376 | 57,831 | 46,347 |
| Motor vehicle, other classes | … | … | … | … | … | … |
| Other non-life insurances | 39,176 | 23,024 | 38,042 | 21,549 | 35,917 | 20,368 |
| Total ignoring missing data | | | | | | |
| General liability | 34,183 | 23,141 | 33,964 | 23,020 | 23,732 | 16,012 |
| Motor vehicle, other classes | 43,290 | 30,532 | 42,102 | 29,756 | 35,473 | 24,938 |

Source: EIOPA.

30. It is difficult to quantify the full welfare benefit resulting from the insurance sector, in part because some of the benefit comes in the form of higher welfare (i.e. lower disutility of risk) rather than higher GDP, and in part because some benefits accrue to others. Some academic studies provide estimates of consumer and producer surpluses associated with particular (mainly U.S.) insurance products, (Box 2).

[15] Data on premiums paid by the nonfinancial corporate sector are not available. A “guestimate” is that the premiums amounted to about €165 billion in 2012 for the EU as a whole and about €125 billion for the euro area.

Box 2

**Consumer and producer surpluses from insurance products**

The net welfare benefit generated by a particular insurance product may accrue to providers of the product, in the form of a producer surplus (which can be roughly equated with excess profits), to users of the product as a consumer surplus (which can be estimated on the basis of demand elasticities), and externalities accruing to others. Studies estimating these benefits are often motivated by the aim of establishing the efficiency costs of various mechanisms to limit adverse selection or moral hazard. For example:

- Manning and Marquis (1996) estimate that the risk-bearing aspects of healthcare insurance in the U.S. generated a consumer benefit of about USD 50 billion in 1998. Nyman (1999) points to an additional benefit of at least USD 150 billion that may arise because insurance makes high-cost treatment affordable.
- Einav, Finkelstein and Schrimpf (2010) estimate that an optimal pension annuity scheme would be worth about 2% of annuitised wealth, although this benefit could be erased if the scheme were mis-designed, and benefits differ widely depending on the circumstances of the policyholder.
- Einav, Finkelstein and Cullen (2010) conclude that the welfare benefit of healthcare coverage for the employees of one large US corporation was the equivalent of about 0.43% of average earnings.
- Town and Liu (2003) provide evidence that a certain US healthcare programme generated USD 18.7 billion in consumer surplus (in 2000 dollar-terms) and USD 52 billion in extra profits over an eight-year period, for a covered population of about 6 million. Thus, the average benefit was the equivalent of over USD 10,000 per participant.

There may also be welfare costs. Feldstein (1973) argues that the availability of health insurance in the US creates extra costs, not only because of associated moral hazard, but also because of the supply response, whereby providers of medical services over-expand in response to artificially price-insensitive demand.

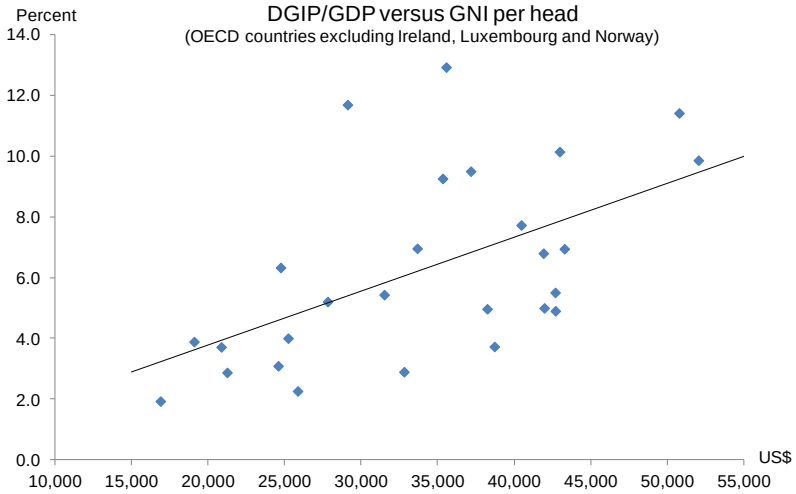
31. In terms of monetary value added, Hess (2006) places a lower bound of 1-2% of GDP on the value added of the insurance sector. That figure is in line with those for Ireland (Everett, McNeill and Phelan, 2011). Ortner and Geiger (2006) estimate the gross value added of the Swiss insurance industry at 3.5% to 4% of that country's GDP. About a fifth of the total comes from reinsurance and the rest is evenly divided between indemnity and life insurance. According to that study, value added in indemnity insurance is generated overwhelmingly by insurance operations, whereas that in life insurance is generated by capital investments with a negative contribution from insurance operations; both sources contribute to value added in reinsurance.

