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J. François Outreville

THE RELATIONSHIP BETWEEN INSURANCE GROWTH AND ECONOMIC DEVELOPMENT: 80 EMPIRICAL PAPERS FOR A REVIEW OF THE LITERATURE

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The relationship between insurance growth and economic development: 80 empirical papers for a review of the literature

J. François Outreville
HEC Montréal
ICER Fellow, Turin
J-francois.outreville@hec.ca

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Abstract

The objective is to examine the determinants of the relationship between insurance growth and economic development. This paper contributes to this body of research by providing an extensive literature review of empirical studies that have looked at both sides of the relationship, i.e. the demand side (economic growth is an explanatory variable among other factors that affect the demand) and the development side (insurance is a determinant of growth).

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The relationship between insurance growth and economic development

1. Introduction

Even though insurance is of primordial importance in domestic economies and internationally, the role of insurance in the development process remain difficult to assess although it has been recognized since the early sixties by some authors.[1] Indeed, so important is insurance in the trade and development matrix that, at its first session in 1964, the United Nations Conference on Trade and Development (UNCTAD) formally acknowledged that "a sound national insurance and reinsurance market is an essential characteristic of economic growth".[2]

While insurance, like other financial services, has grown in quantitative importance as part of the general development of financial institutions, it also has become qualitatively more important due to the increase of risks and uncertainties in most societies. More recently, the economic importance of the insurance sector has been increasing as part of the liberalization of financial systems (including privatization) and globalization and conglomerization of financial markets and during the 1990s, the total assets of insurance companies grew faster than the assets of banks, mainly through M&As (Das, Davies and Podpiera 2003).

The importance of the relationship between financial development and economic growth has been well recognized and emphasized in the field of economic development. Two possible patterns may co-exist in the causal relationship between financial development and economic growth (Patrick 1966). In the first, called "demand-following," the lack of financial growth is a manifestation of the lack of demand for financial services. As the real side of the economy develops, the demand for various new financial services materializes (Jung 1986). In the second, the "supply-leading" approach, financial development causes economic growth and the expansion of the

[1] What Patrick (1966) emphasized about the usefulness and importance of financial development in developing economies is borne out empirically today.

[2] Proceedings of the United Nations Conference on Trade and Development (1964), Final Act and Report, p. 55, annex A.IV.23.

financial system precedes the demand for its services.[3] A third view supports the bi-directional relationship between financial development and economic growth (Demetriades and Hussein 1996; Greenwood and Smith 1997).[4]

More recently, some papers have focused on the relationship between financial development, insurance development and economic growth. The role on the insurance sector and its contribution to development is now at the agenda of international organizations such as UNCTAD, the World Bank and the IMF (UNCTAD 2005).

The case of emerging or developing countries is even more important as many governments have in the past, established financial institutions under what has been termed a "supply-leading approach" to financial development. Many governments have historically held the view that the financial systems could not adequately serve their countries' development needs, and have directed efforts to control or change the structure of these financial systems. However, the share of total insurance premiums generated in developing countries remains at a low figure even though these countries have more than 80 percent of the world's population and their share in the global economy increased from 18% to 28% in the past ten years.[5]

Given the large variation in the role of insurance across countries, the question of the causes of this variation, and therefore the determinants of insurance consumption, arises (USAID 2006). Not surprisingly, when looking at the link between insurance development and economic growth, research efforts have moved onto understanding the underlying factors that affect the demand for insurance. Despite the potential role that the insurance sector may play for financial and economic development, there have been few studies examining the possible interaction between insurance growth and economic growth. Moreover, the bulk of the existing empirical research focuses on the growth of the life sector only. The importance of the insurance-growth nexus (both life and non-life) is a growing concern for research due to the increasing share of the aggregate financial sector in almost every developing and developed country.

[3] See the pioneering study by King and Levine (1993) and subsequent work by Levine and Zervos (1998) and Levine et al. (2000).
[4] There is also the view that rejects the existence of a finance-growth relationship (Lucas, 1988).
[5] See the World Bank data at http://data.worldbank.org/

Within this research agenda, the objective is to investigate the literature on the link between insurance development and economic growth and hence to fill a gap in the current insurance-growth nexus literature. Previous surveys on the demand for insurance have examined the determinants and the impact of financial development and economic growth (Ferry 1977; Zeits 2003; Hussels et al. 2005) but more recent empirical research has focused on the causality links between insurance growth and economic growth.[6] This paper contributes to this body of research by providing an extensive literature review of empirical studies that have looked at both sides of the relationship, i.e. the demand side (economic growth is an explanatory variable among other factors that affect the demand) and the development side (insurance is a determinant of growth).

The paper is structured as follows. Section 2 provides an assessment on how the relationship between insurance and economic growth is measured and the significance of the insurance markets. Section 3 provides an assessment of the theoretical approach to the demand for insurance which is the starting point for examining the list of empirical papers looking at the determinants of the insurance sector's development. These are reviewed in the following section. While there is a plethora of research on the causal relationship between bank lending and economic growth and capital markets and economic growth, the insurance sector has not received ample attention in this respect. Section 5 presents the state of the empirical research looking at the relationship between economic growth and insurance development. Section 6 extends the presentation by looking at papers dealing with the role of foreign direct investment. Finally, section 7 summarizes the main findings and identifies the major research implications for further research on the insurance-growth nexus.

