

Insurance and Inclusive Growth

Rodney Lester

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Abstract

While the real sector and governments (along with a few micro economists) have long recognized the core economic role that the insurance function plays, the mainstream economics profession has largely treated it as invisible background. This literature review of the relevant research, most of which has been carried out in the past few decades, demonstrates that the insurance sector contributes at a basic level to inclusive economic growth and the effectiveness of the credit function. It

also shows that the latter impact may be particularly fundamental in assisting the poor to avoid poverty traps and to progress economically. However, the research and the theoretical models underpinning it also highlight certain constraints to the efficient utilization of the insurance function. The literature dealing with innovations designed to overcome these constraints is reviewed and successful initiatives and remaining challenges are identified.

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INSURANCE AND INCLUSIVE GROWTH

Rodney Lester*

JEL Classification:

- G22: Financial Economics / Insurance Companies. Actuarial Studies
- G28: Financial Economics / Financial Institutions and Services. Government Policy and Regulation
- I32: Health, Education and Welfare/ Measurement and Analysis of Poverty
- O16: Economic Development, Technological Change, and Growth/ Financial Markets. Saving and Capital Investment. Corporate Finance and Governance
- Q54: Agricultural and Natural Resource Economics, Environmental and Ecological Studies/ Climate Change. Natural Disasters. Global Warming

Sector Board: Financial Sector (FSE)

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Introduction

This paper and the World Bank mission

The World Bank's goals are to decrease the percentage of people living with less than \$1.25 a day to no more than 3 percent by 2030 and to promote income growth of the bottom 40% of the population in each country. This paper uses an integrated literature review to examine how insurance supports this mission.

Why this paper is timely

The central role of the insurance sector has long been recognized by the real sector through its budget allocations and by policy setters through regulatory, tax and legal settings.¹ Insurance facilitates trade, makes economic activity more efficient through its role in enterprise risk management, supports financial sector deepening and development, underpins long-term investment and innovation, and helps to improve access to mainstream financial markets for individuals and enterprises. It also addresses poverty by protecting the poor against vulnerability, livelihood risks and catastrophic losses. The poor in turn are able to adopt riskier strategies to increase income and consumption, and accumulate assets.

However, while a few seminal theoretical papers have been produced, there has until recently been little detailed work on transmission mechanisms, or empirical research exploring the socio-economic impacts of the insurance sector. This is now changing rapidly and a growing literature demonstrates that the insurance function, through a range of pre and post loss impacts, plays a critical role in supporting and sustaining inclusive economic growth.

Most rigorous empirical work on the role of the insurance sector in supporting economic growth has been published only in the last decade and a half. Even more recently, useful empirical work has been carried out on the poverty reduction role of the rapidly growing microinsurance sector. This increasingly has employed rigorous performance measurement methodologies at the individual program level. The research presented demonstrates that microinsurance can have positive effects on health utilization, income maximizing investment strategies for poor farmers (including the use of credit) and the elimination of certain types of poverty trap. The literature also highlights a number of challenges including scaling up microinsurance pilots, enhancing value and efficiency in delivery, applying new technologies, avoiding disproportionate regulation that creates barriers to inclusion, and improving health outcomes by better integrating health delivery systems. Empirical research on the fiscal and growth impacts of natural disasters and the key roles insurance and risk securitization can play is also now beginning to emerge. The papers reviewed focus on the direct and indirect costs of natural disasters and the cost and appropriate use of ex ante and ex post risk management mechanisms, both in the broader sovereign risk management space and at the household level.

A substantial literature is also now available on the economic, structural and policy settings that explain residuals in insurance sector development (after controlling for income levels) and this has helped to generate a derivative literature describing initiatives to improve insurance sector inclusion.

¹ The formalization of insurance technology began in the late 17th century. Lloyds was established in 1688 in a London coffee house and Edmond Halley developed the first set of mortality decrement tables in 1693 in order to price annuities. More recently the first UNCTAD conference in 1964 acknowledged the essential role of insurance markets.

The structure of this paper

The paper begins with a concise overview of the literature establishing the theoretical basis for the existence of insurance markets and the causative links from insurance sector development to inclusive economic growth. A comprehensive survey of recent empirical studies of the insurance-growth nexus follows. The next section reviews recent theoretical and empirical work on the role of insurance in reducing the incidence of poverty and helping poor families to increase income, consumption and assets. The third section covers the literature on the growth impacts of rapid onset natural disasters (windstorm, earthquake, tsunami, etc.) and the role of insurance in sustaining growth after such natural macro shocks. Finally the paper concludes.

Two annexes deal with insurance market development. The first of these surveys the extensive econometric literature on the macro structural, economic and cultural factors affecting the development of insurance markets. The second describes some contemporary studies of mechanisms to improve the value and accessibility of the insurance sector for consumers in middle income markets.

A full bibliography, categorized under the main headings, is provided.

The Insurance – Growth Nexus

Insurance as an economic function

Nicolas Bernoulli (1738) in his ‘Exposition on a New Theory of the Measurement of Risk’ pointed out that a person’s certainty equivalent of an uncertain loss event will be greater than its expected value in the presence of risk aversion.² He thus established a theoretical basis (expected utility) for the existence of an insurance sector where market premiums exceed the pure risk premium. Arrow (1974), a Nobel Prize winning microeconomist who first studied to be an actuary, solved for an ideal insurance contract (assuming an isolated decision process) under state dependent utility functions and wealth optimization, assuming a risk neutral insurer incurring expenses. Briys (1988) surveys subsequent work (including key early papers by Smith, 1968, and Mossin, 1968) and extends the findings to cover simultaneous decision making on insurance, portfolio and consumption choices. All models developed indicate that at least partial insurance is optimal, typically involving full insurance with a deductible.

In his famous doctoral thesis Knight (1921, republished in 1971 and 1985) lists five ways of dealing with uncertainty of which the primary methods are to take advantage of the Law of Large Numbers through ‘reduction by grouping’ (or consolidation) and to specialize in dealing with particular types of uncertainty (e.g. production risks).³ He points out the need to classify risks into relatively homogenous sub groups in a competitive insurance market but that even risks that cannot be precisely defined actuarially can still be passed on through the insurance mechanism (without specifically mentioning the Central Limit Theorem). Eeckhoudt et al. (2005) show that while a simple grouping is Pareto efficient where risks are iid⁴ and a population with homogenous risk aversion is involved, a market is needed when risks are not completely independent and risk aversion varies. The issue then becomes how to distribute risk efficiently through risk trading.

² His uncle, Jakob Bernoulli, rigorously proved the law of large numbers, a key mechanism (along with the Central Limit Theorem) in enabling insurers to charge an amount for assuming a potential loss that is not significantly greater than the expected loss (published as *Ars conjectandi* in 1713).

³ His other methods of dealing with risk are better control of the future, better predictive ability and ‘diffusion’ of risk along the lines subsequently examined by Townsend.

⁴ Independent and identically distributed.

In another landmark paper Townsend (1984) discusses the literature on Arrow –Debreu complete risk markets and tests the hypothesis using data from a sample of poor South India villages.⁵ The key risk allocation methodologies described are 1) diversification of land holdings by space and crop; 2) inter-temporal grain storage; 3) purchases and sales of assets; 4) borrowing; and 5) informal insurance mechanisms involving gifts and transfers within family networks. The advantage of the general equilibrium approach is that it overcomes the need to look at each risk sharing mechanism separately. As with similar studies on the US population the hypothesis of complete risk markets is rejected. However in the case of the South India it was noted that, while household income mattered statistically, consumption varied considerably less than income. From a formal insurance perspective this surfaces the need for very specific understanding of where and how formal risk transfer fits into the overall consumption portfolio of an entity (sovereign, enterprise or household), operating in otherwise incomplete markets.

In a seminal paper Arrow (1965, republished in 1971 and 1992) states that insurance ‘is of considerable importance in the economies of advanced nations’, but that ‘economic theorists have had little to say about it’.⁶ On the other hand, ‘insurance theory has developed with virtually no reference to basic economic concepts of utility and productivity’. In this paper he uses the term ‘insurance’ in its most generic sense, and identifies the main institutions for the transfer of risk as the insurance industry and the capital markets. Key insights include the fact that risks should ideally be ‘shifted’ to the agency best able to bear them (including government) and that the main constraining factor in the development of risk transfer markets is moral hazard but that techniques could be developed to address such constraints.

Autor (2010) similarly asserts that ‘There is an exceedingly strong economic case for many types of insurance. Efficient insurance markets can unequivocally improve social welfare’, and explores why incomplete insurance markets exist. Broad reasons given are:

1. Credit constraints - people cannot afford insurance and hence must bear risk.
2. Non-diversifiable risk cannot be insured, e.g., polar ice cap melts.
3. Adverse selection—individuals’ private information about their own ‘riskiness’ causes insurers not to want to sell policies to people who want to buy them.
4. Moral hazard (‘hidden action’)—once insured, people take risky/costly actions that they otherwise would not.

Merton and Bodie (2005) posit that the core financial sector functions (information flows, capital intermediation, liquidity support and risk transfer) are exogenous but that the institutions and markets that facilitate these functions are endogenous, being the outworkings of economic development and other country specific factors. They argue that neoclassical economics defines the equilibria to which financial markets trend as they overcome various frictions and behavioral distortions (assuming a well-run economy). Examples provided include the unbundling of life insurance products as more efficient investment intermediaries such as mutual funds emerged in North America. In similar vein Mey (2007) has described the disintermediation of natural catastrophe risk to capital markets. The authors assume a Solow model of economic growth, which emphasizes the central role of technological advancement, and propose a link to contemporary studies showing that ‘well-functioning financial institutions promote economic growth’. Finally they warn that the stifling of financial innovation ‘for fear of reducing the effectiveness of short run monetary and fiscal policy’ can lead to a much slower pace of technological progress.

⁵ The methodology could conceptually have been applied to other populations where cooperative action could potentially lead to Pareto optimality.

⁶ Demirguc-Kunt and Levine (2008) highlight the non appearance of the financial sector as a whole in much of the development literature.

Whalley and Yuan (2009) in a paper for the NBER Insurance Group argue that climate change will lead to a significant growth in the insurance function (possibly largely through capital markets) and that extreme change would see a fundamental shift in the structure of the financial sector from a focus on intermediation to risk management and asset diversification. They point out that damages from climate change are likely to be disproportionately concentrated in Africa, parts of East Asia, South Asia and coastal areas.

Transmission mechanisms

Pfeffer (1957) shows that regardless of the theoretical model employed, insurance reduces the risk factor in uncertainty and therefore removes some of the obstacles to economic action: 'insofar as insurance enables households and firms to hold smaller reserves for contingencies, it helps to increase their supply of funds available for consumption or investment... The role of insurance in "greasing" the credit mechanism is another example of its place in production.⁷ Consumer credit is undoubtedly more easily available through the use of life insurance'.⁸

Skipper (1997) elaborates on the channels by which the insurance function can contribute to economic growth. These are:

- 1.Promoting financial stability
- 2.Facilitating trade and commerce
- 3.Mobilizing savings
- 4.Allowing risks to be managed more efficiently
- 5.Encouraging loss mitigation, and
- 6.Fostering a more efficient allocation of capital.

