



## Earthquake Reinsurance in Latin America: A London Market Perspective

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### Abstract

Lloyd's and its syndicates underwrite an ever-increasing variety of risks and, in particular, they provide coverage for high severity and low frequency risks, such as those associated with natural catastrophes. London is a leading market for companies and governments that need (re)insurance protection for large, complex or bespoke risks. It benefits from its setup as a subscription market, where more than one carrier can take a share of the same risk, letting them diversify their risks efficiently and giving insureds access to a deep pool of capital with global reach enabled by the various London Market brokers.

Much of the future growth in the reinsurance market is expected to come from Latin America. The region currently accounts for 3.8% of global (re)insurance premiums. Local insurance companies are continually expanding and many infrastructure projects are underway that will require financial protection. This evolution is expected to trigger an increase in the region's participation on the international reinsurance stage.

This study analyses the Latin America earthquake risk market from a London standpoint. Leveraging access to MS Amlin's broad experience in the region as a leading syndicate at Lloyd's, the authors describe how the market currently manages and transfers earthquake risks from Latin America to the global financial networks, and how the reinsurance companies share these risks.

Local authorities such as the National Insurance Institute (INS) in Costa Rica are discussed in the context of the different countries in the region and their respective approaches to managing their catastrophe risks. The paper also revisits the experience of the Chile 2010 event in Maule and how it reverberated through the reinsurance markets.

Keywords: (re) insurance, Lloyd's, Latin America, earthquake

### 1. Introduction

The first part of the study consists of a brief summary of macroeconomic and social indicators in Latin America as well as those related to the insurance business such as premiums, penetration ratios, and efficiency and profitability.

The main sources used were the bodies of supervision of the insurance industry in each country and some associations of insurers. The macroeconomic data is collected from central banks and international organizations such as the International Monetary Fund (IMF), the World Bank and the Economic Commission for Latin America and the Caribbean (ECLAC).

In the second part of the paper, we describe in more depth the perspective of the London Market through the lens of MS Amlin, a London-based leading global insurer. We also look at the national earthquake insurance market in Costa Rica and at how it transfers its risk globally. Costa Rica is an interesting case study since it has evolved from a state-driven insurance system, the Instituto Nacional de Seguros (INS), to a liberal market after 84 years of performing as a monopoly.

Finally, we examine the special conditions of Latin America associated with risk transfer mechanisms, the most feasible options available today and the challenges that the region faces in the future.



## 2. Macroeconomic Context

### 2.1 International Macroeconomic Situation

Growth in the world economy in 2015 is currently estimated at 3.1%, slightly lower than in 2014 [1], reflecting a further cutback in emerging markets and a weaker recovery in advanced economies. This performance was mainly due to a continued decline in economic activity in emerging and developing economies, such as the slowdown and rebalancing of the Chinese economy. Global growth is projected to pick up, reaching 3.4% in 2016 and 3.6% in 2017 [1].

In developing countries, growth in 2015 represented a post-crisis low of 4.3%, down from 4.9% in 2014 [2]. Most of the largest emerging economies in each region have been slowing down simultaneously for three consecutive years. Activity in emerging and developing commodity exporters weakened in 2015, as they continued to be hard hit by decreasing commodity prices. As a result, the contribution to global growth from these economies has declined substantially. Latin America's GDP contracted 0.7% in 2015 as shown in Fig. 1. A recovery in activity in a number of distressed economies is expected to result in a pickup in growth in 2016 [2].

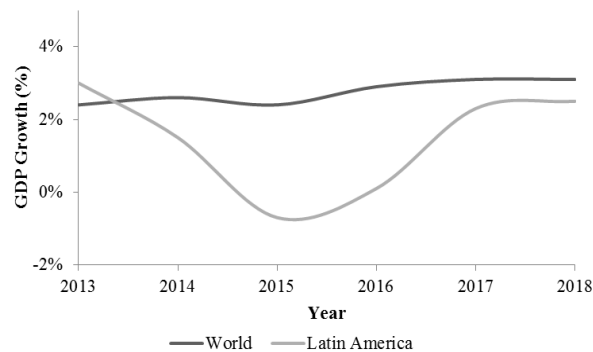


Figure 1. World and Latin America GDP growth.

According to the International Monetary Fund (IMF) the distribution of risks to global economic activity is still sloping to the downside [1]. Near-term risks include increased financial market volatility and disruptive asset price shifts, while lower potential output growth remains an important medium-term risk in both advanced and emerging market economies. Lower commodity prices also pose risks to the outlook in low-income developing economies after many years of strong growth [1].

### 2.2 Macroeconomic Situation in Latin America

Latin America is a huge region, comprising well in excess of 600 million people and more than 20 countries. It has a GDP of more than US\$600tn [3].

The contraction in economic growth experienced in Latin America in 2015 reflected strong declines in economic activity of large regional economies, such as Brazil and Venezuela (Fig. 2). This reduction in output slowed from a combination of global and domestic factors, particularly the continued fall in commodity prices. Lower crude oil prices, down around 45% from 2014 levels, have reduced export earnings and fiscal revenues of regional oil exporters, such as Belize, Colombia, Ecuador, Mexico, and Venezuela. Some large South American economies have also been facing severe domestic macroeconomic challenges that have eroded consumer and investor confidence, further contributing to the regional output decline in 2015.