32. A number of studies have investigated the relationship between the development of the insurance sector and overall economic development, and in particular financial sector development (Arena, 2006, 2008; Catalan, Impavido, and Musalem, 2000; Feyen, Lester, and Rocha, 2011; Haiss and Sümegi, 2008; Han, Cheng, and Yu, 2012; Lee, Lee and Chiu, 2013; Nguyen, Avram, and Skully, 2010, 2011; Outreville, 2013; Peter, Dahlen and Saxena, 2012; Ward and Zurbruegg, 2000; Webb and Skipper, 2002). Not surprisingly, the insurance sector tends to be larger in the larger, and more mature, economies, but there is no clear,

unidirectional causation: insurance may contribute to the development of banks and organised financial markets, but the latter also enable and encourage the former to grow. Insurance penetration, as measured by premiums relative to national income, displays an S-shaped relationship, starting at a low level, rising steeply among middle-income countries, and eventually flattening out. Some studies suggest that a strong insurance sector is associated with stronger growth, but again the direction of causation is unclear.

33. The following chart illustrates the positive relationship between gross national income and insurance penetration, as measured by direct gross insurance premiums as a percentage of GDP. The relationship holds for European countries as it does for other OECD members such as the US, Canada, Japan and Australia. Ireland and Luxembourg are outliers because of their large international insurance sectors. Norway is an outlier displaying exceptionally low insurance penetration.

Chart 1
DGIP/GDP versus GNI per head (OECD countries excluding Ireland, Luxembourg and Norway




## 6.2. Investment behaviour

34. OECD insurance data provide international comparators for some main balance sheet items.[16,17] IUs liabilities are dominated by their technical provisions, i.e. the anticipated claims of policyholders. In relative terms, life insurers and composites are dominant regarding asset accumulation and management, but the absolute amount of assets accumulated by non-life insurers and reinsurers is significant. In particular, in some jurisdictions and for life insurers, unit-linked business (i.e. the management of mutual funds where savers bear the investment risk) makes up a substantial part of the balance sheet.

[16] The table covers EEA countries, but data for non-OECD countries are missing.

[17] IAIS (2011) estimates that insurance companies worldwide hold invested financial assets of about USD 25 trillion.

Table 3
European Insurers' Balance Sheet Aggregates, 2012

(in euro billions)

| | Euro area | EU |
|---|---|---|
| Life | | |
| Total assets | 3,003 | 4,632 |
| Gross technical provisions | 2,572 | 4,206 |
| Gross unit-linked provisions | 566 | 1,626 |
| Non-Life | | |
| Total assets | 925 | 1,129 |
| Gross technical provisions | 666 | 798 |
| Gross unit-linked provisions | 0 | 0 |
| Composites | | |
| Total assets | 2,172 | 2,509 |
| Gross technical provisions | 1,884 | 2,180 |
| Gross unit-linked provisions | 266 | 328 |
| Reinsurance | | |
| Total assets | 341 | 345 |
| Gross technical provisions | 172 | 185 |
| Gross unit-linked provisions | 1 | 1 |
| Memorandum item: | | |
| Total household financial wealth | 19,709 | … |

Source: OECD, Eurostat.

35. The following table shows that euro area insurers (and pension funds) tend to keep about one-third of total financial assets in each of long-term securities and equity, and about one-eighth in bank deposits. The remainder is made up of short-term securities and non-market financial assets such as loans and project financing. The portfolio shares of other financial sectors generally display higher standard deviations.