A number of subsequent papers have elaborated on these headings. Arena (2008) and Chen et al (2012) point out that life and non-life insurers have different impacts as they provide different services. Curak et al (2009) point to three direct channels – marginal productivity of capital, technological innovation and savings rate, and one indirect channel – facilitation of exchange. By enabling the transfer of risk, insurance enables greater consumption (as economic units need to hold smaller financial buffers), and entrepreneurs can invest in new technologies - while risk aversion does not change with insurance, it does free up entrepreneurial activity. Life insurers, by providing long term risk and capital protection can increase the propensity to save when capital markets are seen to be risky. However the impact of insurance on the savings rate is ambiguous with some authors arguing that a reduction of risk through greater access to insurance could lead to lower savings rates (Pagano, 1993)⁹. Insurers are also gatherers, analyzers and promulgators of information about risk and in the process help to reduce information asymmetry and optimize resource usage, including credit allocation (Greenwood and Jovanovic, 1990). Finally insurers can improve collateral, and thus reduce risk for lenders, through the provision of property, liability and credit insurances.

Puri in her introduction to UNCTAD's massive 2007 review of the global insurance market sees insurance as both a commercial and infrastructure service. She lists transmission mechanisms including the promotion of financial and social stability, mobilization of savings, and supporting trade, commerce and entrepreneurial activity. She also points out that the insurance sector grows far more rapidly in emerging markets than in industrialized markets, supporting an insurance-growth hypothesis. Another indication of the sector's potential contribution to growth was that

⁷ Insurance and housing are often lumped together in national accounts. A US Congressional Sub Committee deals with insurance and housing jointly.

⁸ From a review of Pfeffer's book by Kurt Flexner, NYU.

⁹ However it should be noted that it is the application of savings rather than the level that drives productivity growth.

approximately 45% of the offers made in the Doha round of trade negotiations related to insurance: this is a sector not as bound by sovereignty issues as the banking sector.

Insurers also tend to be less sensitive to economic crises and can more easily ride through them than deposit takers (Leidke, 2007). Leidke has also pointed to the use of the insurance mechanism by governments to effect merit goods through insurance products with positive externalities (e.g. motor third party) and Curak et al (2009) to the transfer of risks to the insurance sector that would otherwise limit fiscal space (e.g. health and longevity insurance).

Empirical evidence

One contemporary study to which Merton and Bodie (2005) referred was carried out by Levine, Beck and Loayza (2000). This looks at the impact of financial sector development on economic growth rates, and introduces GMM methodologies that are able to deal with endogeneity issues (i.e. broadly feedback loops from the dependent variable to the explanatory variables), including omitted variables, through their application to panel data (i.e. data that are both cross country and longitudinal). These are supplemented by more traditional cross country techniques.¹⁰ Proxies for financial sector development in this paper assume financial intermediation is the key growth driver. Subsequent empirical papers in the mainstream literature, while acknowledging the relative balance sheet parity of insurers and pension funds with banks in advanced markets, have continued to focus on credit and/or money supply (M2 or M3) as the main metrics for measuring financial sector development.

However some recent papers have acknowledged the role of risk transfer and spreading mechanisms. A World Bank overview paper by Demirguc-Kunt and Levine (2008) defines the 5 functions of the financial sector as follows:

1. Produce information ex ante about possible investment and allocated capital
2. Monitor investments and exert corporate governance after providing finance
3. Facilitate the trading, diversification and management of risk
4. Mobilize and pool savings
5. Ease the exchange of goods and services.

However, the paper does not specifically refer to the role of the insurance sector.¹¹ In a recent paper Cihak et al. (2013) describe the World Bank's new Global Financial Development Database, which proposes the inclusion of a number of insurance sector metrics. Given evidence that the banking function can be neutral or even negative in certain contexts¹² in fostering productivity (De Gregorio and Guidotti, 1995; Leahy et al, 2001; Fitzgerald, 2006), and that the insurance sector may be superior in this regard (Adams et al, 2009; Lee, 2013) an investment in the development of a World Bank insurance data panel would generate a significant public good.

¹⁰ Demetriades and Hussein (1996) point to the dangers inherent in the assumption of institutional homogeneity in cross country studies.

¹¹ This unwillingness to include insurance metrics in the mainstream empirical work partly reflects a lack of suitable data, but may also be due to a historical path dependency whereby a separate insurance academic stream developed. To quote Athearn, 1962, most economists treat insurance 'as they would an unwanted step-child'. Agricultural economics is one of the few sub streams that has bridged the two disciplines, reflecting the unavoidable existence of risk and uncertainty in that space.

¹² Typically for fragile economies or where rapid liberalization occurs in the absence of necessary institutional controls.

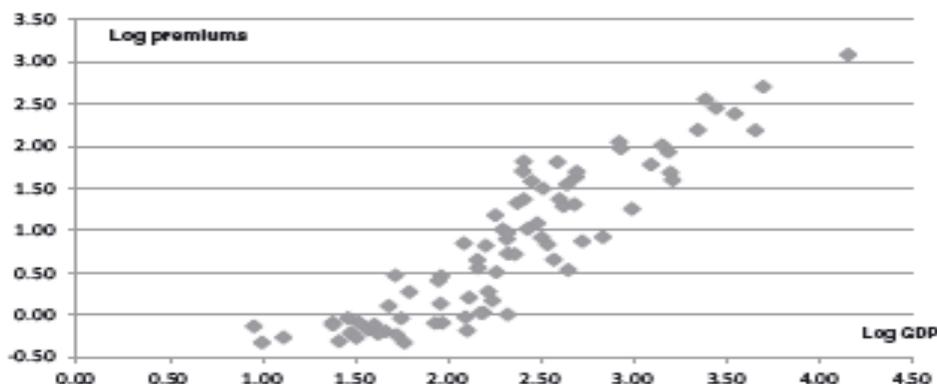
Rigorous empirical examinations of the role of insurance and contractual savings have thus been largely confined to the Financial Development Sector in the World Bank, The Geneva Papers, UNCTAD and the specialist academic community, using a range of country level and regional data and two global proprietary data sets.¹³

In their 2002 paper Webb, Grace and Skipper, assuming a Solow development process, and using four different models, found that the exogenous components of banking and life insurance penetration accounted for part of the 20% to 40% residuals left after allowing for the Solow model’s original specifications. In addition they found that the combined impact of insurance and banking was greater than the sum of their individual contributions. Beck and Webb (2003) similarly found a robust linkage between life insurance development and banking sector development. Chang et al. (2013) also point to the importance of including banking activities when examining the insurance growth nexus.

Catalan, Impavido and Musalem (2000) found evidence supporting the proposition that causality runs from the development of contractual savings institutions to market capitalization and turnover. While not developing a detailed theoretical model the authors posited that the development of capital market institutions enabled a banking system to ‘adjust towards its comparative advantage... thus reducing bank’s exposure to term transformation risks’.

Looking at insurance in isolation one finds a close correlation between national income and insurance usage (Figure 1).

Figure 1: Insurance and Economic Development – cross country



Source: Outreville, 2013

However there is a limited body of work on the direction of causality with almost all empirical research having been carried out in the last decade. Two overview papers covering the insurance growth nexus literature were published in 2013. Outreville lists 85 papers, of which 9 have some variant of GDP as the dependent variable. Richtervoka and Korab list ten such papers where t-statistics were reported, of which six overlap with Outreville’s list. Altogether a total of 19 post 2000 econometric papers examining the links between insurance sector growth and economic growth have been identified.¹⁴ Of these, 7 are country specific, 4 deal only with OECD, EU or industrial countries and 6

¹³ Swiss Re. and AXCO provide the two core cross country time series for insurance panels. However, the Swiss Re. non-life data has to date combined health insurance and property/ casualty data, which have been found to have different drivers. Future series will separate property/ casualty and health.

¹⁴ There is evidence that some results can be affected by the fact that cointegration can be found with aggregated data but not when the data is disaggregated, and vice versa (Kugler and Ofoghi, , 2005). Studies employing total premium and single countries should be

analyze panel data from a wide range of both industrial and emerging markets. One study differentiates 31 different provinces within China and another, the 5 former Yugoslav states.

Most of the studies (Table 1) find causality from insurance development to economic development. Richterikova and Korab (2013) apply a meta-analysis assuming random effects that applies weights according to the size of the database. They find an ‘effect size’ that supports the case that insurance development has a positive effect on economic growth. However cases of neutral or reverse causality are also found, sometimes depending on the country, the time period or even on the specific insurance type involved.

Many of the studies add conditioning variables in order to isolate the impact of the insurance variables chosen (usually insurance penetration – the ratio of insurance premiums to GDP, or insurance density – premium per capita), and the impacts of these provide some insight into the role country specific factors play in helping or hindering the transmission process. These may help to account for different results obtained as to the importance of the insurance sector according to the stage of development of the country or region.

Table 1: Causality studies

Author	Year	Countries	Years	Dependant Variable	Explanatory variable	Methodology	Conditioners	Findings
Ward and Zurbruegg	2000	14 OECD and 5 emerging markets	1961-1996	Real GDP	Total real premiums	Granger causality with co-integration analysis		Causality can run either way according to the country circumstances.
Webb, Grace, Skipper	2002	55 countries	1980-1996	GDP/capita	Life premium, P&C premium, bank credit	3sls regression	Education, exports, gov’t cons., investment	Insurance and banking jointly causative
Kugler and Ofoghi	2005	UK	1966/71-2003	GDP, GDP growth	Premiums disaggregated by type of insurance	VAR, Granger		4 products supply leading, 1 product demand following, others ambiguous
Boon	2005	Singapore	1991-2002	GDP growth	Growth in bank loans, market cap and insurance premiums - disaggregated	VAR, Granger		Insurance and capital markets promote growth over long term, banking a

treated with due caution in consequence. Measures of financial development employing M2 must also be questionable given the assumption of constant velocity of money.

								passive follower
Haiss, Sumegi	2006	29 European countries	1992-2004	Real GDP/employee	Life prem., P&C prem., total prem.	Cross country panel	Physical capital, human capital, interest rate, inflation	Weak causality from life insurance to growth.
Arena	2008	55 countries	1976-2004	Real GDP/capita growth	Life, non-life penetration	Dynamic panel GMM	Private credit, SX turnover, openness, gov't cons, inflation, human capital, terms of trade change	Significant causal effect from insurance to GDP growth.. Non life at all stages of development, life later.
Vadlamannati	2008	India	1980-2006	Real GDP/capita	Life, non life, total, penetration		Pop. growth, savings, lending, inflation, various reform measures/ inc. dummies.	Strong supply leading – reinforced by reforms.
Curak, Loncar and Poposki	2009	10 UE transition countries – unbalanced panel	1992-1997	GDP/capita growth	Life prem., P&C prem., total prem.	OLS after differencing, 2sls	GDP/ capita, private credit, SX capitalization, investment, education, openness, inflation	Insurance development promotes economic growth
Adams, Andersson, Andersson and Lindmark	2009	Sweden	1830-1998	Ln Real GDP/capita	Real bank credit, real total premiums per capita (insurance density)	Granger causality with lags		Insurance is supply leading for economic growth and bank lending with a 4 year lag. Banks have neutral effect on growth.
Avram, Nguyen, Skully	2010	93 countries	1980-2006	Real GDP/capita growth	Density and penetration, life non life	Cross section regression, Dynamic	Bank credit, SX turnover, in. GDP/capita, gov't	Significant supply leading based on density, but

					disaggregated	panel GMM	cons., Inflation, openness, terms of trade, econ. Dev. Stage, legal system, property rights, rule of law.	not penetration for life and non life. Importance of legal system identified. Supply leading effect weaker in less developed countries.
Han, Li, Moshiran and Tian	2010	77 countries	1994- 2005	Real GDP/ capita growth	Insurance density, life and non life disaggregated	Dynamic panel GMM	Income/ capita, tertiary education, inflation, trade balance, investment.	Insurance plays a more important role in developing countries.
Ching, Kogid, Furuoka	2010	Malaysia		Real GDP growth	Total life insurance assets	Granger causality/ VECM		Life insurance is long run supply leading, short run demand following.
Njegomir and Stojic	2010	Former Yugoslav ia – 5 countries	2002- 2008	Real GDP/ capita growth	Insurance density, life and non life disaggregated	Fixed effects panel regression	Insurance investments, bank lending, SX capitalization , gov't cons., physical capital, exports,	Positive impact of insurance as both risk carriers and investors, insignificant impacts from banking and capital markets. Reflect the greater resilience of the insurance sector to crisis.
Ege and Sarac	2011	29 mainly OECD countries	1999- 2008	Real GDP/ capita growth	Growth in total premium income	Panel regression after unit root test.	Employment growth rate, openness, share of fixed cap. Exp. In GDP	No causality tested but clear link between insurance and growth.