The economy that grew fastest in the region was Panama at 5.9%, followed by the Dominican Republic, with 5.6%, and Bolivia with 4%. These three were the only economies that had GDP growth rates above 4% [4]. A gradual return to growth is anticipated over the medium term, as commodity prices stabilize and economic growth become constant in the United States and the Euro Area. Activity at the broader regional level is projected to be flat in 2016. Growth will then recover and strengthen to an average of 2.2% for 2017 [1].

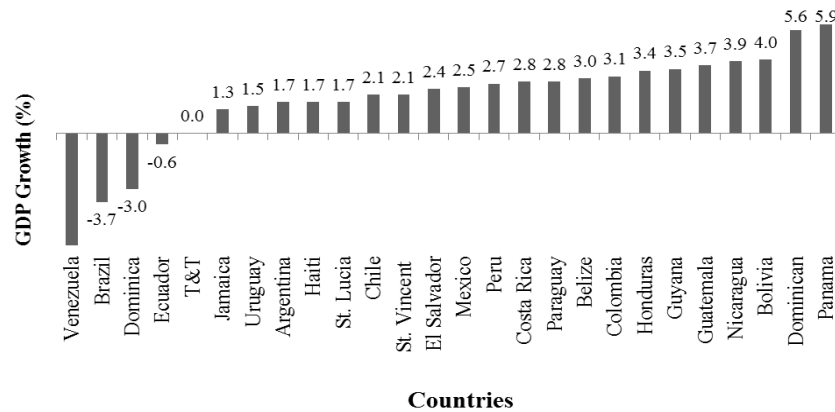


Figure 2. Latin American GDP growth by country.

### 3. The (Re)Insurance Industry Landscape

#### 3.1 Global Market

The global insurance industry is affected by global economic factors such as weak economic growth, low inflation rates, volatile financial markets and near-zero interest rates. However, it managed to still grow in 2015, after an impressive recovery in 2014. Premium growth has been progressively slowing down slightly in 2015, in both the advanced economies and in the emerging markets. Global life insurance premiums have risen by 3.3% in inflation-adjusted terms, significantly lower than the 4.7% of 2014. Whereas, non-life insurance premiums rose 2.5% after a 2.8% increase in 2014. Non-life insurance premium growth in emerging markets slowed down notably, reflecting weaker economic growth [4].

Premium growth in reinsurance has been modest in recent years. In 2015, global non-life reinsurance premiums increased by 1% year-on-year, global life reinsurance premiums expanded by 1.6% in 2015, after 1.5% in 2014 [4].

A prolonged period of relatively benign catastrophe pay-outs and the capital inflows into the alternative capital market [5] have led to overcapacity in the reinsurance market and were the main underlying cause of decreasing reinsurance rates in the past few years. Much of the risk taken on by alternative capital is North America hurricane risk and this capacity has had a fortunate run of low losses. The recent renewal rounds have seen a slight stabilization in reinsurance pricing. However, the fierce competition and the pressure on pricing are expected to continue into the future as well.

#### 3.2 The (Re)Insurance Market in Latin America

In the first half of 2015, the Latin American insurance market placed a premium volume of US\$100,681m, of which 58.3% are non-life branches, and the remaining 41.7% correspond to life products. The premium volume increased by 13.3 % over the same period in the previous year, which represents a significant acceleration of growth, when compared with a contraction of 6.6 % experienced in the first half of 2014. The increase in life premiums was higher (19.9%) than in non-life (8.9%) [4].

Except for Venezuela, where premiums fell by 49%, the other countries observed growth in total revenue over 20% in many cases. In the largest market, Brazil, premium volume rose 8.6% thanks to strong growth in life branches (18.4%), which offset the fall of the non-life products (-3.3%) [4] with the only exceptions of Brazil and Venezuela, premiums have grown in both fields life and non-life (see Fig.3).

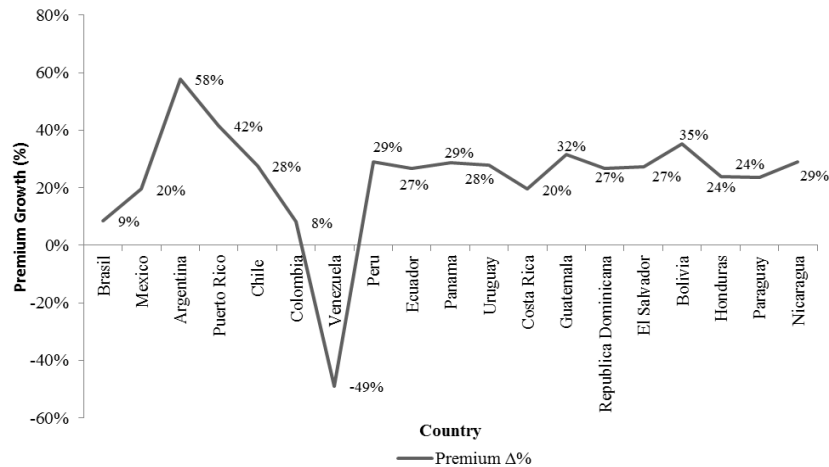


Figure 3. Growth in nominal premium by country in 2015.