Table 4
Euro area: Main components of financial portfolios

(percentage share of various instrument in total financial instruments, by owner type; summary statistics 2002Q4 - 2013Q3)

| | | Currency and deposits | Long-term securities | Shares and other equity |
|---|---|---|---|---|
| Insurance corporations and pension funds | Mean | 12.25 | 38.38 | 35.52 |
| | Standard deviation | 0.88 | 1.41 | 1.73 |
| Monetary financial institutions | Mean | 30.29 | 17.86 | 6.21 |
| | Standard deviation | 1.39 | 0.94 | 0.89 |
| Other financial intermediaries | Mean | 13.55 | 18.14 | 40.46 |
| | Standard deviation | 1.95 | 2.51 | 2.36 |

Source: ECB and Eurostat, and staff estimates.

36. The following data from the UK's Office of National Statistics illustrates in more detail the tendency of IUs to have few non-insurance short-term liabilities, and to hold mainly longer-term assets in the form of securities including equity. The portfolio allocation may display

some “home bias,” and some bias towards government securities, but holdings of foreign assets including corporate bonds and equity are significant.

Table 5
UK Insurance Sector Aggregate Balance Sheet, 2012

(in millions of GDP)

| ASSETS | | LIABILITIES | |
|---|---|---|---|
| Short-term claims on British MFIs | 42,456 | Borrowing | 46,240 |
| Other short-term assets | 47,221 | General business technical reserves | 61,771 |
| UK public sector securities | 202,151 | Long-term insurance contract | 1,241,671 |
| UK corporate bonds | 190,754 | Shareholders’ capital and reserves | 92,297 |
| UK ordinary shares | 172,077 | Other | 129,659 |
| Overseas bonds | 149,501 | | |
| Overseas shares | 178,444 | | |
| Mutual fund investments | 332,893 | | |
| Fixed assets including real estate | 44,020 | | |
| Other longer-term assets | 83,450 | | |
| Other | 128,671 | | |
| TOTAL ASSETS | 1,571,638 | TOTAL LIABILITIES | 1,571,638 |
| Memorandum item: | | | |
| GDP | 1,570,514 | | |

Source: Offie of National Statistics.

37. Insurers are significant players in certain financial markets. As shown below, about 16% of long-term securities in the euro area are held by IUs and pension funds, which also hold about 8% of equity; the sector contributes around 5% of bank deposits. Insofar as these deposits are relatively long term, they may constitute especially valuable funding for banks. IUs are much less important in the market for short-term securities.