Horng, Chang and Wu	2012	Taiwan, China	1961-2006	Real GDP/capita	Total insurance density, growth in real insurance density, M2/GDP	3 variable VAR Granger / VECM		Financial development short run supply leading, demand following for insurance growth.
Chen, Lee and Lee	2012	60 countries	1976-2005	Real GDP/capita growth	Life insurance density and life insurance penetration	Two step GMM, basic and extended models	Base: Inflation, Gov't cons., openness, trade, human capital	Both life density and life penetration are supply leading to GDP growth but density has more effect. The positive impact of life insurance is driven by middle and low income countries, but life insurance and capital markets tend to be substitutive.
Akinlo	2013	Nigeria	1980-2010	Real GDP growth	Total premium	Granger causality /VECM.	Inflation, interest rate	Long run supply leading. No short term causality.
Chang, Lee and Chang	2013	10 OECD countries	1979-2006	GDP	Life insurance premium, Non life insurance premium, total insurance premium	Bootstrap panel Granger causality, cross sectional dependency and slope homogeneity.		Insurance - growth nexus is dependent on country conditions. Research needs to consider banking insurance interactions.
Hu, Su and Lee	2013	31 Chinese provinces	1997-2011	Real GDP/capita	Real total insurance density	Bootstrap Granger panel causality		Direction of causality varies by province with

								most being neutral or demand lagging. Supply leading causality was found in more developed Eastern provinces.
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In their paper Chang, Lee and Chang (2013) include two tables, the first showing the studies that point to a demand following view and those that point to a supply leading view. Most of the demand following studies used variants of OLS and Granger causality and were carried out before 2004. All the supply leading studies occurred after 2000 and from Arena (2008) onwards most were able to take advantage of large (but still somewhat flat) panels and modern applied statistics methodologies. There is likely to be a growing convergence between the theory showing the importance of the insurance sector and empirical evidence. However it is also clear that country specific conditions can influence the ability of the insurance sector to contribute to economic growth.

The mechanisms underlying the banking/ insurance sector linkage, such as credit risk transfer to insurers, group dynamics and cross holdings of assets, have been noted by policymakers concerned about financial sector contagion (Trichet, 2005). However there is virtually no literature on the impact of shocks arising from insurer failure on economic growth. Anecdotal evidence from the few cases that have been documented (e.g. Jamaica in the later 1990s, the Southern and Eastern Caribbean following the 2007/ 8 liquidity crisis, AIG following the same crisis) show that that these events can have a long term dampening effect on growth. In each of these cases poor governance and risk management, combined with links to banking systems contributed to the systemic aspect of the failure: more work needs to be done to understand and cauterize these potential leakages into the broader economy. In the meantime regulatory frameworks have evolved, particularly since the 2007/9 financial crisis, under G20 and Financial Stability Board oversight (FSB, 2013): the 2011 IAIS¹⁵ Insurance Sector Assessment Methodology, which is heavily influenced by the recent financial crisis, includes ICP 23, Group Supervision, which requires cooperation between the various financial sector supervisors in a country in identifying risk concentrations and a much strengthened Governance ICP. Nine international insurance groups are now classified as being systemically important and are subject to enhanced supervision.

Insurance and the poor – reducing poverty

Thesis and theory

Clarke and Dercon (2009) point out that the poor are subject to both liquidity and risk constraints in raising productivity and income/ consumption (Table 2). However the traditional view of poverty has assumed a world without risk – an asset focus - and that in analogy to standard growth theory ‘there may not be any convergence in the asset accumulation process, but divergence. Left to their own resources and efforts there may be a limit to the amount [the poor] can accumulate, leaving them in a perpetual cycle of poverty’.

¹⁵ International Association of Insurance Supervisors

The alternative, vulnerability, view of poverty sees risk forcing householders to focus on mitigating serious shocks, instead of accumulating for the future. Risk management for the poor includes a range of mechanisms such as precautionary savings, diversification of income streams, reduced consumption, migration, mutual support networks and asset sales. Access to informal credit (i.e. moneylenders) is also a common risk management technique for the poor.

Table 2 – Responses of the poor to risk and credit constraints

	<i>Poverty</i>	<i>Vulnerability</i>
	Asset-focus, in a world without risk	Risk-focus in a world focusing on protection
Responses		
Self-based	Accumulation (savings for investment into productive assets, including physical and human capital)	Self-insurance (savings via liquid assets) and other risk management and coping mechanisms
Intervention-based	Asset creation programmes (targeted by wealth); transfers as gifts or gifts conditional on work or action (e.g. conditional cash transfers with education objective)	Safety net (responsive to crisis)
Market-based or inspired	Microcredit, focusing on physical capital	Microcredit, focusing on consumption smoothing. Microinsurance

Source: Clarke and Dercon

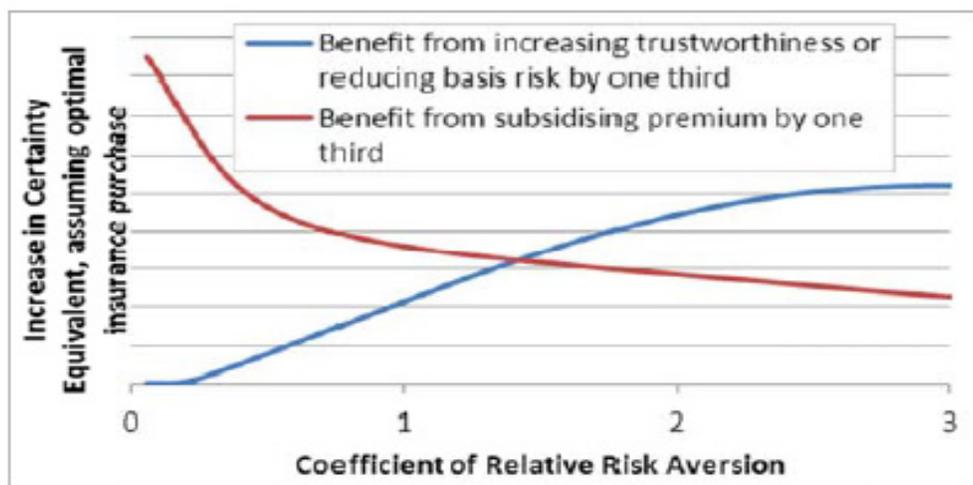
Clarke and Dercon list the major constraints on the supply of insurance services for the poor as follows:

1. Information asymmetries (including moral hazard)
2. Enforcement constraints
3. Transaction costs
4. Ambiguity aversion (i.e. lack of data)

The impact of these four potential hurdles varies according to the type of insurance involved with moral hazard being a major issue for crop risks and adverse selection for health insurance: these inefficiencies can increase the market cost of insurance services substantially over the expected losses.

Clarke (2011) explores rational demand for index insurance using various utility functions (incorporating risk aversion, price and wealth). He shows that rational demand for hedging products (such as index insurance) where the contract may not deliver in certain circumstances has a different pattern to that for classical indemnity insurance. In particular some unsubsidized weather derivatives currently available to poor farmers may provide poor value. He illustrates the impact of recognized basis risk (the chance that an index based contract will not pay out even if a loss has been incurred) in a subsequent briefing paper (2011) and points out that premium subsidies may increase demand from the relatively better off farmers, while reducing basis risk is more important for poorer, more risk averse farmers (Figure 2).

Figure 2 – Relative impacts of subsidies and increased trust according to risk aversion



Source: Clarke

Alderman and Paxton (1992) discuss the range of risk management options open to the poor in the absence of insurance markets, and in particular point to the possibility of poverty traps arising due to the employment of expensive alternative risk reducing strategies by the very poor. Barnett et al (2008) directly address the Alderman and Paxton thesis in the presence of multiple equilibria and a critical threshold: exogenous shocks that can ‘flip people from one growth path to another’. In this scenario two processes are at work – ‘First, ex ante efforts to reduce risk exposure can dampen accumulation, thereby creating low level equilibrium. Second, the ex post consequences of shock can knock people back into a poverty trap’. Barnett et al state that insurance and credit market failures perpetuate poverty in many low-income rural areas as a result of poor contract enforcement mechanisms, information asymmetries, high transaction costs and covariate risk exposure.

Carter, Cheng and Saris (2011) point out that informal risk management techniques can be very expensive and also carry basis risk. They develop a theoretical model that shows ‘that the interlinkage of credit and index insurance contracts can allow both markets to develop because the interlinked contract is more likely to stochastically dominate self-insurance. The analysis also shows that the way interlinkages will work depends fundamentally on the nature of the credit market and the degree to which lenders are able to demand and seize collateral in the event of a loan default. This interplay between collateral and the nature of credit –insurance interlinkage has direct and important implications for the design of programs to simultaneously boost small farm productivity and deepen rural financial markets.’

Karlen and Mordoch (2009) discuss the problems in extending formal financial services to the poor and review the innovations currently being introduced – ‘This chapter illustrates how much is being learned from this expansion of activity—and how much remains to learn. If there is a single message of the chapter, it is that mechanisms matter. The design of products (including their prices, term structure, flexibility, and marketing) affects adoption and usage—and ultimately economic and social impacts.’

The IAIS (IAIS, 2012) has produced an Application Paper laying out the role of regulation in supporting inclusive insurance markets. However Lester and McKee (2012) emphasize the need to avoid ‘protecting the consumers out of the market’, by tailoring the regulatory environment appropriately.

Empirical evidence

Research methodologies

De Bock and Ontiveros (2013) in a literature review of 42 studies comment on the application of research methodologies to microinsurance channel effectiveness. This follows on from a well cited presentation by Radermacher et al. (2010) which was very critical of the approaches being used up to that point. As with the mainstream research cited above problems of omitted variables exist in the earlier studies. In addition ‘evaluations that do not assess outcomes against explicit and policy relevant counterfactuals are now widely seen as unsatisfactory’.¹⁶ A full discussion of research design issues, according to the methodology being employed (experiment, matching etc) appears in section 5 of the De Bock and Ontiveros paper.

Morsink and Geurts (2011) also address research designs appropriate to exploring the added value of microinsurance. They identify four types of validity if a study is to be credible, using health insurance for female clients in Nigeria as an example. They point out that while internal validity can be tested with double-blind experiments (through removal of omitted variable bias) these need to be complemented with contextual factors, not all of which are easily quantifiable. This can mean that mixed methods produce superior research. In addition studies need to be designed carefully to separately identify the ex ante and ex post effects of insurance usage.