Expectations of stronger economic growth in Latin America should translate into stronger non-life premium growth in 2016 and 2017, although recovery will likely be slow.

Venezuela continues to be the most challenging market for insureds, with rising rates across numerous lines of coverage. Rate increases were also seen across several lines of coverage in countries such as Argentina, Brazil, Peru, Puerto Rico and Uruguay.

Despite the macroeconomic challenges mentioned above such as the current Chinese crisis, the penetration of foreign capital into Latin America continues to increase steadily. Although it may drive demand for reinsurance, there also exist concerns over the implications of the introduction of new solvency requirements.

Overall, insureds continue to benefit from the willingness of local and international insurers to provide innovative solutions to the growing economies of Latin America and the capacity needed to keep insurance rates relatively stable despite the increase in demand for coverage in several lines.

## 4. A Deeper Look into Two Case Studies

### 4.1 MS Amlin in the London Market

Amlin Plc. is an independent, global specialty insurer and reinsurer with over a hundred years of experience in the insurance market. Amlin underwrites more than 30 classes of business through three underwriting platforms: Syndicate 2001 at Lloyd’s of London, Amlin AG in Bermuda and Amlin Europe in Switzerland and The Netherlands. Specialising in providing insurance cover to commercial enterprises and reinsurance protection to other insurance companies around the world, Amlin Plc. was acquired by Mitsui Sumitomo Insurance Group in February 2016 and became MS Amlin.

Lloyd’s embodies a group of syndicates based in London. A Lloyd’s syndicate is formed by one or more members joining together to provide capital and accept insurance risks. It is a broker market in which strong relationships, backed by deep expertise, play a crucial part. Brokers facilitate the risk transfer process between policyholders and underwriters. Much of this business involves face-to-face negotiations between brokers and underwriters. Lloyd’s provides coverage for high severity and low frequency risks, such as those associated with natural catastrophes.

#### 4.1.1 MS Amlin’s Portfolio of Latin America Risks

MS Amlin’s portfolio is exposed to all perils worldwide. 20% of the Total Insurable Value (TIV) within MS Amlin’s book of business corresponds to Latin America region and from this percentage Mexican and Chilean earthquake accounts for the 68%.

The Average Annual Loss (AAL) expected from MS Amlin’s portfolio split by peril is shown in Fig. 4a where earthquake is responsible for 25% of total losses, second only to windstorm-driven losses. Among the earthquake losses (See Fig. 4b), 11.8% arise from Latin America. Therefore, Latin American earthquake is considered a peril/region with moderate materiality under MS Amlin’s view of risk.

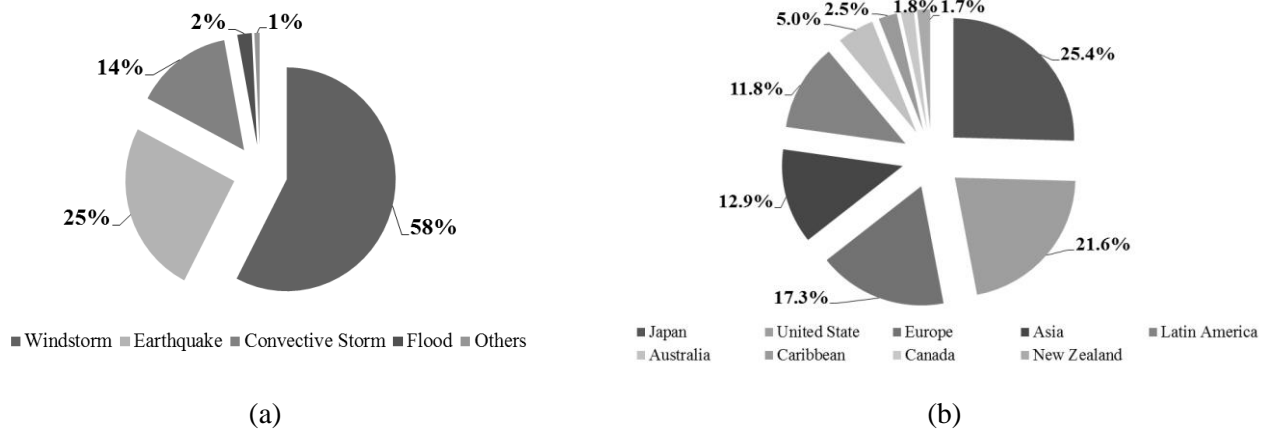


Figure 4. Amlin’s Expected Loss by Peril (a) and Earthquake peril by country (b).

The relatively significant participation of MS Amlin in Latin American earthquake business can be observed in the history of claims. The proportion of paid claims from 2006 to 2015 by MS Amlin compared to the proportion of paid claims by the Lloyd’s market for Latin America is shown in Fig. 5a. In 2010, after the Maule earthquake in Chile, 40% of MS Amlin’s total paid claims came from Latin America. The relative proportion of paid claims by country, by both MS Amlin and Lloyd’s is presented in Fig. 5b. Note the peaks for Chile and Mexico, representing paid claims mainly for the Maule 2010 and Gulf of California 2009/2013 earthquakes.