Table 6
Euro area: Holdings of Financial Instruments by Owner Type

(percent of total outstanding, by owner type; summary statistics 2002Q4 - 2013Q3

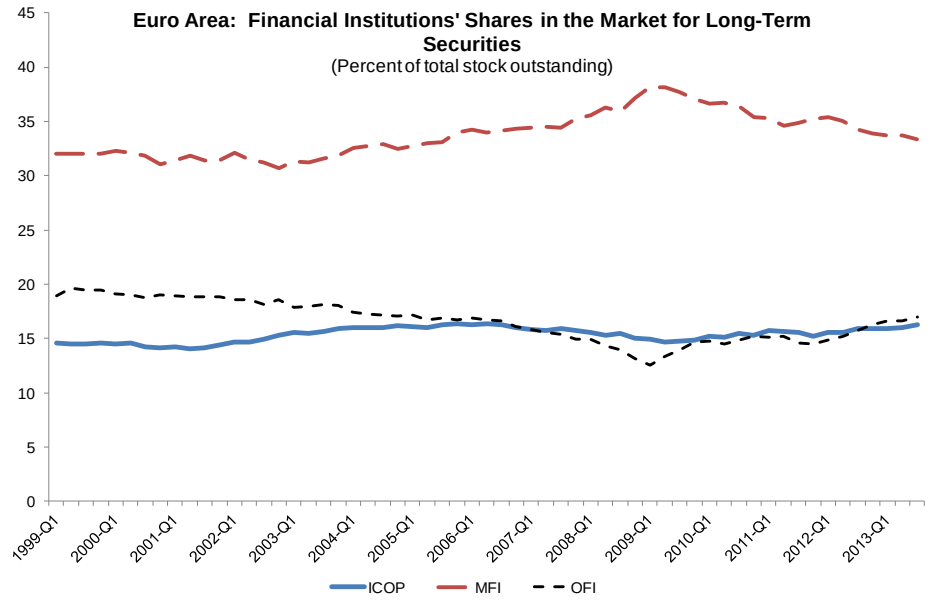
| | | Currency and deposits1) | Long-term securities | Shares and other equity |
|---|---|---|---|---|
| Insurance corporations and pension funds | Mean | 5.25 | 15.70 | 7.98 |
| | Standard deviation | 0.32 | 0.46 | 0.22 |
| Monetary financial institutions | Mean | … | 34.79 | 6.60 |
| | Standard deviation | … | 1.62 | 0.55 |
| Other financial intermediaries | Mean | 12.39 | 15.60 | 19.25 |
| | Standard deviation | 2.33 | 1.31 | 1.49 |

Source: ECB and Eurostat, and staff estimates.
1) Excluding interbank claims.

Chart 2

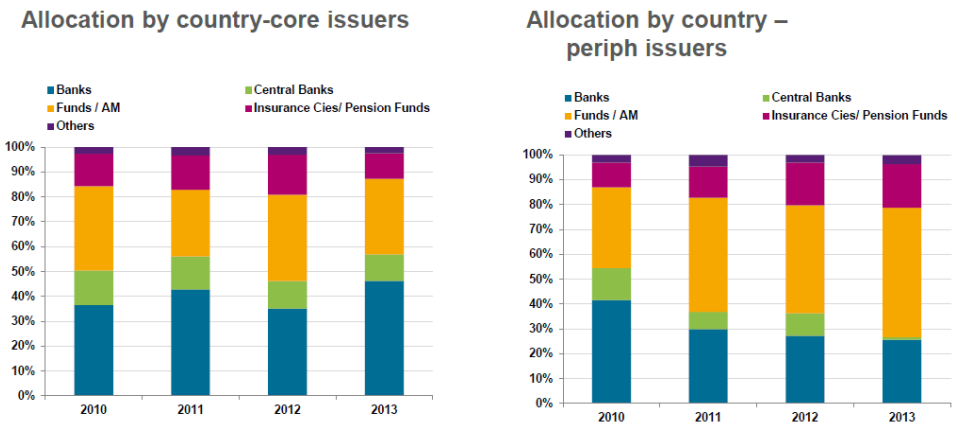
Euro area: Financial Institutions' Shares in the Market for Long-Term Securities

(percent of total stock outstanding)




38. At a more disaggregated level, IUs are consistent investors in covered bonds, and therefore indirectly provide funding for construction and local government projects. They play this role both in countries with long-established covered bond markets and in those with newer markets.

Chart 3




Source: European Covered Bond Council.

## 6.3. Insurance and savings

39. Eurostat data confirm that a substantial part of European household savings are channelled through the insurance (and pension fund) sector, though with large differences across

countries depending on their institutional features. Also, the stock of savings mobilised through the insurance sector tends to be lower in the new member states, which have had less time to build up such balances, and in less affluent countries. Counter-intuitively, in a few countries such as Germany, the insurance sector has a relatively large net claim on the nonfinancial corporate sector, i.e. insurers have channelled more financial resources to corporates than the corporates have built up claims on insurers.[18]