Four types of validity: Examples

A study concludes that enrollment in a health microinsurance program causes female clients in rural Nigeria to visit the doctor sooner when they are sick. The study’s:

Internal validity is the confidence we have that the impact (visiting the doctor sooner) is caused by the insurance and not by some other factor (e.g., that those who enrolled were generally more cautious about their health)

External validity is the extent to which this finding can be generalized to other areas, clients, and products (e.g. men in Latin American cities)

Construct validity is the confidence we have that the indicator (the response to a survey question about how long the respondent waited to visit the doctor) accurately represents the intended concept (the actual amount of time)

Statistical conclusion validity is the confidence we have that the study’s statistical methods were used correctly to draw the conclusion

Source: Microinsurance Centre

Doyle et al (2011) highlight the dangers of creating feedback loops that change the environment when conducting randomized trials. They describe an approach to defining the clusters/ units of randomization used, which preserves community structures ‘as far as possible.’

¹⁶ The Microinsurance Learning and knowledge Project defines client value as ‘the added value provided by microinsurance in comparison with other available risk coping mechanisms’.

The demand function

Clarke and Dercon touch only briefly on demand constraints, pointing to the potential of a substantial investment in education. Matul et al (2013) explore this aspect in some detail via a review of more than 30 studies. They find that trust, liquidity constraints, quality of client value proposition and behavioral constraints are the most important determinants of demand for first sales. For renewals the key constraints were limited understanding of insurance, value proposition and behavioral constraints. The impacts of these sources of friction vary according to the nature of the risk involved. Some key lessons are as follows:

- Consumer education seems to stimulate demand for index insurance but not health microinsurance.
- Liquidity is often a temporal issue – premium timing should reflect the buyer’s cash flow.
- Peer influence is important – sometimes more so than personal loss experiences.
- The cost of insurance is more than the premium – ease and comfort of access are important both at the premium paying and claims stages.
- The poor quality of health centers is often a key impediment to demand for health insurance.
- Bundling insurance with other products/ services can increase uptake – the perception being that it is a free service. However this effect appears to be context sensitive.
- Personal characteristics such as gender, age and risk aversion do not affect demand significantly.

Eling et al (2013) similarly review 41 demand oriented papers published since 2000 using the demand framework developed in Outreville’s 2013 survey. Significant drivers are summarized as follows:

Economic – price, wealth (including access to credit)

Social and cultural – risk aversion, non-performance risk, trust and peer effects, religion and financial literacy.

Structural – informal risk sharing, quality of service, risk exposure

Personal – age, gender

Two factors that stand out for microinsurance versus mainstream markets are the impacts of trust and financial literacy. In addition price appears to be a particularly important consideration for the poor.

In her doctoral dissertation Morsink (2012) details the results of interviews with 850 low income households over 1.5 years in India, Kenya, the Philippines and Ethiopia. The assumptions of expected utility theory are compared with actual findings in the field and the following modifiers identified – price, subsidies and discounts, the nature of the insured risk and the household’s risk profile, credit constraints, informal risk management techniques, marketing characteristics, risk preferences, the understanding of insurance, social capital and networks and trust levels. One interesting finding is that take up of insurance by poor households is often low even when the price is below the expected loss – pointing to the importance of the other factors.

While Morsink found a correlation between risk level and insurance take up, she also found that aversion in isolation led to reduced insurance take up – insurance could not be evaluated properly and was seen as a direct cost (see also Karlan and Mordock, 2009). The fact that positive peer claims experiences had a larger positive impact on risk-averse households was perhaps not surprising in light of this finding. Social capital and networks were similarly seen to be positive for take up. In her final chapter Morsink finds evidence based on general patterns of insurance take up that formal insurance reduces the likelihood that households have to use more costly consumption smoothing methods (such as asset sales, mortgaging their children’s futures by removing them from schooling and sub-

optimally diversifying income streams). Morsink's findings are largely consistent with the recent microinsurance demand literature reviews already referenced (De Bock and Gelade, 2012 and Eling et al, 2013).

Health microinsurance

Leatherman (2011) points out that approximately 100 million people slip under the poverty line annually – and 150 million more suffer financial catastrophe – as a result of making payments for health services. However to date only approximately 40 million people have some form of health microinsurance coverage. One major problem she identifies is that while catastrophe health events are more easily insured (and hence offered by insurers) the poor perceive more value in coverage for higher frequency low cost services – in developing countries pharmaceuticals account for 30% to 50% of total health care expenditures.

Schmidt and Mayindo (2006) explicitly investigated the trade-off between price and total premium pool for health insurance in Rwanda. They found the price elasticity was so high that 'the goals of maximizing health revenue and maximizing participation in community-based health insurance are mutually exclusive.' On a more positive note they were able to segment the population by income level and posit a limited subsidy requirement (which would in this case apply to the bottom quartile of income earners).

In their literature review De Bock and Ontiveros (2013) focus mainly on health microinsurance. They examine statistical impact findings (allowing for self-selection bias) and the channels through which microinsurance affects outcomes. Key headings and findings are as follows:

Use of health care services

Studies in Rwanda, India, Nicaragua, and Nigeria showed that microinsurance improved access to health services and utilization rates. In addition households with increased access were more likely to engage in risk mitigation (purifying water, etc.). Results were less positive in studies in Cambodia and Kenya.¹⁷

Financial protection

Most studies find a reduction in out of pocket expenses when there is access to microinsurance. Levine and Polimeni (2012) in an Indian study find a 44% reduction in treatment costs for serious health incidents once insured while Gustafsson –Wright (2013) finds a 40% reduction in a Nigerian study. Where the effect was not observed the reason appeared to be high co-payments or limited coverage.

Health status

There are few studies examining the impact of health microinsurance on health status, with most relying on anthropometric measures such as height, weight, wastage metrics and biomarkers. To date outcome findings have been mixed, consistent with ambiguous findings on the use of preventative medicine.

Distributional effects

The equity of results across income groups and ages appears to be a function of societal homogeneity, with greater homogeneity leading to a better allocation of outcomes. A Bangladesh study (Chakrabarty, 2012) found that child

¹⁷ Savitha and Kiran (2013) find similar mixed results in the literature survey included in their study of health seeking behavior in Karnatak, India. A key determinant appears to be the accessibility and quality of primary and secondary health care facilities.

labor is differentially influenced according to income, with insurance sharply decreasing the reliance on child labor among households suffering moderate poverty but needing to be bundled with microcredit to similarly affect very poor households.

Agricultural microinsurance

IFAD¹⁸ in its 2011 Rural Property Report states that 50% of the World's population and 70% of the developing world's extremely poor live in rural areas. Sub Saharan Africa's is more agriculture dependent with 70% of its population living in rural areas: it is the only region where extreme poverty is increasing. However total agricultural insurance premiums in Africa are only slightly more than in Australia and New Zealand, which have a small fraction of Africa's population, are highly urbanized and provide no government subsidy.

IFAD proposes a four element agenda to address rural poverty:

1. Improve the overall environment of rural areas, including infrastructure, utilities, services and governance.
2. Enable poor rural people to manage risk and reduce the level of risk they face.
3. It is fundamental to invest in education.
4. There is an ongoing need to strengthen the collective capabilities of rural people.

Regarding the credit-insurance nexus Karlan et al. (2012) in a Ghana study find that relaxing liquidity constraints alone has no significant effect on agricultural investment whereas relaxing the risk constraint by providing crop insurance has a substantial positive impact on investment in the risky asset. De Bock and Oniveros find studies showing reduced asset sales (Cambodia, Kenya), more use of specialized crops (India) and a willingness to experiment with risky swine breeding investments in China (Cai et al. 2009) when insurance is involved. A reduction in debt and a switch from informal to formal debt is also noted in some studies.

Cai (2013) uses a household panel covering the 2000 to 2008 period provided by the Rural Credit Cooperative of China to explore the impact of weather insurance (compulsory case for certain regions) on tobacco production, borrowing and savings decisions. A two stage model employing difference in difference regression is employed. He finds that the introduction of insurance increases the production area of insured crops but that production diversification is reduced. He also finds that a long term increase in demand for credit occurs while a medium term drop in savings rate is noted. Finally, in line with Clarke's model he finds that the impacts are greater for larger farmers, although this was also found for those with lower remittance incomes.

Another recent study by Sandmark et al (2013) that examines the current state of play with agricultural microinsurance begins by pointing out that this subject is garnering increasing high level interest because of a growing concern about food security¹⁹ and climate change. This may account for the fact that the greatest government support for agricultural insurance is to be found in high population emerging countries, including China, India, Mexico and Brazil.²⁰ Markets are growing considerably more slowly in countries without such support. The authors explain that certain single hazard risks (hail, fire) can be insured in private markets but that broad yield or revenue based coverages tend to attract subsidies (including in industrial countries).²¹ The trade-off then becomes

¹⁸ International Fund for Agricultural Development

¹⁹ For a more complete discussion of insurance and food security see Swiss Re., Sigma 1, 2013.

²⁰ Direct subsidies are also usually accompanied by investment in research into public goods such as relevant expertise, granular meteorological and crop production time series and supportive public policy.

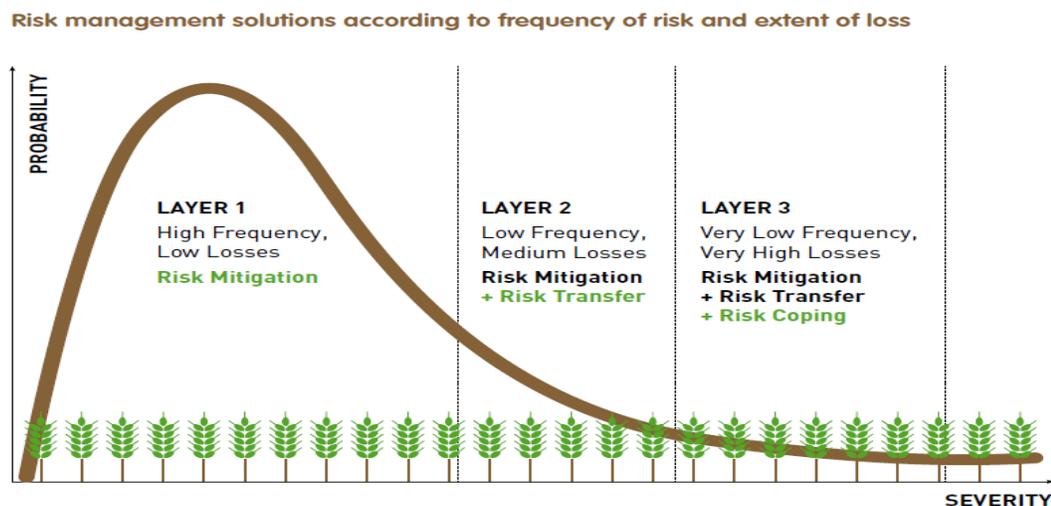
²¹ Almost two thirds of 104 countries surveyed in a recent World Bank Report provide subsidies, typically at around 50% of the market premium.

agricultural productivity versus fiscal cost: agricultural insurance is subject to all of the Clarke-Dercon supply constraints and the price at which broad indemnity based insurance could be provided is beyond most emerging and developing countries (market premiums are often 3 to 5 times the pure risk premium and tax bases are narrow).

Since 2000 a number of innovations have been piloted to address these constraints and in particular moral hazard, information asymmetry and transaction costs. All of these involve some sort of indexing (the Sandmark paper lists 52 projects under way in 40 countries), with all except a few in India and Mexico being pilots. Aside from the usual microinsurance hurdles already listed, Sandmark et al identify basis risk (the difference between the actual loss and the contractual payout) as the major challenge facing these pilots. They explore a range of innovations being trialed that could reduce its impact – including better and multiple triggers,²² combined yield/ index contracts that offer more accurate loss assessment but ensure some early payment, the employment of meso-level intermediaries (which can help with farmer level idiosyncratic risk) and the use of modern technology including satellite imagery. Some of these, including meso-level contracts are at a very early stage of trialing, but field experimental results are encouraging. In Ethiopia Clarke and Dercon (2014) found support for a theory that the presence of basis risk in index insurance makes it a complement to informal risk sharing, implying that index insurance crowds-in risk sharing.