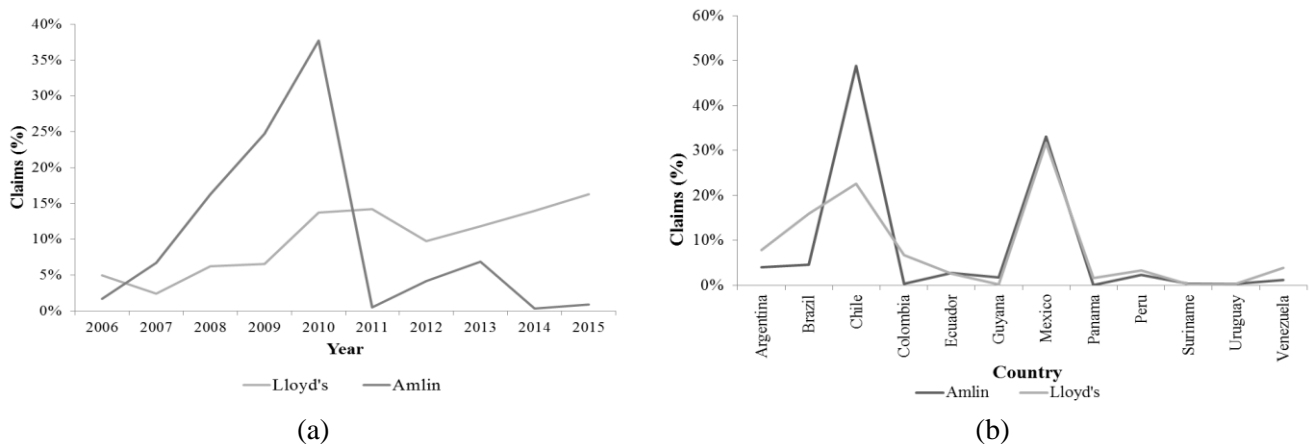


Figure 5. MS Amlin’s vs Lloyd’s proportion of paid claims by year (a) and by country (b).

#### 4.1.2 Market Shares of Latin American Business

The United Kingdom (UK) insurance sector is the largest in Europe [2] and a leading centre in a truly global industry. The sector forms a vital part of the wider financial services cluster in the UK and benefits from a broad

and highly developed skills base. The UK insurance sector has always been outward looking. It is one of the most competitive places in the world to undertake insurance and current firms are grasping opportunities in emerging economies, especially in high growth economies such as those in Asia and Latin America.

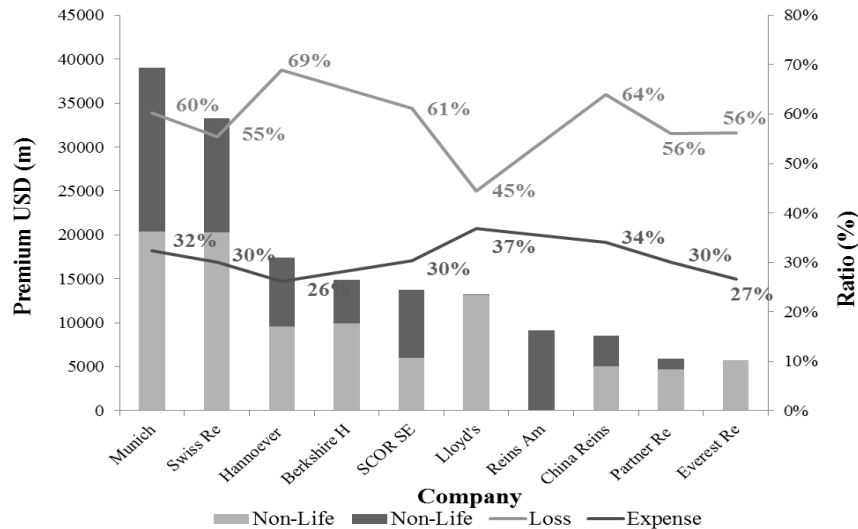


Figure 6. Top 10 global reinsurance groups by reinsurance premiums written in 2015 [5].

In 2015 MS Amlin insured 0.5% of the estimated accessible insurable market in Latin America. At the same time, MS Amlin's total gross written premium accounts for 10% of Lloyd's annual premium. Likewise, Lloyd's premium represents 9.2% of the UK's aggregate premium and finally, the UK is the third largest reinsurance agent in the world with a market share of 7% [13] (see Figs. 6 and 7).

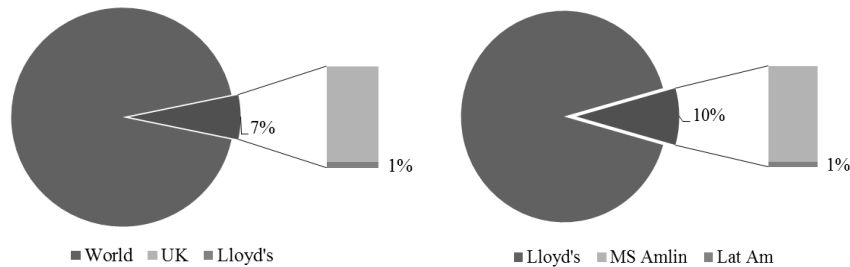


Figure 7. Insurance market chain for MS Amlin's Latin American written premium in 2015.