Table 7
Claims on insurers as a Share of Total Financial Assets

(Selected European countries, percent of gross financial assets

| | Households<br>Gross claims | Government<br>Gross claims | Non-financial corporates<br>Gross claims | Non-financial corporates<br>Net claims | Rest of the world<br>Gross claims |
|---|---|---|---|---|---|
| Euro area 2012 | 31.6 | 0.1 | 1.0 | -1.0 | 1.4 |
| Denmark 2012 | 50.6 | 0.1 | 0.7 | 0.7 | 0.4 |
| Germany 2012 | 35.9 | 0.1 | 1.2 | -6.0 | 1.7 |
| Hungary 2012 | 10.8 | 0.0 | 0.1 | 0.1 | 0.0 |
| Italy 2012 | 18.7 | 0.3 | 1.2 | -5.5 | 0.4 |
| Poland 2012[2] | 27.5 | 0.2 | 1.5 | 1.5 | 0.0 |
| Portugal 2012 | 10.8 | 0.0 | 0.1 | 0.1 | 0.0 |
| Romania 2011 | 3.9 | 0.0 | 0.5 | 0.5 | 0.0 |
| Slovenia 2011 | 11.4 | 0.0 | 1.0 | 1.0 | 0.4 |
| Spain 2012 | 15.0 | 0.0 | 1.5 | 1.5 | 0.2 |
| UK 2010 | 51.7 | 0.1 | 0.5 | … | 0.1 |

Source: Eurostat.

40. There appear to be few decisive empirical results concerning the relationship between the availability of insurance and the level and variability of savings. Balance of payments crises and overheating are associated with a deficiency in net domestic savings, and countries with high domestic savings are less vulnerable (but not invulnerable) to strains arising from high sovereign debt and reliance on foreign funding. Higher domestic savings can be stabilising and, over time, may be growth enhancing.[19] Whether attractive long-term insurance products can induce households to save more is an important open question.

41. Institutions matter: countries with, say, a national health service tend to have less private health insurance, but the relationship is not straightforward because, especially in richer countries, individuals often supplement government-provided healthcare with private insurance. Likewise, a state pension scheme diminishes demand for savings products

[18] The relevant claims are termed “net equity of households in life insurance reserves and in pension fund reserves,” and do not include other forms of financing.

[19] The life cycle hypothesis suggests that an economy that is growing quickly and steadily should have a low savings rate, and thus low investment in life insurance policies. The hypothesis assumes that a country can grow with the help of a steady inflow of capital from elsewhere. However, such dependence may make the country vulnerable to a “sudden stop.” In recent years, many high growth countries have relied predominantly on domestic savings.

provided by life insurers.[20] The effect of tax incentives as to whether or not savings go to IUs has been mentioned above.

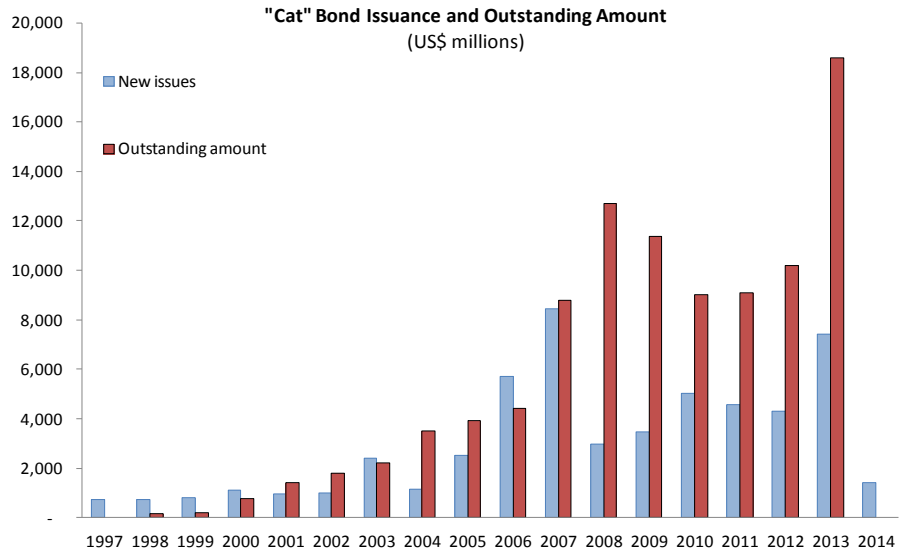
42. History also matters. Countries with a long tradition of political and economic stability tend to have higher and longer-term savings, and a larger stock of financial assets. However, casual empiricism suggests that savings in these stable countries, including those placed in IUs, may decline during periods of macroeconomic stress, especially when returns on traditional savings, such as life insurance policy vehicles, are low.[21]