Sandmark et al summarize by presenting a stylized hierarchy of risk management tools (Figure 3).

Figure 3: Hierarchy of risk management responses for agricultural risk



Source: Sandmark et al; World Bank

An important issue also addressed by Sandmark et al. is the role of governments, including the design of smart subsidies (i.e. that do not become long term unaffordable fiscal drains). They point out that the most successful large scale programs involve public private partnerships. This raises the question (also relevant to health insurance) as to whether agricultural insurance programs should be top down national efforts rather than bottom up pilots (this is

²² In their review of Index based disaster insurance programs Chantararat et al (2012) show how temporal factors can be introduced to rainfall insurance triggers that significantly reduce household income variability compared to the use of a simple cumulative rainfall index.

further discussed below).²³ One area where governments do have a key role is in providing an enabling environment, including a ‘well-specified regulatory regime and legal framework’. Mahul (2012) has proposed a protocol for setting the balance between private and public involvement.²⁴

1. Underwrite agricultural insurance through the private sector wherever possible.
2. Involve the government in the following –
 - i. Data and infrastructure
 - ii. Education, training etc.
 - iii. Technical support on product design and rating
 - iv. Creation of enabling environment (legal and regulatory)
3. Be cautious with the introduction of subsidies – design them to support well-defined social objectives and not to become a fiscal burden
4. Government may have a role as a reinsurer of last resort.

The global microinsurance market – current status

Swiss Re. (Sigma 6/ 2010) estimates that at the time of writing there were approximately four billion people living on under US\$4 per day (2005 dollars, PPP), of which 1.4 billion were living on less than US\$1.25 per day.²⁵ They argue that the 2.6 billion living on more than the poverty line could effectively be serviced with commercially viable microinsurance, while those below could be serviced by a combination of microinsurance and government support. The largest potential commercial markets are in the Asia and Pacific region, with Sub Saharan Africa having the largest proportion of below poverty line population. Potential microinsurance premium volume is estimate as up to US\$40 billion. Swiss Re. reports that credit life is the largest selling microinsurance product,²⁶ and points out that the major beneficiaries of this class are the microfinance providers.

A series of landscape papers written by various development organizations and covering commercial microinsurance has been published online by the Munich Re. Foundation.²⁷ While the definition of microinsurance has been widely debated these studies have adopted a pragmatic approach that identifies the target populations and specify that the premium amount is commensurate with income levels of those populations. The first study, published in 2007 by the Microinsurance Centre identifies the needs of the poor, with health insurance being the most common first priority and property related insurances coming in second. Three regional studies, covering Africa (MFW4A; Munich RE. Foundation; and AfDB, 2012), Latin America (IADB, 2012), and Asia and Oceania (Munich Re. Foundation; GIZ, 2013), have recently been published. Key findings are summarized in Table 3.

²³ Deblon and Loewe (2012) argue that microinsurance should be viewed within a broader social protection framework and develop an analytical framework for determining its possible roles.

²⁴ Also see Hill et all (2014) for a recent survey of lessons learned regarding government subsidies for health and agricultural insurance.

²⁵ See [HTTP://research.worldbank.org/PovcalNet/](http://research.worldbank.org/PovcalNet/) for data.

²⁶ Life insurance suffers considerably less than other classes from the Clarke-Dercon constraints.

²⁷ <http://www.munichre-foundation.org/home/Microinsurance/MicroinsuranceLandscape.html>

Table 3 – Key findings of Landscape studies

Region	SS Africa	LAC	Asia Oceania
No. of countries evaluated	51	20	31
No. countries with MI	39	19	24
No. providers	511	99	216
No. products	598	159	500
No. lives or properties covered - millions			
Life and credit life	42.7	48.3	83.9
Health	2.4	10.2	27.9
Accident	2.0	23.9	77.8
Property	0.8	2.9	7.7
Agriculture	0.2		26.2
Takaful			4.7

Detailed country level data are provided by the studies. Currently the largest commercial microinsurance markets in terms of percentage coverage are South Africa, Tanzania, Ethiopia, Mexico, Brazil, India, Bangladesh, the Philippines and Thailand, with South Africa and the Philippines having the largest penetrations. If government sponsored arrangements were added the numbers would increase dramatically, especially in the cases of India and China.

The main challenge for microinsurance

A number of high level papers (Joint NGO briefing paper on health insurance, 2008; and Ekman, 2004 on community based health insurance; Smith and Watts, 2009; and Skees et al., 2007 on Index based agricultural insurance) discuss the scalability of health and index based microinsurance programs. These are not research papers based on any rigorous methodology and tend to be descriptive. However they do raise the important issue of whether microinsurance can be scaled up to cover more than the relatively small audiences reached to date by most pilots.

Thom et al (2014) review 95 microinsurance initiatives that have achieved scale. Their summary of findings reads as follows: ‘Most initiatives that achieved scale in microinsurance did not build up to scale over time. Rather they sought out and maintained access to large target groups either through mandatory sales, partnerships (including access to voluntary groups, branding and product design) as well as agency. These were found to be the main drivers of scale that microinsurance schemes could control. Government subsidy and latent demand also significantly increased uptake as external drivers of scale beyond the control of microinsurance schemes. Technology, management capacity, regulation and infrastructure were found to be significant enablers, not directly driving uptake of the products but critical to support sustainable scale.’

There have been some major successes where governments, insurers and development organizations have worked together. These include crop insurance in India where 9 million farmers are covered (see Clarke et al (2012)) and mutual health insurance in Rwanda where 90% of the population is covered (see Binagwaho (2012)). These examples still have outcome issues but do suggest a possible way forward.

Insurance and rapid onset natural disasters – sustaining growth

Theory and thesis

Rapid onset natural disasters are only a subset of a range of exogenous shocks that can affect a country. However the insurance function potentially has a key public policy role to play in managing such risks. Several papers (Gurenko and Lester, 2004; Mahul and Gurenko, 2006; Mechler and Hochrainer-Stigler, 2014), have highlighted that the assumption of country's risk-neutrality (i.e. governments can afford to self-insure) proposed by Arrow and Lind (1970) may not hold for those middle and low income countries exposed to natural disasters.

Cummins and Mahul (2009) discuss the market imperfections limiting the development of catastrophe insurance markets and list a range of constraints. Demand constraints include low property insurance penetration in a country, low awareness of catastrophe exposure, low insurance awareness, limited ability to pay, an assumption of post disaster third party financing, and continuity issues in dealing with governments. Supply constraints include limited access to and capacity in reinsurance and capital markets, the capacity/ pricing cycle, various agency costs (including monitoring and information costs), local technical capacity and regulatory issues.

Kousky and Cooke (2009) point to the potential invalidation of the insurance mechanism (underpinned by the Law of Large Numbers and the Central Limit Theorem) in certain insurance risk portfolios, the three primary challenges being fat tailed loss distributions within single classes of insurance (largely reflecting power curve processes such as tropical cyclones and wildfire), tail dependencies (different classes of insurance being effected by a disaster at the same time) and micro correlations where small positive correlations between individual risks become significant when multiple risks are aggregated. Tentative conclusions include the need to develop risk securitization instruments based on a better understanding of the three sources of tail risk, the need to identify indemnity caps under which domestic private insurance markets can safely operate, the need to emphasize the role of risk mitigation, and learning lessons from political economy responses (such as the Florida hurricane risk residual and reinsurance pools) that threaten the fiscal positions of governments and potentially discourage mitigation efforts.

Okuyama (2003) develops the earlier work of Darcy and Kunreuther (1969)²⁸ and considers the impact of disasters on ex post decision making in macro- economic models – ‘..technological replacement or update resulting from the reconstruction of damaged capital stocks by a disaster is different from usual technological progress, in terms of its exogenous nature of shock, but is similar [in terms of] the endogenous level of technology available for replacement. On the other hand, the speed of recovery depends on the extra amount of savings allocated to reconstruction activities, ... However, this result extends to .. disaster insurance, which can be considered as saving for the future’.

Hellegate and Przulski (2010) point out the multidimensionality of natural disaster losses and the lack of clear definition in what is measured after a disaster. They propose a lexicon of terms (direct market losses, non-market losses and indirect losses) and examine techniques for estimating indirect losses (‘all losses that are not provoked by the disaster itself, but by its consequences’). The authors suggest four main avenues of research, including the ‘the role of the insurance industry (and of its regulation) and its capacity to help fund reconstruction and reduce natural disaster indirect cost.’

²⁸ The purpose of their paper was to encourage the development of a comprehensive natural disasters insurance system in the United States that would reduce dependence on government resources.

Jaffe and Russell (2012) use a welfare economics approach to examine the relative roles of ex ante private insurance and ex post government aid to deal with catastrophic risks²⁹. They find that individuals have heterogeneous perceptions of risk (over and above dealing with free rider and Samaritan's dilemma issues) and that a welfare improvement could possibly be obtained by the imposition of actuarially priced mandatory catastrophe insurance.

Empirical evidence

While there is a growing theoretical literature on exogenous shocks³⁰, Cavallo and Noy (2010) in a literature review on the economics of natural disasters highlight the lack of detailed public data sources³¹ that can support empirical research work on the impacts of natural disasters. The authors specifically mention a lack of information about the channels through which natural disasters affect short and long term output, including at the household level. They point out that while insurance mechanisms can be useful³², politicians have very weak incentives to consider such expenditures. In addition if such mechanisms are to be effective they need strong institutional settings, including transparent asset management, good risk statistics and strong systems for loss valuation and funds disbursement (also see Petterson et al, 2005).

Toya and Skidmore (2005) examine direct losses and death rates after disasters, and control for income levels. Using a panel of 151 countries and an OLS methodology they find that socio/ economic infrastructure, including financial sector depth (using M3 as a proxy) is an important determinant of post disaster outcomes.

Beilharz et al (2013) summarize more recent literature on the impact of natural disasters on economies and fiscal space, and the potential role of the insurance function. The authors highlight the growing real direct global costs of natural disasters and point to the disproportionate direct losses (relative to GDP) suffered by emerging markets³³. The average top decile of direct losses for emerging markets equates to 2.6% of GDP, compared to 1.9% in developing countries and 0.5% in industrial countries, implying that risk management (including building standards) lags the development of physical capital (Figure 4).

²⁹ This is becoming a more important issue as governments face up to the fiscal implications of natural disasters in the face of increasingly severe events.

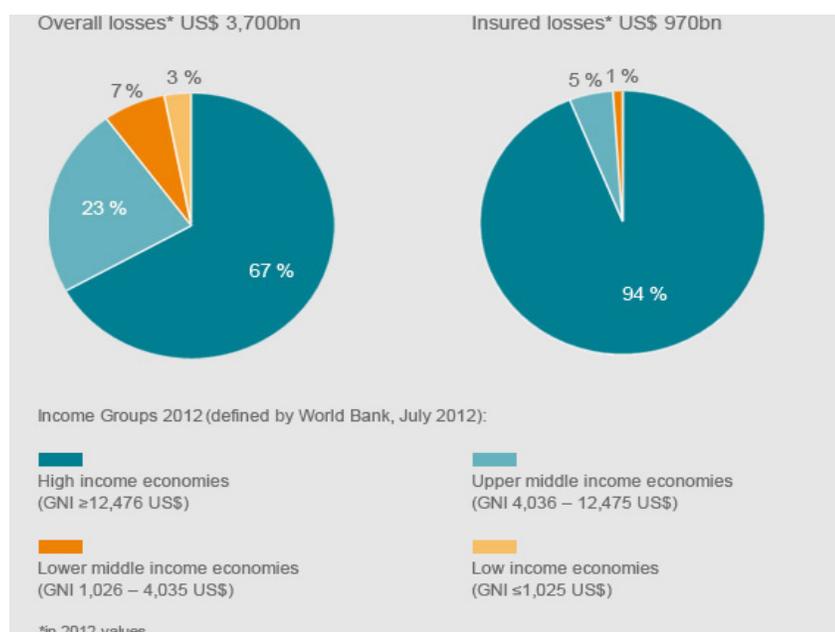
³⁰ Some of which explore the exogenous/ endogenous growth debate – see Noy and Nuasri (2007) who argue that human capital loss is more important than loss of physical capital.