#### 4.1.3 Transfer of Risk from Latin America to the Rest of the World

The leading global brokers and insurers operate all over Latin America. MS Amlin writes business with many brokers and the risk transfer from Latin America to London is analysed here in detail leveraging 2015 data with the cooperation of one of MS Amlin's key brokers.

Fig. 8a shows MS Amlin's market share compared to an average peer's market share within the broker's book for Latin America and displays how MS Amlin writes less premium for each line of business.

The renewal rate per month comparison in Fig 8b reveals that MS Amlin has a renewal rate lower than an average peer in the peak renewal months of July and January as shown. Also, MS Amlin focuses on higher limits and attachment points compared to an average peer within the broker's book.

Risk is transferred from Latin America to the global markets through traditional reinsurance systems. In particular, this study shows that there is considerable business that flows through cedents and brokers in Brazil, Chile, Argentina, Colombia and Mexico. MS Amlin tends to write less than typical peers in all territories, except for business brokered through Mexico (see Fig. 9).

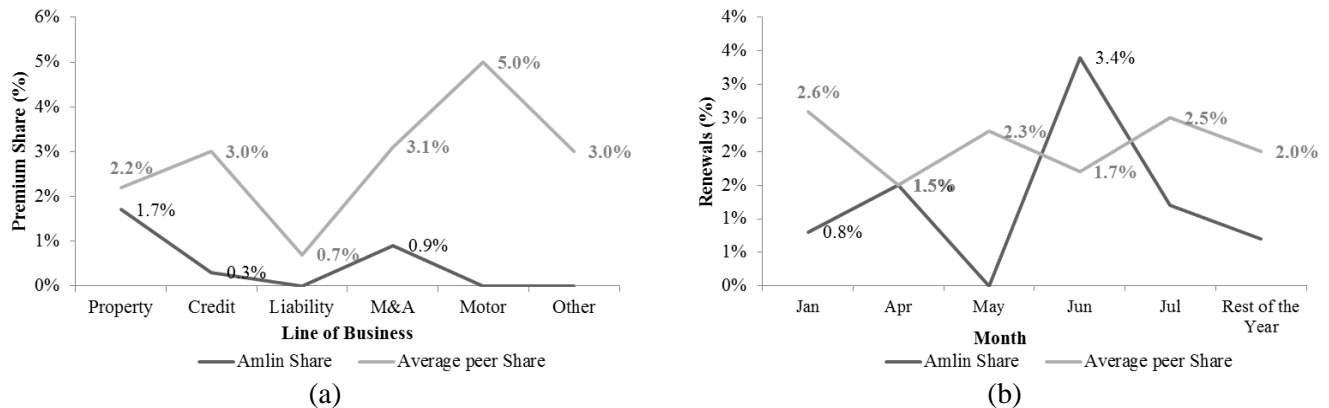


Figure 8. MS Amlin performance in comparison with an average peer within the market (a) by class and (b) by renewal rate per month.

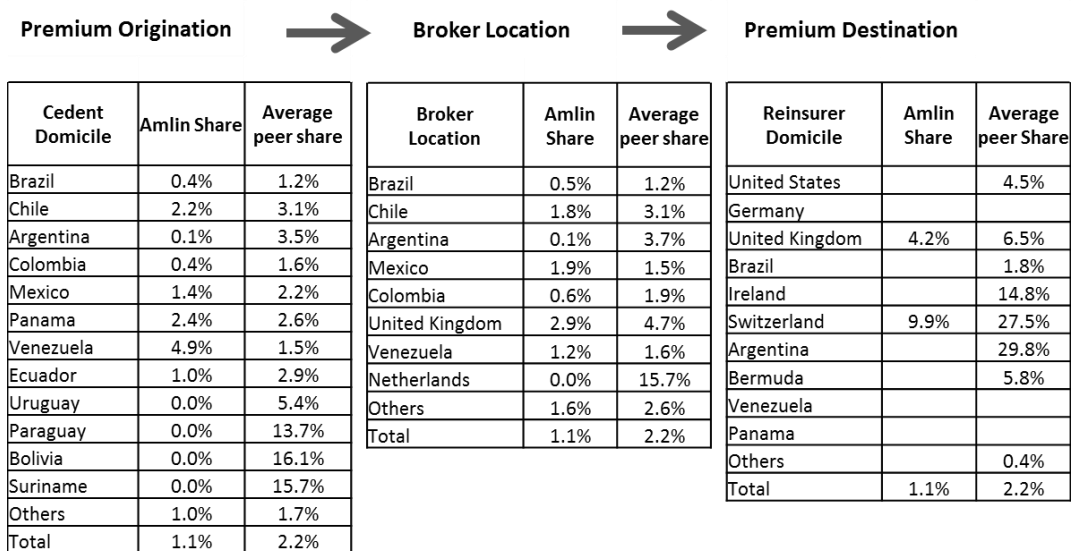


Figure 9. Reinsurance premium flow from Latin America through a global broker.