2. Measuring the Economic Significance of Insurance Markets

In 2009, insurance companies worldwide wrote US$ 4,066 billion in direct premiums, in other words, the equivalent of about 7.0% of global GDP was used to purchase insurance products. During the same year, insurance companies in developing countries generated premiums worth US$ 533 billion representing 13.1 per cent of global

[6] Haiss and Sumegi (2008) also provide a literature review on the insurance-growth nexus.

insurance premiums.[7] The last two decades have seen accelerated growth of all insurance markets (world premiums in US dollars increased by 175% between 2000 and 2008) and although the financial crisis and economic recession in 2009 have had a negative impact on insurance premium growth, the share of emerging and developing economies continued to increase (9.3 % of total business in 2000 and 12.0% in 2008).

Two measures are used traditionally to show the relative importance of insurance within national economies. Insurance density indicates the average annual per capita premium within a country expressed in US dollars. It indicates how much each inhabitant of the country spends on average on insurance but currency fluctuations affect comparisons. Premiums per capita can be converted using Purchasing Power Parity (PPP) values rather than US dollars exchange rates. The PPP correction can be significant. Insurance penetration is the ratio of direct premiums written to gross domestic product (GDP). It shows the relative importance of the insurance sector within national economies and is not affected by currency fluctuations. However, it ignores difference in product design, price levels and other market characteristics.[8]

With few exceptions, the ratio of total premiums to Gross Domestic Product is much larger than 5 per cent for the industrialized countries and smaller than 3 per cent for the developing countries (Table 1). This ratio show an impressive increased in almost all countries from 1970 to 2009. In the early 1990s only a few countries had a ratio greater than 8. This may be seen as an indication of the growing importance of the insurance sector in national economies. The growth has been spectacular particularly in Asian countries, i.e. Japan, the Republic of Korea and Taiwan. On the other hand, in some developing countries of South America and Africa this ratio has remained low and reflects the economic situation experienced in these countries.

Insert here table 1

[7] Sigma, World Insurance in 2009, No2/2010, Swiss Re publication

[8] An alternative is suggested by Zheng et al. (2008 and 2009) and defined as the "Benchmark Ratio of Insurance Penetration." It is claimed to be an adjusted measure that evaluates the relative relationship between a country's insurance penetration and the world's average penetration at the same economic level.

Following previous empirical research, the relationship between insurance premium volume and GDP is hypothesized to be a non-linear relationship. This also holds for per capita data (see figures 1a and 1.b). The relationship is estimated by ordinary least squares for 80 countries and for average values of premiums and GDP over the period 2007-2009 to smooth the effects of the financial crisis over this period of time (table 2).[9] The results are very similar to previous results found by Beenstock, Dickinson, and Khajuria (1988) for a sample of 45 developed and developing countries in 1981, by Outreville (1990) for 55 developing countries in 1983-1984, or Beck and Webb (2003) for 68 countries over the period 1961-2000. Li et al. (2007) claimed also similar results for a sample of 30 OECD countries from 1993 to 2000.

Insert here figures 1.a, 1.b and table 2

Carter and Dickinson (1992) and Enz (2000) developed a logistic model to describe the relationship between insurance penetration and GDP per capita. Under these growth models, the regression curves for insurance depict an S-shaped relationship and have been referred to the S-curve model. The insurance penetration rises with the GDP per capita, but different levels of GDP are assumed to be accompanied by different growth rates of penetration. After the GDP reaches a certain level, the insurance penetration tends to a plateau. This hypothesis cannot easily be visualized on a cross-section of countries and it even breaks down for countries with GDP per capita greater than $30,000 (Figure 2).[10] Enz (2000) emphasized that the estimation requires a very long time series,[11] and that the model neglects all factors influencing the demand for insurance other than GDP per capita. Other authors argue that the other factors linked to the culture of the nations are becoming more important at higher levels of education and GDP (Chui and Kwok 2008 and 2009; Park and Lemaire 2011).

Insert here figure 2

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[9] Data is published each year by Swiss-Re in Sigma publications.
[10] This has also been recently recognized by Park and Lemaire (2011).
[11] The S-curve can also be used for long-term forecasting as in Zheng et al. (2008) for China.

Penetration and density measure different perspectives of the relative importance of the insurance sector. High GDP countries will certainly spend more on insurance in absolute terms, i.e. the positive relation between density and GDP, but in relative terms, for two countries with similar GDP per capita, insurance may play a different role. The analysis is further complicated by differences that may exist in the relative importance of the life insurance sector on the one hand, and the property-liability insurance sector on the other hand, which is by itself an agglomeration of personal and commercial lines of business. Furthermore, both life and non-life insurance business is affected by the legal and fiscal context of each country.[12]

The influence of the insurance industry on the macroeconomic activity can be analyzed from two viewpoints: (1) its role in providing indemnification, and (2) its role as an institutional investor. At the macroeconomic level, the insurance industry contributes to the formation of national income by creating value added. The latter is often ignored in national accounting systems. The service offered by the insurer is that of an intermediary and knowledge of the cost of insurance helps to measure the effort made by the community to provide itself with an insurance system. On the basis of premiums collected less liabilities incurred (and ultimately monetary compensation), this value added is apportioned for the payments of salaries and commissions, dividends and indirect taxes. This approach is not used in empirical studies looking at the relationships between insurance and growth.