³¹ EM-Dat is seen to cover too many events and with insufficient granularity.

³² e.g. Borensztein et al, 2009, show that Belize could significantly increase its debt sustainability through purchases of catastrophic risk insurance.

³³ Emerging markets are defined as those with per capita incomes between US\$1,036 and US\$12,615. Developing economies have lower per capita incomes.

Figure 4 – direct catastrophe losses 1980 to 2012³⁴



Source: Munich Re.

Secondary economic losses can be more difficult to measure but can be significant – including loss of life, loss of key productive capacity and production stoppages³⁵. Indirect losses include negative impacts on governments’ fiscal positions and trade balances³⁶.

Two recent papers empirically examine the role of insurance in reducing economic and indirect losses. Melecky and Raddatz (2011) employ a PVAR approach with a panel consisting of all middle income (emerging) and high income (industrial) countries and normalized large loss frequencies, categorized by hazard type, for the period 1975 – 2008 and extracted from the EM-Dat database maintained by CRED. Dependent economic variables employed are output (real GDP/ capita) and government expenses and revenues. Conditioning variables include inflation rates and interest rates. Low income countries are omitted because of distorting impact of aid flows. The paper concludes as follows:

- Climatic, geological and other disasters have an important negative impact on the fiscal stance by decreasing output and increasing deficits, especially in lower middle income countries.
- While financially developed countries suffer less in terms of output declines after disasters because of their ability to raise funds from capital markets, countries with high insurance penetration also suffer less and do not experience a material fiscal expansion.

Von Peter, Von Dahlen and Saxena (2012) work up a panel of 213 countries over the period 1960-2010. Natural disasters data were extracted from Munich Re’s NATCAT database (which is more granular than the CRED database) and categorized by type of hazard (geophysical, meteorological etc) and into six levels of severity. Man-

³⁴ Using IMF definition (2003).

³⁵ Secondary losses after Hurricane Katrina were greater than direct losses.

³⁶ Da Silva and Cernat (2012) estimate using a gravity method that the exports of small countries (population less than 20 million) decline by 22% with negative effects lasting 3 years after a natural disaster. This was in accord with an earlier finding by Gassebner (2006).

made disasters were also categorized (bank crisis, debt crisis, war etc). A panel regression methodology was applied. Conclusions are as follows:

- Natural disasters have a significant impact on output that strikes severely but also unfolds over several years. The output pattern typically shows an initial loss, a rebound in the year after the disaster and a subsequent further drag on output.
- Growth falls by 0.65% on impact in a typical median disaster with a cumulative loss of 1.7% (1% and 2.6% for an average disaster).
- It is the uninsured part of catastrophe related losses that drives macroeconomic costs. Well insured losses can be inconsequential or even positive for economic activity, with the strongest growth enhancing effects appearing in the three years following a catastrophe (i.e the reconstruction stage).
- Insurance tends to be less economically important for earthquakes and volcanic eruptions than for flooding and other meteorological events.

Magnoni and Budzyna (2013) report the ex post results of the employment of property microinsurance by typhoon prone rural communities in the Philippines. They find that insurance reduces vulnerability (specifically through an enhanced ability to raise immediate informal bridging loans) but that faster payout and reduced uncertainty would further reduce the need for alternative coping mechanisms such as reduced consumption. Using data from the same the same population Morsink et al (2011) emphasize that covariate shocks invalidate risk management methods based on the mutual support mechanisms of the poor and increase the risk of falling into poverty traps. However Akter and Fatima (2011) find that ex post micro-credit is preferred to ex ante microinsurance in the case of flood risk for poorer farmers in Bangladesh in a series of bidding tests and using interval regressions. Akter (2012) elaborates on this finding by pointing out the many challenges inherent in introducing an indexed flood insurance product. These include Clarke's (2011) concerns about complexity and technical nonperformance, but also raise issues of cost and poor consumer protection.

A Primer published for policy makers by the World Bank (Ghesquiere and Mahul, 2010), based on a decade of advising governments and designing new instruments to fill market gaps, points to at least 10 dimensions that governments need to consider when designing a funding plan:

- The amount of funding that may be required.
- When funding is needed (relief, recovery and reconstruction stages).
- When and if funds are like to become available from each funding source post disaster.
- The cost of each funding source.
- Bureaucratic and legal hurdles to releasing each type of funding.
- The limited and highly targeted funds available from most NGOs³⁷.
- The country's capacity to deal with disasters (e.g. large diversified economies versus small island states with narrow economies).
- Opportunity costs associated with each type of funding (e.g. reallocated budget).
- The country's capacity to utilize the funding effectively (are relevant institutional arrangements such as EMAs in place)³⁸.

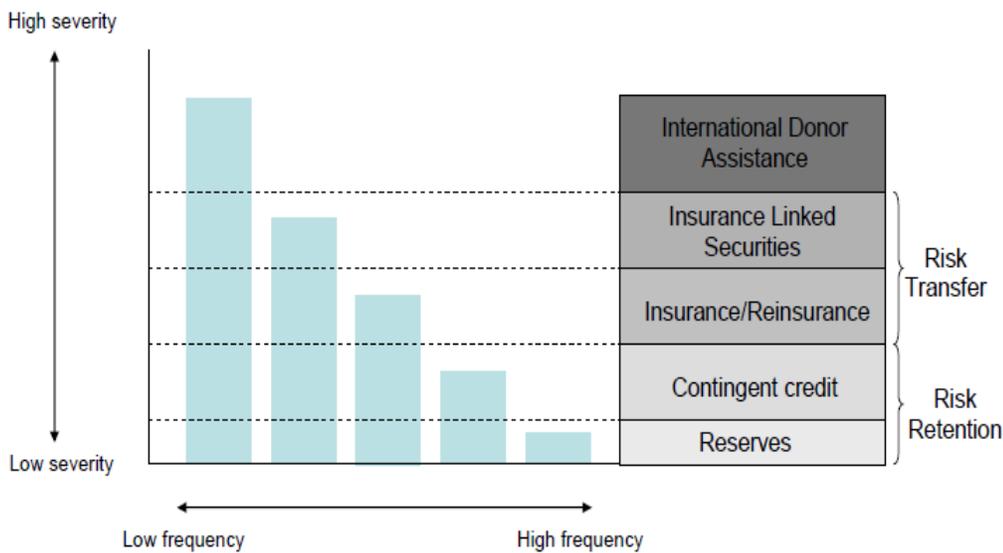
³⁷ See for example <https://nacla.org/blog/2012/6/21/undeserved-confidence-broken-system-aid-haiti-%E2%80%93-part-2>

³⁸ See Popp (2006) for a full discussion of the importance of institutions.

- The country’s existing fiscal situation – especially given that the capacity to borrow may reduce after a disaster.

As a broad conclusion they find that natural disasters insurance is expensive (whether from insurers or capital markets) and that the best theoretical use of catastrophe insurance may be for immediate liquidity provision at the state level (particularly for immediate relief to the poor) or by reduction of state contingent fiscal liabilities through efficient delivery of insurance to middle and upper income households. A stylized approach is presented (Figure 5) but in practice the approach adopted will be context specific.

Figure 5 – Stylized layering of ex ante and ex post catastrophe funding instruments



Source: World Bank

Concluding remarks

Development organizations have devoted considerable resources over the last two decades to supporting the emergence of viable insurance mechanisms in developing and emerging markets³⁹. This investment has been validated by a growing empirical literature on the role of the insurance sector in fostering inclusive growth, in reducing poverty and in mitigating the primary, secondary and indirect impacts of natural disasters.

Dealing first with the insurance-growth nexus the correlation between GDP and insurance demand has long been clear, as demonstrated in Figure 1, and the correspondence between regional insurance sectors and emergent middle classes is if anything even more striking (Table 4). Thus the challenge from a developmental perspective becomes to establish whether the insurance sector leads economic development or follows.

Table 4: Insurance and the middle class (defined as daily expenditure between US\$10 and US\$100)

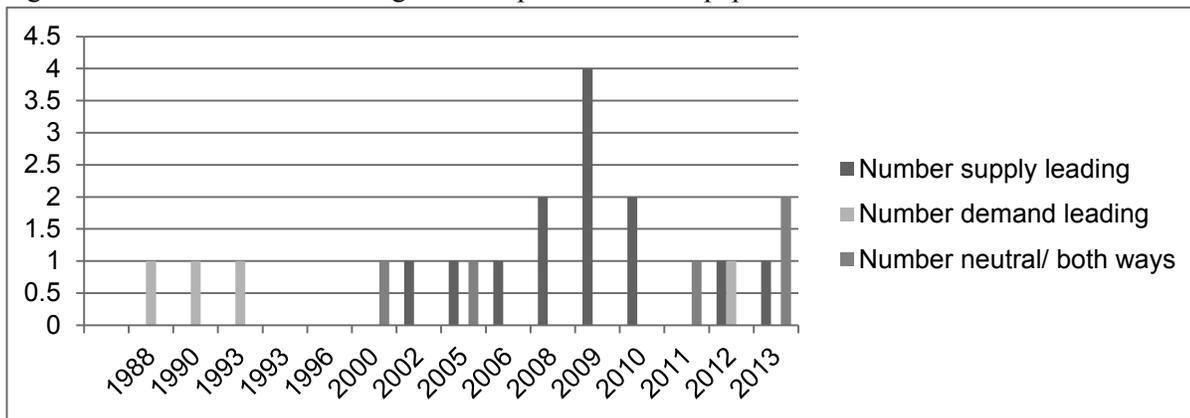
	Middle class pop. mill	% global middle class consumption	% life global premium	% P&C global premium
North America	338	27	25.0	39.7
Europe	664	38	35.7	29.7
Central/ South America	181	7	2.3	4.7
Asia Pacific	525	23	36.5	23.6
Sub Saharan	32	1	0.1	0.5
MENA	105	4	0.5	1.9
	1,845			

Source: World Bank

In this regard the source and nature of data and the methodologies employed are important considerations in assessing the reliability of any causality findings. Single country time series data (spurious correlation) and cross country data (omitted variable bias) need to be handled particularly carefully, especially when different classes of insurance are aggregated. More recent data sets have enabled relatively large panels to be assembled and modern methodologies to be adopted: greater weight needs to be given to these in drawing inferences. The later studies broadly support the general proposition that causality runs from insurance sector development to economic development. The evolution of the findings can be illustrated as follows (Figure 6):

³⁹ The World Bank's investment banking arm, the International Finance Corporation, has more recently reflected this resource allocation. Its portfolio of investments in the insurance sector now comfortably exceeds US\$1 billion (of which 83 percent is in direct equity) and quintupled between 2011 and 2013.

Figure 6: Evolution of insurance-growth empirical research papers.