From MS Amlin’s perspective this represents an opportunity to develop a new strategy in Latin America by maybe reconsidering risk appetite in the region, the target cedent profile, the key renewal dates, and also by improving and engaging its existing connections with brokers in Latin America. Risk transfer is a complex process involving many intermediaries [7]. However, with this simple exercise between two main insurance actors, the market can be broken down into steps and allow the implementation of new strategies to achieve specific objectives.

#### 4.1.4 The Case of the Maule 2010 Earthquake

The Maule, 2010 earthquake in Chile produced economic losses in the order of US\$30bn to the Chilean economy [8]. This earthquake represented a major event for the global insurance industry, as Chile is a well-established market that incurred significant damage to the highly insured commercial and industrial sectors of the country, the majority of which is reinsured abroad. Total insured losses estimated by La Asociación de Aseguradores de Chile (AACH), the insurance association in Chile, reached \$8.5bn [8].

MS Amlin’s reinsurance book for Chile at the time of the Maule earthquake was composed by 13 local clients, who have combined TIV added to \$44.3bn. The losses reported by those companies after the 2010 earthquake summed \$794.5m. Layering is the usual method of allocating automatic reinsurance among several reinsurers, in which reinsurance is ceded in layers. Fig. 10 shows a sample of the property market (2011) one

year after the loss by cedant and earthquake loss relative to percentage of TIV. It can be notice how each client has a different allocation of layers depending on the limits established when ceded the risk.

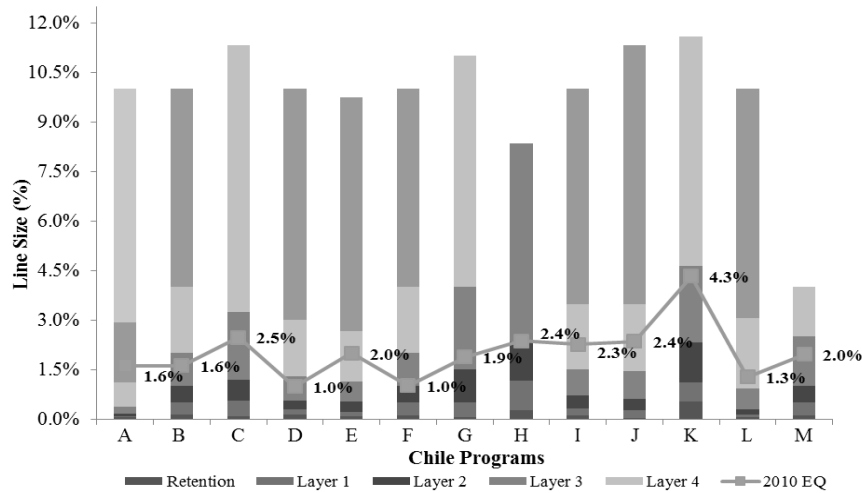


Figure 10. MS Amlin Chilean book in 2011.

## 4.2 The Market in Costa Rica

### 4.2.1 Overall Market Situation in Central America

Central America’s technical insurance profitability compares well against the rest of Latin America. Insurance growth prospects are aligned with the economic recovery and the development of investment projects in the United States of America. The growth of gross domestic product (GDP) of Panama has been the highest in Latin America and, although it is expected to decrease in the future, it will still remain the highest in Latin America.

Dependence on financial income is low due to the high share of short-term business in the business mix of Central American markets. The initial high investment needed for the creation of new insurance companies in Costa Rica has affected operating costs across the region. In general, governments have significant challenges investing in infrastructure, tax collection, structural reforms and crime in some markets. The contribution per country to the \$2,263m gross written premium in Central America in 2015 is shown in Fig. 11 [4].

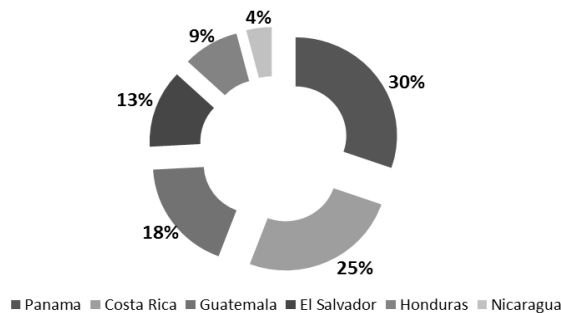


Figure 11. Contribution to gross insurance premium in Central America per country in 2015.

### 4.2.2 The Costa Rican Insurance Market

The Instituto Nacional de Seguros (INS) was created in 1924. It was protected by legislation that prevented any national or foreign competition. INS enjoyed a captive market and over the years became the largest insurer in Central America. In August 2008, after 84 years of operating as a de facto monopoly, the insurance market was liberalized and open to competition.