To measure the contribution of insurers to the financing of the national economy, it will suffice to compare the increase in technical reserves and provisions (or assets) of the insurance sector with the economy's financial requirements. However, such data generally do not exist and there has been a lack of quantitative evidence on this subject both in developed and developing countries. An example of this measure for France[13] shows the growing importance of the insurance sector as a financial intermediary.

[12] Because the motivation for buying insurance may differ from one case to another, Karl Borch (1981) found it convenient to divide the field of insurance into three classes of insurance: (1) life insurance and annuities; (2) business insurance covering all kinds of risks; (3) household or personal insurance. Another class should certainly be added to K. Borch classification, i.e., group insurance or employee benefits which is bought by firms for their employees.

[13] In Outreville (1987) an analysis of the total annual increase in technical reserves of the insurance sector divided by the annual increase in the gross fixed capital formation shows that the average ratio for the period 1976 to 1982 was equal to 20.5 compared to 13.8 for the period 1969 to 1975.

An alternative approach to measure the economic significance of insurance market is to link the size of the sector to the level of financial development. Financial development is generally identified with the growth of the real size of the financial sector in absolute terms, and in relation to GDP or national wealth, i.e. financial deepening. Broad money M2 is often taken as an adequate measure of the size of the financial sector in developing countries in view of the predominance of the banking sector, as well as because of the lack of data on other financial assets. This variable also may be an appropriate measure of monetization in inflation prone countries. As expected when the ratio M2/GDP increases, the demand for insurance increases significantly.[14]

Measurement of financial development seems controversial because countries differ in their institutional environment and have different financial structures according to their development stage. The size of bank credit relative to GDP is another measure of the level of financial intermediation. The ratio of M2 to GDP captures the degree of monetization in the system, but does not capture the degree of bank intermediation. The ratio of private credit to GDP does not control for the quality and efficiency of credit allocation. Another alternative is to link the size of the insurance sector to the level of development of the banking sector by considering the amount of deposits (Beck and Webb 2003).

3. The demand for insurance

Nearly all theoretical and empirical work on the demand for life insurance takes Yaari as a starting point.[15] He pointed out that the demand for life insurance is properly considered within the context of the consumer's lifetime allocation process. Within this framework, the demand for life insurance is attributed to a person's desire to bequeath funds to dependents and provide income for retirement. The consumer maximizes lifetime utility subject to a vector of interest rates and a vector of prices including

[14] This measure has been proposed by Outreville (1990, 1996) and used in several papers including recently Li et al (2007) and Yee et al. (2009).

[15] Yaari (1964 and 1965) and Hakansson (1969) were the first to develop a theoretical framework to explain the demand for life insurance. Other papers often quoted are Fisher (1973), Campbell (1980), Lewis (1989) and Bernheim (1991).

insurance premium rates.[16] This framework posits the demand for life insurance to be a function of wealth, expected income over an individual's lifetime, the level of interest rates, the cost of life insurance policies (administrative costs), and the assumed subjective discount rate for current over future consumption. It is also assumed here that each utility-maximizing household has the same degree of relative risk aversion.[17]

This focus is clearly on life insurance but it could be generalized to the consumption of all insurance products as part of a basket of securities available to the consumer.[18] By considering this approach, the analysis ignores the corporate demand for insurance. The insurance literature has paid insufficient attention to the fundamental differences between individual and corporate purchasers. Although risk aversion is at the heart of the demand for insurance by individuals, it provides an unsatisfactory framework from the corporate finance point of view. The Modigliani-Miller (1958) assumption was that if the firm's decision is important it is so because of (1) taxes, (2) contracting costs, or (3) the impact of financing policy on the firm's investment decisions. [19] The empirical literature on the corporate demand for insurance relies heavily on Mayers and Smith (1982, 1987) and Main (1982, 1983) to investigate the determinants of the corporate demand.

In the standard consumer approach, it is assumed that there is an income stream Y_t, Y_{t+1}, . . , Y_{t+T} where t represents the times at which the consumer's decisions are to be made and $t+T$ represents his maximum possible attained age. This income steam is split between a consumption plan (C) and a bequest plan (W)[20] according to utility functions maximizing the total utility of the consumer: $U = a(.)\ g(C_t) + b(.)\ h(W_t)$, with a(.) and b(.) being the consumers' subjective discount for consumption and wealth.

[16] Lewis (1989) extends this framework by explicitly incorporating the preferences of the dependents and beneficiaries into the model.

[17] Karni and Zilcha (1986) develop a model that incorporate risk aversion. However, empirical evidence indicates that inter-country differences are likely to reflect differences in the degree of relative risk aversion and therefore affect the demand for life insurance (Szpiro and Outreville, 1988). As well, a country's health status may alter the structure of utility functions (Viscusi and Evans, 1990).