## 6.4. New products and trends

43. Innovation in the market for catastrophe bonds is evidence of how insurers can offer innovative, "low beta" financial investments, but so far the amounts outstanding have been small. As an example of such innovation, the following chart summarises available market data on new public issues and the outstanding stock of "cat" bonds, whose payoff is contingent on natural events such as US windstorms or earthquakes.[22] These bonds rarely have a tenor greater than three years (matching that of the coverage provided by reinsurers, who are the main issuers), so the outstanding stock has stabilized at a modest level.

Chart 4
"Cat" Bond Issuance and Outstanding Amount

(USD millions)




Source: Bloomberg market reports and **www.Artemis.bm**, and staff estimates.

[20] For example, Norway has a gross national income of about USD 62,000 per head, but insurance premiums amount to under 5% of GDP (OECD data). A country with such high income could be expected to display insurance penetration of around 10%, but presumably the public sector safety net there assumes many of the roles of the insurance sector.

[21] Precautionary savings may increase with stress in countries with fewer reliable financial institutions and poor macroeconomic performance, but those savings might be placed abroad or in nonfinancial assets.

[22] See also EIOPA, 2013b. Longevity risk-related bonds also exist.

44. Looking forward, non-life business is likely to remain an important but fairly stable component of the insurance sector and the European economy in general. Insurance penetration is likely to increase in the new member states as their level of income converges on the EU average and as their financial sectors develop. The rate of premium growth there should therefore exceed that of GDP.

45. Demographic shifts and pressure on public insurance schemes, including healthcare, may increase demand for health insurance and especially that associated with an older population. The same demographic pressures will affect the life sector, which may eventually suffer a decline in assets under management (or at least slower growth) as older policy holders run down their savings, and premium income may be depressed if real interest rates and the real return on capital remain at very low levels. However, reduced provision of public sector pensions and rising longevity may eventually induce younger cohorts to save more, possibly in the form of savings products offered by IUs. Meanwhile, the phase-in of Solvency II will affect IUs' costs and their competitive positions relative to providers of substitutes.

# Addendum I
# Substitutes for insurance sector products

46. Risk management, including diversification, transfer, pricing, and related contracting, constitutes a major activity in any economy, and especially in financial markets and financial institutions. The insurance sector is just one locus of such activity. Insurance in this broad sense of risk management and mitigation is undertaken by many institutions, markets, and practices. Countries differ in what is allocated to what sector, and the degree to which economic agents can seek substitutes from different sectors. The main alternatives to insurance products provided by IUs are the following:

- **Self-insurance.** Individuals, households and corporates can self-insure by building up reserves, establishing lines of credit (perhaps informally and on a mutual basis), and also acquiring diverse human capital. However, it may be expensive for private persons to build up enough reserves to cope with non-diversified risks; to acquire the requisite information to make sound investments; to pay transaction costs (especially for international investments); and, especially in developing countries, even to maintain security of ownership. Private individuals also typically lack quantitative information on the distribution of the risks that they face. Larger corporates can undertake an active program of self-insurance, perhaps through a "captive," where they make use of their own access to financing, a diversified pool of corporation-specific risks, and technical expertise concerning the risks that they face. In some cases self-insurance by corporates may help stabilise their cash flow and profits, and therefore reduce the costs of financing and tax charges.
- **Pension funds.** Pension funds offer savings products very similar to those offered by insurers, and may include risk-mitigating features such as guarantees on principal. The boundary between pension funds and (non-term) life insurance may largely be determined by the regulatory features of the jurisdiction concerned, its institutional history, and tax incentives. In some countries, the same financial institution or group offers both life insurance and pension products.
- **Other financial institutions.** Mutual funds offer nonfinancial corporations and households the means to invest in a diversified portfolio whilst economising on transaction costs and, possibly, on information costs, although it is uncommon for mutual funds to provide long-term guarantees on principal. Banks can offer certain products that are substitutes for insurance, or that complement self-insurance. Even a savings plan with an option of a credit line can be considered to include an element of insurance against unexpected fluctuations in income or expenses.
- **Organised financial markets.** Many financial products, and especially options, are essentially forms of insurance. It is, for example, possible to buy protection against default by corporates or sovereigns, fluctuations in raw materials prices (which may be correlated with the weather), an acceleration in inflation, etc., albeit not over very long horizons. However, such risks are generally less idiosyncratic and diversifiable. Moreover, where they exist, organised markets facilitate the diversification of idiosyncratic risks, including those facing the investor, and secure a stream of income over decades. Some IUs are active in financial markets not only as investors, but also as sellers of protection (as were the "monolines" in the US) or buyers of protection through the issuance of insurance-linked securities (such as catastrophe bonds).