The current Costa Rican insurance market needs to be analysed under the implication of two recent relevant events: First, the launch of the Comprehensive Crop Insurance version 7 by INS, which not only expanded its agricultural products portfolio but also started to cover investments made prior to sowing (livestock cover, however, is still pending). Second, the approval of 6% reduction on rates for work-related risks. INS continues to dominate the insurance market with an 84.3% market share.

After seven years of open market, insurers have experienced sustained growth. All insurers reached higher premium levels for general lines. Fig. 12a shows each company’s market share in terms of gross premiums as of May 2015, and Fig. 12b shows the number of market players for 2014 and 2015 [4].

The risk culture promoted through regulation in Costa Rica by the General Superintendence of Insurance (SUGESE) has produced a reasonable average loss ratio (52%) of the insurance market [10]. SUGESE had to start from scratch, regulating an aggressive market with thirteen insurance companies and a varied market of intermediaries, while at the same time adhering to very clearly defined risk-based supervisory guidelines which sought to position the country among the first in Latin America in this field.

Calm is expected as regards entry of new participants in the future as well as normalization of costs, especially with SUGESE’s inclusion of capital adequacy ratios as a parameter to measure insurers’ financial and underwriting capacity.



Figure 12. Costa Rica insurance companies market share for 2015 (a); and insurance market players 2014/2015 (b).

The liberalization process has been very successful. Consumers have benefitted from a lower cost, a greater variety of products, and better services. This is an advanced operational model that follows the supervisory trends promoted by the International Association of Insurance Supervisors (IAIS) quite closely, and is based on the Spanish legal structure and the Chilean supervisory model [10].

Costa Rica has a great potential for a robust insurance market with only four years since real competition started, when a private insurer sold its first policy and new products started to be developed. Innovative insurance proposals, new sales channels, and the dynamic participation of intermediaries have contributed to present Costa Ricans with a new approach to protection against risks.

## 5. Risk Transfer in Latin America

### 5.1 Regional Context

The higher income level and economic and financial stability in Latin America provide important foundations for the development of a sound and beneficial insurance market. In order to strengthen the resilience of their economies and to broaden the investor base, emerging and developing markets seek to attract foreign direct investment (FDI). Over the last decade, the pattern of FDI into Latin America has changed considerably. While



until the 2000s, multinational companies located in developed economies provided the most important source of foreign investment into the region, more recently investments by multinationals from other emerging economies have been on the rise.

Latin America has experienced the world's strongest increase in outward FDI in the last few years. Encouraged by strong economic growth at home, Brazilian and Mexican firms have increased their investments abroad in particular in advanced economies in the region. Global insurers can play a vital role in helping firms located in emerging markets manage the risks associated with their foreign activities.

However, many Latin American countries rely excessively on post-event assistance as opposed to prevent preparedness and mitigation. Poor disaster preparedness and poor building standards are often the cause of high mortality and injury from building collapses caused by earthquakes or floods. Adaptation measures, such as urban planning, building codes, drainage and hillside stabilization projects, could significantly reduce expected losses. The lack of appropriate building standards has been identified as one of the main causes for the devastation caused by the Haiti earthquake [11]. By way of comparison, the Chilean earthquake caused a far lower number of casualties even though it was 500 times more powerful, not least due to advanced building codes [11]. Insurance can not only help cover economic losses and contribute to a faster recovery, it can also help to strengthen the resilience to natural disasters by sharing its experience in risk mitigation and risk management [7].

The international insurance and reinsurance markets provide more efficient and extensive protection against large-scale disasters by pooling risks at the global level. Following the earthquake in Chile in 2010, for example, insurers, mostly international, paid out claims equalling 4% of Chilean GDP [7].

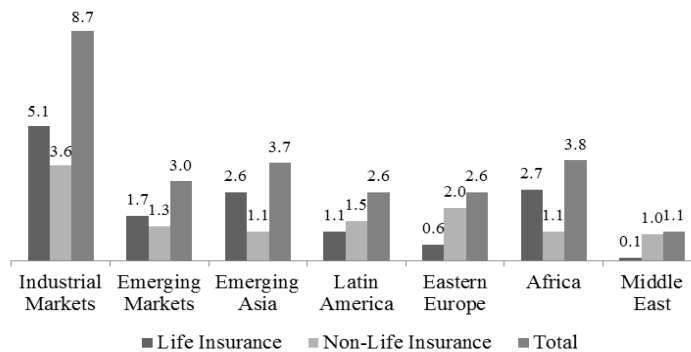


Figure 13. Insurance Penetration as a percentage of GDP around the world.

Despite the capability of insurance to mitigate some of the key challenges facing the sustainable development of emerging economies, its potential remains largely unexploited. This is particularly true for Latin American countries where insurance penetration, i.e., the ratio between insurance premiums written and GDP, remains low even compared with other emerging economies (see Fig. 13). Insurance penetration varies considerably among Latin American countries, ranging from 2% in Argentina and Mexico to 4% in Chile [7].

Insurance penetration in Latin America increased more strongly than in advanced economies but less than in emerging markets in general. A steady and strong increase could be observed in Brazil, the largest country. Strong fluctuations were observed in Chile and Venezuela. The other countries saw a more modest increase together with some fluctuations. Regarding the future development of the Latin American insurance markets, it can be expected that premium growth will continue, based on both economic growth and increasing penetration.