[18] The focus is also clearly on demand and neglects the supply side effects as mentioned by Husssels et al. (2005).

[19] On a review of the convergence between risk management and finance see Hunter and Smith (2002).

[20] See Bernheim et.al (1985), Bernheim (1991) or Hurd(1987) for a definition.

The total wealth of the consumer is defined as the sum of his net assets in dollars (A_t) at the end of period t and the dollar amount of insurance (Q_t) during the period. Hurd and Smith (2001) report that current wealth holdings of older households significantly exceed their average desired bequest**.** Also, according to the life-cycle model, households will tend to want to "smooth" consumption so that they will save when income is high and dissave when income is low (Browning and Lusardi 1996).

When insurance is available, the constraint becomes for each year between t and $t + T$ $A_{t+n} + Q_{t+n} > 0$ with n = 0, l...., T.[21]

Under this formulation, standard instantaneous utility functions (concave in consumption) will generate relatively flat consumption demand over the life cycle.[22] A demand function for insurance derived from the maximization of the utility function of the consumer should depend on wealth (A), the income stream (Y), the price of insurance (Pi), a vector of interest rates (R), a vector of consumer price indices (P), and the consumers' subjective discount for consumption a(.) and wealth b(.).

[1] $Q_t = Q_t [Y_t, A_t, Pi_t, R_t, P_t, a(.), b(.)]$.

The model is dynamic because it represents maximization over a future time period.[23] The whole complex of future prices, interest rates and income must be based on the personal anticipation of the individual household. Therefore anticipated inflation (PA) is a major determinant of demand in the equation and real interest rates (RR) should be preferred to nominal rates. The theoretical relationship between rational insurance demand and wealth *(A)* is stated in terms of the unobservable present certainty-equivalent value of all future disposable personal income sometimes referred to as human capital. As suggested by some authors (Darby 1974), a second best solution

[21] To avoid the theoretically possible action by the consumer borrowing unlimited amounts, the present lifetime expenditures should not exceed the discounted value of his expected lifetime earnings.

[22] It is only under the assumption that a change in the population growth rate does not affect the intergenerational distribution of income that the life-cycle hypothesis will work. In the context of the least-developed countries, the life-cycle hypothesis may be less well equipped to explain aggregate behaviors. First, capital markets are frequently poorly organized and the timing of consumption may be, by necessity, more closely tied to the income stream than is allowed in the stylized maximization problem of the individual. Second, the growth rate of the population and at the same time the existence of a highly skewed distribution of personal income may disturb the hypothesis of the model.

[23] The model developed in Outreville (1980 and 1985) follows the work by Fischer (1973), Cummins (1973), Pesando (1974) and Depamphilis (1977).

appears to be the use of permanent (YN) and transitory (YT) income in the equation. Therefore the equation shall be expressed in the following form:

$$[2] \quad Q_t/_{P*N} = f\,[YN_t/_{P*N},\ YT_t/_{P*N},\ Pi_t,\ RR_t,\ PA_t,\ a(.),\ b(.)]$$

The proxy variable for permanent or expected normal income[24] is defined as a distributed lag on past observations of the disposable personal income. Transitory income (YT) is calculated as the difference between current income at period t and expected normal income at period t. These variables are also calculated as real term per capita, i.e., divided by the price deflator *(P)* and the working age population (N). The equation is therefore defined as the relationship between insurance density and GDP per capita.

Consumer's subjective apprehension and risk behavior is related to many factors that could be regrouped under demographic (family size, location) and social and cultural variables (education, religion). The political and legal context may provide an incentive or a deterrent for the decision process and is affecting by such the consumer's choice. It could also be hypothesized that the demand for insurance is a function of the competitive structure of the domestic market, supply forces and of the country's level of financial development (FD).[25] Assuming that the market is in equilibrium and that demand equal supply, a reduced-form equation to explain the relationship between insurance density and GDP would also include variables measuring the structure of the market forces.

Acknowledging the theoretical framework, it is important to look at the historical development of empirical research applied to the demand for insurance. By identifying factors that impact the demand for insurance services, it becomes possible to highlight those factors that actually are ultimately linked to economic growth. A paper by Hammond, Houston and Melander (1967) is usually recognized as the first original study on the demand for life insurance although the authors mentioned a particularly important paper published ten years earlier by Kreinin, Lansing and Morgan (1957).

[24] The normal income hypothesis refers originally to Taubman (1965) and differs from the permanent income hypothesis in terms of limited time path horizon.

[25] Most empirical papers on the demand for insurance neglect the supply side of the market with the exception of Diacon (1980), Beenstock et al. (1986 and 1988) and Outreville (1996 and 2000).

These earlier papers were investigating surveys of life insurance purchases and were mainly concerned with the microeconomic factors motivating the demand for life insurance such as the demographics of households.[26,27] In fact, the empirical research on the determinants of the insurance sector has essentially focused on the life sector in the United States and explored the role of education, income, religion, and cultural factors, as well as prices.[28]

Within the insurance-growth nexus, a total of 80 empirical papers have been found (appendix 1). Most of these papers are investigating the demand for life insurance and only 15 papers are concerned with Property-Liability (non-life) insurance. It is important to mention that empirical papers investigating the corporate demand for insurance (property-liability insurance by firms or reinsurance by insurers) are not included in the list for reasons mentioned earlier but are covered in appendix 2. Similarly papers investigating the demand for heath care and health insurance are not included in the list due to the particular nature of the demand for private health care in many countries.[29]

A distinction has to be made between national studies (45 studies including 26 concerned only with life insurance demand in the United States) and cross-country studies (35 papers dealing with OECD countries, emerging Asian countries or developing countries).