- **Government.** Governments, and especially European governments, have assumed a major role in insuring individual, sectoral, and aggregate risks (Krueger and Perri, 2010). Some major elements include:
  - state-run health services;
  - old-age benefits;
  - disability benefits:
  - unemployment insurance:
  - compensation for natural catastrophes;
  - mandatory deposit guarantee schemes, insurance guarantee schemes, and ex post bailouts of financial and nonfinancial institutions.[23]

[23] Even when a deposit guarantee scheme is privately operated, it is not classified as part of the insurance sector.

# Addendum II
# Why is there not more insurance?

47. The role of the insurance sector in the economy is circumscribed by the products that IUs can induce policy holders to purchase. However, the extent to which individuals or groups buy insurance, and what is covered, is not always easy to explain. Third-party motor insurance may be required by law, the market may demand that companies hold liability insurance, and mortgage lenders may require homeowners' insurance, but there is also a very visible market in insurance against relatively minor risks (such as travel insurance), and little insurance of certain major risks, such as catastrophe or long-term health care.

48. IUs, of course, only provide products on which they can make a reasonable risk-adjusted return. Some consumers may be somewhat irrational in buying insurance against certain risks but not others. More fundamentally, certain risks may be difficult to insure because, perhaps:

    - IUs, and also potential policyholders, face great uncertainty about their distribution for each individual and in aggregate;
    - providing insurance would generate high costs ("load"), including capital costs;
    - potential policyholders are discouraged by the average level of losses rather than the uncertainty around the mean, i.e. by the savings component that would be required rather than the insurance component (arguably, insurance for longevity and morbidity risk suffer from this conundrum); and
    - it is especially difficult to establish appropriate risk pools, and moral hazard or adverse selection is therefore acute.

49. Noticeable by its near absence is insurance against macroeconomic risks, although proposals have been made (Ahrend and Moeser, 2011; Gersbach, 2009; Shiller 1994 and 2004). In some jurisdictions it is possible to obtain life insurance with some form of inflation protection; a guarantee of principal is fairly common on savings products; and in several countries it is possible to buy payment protection plans, which ensure that a mortgage is serviced even if the borrower loses his or her income. In principle it would, however, be possible to have market-based or institution-based insurance against falls in GDP, house price declines, inflation, and even low bank capitalisation and unemployment, on a national or at least sub-national level. Were such insurance to be made available, it would operate on a very large scale, and would have to manage a very large body of provisions. It would also have to deal with the attendant adverse selection and moral hazard problem.

50. For a national scheme, where reserve assets would need to be invested largely abroad, two other considerations come to mind. First, there would need to be a political consensus that it is appropriate to invest a major share of national savings abroad. Second, the investment scheme would be dependent on the certainty that foreign assets would not be expropriated. Nonetheless, countries that have major public savings in the form of natural resource income, including one EEA member, are willing to create what amounts to macro self-insurance through the establishment of a sovereign wealth fund.