## 5.2 Risk Management through Insurance

Risk pooling is the basic principle of risk management in insurance. Simplified this principle can be described as: for an individual the materialization of a risk can have high, potentially unbearable financial consequences. If the risks of a large number of individuals are pooled, only a few individuals are affected. For them the resulting costs can be covered by the jointly paid premiums [13]. It is also important that the pooled risks are independent,



meaning that not all individuals are affected at the same time. Natural disaster insurance, for example, can only work efficiently at the international/global level.

The assessment of risks is another core function of insurance. By providing a price (i.e., a premium) for individual risks, insurers make protection efficient and over the long run financially feasible [11]. They also provide crucial information for risk takers and give an incentive to reduce risks. In addition, insurers draw on their risk expertise to help individuals and companies to find ways to avoid or reduce risks. This applies to constructing safer buildings, increasing safety in traffic or living a healthier life [7].

The investment of portfolios of insurance companies in the majority of countries around the world continues to be heavily allocated towards bonds. However, whilst in Europe the insurers' investment portfolio is composed with over 9 types of major investments (bonds, loans, funds, equities, derivatives, etc.) with just 50% allocated in bonds [15], in Latin America the bonds investments take 61% [14]. As shown in Fig. 14 in Latin America large economies like Argentina, Chile, Brazil and Mexico have over 50% of their premium ceded globally, but for most of the countries it is very little ceded globally limiting the diversification of risks and representing an opportunity for international insurers such as Lloyd's market [14].

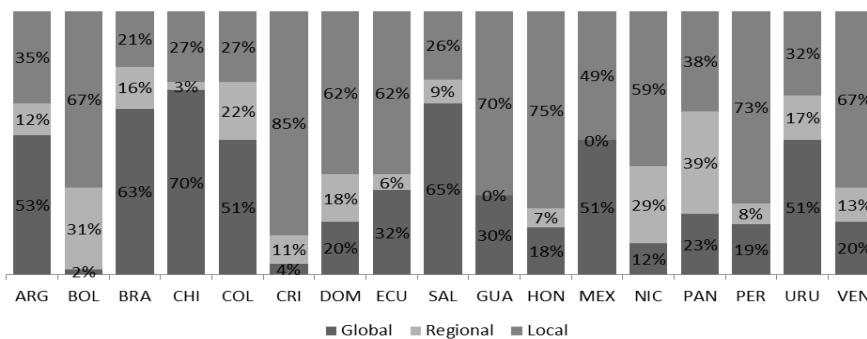


Figure 14. Latin America ceded premium market share by country.

### 5.3 Challenges

The under-development of insurance markets in Latin America can be attributed to a number of factors. Some of them are on the demand side and others are on the supply side. There are also important regulatory barriers to an efficient insurance market in emerging economies.

A fundamental barrier for insurance in Latin America is the lack of trust in insurers and their products coupled with a high uncertainty about future economic development. As Latin America is not only getting richer but also more stable, the demand and supply of insurance products increases and will likely increase further [16].

Regulation has a profound impact on the development of a mature and efficient insurance market. A key role of regulation is to help build trust which is a necessary precondition for a functioning insurance marketplace. It is essential that such regulations to protect policyholders are designed in a way that does not hinder the pooling of risks, the core economic function of insurers. Uncoordinated regulation with no mutual recognition, for example, not only increases administrative costs for insurance, it also harms competition and international risk pooling. Even though the intention of these measures might be to protect the domestic economy, they actually hinder an efficient functioning of the insurance market and, therefore, its beneficial effects for the economy and society at large [9].

## 6. Conclusions

The beneficial role of insurance for emerging economies is widely underestimated. Insurance has the potential to contribute and to make more sustainable the impressive progress in economic development that Latin America has made over the last decade.



MS Amlin has large opportunities for growth in all territories of Latin America, which demonstrates the existence of opportunities for improvement and development that a medium size global insurer has in the region, without further investment required, since the engagement with key stakeholders already exists for most of them [14]. This is an assurance of the potential growth of global markets, particularly Lloyd's, could experience from emerging markets like Latin America.

Costa Rican insurance market has already borne its first fruits by building an industry on strong foundations, and now focuses its efforts on attaining a deeper penetration and a stronger growth as well as extending insurance protection to all levels of the population.

Insurance can strengthen the resilience of both emerging economies and individuals against the negative impact of natural catastrophes, including disruptions to supply chains. Therefore, it is important a global insurance transfer and the ability for countries to be able to access this worldwide capacity. Reinsurers need to have a diverse portfolio to pay extreme losses in one territory offset by other territories. This is why there is normally a market cycle as isolated pots of capacity do not really exist in respect of single territory and capacity withdrawal/hardened rates will affect the total re(insurance) market. Without this, reinsurers would not be able to sustain such events and help with cash flow to help with rebuilding/economies of said countries will not improve.

Given the importance of these issues for Latin America, it is surprising that insurance is not more widely used and leveraged. Political risk is perceived to be the single most important impediment to inward investment for emerging economies as it is Latin America.

## 7. Acknowledgements

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