From 2000 onward there is a surge of interest for national studies of emerging Asian countries (8 papers). The first two papers to have a broader view are proposed by Beenstock, Dickinson and Khajuria (1986 and 1988) and examine a panel of OECD countries. These and other studies investigating a cross-section panel of countries have attempted to link numerous variables mentioned in the clusters presented in table 3 to

[26] The study by Bereckson (1972) is the first of its kind to study the behavioral aspects of the demand for life insurance using experimental economics with a panel of students.

[27] Mantis and Farmer (1968) is the first paper to look at macroeconomic factors, followed by several papers investigating the role of inflation on the demand for life insurance.

[28] See the survey by Zietz (2003).

[29] Most recent significant papers include Propper (1989 and 2000), Hopkins and Kidd (1996) and Gruber and Lettau (2004).

insurance demand (life or non-life). In the following review we will focus mainly on these cross-country studies.[30]

Based on the previous model of the demand equation, table 3 summarizes the main macroeconomic factors reported in all these empirical studies that should drive the development of the insurance sector. The variables are clustered into four major groups: (1) economic variables included in equation [1] and [2]; (2) demographic variables related to the structure and location of households; (3) social and cultural variables accounting for subjective discount functions by consumers; and (4) institutional and market structure variables. Many of these variables have some importance in cross-sectional studies only.

Insert here table 3

4. The determinant factors in cross-section studies

Income

Income level significantly affects the demand for insurance in all studies. The personal disposable income has generally been measured as a variant of current GDP, or GDP per capita, which can be weakly presumed to provide a proxy for permanent income. Only a few papers have in fact tested the model with the true variable, i.e. the permanent income (Fortune 1972; Outreville 1980 and 1985; Beck and Webb 2003). Some studies have tried to define more accurate alternatives of the disposable income.[31]

Not only the level and size income but also the income distribution within a country may have an impact on the aggregate insurance demand. The early study by Beenstock et al. (1986) finds a negative relationship between income inequality measured by the Theil inequality coefficient and life insurance penetration. Similar results are found in recent studies (Nakata and Sawada 2007; Feyen et al. 2011). But life insurance demand

[30] This approach complements the previous work of Zietz (2003) and Hussels et al. (2005).
[31] Cargill and Troxel (1979) refer to the normalized disposable personal income; Babbel (1985) uses two different measures for disposable personal income; Browne and Kim (1993) refer to the national income.

would also depend on the interactions between the level of income and the shape of the income distribution, which could make the effect of income inequality on insurance demand ambiguous. Beck and Webb (2003) find that higher inequality (measured by the Gini coefficient) does not have any significant effect on the demand for life insurance.

Wealth

Because the variable is by definition correlated with the income stream of households or replaced by the permanent income hypothesis, but also because information or data on wealth is not reliable for many countries, this variable has almost never been tested directly in a cross-section model of insurance demand.[32]

The price of insurance

Although virtually all theoretical work on insurance demand has identified price as an important factor but it was omitted in earlier studies with the exception of Mantis and Farmer (1968) and Fortune (1973) both recognizing the difficulty of assessing the price of life insurance. Measuring the impact of price on the demand for insurance is difficult due to the problem of actually determining the price. The price of insurance is generally significantly and inversely related to the demand for insurance. A high insurance cost tends to discourage the purchasing of insurance.

This commercial price of life insurance is not observable. Babbel (1985) is the only author to propose an index value for this price. Proxies are assuming a known mortality rate, interest rate, and expense rate. Outreville (1985) defines the proxy for the price of pure protection *as* the ratio of group life insurance premiums to total group life insurance in force (i.e., the price of $1000 of insurance coverage). Browne and Kim (1993) use the policy loading charge as the price measure. It is the ratio of the life insurance premiums to the amount of insurance in force, i.e. the cost per dollar of life insurance coverage. Other authors use the life expectancy at birth (Outreville 1996). A longer life expectancy is likely to have a positive effect on life insurance demand as it

[32] Browne et al. (2000) is one exception. Haiss and Sümegi (2008) tested the physical and human capital stocks.

results in a reduction in the price of insurance and leads to greater opportunity to use life insurance to generate wealth.

In property-Liability insurance, most studies of insurance demand have used the inverse of the loss ratio as a proxy for price (Esho et al. 2004). The economic premium ratio is also used to proxy for the price of insurance by line of business. It is defined as premiums written net of dividends to policyholder and underwriting expenses scaled by the estimated present value of losses (Cummins and Danzon 1997 or Cummins and Phillips 2005). It is the standard price measure in the insurance financial literature but hardly available in most countries (with the exception of the United States). The market share held by foreign insurers in a country during a year is also used as a proxy for the price of insurance (Browne et al. (2000), but it is an indirect measure of price and highly debatable. Although it is reasonable to assume that the price of insurance is higher in countries with trade barriers, other factors are also likely to affect the price of insurance.