Source: Table 1

Where reverse or neutral causality has been found there is evidence that, statistical methodology aside, this may arise from the aggregation of data from classes of insurance with different characteristics⁴⁰. Kugler and Ofoghi disaggregate UK insurance data by line of business to explore earlier findings by Ward and Zeubregger (2000) of no relationship in the UK and USA between insurance and economic development. They find causality where Ward and Zeubregger do not, but at a more granular level, and attribute this to cointegration effects. The three classes of insurance testing as most clearly supply leading, are life, health and property. Property insurance enables banks to lend for housing and for major projects, and private health insurance can enable governments to create fiscal space and focus resources on the poorer sections of society. Results for most other classes were neutral, although there does appear to be some support for a longer run causality from motor insurance to economic growth. Liability classes such as Motor Third Party and Contractors All Risks that effectively increase access for the uninsured may not be directly supportive of growth, but as public policy has demonstrated, are seen as increasing welfare.

Life insurance appears to be heavily influenced by cultural factors and social policy – with above expected penetration levels seen in East and North Asia and well below expected levels observed in MENA. Traditional life insurance is now the main source of long term funds in the world with the universal move from defined benefit to defined contribution pension plans, and countries where this sector is undeveloped are likely to be more dependent on international capital flows if they are not resource rich. In China local governments are now turning to the life insurance sector for funding as central monetary policy is tightened⁴¹.

Secondly, and despite the recent positive research, the direction of causality is probably not an iron law even for economically supportive insurance classes – conditioning variables and choice of time frame can individually or in combination modify and even reverse the direction. If the policy environment for domestic insurance development is negative in a country the supply leading effect is likely to be muted. In addition certain classes of insurance, such as professional liability may be a function of local legal approaches rather than intrinsic to economic development. The overweighting of North America in the Property and Casualty (General Insurance) column in Figure 3 above reflects the important role that liability insurance plays in what is the most litigious society in the world. The fact that liability insurance is not supply leading in such circumstances is perhaps not surprising.

⁴⁰ Life, health and property and casualty all exhibit quite different slopes when regressed against national income.

⁴¹ Asia Insurance Review, May 7th, 2014

Thirdly, while the empirical literature drops hints, it still does not rigorously verify the key transmission mechanisms from insurance sector development to more general economic development, although there is evidence that a productive interaction between credit and insurance is at work. In this regard a search for papers on the nexus between housing and insurance proved to be largely fruitless despite these two economic sub categories being grouped together in some national accounts. Similarly, while plenty of anecdotal evidence exists, no rigorous research could be found on the relationship between distribution systems and insurance sector development. There is some evidence that bancassurance is a more efficient distribution system than traditional agency systems in emerging and industrial countries⁴², presumably reflecting both more widely and densely distributed branches and greater levels of trust.

A number of the studies reviewed in the paper suggest policy settings that can lead to more efficient and effective insurance markets. Vlamannati (2010), uniquely, constructs an index of regulatory reform using Indian data. Reform indicators include the licensing of private insurers, the various stages of reform following the setting up of the Malhotra Committee in 1993, and changes in FDI caps for the sector. While interpretation of results is tricky the author finds that the rate of regulatory reform in the sector contributes to economic growth. In consequence he recommends a full opening up of the sector. Avram and her co-authors (2010), using a large multi country panel, similarly find that policy settings are important with the quality of a country's legal system and enforcement of property rights being highlighted⁴³. Chang et al (2013) find causality running in different directions in different OECD countries and attribute this to country specific factors including the idiosyncratic interaction of the insurance and banking sectors in different jurisdictions (echoing Webb et al., 2002 and Beck and Webb, 2003).

These implications from the insurance-growth literature are broadly consistent with the findings of the papers on insurance sector drivers discussed in Annex 1. Market liberalization is generally positive as are a strong legal system and enforcement of property rights. Private credit is closely correlated with insurance sector development. At the main subsector level, bond market development is good for life insurance markets, while the size of the car fleet is a direct driver of property and casualty (general) insurance premium growth.

Despite the fact that the researchers are still to some extent in Plato's cave⁴⁴, there are now sufficient indicators to help focus the allocation of developmental resources to support insurance sector development in emerging markets. In addition to the obvious need to encourage supportive macroeconomic management, honest judiciaries with knowledge of the financial sector need to be established and backed up by strong law securing property rights. Retail credit market development is important and there is now enough research and anecdotal evidence to justify supporting the legal and regulatory environment for insurer/ bank partnerships. Bond markets are important if life insurance is to become an important contributor to growth in emerging markets. Islamic risk sharing mechanisms (Takaful) are still largely an experiment in progress but appear to be worth supporting based on progress to date (Gonulal et al, 2012).

The papers dealing with the risk management needs of the poor tend to be highly focused on individual geographical regions and particular risk management needs (mainly death of the wage earner, health and crop). This is inevitable as few microinsurance arrangements have developed a national profile. However the literature is now exhibiting a consistent set of themes. Acceptable price, fit with specific needs (including household cash flows) and trust are

⁴² Bancassurance: Emerging trends, opportunities and challenges, Swiss Re. Sigma 5/ 2007

⁴³ Also see Echo et al, 2004, Law and the Determinants of Property Casualty Insurance, The Journal of Risk and Insurance 71: 265-283

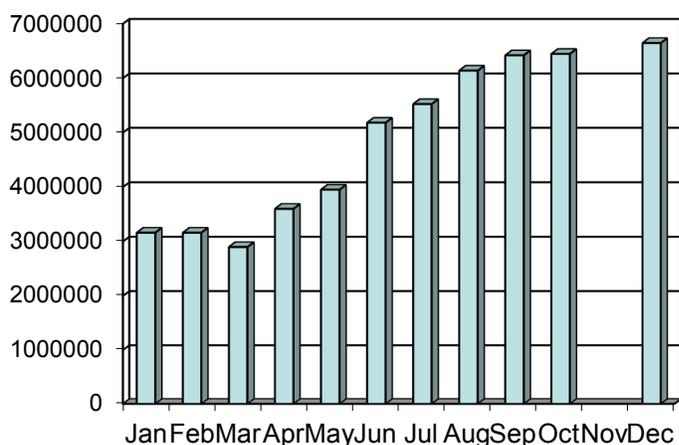
⁴⁴ For example very little work has been done on the role of property insurance, although there is evidence that this class may be important.

three critical elements of any successful business model. Price is a function of the actuarial credibility of the data available and the cost structure inherent in the business model. While the former can be dealt with over time through the actuarial control cycle (see Garand et al, 2012) the latter is an ongoing challenge – and raises the thorny topic of the role of subsidies. However the literature is replete with hopes that modern technology, and the universal adoption of cell ‘phones in particular, offers substantial opportunities to cut costs and improve quality of delivery⁴⁵. Fit with specific needs is increasingly being dealt with through involving the people in the target markets in the design of the marketing mix (and teaching mainstream markets a thing or two in the process) –see for example Dror et al (2014).

The question of trust is perhaps the most difficult in the medium to long term as it encompasses all aspects of the business model, and is manifested as an assessment by the household of the likelihood of delivery on promises. Clarke and Morsink emphasize this aspect in their work and Dror et al (2014) claim that overcoming this constraint is a major contributor to the success of a community based arrangement launched in Nepal in 2011. Clarke focuses on the negative impact of crop insurance basis risk in a number of his contributions: while indexes based on weather phenomena offer huge potential savings in cost and time it appears that they need to be part of the solution rather than the whole solution.

Finally there is the issue of scale – so critical to the viability of any unsubsidized microinsurance arrangement or any system that plans to wean itself off subsidies. Thom et al (2014) point to the need to aim for scale quickly, rather than building up slowly – this means linking insurance to another product in wide demand (examples include credit, fertilizer and telecommunications) or achieving an agency relationship with an organization that already has a large membership. Partnership with government also appears to offer opportunities in certain contexts, such as community health systems, although access to quality health care is an important precondition. The major impact of gaining access to local secondary health facilities in Rwanda is evidenced by the rapid increase in membership of the Mutuelles de Sante observed in 2006 (Figure 7).

Figure 7: Impact of access to enhanced healthcare on Mutuelles de Sante membership in Rwanda



Source: Mutuelles de Sante support team in Rwanda

For the poor (and possibly the not so poor, although this has not been tested rigorously) consumer education and protection appear to be critical to overcoming cognitive barriers. In addition intense ongoing work on the role of

⁴⁵ See for example McKinsey’s recent report on technology in Africa (Manyika et al, 2013).

technology in reducing costs and quality of delivery is likely to deliver major gains. The key issue however is a combination of the need for scale and the need to engender trust. These are linked because as already noted one necessary success factor appears to be for the insurer to gain access to the poor via an organization or mechanism that already encompasses a large number of families, and is trusted by those families.

Thus the need to conceive of marketing mixes that are seen to deliver is fundamental. In particular significant efforts are required to deal with basis risk in weather related index based instruments. The rewards in terms of cost and timely payment to the farmer are enormous if this current significant barrier to trust can be overcome, either through technology/ better data or in combination with other mechanisms such as area yield indexes and community arrangements. Similarly the best designed health microinsurance scheme in the world will not work if the third pillar, the health delivery system, is not able to perform. The poor have an acute sense of value for money (over and above strict spending caps) and very high discount rates. As one young Indian mother (who happened to be an insurance agent for the Self Employed Women's Association when not working the fields, feeding her husband and children, tending her one treasured cow or sitting on the community school council) said to the author during his immersion in Gujarat, "if I do not work every day I die" (Lester and Vanhuynegem, 2004).

This review also examines the role of insurance in dealing with shocks arising from natural disasters. The evidence is clear that emerging countries that are beginning to build their infrastructure are the most affected in terms of relative direct costs. They have a physical capital base but have yet to develop adequate risk management capacity. The impacts of natural disasters in terms of secondary (loss of life, production etc.) and indirect costs (effects on governments short and medium term fiscal planning) are less well documented but appear to be potentially even more significant than direct costs.

The recent econometric work of Melecky and Raddatz (2011) and Von Peter et al (2012) strongly supports the role of insurance in mitigating the aftereffects of natural disasters on economic growth, and possibly even providing a stimulus in the few years after the event. However insurance has a cost and as Toya and Skidmore (2005) and Ghesquiere and Mahul (2010) point out this instrument needs to be seen as a complement to strong infrastructure (including a developed financial sector) and alternative funding mechanisms. Thus the role of the development organizations is two-fold – developing ex-ante instruments to fill gaps in the catastrophe financing market and helping countries to build the infrastructure and institutions that create resilience.

The literature on the impact of rapid onset natural disasters on the poor is nascent, reflecting limited useable data and the fact that few experiments are underway. The experiments that have been started are concentrated in the Philippines and Indonesia – the two most disaster prone countries in the world - and the hazards involved are flood and windstorm, the calamities of most relevance to the poor because of their impact on livelihoods. Magnoni and Budzyna's work in the Philippines appears to show positive post typhoon results, although all of the complexity of the poor household's risk coping mechanisms is highlighted by the time taken to settle claims. However Akter (2012) highlights just how difficult it will be to use index based catastrophe products for the poor⁴⁶, based on her experience with flood risk hedging in Bangladesh. Microinsurance against rapid onset natural hazard disasters is probably the area offering the greatest challenges, and alternative approaches need to be explored.

Summarizing, insurance has been shown by this literature review to be a useful instrument in fostering inclusive economic growth (although this effect varies by class of insurance) and in helping the poor to escape poverty traps. While the policy settings that support the development of the insurance sector are now reasonably well understood,

⁴⁶ Which theoretically pay out quickly.

more work needs to be done on understanding transmission mechanisms in order to better focus developmental efforts. In this regard the review has highlighted a potential nexus between credit and insurance that requires further investigation, as the two in tandem appear to be more potent than when developed separately. Finally insurance is an essential element in the suite of funding mechanisms required to deal with rapid onset natural disasters and offers major opportunities for the development organizations to add value for their partner countries.