Anticipated Inflation

The inverse effect of inflation on life insurance demand has been largely documented in past research. Pioneer papers have tried to clarify the relationship that exists and demonstrate the negative influence on demand (Houston 1960; Hoflander and Duvall 1967; Neumann 1969; Fortune 1972; Babbel 1981).[33] In accordance to equations [1] and [2], anticipated inflation should be considered rather than the current inflation rate or the consumer price index. The survey of all the studies incorporating such a variable demonstrates a negative and significant relationship between anticipated inflation and the demand for life insurance. No such relation has been validated for property and liability insurance.

To proxy the anticipated inflation rate, most studies use an average inflation rate based on past realized price changes consistent with earlier papers by Browne and Kim (1993) (the average of the last eight years represent the expected inflation rate) or Outreville (1996) and Li et al (2007) (a weighted average over the last five years). Most other papers have considered current annual inflation as a proxy for inflationary expectations.

[33] Cargill and Troxel (1979) discuss the various impacts that inflation can have on the market for life insurance.

Real interest rates

Real interest rates have never been included in models explaining the demand for property and liability insurance[34] and only a few studies have included this variable in the models of the demand for life insurance. The main reason is that returns from life insurance savings are not directly measurable, and yields are not available industry-wise. Interest rate effects on life insurance demand are difficult to predict since higher rates are expected to stimulate the demand for alternative assets as well as life insurance sales through consumer expectations. Furthermore, several proxies using the current yield on industrial or government bonds are used in these studies and the findings on the relationship between interest rates and the demand for life insurance are inconclusive because these proxies do not pick up the differential between the returns on life insurance products and the returns on alternative saving opportunities.

Theory predicts a positive relation.[35] A higher real interest rate increases life insurer's investment returns and so profitability. Another theoretical consideration is that high real interest rates may decrease the cost of insurance, thus stimulating its demand.[36] On the other hand, consumers may take advantage of higher real rates to reduce their investments in life insurance without giving up future benefits. Higher real rates are therefore associated with a lower demand for life insurance.[37] Headen and Lee (1974) found that the impact of interest rates on life insurance demand is both a short and long-run phenomenon, with demand increasing with higher rates only in the short-run. In the long run, life insurance demand is inelastic with respect to a change in interest rates.

Cargill and Troxel (1979) examine two kinds of interest rates in their study: the return earned by life insurers and the competing yield on other savings products. The competing yield tends to be negatively related to life insurance savings. A higher interest rate on alternative savings products tends to cause insurance products to become less attractive as a savings instrument. On the other hand, Outreville (1996) has shown that interest rates such as the real interest rate and the lending rate are not determining

[34] Bennstock et al. (1988) discuss the importance of interest rates but do not test the variable.
[35] See Fortune (1973). His results indicate that real interest rates, the difference between the bond rate and the expected rate of inflation, have a positive impact on the amount of net life insurance in force.
[36] Beck and Webb (2003) find a positive relationship.
[37] This hypothesis is validated by Li et al. (2007).

factors affecting the demand for life insurance. In a study concerning Malaysia, Rubayah and Zaidi (2000)[38] investigate three types of interest rates: the personal savings rate on saving accounts, the market short-term interest rate and the lending rate on banks borrowing. The personal savings rate and short-term interest rate are found to influence significantly and negatively the demand for life insurance, while the current borrowing rate is found to have no significant effect on life insurance demand.

The role of the stock market

Another variable that will affect household portfolio decisions is the price level of stocks. Higher expected prices for stocks would tend to stimulate the investments into primary securities and tend to depress life insurance sales. These decisions relate to the composition of the portfolio of financial assets held by households and expectations concerning future economic conditions, and the flow of funds into alternative financial assets. However, as noted for real interest rates, the sign of this variable is ambiguous. Headen and Lee (1974) noted that a positive sign and elastic effect of stock prices could simply be that higher stock prices generally tend to be coincident with a growing economy, higher personal incomes, and higher net savings levels.[39]

Unemployment

Evidence on the effect of unemployment on demand is limited, and only a few studies have identified the relationship between the two variables directly (Mantis and Farmer 1968; Outreville 1980; Lenten and Rulli 2006).[40] Results suggest that unemployment has a negative influence on the demand for life insurance. However, if other studies have not considered this relationship, it is important to notice that studies dealing with life insurance lapse rates (the inverse of life insurance purchases) in the context of the emergency fund hypothesis have consistently found a positive relation between lapse rates and unemployment (Pesando 1974; Outreville 1990; Kuo et al. 2003; Kim 2005).

[38] The study by Rubayah and Zaidi (2000) is reported by Lim and Haberman (2003).
[39] Similar positive results are found in Lim and Haberman (2003), Arena (2008) and Avram et al. (2010).
[40] Beenstock et al. (1986) find a non significant relationship.

Demographic factors

The size of the population has of course a positive effect on the demand for insurance, but most studies are considering per capita variables to discount this effect. Population density should also have a positive effect on life insurance. Economies with a higher share of urban to total population are expected to have higher levels of life insurance consumption because urbanization simplifies the distribution of these products. This variable has generally been neglected in empirical research and results are not conclusive.[41] However, recent papers looking at life insurance demand in Asian countries find a positive relationship (Hwang and Gao 2003, Hwang and Greenford 2005). Hwang and Greenford (2005) use the ratio of the agricultural population to the total employed population as a measure of the change in social structure. The decline in the agricultural population is likely to increase the growth of the urban population, which may have an impact on the traditional Chinese family structure.

In property-liability insurance, the frequency of losses is greater in areas with higher rates of urbanization, and the relationship between urbanization and premium density is statistically insignificant (Browne et al. 2000). Esho et al. (2004) use this variable as a proxy for the loss probability and find it positive and significant.

Almost all past research dealing with panel or survey data in the United States has focused on life insurance purchasing behavior as a function of various demographic and socioeconomic variables.[42] The probability of holding life insurance falls with age. One would expect, other things being equal, that fewer purchases would be made as the age of the insured increases because life insurance premiums increase with age and because older age implies a lower need for insurance protection. This is consistent with the effect predicted by the bequest motive hypothesis. In a macroeconomic and cross-country context however, this variable should be replaced by an age-structure variable. The ageing of a population is of major concern for the whole economy and especially for the pension and insurance sectors, which are both directly affected by longevity; but

[41] Both Outreville (1996) and Beck and Webb (2003) test an urbanization variable and find it not significant. Sen (2008) find a negative relationship.

[42] Hammond et al. (1967), Duker (1969), Berekson (1972), Anderson and Nevin (1975), Ferber and Lee (1980), Burnett and Palmer (1984), Miller (1985), Fitzgerald (1987), Auerback and Kotlikoff (1989), Berheim (1991), Showers and Shotick (1994).

the population aging process effect on the demand for insurance is ambiguous (Browne et al 2000). For example, Truett and Truett (1990) and Chen et al. (2001) conclude that age distribution of the population positively affect the demand for life insurance.

The age dependency ratio (defined as the ratio of people under 15 and above 65 years of age over the working age population) is traditionally assumed to have a positive effect on life insurance demand, on the grounds that wage earners buy life insurance primarily to protect their dependents against mortality risk.[43] All cross-country studies find that a young dependency ratio is positively correlated with life insurance demand (Beenstock et al. 1986; Truett and Truett 1990; Browne and Kim 1993; Feyen et al. 2011). However, Beck and Webb (2003) argue that the effect is rather ambiguous, because dependency ratios can have different effects across different business lines. Outreville (1996) find a non-significant relationship for a cross-section of developing countries and two other recent papers by Li et al. (2007) and Sen (2008) a negative relation.

Life expectancy

The relationship between life expectancy and life insurance demand is ambiguous. Within the life cycle hypothesis, a high mortality rate (a low life expectancy) should result in higher life insurance demand. However, as explained before, a longer life expectancy is likely to have a positive effect on life insurance demand as it results in a reduction in the price of insurance. Most empirical cross-country studies show that life expectancy is positively related to life insurance demand but lack statistical significance (Beenstock et al. 1986; Browne and Kim 2003; Outreville 1996; Ward and Zurbruegg 2000; Lim and Haberman 2003; Li et al. 2007; Sen 2008; Feyen et al. 2011). Beck and Webb (2003) show an ambiguous correlation with the demand for life insurance products. One of the possible reasons for this is that people with longer life expectancy should have less perceived need for mortality coverage, but more need for savings through life insurance vehicles.[44]

[43] Hammond et al. (1967) explain that one of the main purposes of life insurance is to protect dependents against financial hardship in the event of the wage earners premature death.

[44] Lim and Haberman (2003) also find that the live-birth rate and fertility rate do not to have an important association with the demand for life insurance.

Risk aversion

Within an expected-utility framework, decision-makers are usually assumed to be non-satiated and risk-averse. In the theoretical literature the level of risk aversion is hypothesized to be positively correlated with insurance consumption in a nation (Schlesinger 1981 and Szpiro 1985). Unfortunately, measuring attitudes to risk is difficult if not impossible at a macro-level and in the past most empirical studies have used education to proxy risk aversion. In general a higher level of education may lead to a greater degree of risk aversion and greater awareness of the necessity of insurance (Browne and Kim 1993). Outreville and Szpiro,[45] however, provide evidence that aversion toward risk is negatively correlated with higher education. They argue that higher education leads to lower risk aversion that in turn leads to more risk-taking by skilled and well educated people.

An alternative risk aversion proxy is the uncertainty avoidance index proposed by Hofstede (1995) as a determinant of the demand for insurance. Based on survey data, this index is constructed using employee attitudes toward the extent to which company rules are strictly followed, the expected duration of employment with current employers and the level of workplace stress. [46]

Education level

The demand for insurance may differs according to country-specific variables including human capital endowment. The level of education can be proxied by the percentage of the labor force with higher education (usually tertiary education) relative to the population. Human capital endowment indices have been developed by international organizations such as UNESCO, UNDP and UNCTAD but have not been generally used in empirical papers.[47] Higher level of education may lead to a greater degree of risk aversion and more awareness of the need for protection and the need for insurance

[45] Unpublished working paper quoted in Browne et al. (2000).
[46] This is formally tested by Park, Borde, and Choi (2002) and Esho et al. (2004), who found no significant statistical relationship.
[47] Haiss and Sumegi (2008) tested a human capital index which takes into account education and other variables such as the UNCTAD's innovation capability index proposed in UNCTAD (2005b) but found it negative and non-significant.

in general. Therefore, education is hypothesized to be positively related to insurance consumption.