Annex I: Factors influencing insurance sector development

Outreville (2013) identifies more than 70 papers that examine the factors that influence insurance sector growth. The World Bank has produced the most recent paper in this sequence (Feyen, Lester and Rocha, 2013), using fully disaggregated AXCO data (life v. P&C) and a number of structural variables for the first time. This section draws on the Outreville literature review with an initial overview from the Feyen et al paper. The findings of a Swiss Re. (2011) anecdotal paper on the development of insurance in emerging markets are then described.

The empirical research on the determinants of the insurance sector has focused on the life sector. Early contributions to the empirical literature were also mostly focused on the US, and explored the role of education, income, religion, and cultural factors, as well as prices. By way of illustration, Hammond, Houston and Melander (1967) stress the importance of the occupation of the main wage earner. Headen and Lee (1974) show that the demand for life insurance depends on savings and interest rates. Burnett and Palmer (1984) show that education, income and religion are key determinants of the demand for life insurance. Babbel (1985) shows that price has a negative effect on the demand for life insurance. Beenstock, Dickinson, and Khajuria (1986) provided one of the first empirical studies exploring cross-country data. Using a dataset of 10 developed countries, the authors conclude that income, life expectancy, and the dependency ratio have a positive impact on life insurance demand, while social security expenditures have a negative impact.

More recent empirical studies include Browne and Kim (1993), Outreville (1996), Beck and Webb (2003), and Li et al (2007). These studies rely on larger cross-country datasets, especially the latter two. Browne and Kim (1993) use data from 1987 for a cross-section of 45 developed and developing countries, while Outreville (1996) bases his analysis on a cross-section of 48 developing countries for the year 1986. Beck and Webb (2003) use a large dataset of 68 developed and developing countries over the 1961-2000 period, while Li et al (2007) rely on a panel of 30 OECD countries over the 1993-2000 period. These studies use life premiums as the dependent variable (usually expressed as ratios to GDP or the population). Browne and Kim (2003) and Li et al (2007) define the estimated equation as the demand for life insurance. Outreville (1996) specifies briefly the demand and supply for life insurance and defines the estimated equation as a reduced form. Beck and Webb (2003) also indicate that the life premium reflects both demand and supply factors, while stressing the difficulties of distinguishing between the demand and supply sides.

Table 5 shows the strongest predictors of insurance sector growth (mainly at the 1% confidence level) by Feyen et al category, and the papers supporting these findings. While some predictive economic, structural and cultural variables (e.g. population, religion) cannot be easily changed, or can only be changed over the long term, other policy variables are amenable to reform. However even some invariant variables can be addressed (e.g. the introduction of Takaful in Islamic countries).

Table 5 – Strong Predictors of Insurance Function Growth⁴⁷

	Life	Papers	P&C	Papers
Economic				
Inflation	-	All relevant studies	+	Feyen et al
Income	+	All studies	+	All studies
Unemployment	-	Mantis and Farmer, Outreville (1980), Beenstock et al, Lenten and Rulli		
Education	+	All relevant studies	+	All relevant studies
Structural				
Population	+	Mantis and Farmer, Feyen et al	+	Nakata and Sawada, Millo and Carmeci, Feyen et al
Population density	+	Feyen et al		
Social/ Cultural				
Muslim	-	All relevant studies	-	Feyen et al, Park and Lamaire
Private v. gov't control	+	Feyen et al	+	Feyen et al
Monopoly	-	Outreville (1996)	-	Outreville (1990a, 1990b, 1992)
Openness	+	Arena, Curak, Avram et al, Chen et al		

⁴⁷ Health insurance is largely policy driven and has not been modeled.

Market structures				
Private credit (proxy FD)	+	All relevant studies	+	Outreville (1990a, 1990b, 1992), Millo and Carmenici, Feyen et al
Bond Market development	+	Feyen et al		
Legal enforcement/ property rights	+	Web et al, Beck and Web, Feyen et al, Avram et al, Chui and Kwok, Ward and Zurvruegger	+	All relevant studies
Car fleet			+	Feyen et al,
Political risk	-	Ward and Zurbruegger, Web et al, Beck and Webb	-	Park and Lemaire

Note: A full listing of explanatory variables and papers appears in Outreville (2013).

Most of these explanatory variables have expected causality. The positive effect of inflation on P&C premium levels may reflect a tendency for property investment to increase as inflation rates rise and a desire to anticipate nominal value increases..

Swiss Re. (2011) point out that emerging insurance life markets are growing at 10% p.a. faster than in industrial economies and emerging non-life markets are growing 7% p.a. faster. However most of the emerging market growth is presently confined to Asia and Latin America (specifically China, India and Brazil – projected to be 3 of the top 10 economies by 2021). The Swiss Re. paper develops an on the ground, experience based model of insurance growth in emerging markets based on four drivers:

- A sound economic environment
- Improving insurance regulation and supervision
- Product innovation, and
- Effective use of alternative distribution channels

Major economic trends noted include the transition from rural to urban societies and the development of vehicle fleets, and resultant demands for personal loans and mortgages. On the other hand economies suffering from poor governance and high inflation are seeing reduced demand for life insurance.

Regarding insurance regulation Swiss Re. notes that some markets are being opened up to competition, price controls are being removed and bank-insurer (including private insurer/ public bank) links are being permitted. In addition some countries (India, Brazil, Philippines, Bangladesh, CIMA members, South Africa, Pakistan) are now developing

regulatory regimes that recognize the growth of insurance for the poor (inclusive insurance or microinsurance). Product innovations noted includes index-based weather insurance, takaful and various microinsurance classes. In addition mainstream insurance lines are being extended to poorer sections of the population (e.g. motor physical damage insurance for old cars in Brazil).

Aside from the rapidly growing role of banc-assurance (now accounting for more than 50% of life sales in Brazil and China and nearly 50% in Malaysia) the Swiss Re. paper points to the growing use of mobile phones, retail stores, utilities, agricultural cooperatives and even the internet for sales and service.

The paper's analysis of profitability in emerging markets shows ambiguous results, with some indication that joint ventures are sub-optimal for life insurance (possibly due to capital demands). On the other hand insurers within financial conglomerates tend to outperform, reflecting enhanced efficiencies and access to customers, although non life joint venture insurers tend to do better as stand-alone entities. In terms of scale there is some evidence that a Kuznets curve applies to life insurance, with the optimal size in emerging markets being between US\$10million and US\$100 million annual premium income.

A literature on insurance sector efficiency and structural implications has recently emerged. Thorburn (2008) finds evidence of optimal structures based on cross country scatter diagrams and longitudinal trend data, with life insurance equilibria implying more concentrated markets (based on the Herfindahl index) than for non-life. Fenn at all (2008) , employing frontier analysis with x- efficiency as the dependent variable find scale effects in the European insurance sector, with large insurers having significant market shares being more cost efficient but less profit efficient. A study by Harchaoui (1997) using an incomplete panel with 10 years' of data finds similar results in Canada.

While theory points to a reduced propensity to purchase insurance with increasing wealth the empirical evidence points to property and casualty insurance as being a normal but not a luxury good (i.e. consumption increases broadly in line with income or wealth). Galabova and Lester (2001) using decile expenditure groupings from a panel of industrial and emerging countries find that personal property insurance consumption changes little as a proportion of income, excepting those countries such as France that have a large number of mandatory insurances. Foncel and Treich (2007) find that property insurance is a normal good. No empirical research could be found on the status of life insurance, although it is likely that results would depend on the product involved (e.g. term insurance versus variable annuity). Most other extant studies involve the US health insurance market and are not relevant to this review.

Annex II: Improving access to mainstream insurance markets

While the main access to insurance emphasis has been on microinsurance (including index based insurance) the World Bank, working with the private sector and regulatory bodies, has also been supporting initiatives to expand mainstream insurance markets to less well off working populations. These projects have targeted emerging markets where institutions and infrastructure are already established and have been focused on Islamic risk sharing (Takaful), bancassurance (to take advantage of developed bank branch networks), helping to make motor third party insurance systems work more effectively and efficiently, and consumer protection. What literature exists has been largely produced by the World Bank and academics working in Islamic institutions.

Feyen et al (2013), found that in strongly Islamic countries traditional risk insurance mechanisms based on risk transfer are likely to have only 50% to 60% the penetration they would elsewhere, ceteris-paribas. Reasons for this include a number of prohibitions under Sharia law inherent in traditional insurance mechanisms. Takaful mechanisms which involve separation of the profit motive from the mutuality concept, offer an opportunity to overcome this constraint. In its 2013 global survey Ernst and Young forecasts that Takaful contributions will increase from US\$9.4 billion in 2012 to US\$17.1 billion in 2017, with Takaful growing substantially faster than mainstream markets (although this growth is presently confined to a few markets). They point to a need to consolidate this sector and for regulators to facilitate its development while monitoring solvency. Rahman (2009) points out that Takaful operators are now being established in industrial countries (including the UK and US) and Gonulal et al (2012) in a wide ranging review of mutual insurance mechanisms, point out that the mutuality concept appeals to a wider audience than the Muslim population.

Bancassurance uses a bank's customer relationships to market life and non life insurance. It accounts for well over 50% of life insurance sales in a number of industrial countries and is becoming the major channel for life insurance in emerging markets, including Brazil, China, India, Morocco, Malaysia and Thailand. Gonulal et al (2012) highlight the opportunities inherent in developing this channel, while laying out the business model, consumer protection and privacy challenges that it presents.

The World Health Organization (WHO, 2013) reports that road traffic injuries are a huge public health and development problem. 1.2 million individuals a year are killed, and between 20 million and 50 million more are injured or disabled. Road traffic injuries are the leading cause of death for young people aged between 15 and 29. Over 90 percent of the world's fatalities on the roads occur in low-income and middle-income countries, which have only 48 percent of the world's registered vehicles. WHO and World Bank data shows that, without appropriate action, these injury rates will rise dramatically, particularly in rapidly motorizing countries. Although data on the costs of traffic accidents are sparse, particularly for low- and middle-income countries, these injuries clearly have an enormous economic impact on individuals, families, communities, and nations, costing countries between 1 and 2 percent of their gross national product. Gonulal (2010) explains that Motor Third Party Liability Insurance (MTPL⁴⁸) accounts for more than 50% of non life premiums in many developing and emerging markets, and lays out the requirements for such a market to operate successfully and to support road safety measures.

Lester (2009) explains that '*At its heart, the need for consumer protection arises from an imbalance of power, information and resources between consumers and their financial service providers, most often placing consumers at*

⁴⁸ MTPL insurance is typically mandatory, and ensures that damage to third party health and property caused by an accident for which the driver and/or owner of the car is responsible, is compensated.

a disadvantage (although information asymmetries can run in the opposite direction as well)..... Imbalances are most likely in cases where:

- *Transactions are infrequent* (for example, when taking a mortgage on a personal residence),
- *Entry or exit costs are low* (such as for financial intermediaries), thus allowing disreputable firms to emerge, or
- *The cost or payoff to the consumer is postponed or very high*. For many long-term investment products such as life insurance and pension savings, performance cannot be evaluated until many years have elapsed.’

An effective consumer protection regime should provide:

- **Transparency** by providing full, plain, adequate and comparable information about the prices, terms and conditions (and inherent risks) of financial products and services;
- **Choice** by ensuring fair, non-coercive and reasonable practices in the selling of financial products and services and collection of payments;
- **Redress** by providing inexpensive and speedy mechanisms to address complaints and resolve disputes; and
- **Privacy** by ensuring control over access to personal financial information.

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