Most of the empirical papers have verified a strong positive and significant relationship (table 3). However some papers did not found any significant relation questioning the fact that the level of education may not interfere at the earlier stage of development but does later (Outreville 1990 and 1996; Browne and Kim 1993; Beck and Webb 2003; Esho et al. 2004; Park and Lemaire 2011).

Religion

The demand for insurance (and particularly life insurance) in a country may be affected by the unique culture of the country to the extent that it affects the population's risk aversion. An individual's religion can provide insight into the individual's behavior; understanding religion is an important component of understanding a nation's unique culture.[48] Countries with Islamic background have a reduced demand for life insurance consumption as verified in empirical papers dealing with this variable (table 3).

Hofstede's cultural variables

The peculiarities of a country's society may influence the performance of the whole insurance sector. As shown above, the demographical and religious setup of a country can dramatically alter the connection between insurance consumption and economic development. Although some recent papers mentioned in this article are focusing on Hofstede cultural variables in the life insurance sector it is surprising that this subject has remained unexplored for a long time considering the article published by Hofstede (1995) in the Geneva Papers on Risk and Insurance and which opened the door to such research.

Burnett and Palmer (1984) were probably the first to examine psychographic and demographic factors and find that work ethic and religion as well as education and

[48] See Browne and Kim (1993) for an introduction to the justification of this variable.

income, among other characteristics, are significant factors of life insurance ownership. Ward and Zurbruegg (2000) point to the importance of the cultural environment.[49]

Hofstede's cultural dimensions are related to "power distance" which refers to the degree of inequality among people; ''individual ism/collectivism'' which measures the degree to which people in a country prefer to act as individuals rather than members of a same group; "masculinity" to evaluate the impact of gender differences in a country; and ''uncertainty avoidance/tolerance for ambiguity'' which assess the degree of preference for known situations. One of the most important studies that would provide a profound impact on the recent cross-cultural research is Hofstede's work.[50]

Park (1993) attempts to understand the impacts of national culture on the insurance business but these ideas were formally tested by Park, Borde, and Choi (2002) who found no statistical relationship between insurance penetration and cultural variables with the exception of the masculine/feminine dimension. Esho et al. (2004) highlight that the demand for non-life insurance is unaffected by cultural factors.[51] More recent papers have examined these variables and found significant relationships by looking at a panel of data for a larger set of countries (Chui and Kwok 2008 and 2009; Park and Lemaire 2011).

Financial development

Financial development is generally identified with the growth of the real size of the financial sector in absolute terms, and in relation to GDP or national wealth, i.e. financial deepening. Financial development should have a positive effect on the insurance sector, and this effect could operate both from the demand and supply sides. Broad money M2 is often taken as a measure of the size of the financial sector. This variable also may be an appropriate measure of monetization in inflation prone

[49] They mention the work of Fukuyama (1995). The economic benefits derived from insurance are likely to be conditional on the cultural context of a given economy. Douglas and Wildavsky (1982) (mentioned in Hussels et al., 2005) show that the demand for insurance in a country may be affected by the unique culture of the country.

[50] Hofstede (1983a and b) published two important papers on cultural dimensions the same year.

[51] Other papers by Hwang and Greenford (2005) and Kwok and Tadesse (2006) could be mentioned.

countries. Several papers document a positive relationship between insurance consumption and the size of the financial sector.[52]

In view of the predominance of the banking sector in many countries (and mainly developing countries), several authors are considering the role of banks and the banking sector development. Well-functioning banks may increase the confidence consumers have in the financial system and increase the efficiency of financial transactions.[53] Following empirical papers in the banking sector, several variables are used to verify the significant effect of financial development: bank credit to the private sector (as a proportion to DGP) (Arena 2008; Avram et al. 2010; Chen, Lee and Lee 2011; Feyen et al. 2011),[54] total deposits in bank assets as a share of GDP (Beck and Webb 2003; Chui and Kwok 2008 and 2009), bond market capitalization to GDP (Feyen et al. 2011).

The level of financial development can also have a side effect as it positively influence the level of foreign participation. More developed financial markets are associated with higher transparency in regulatory and reporting requirements and better corporate governance practice, thus attracting more foreign participation.

Market structure

The structure of the insurance market could have significant effects on the growth of the market, but there have been few attempts to test these effects. For example, a monopolistic market based on state insurers could have a strong negative impact on market development.[55] The presence of foreign insurers would be expected to contribute to market development through product innovation and marketing techniques, but has

[52] Outreville (1990 and 1996) introduce the role of the financial sector in insurance development. The same approach is used in Ward and Zurbruegg (2002) and Li et al. (2007). The complexity of the financial structure could also be defined as the ratio of quasi-money (M2–M1) to the broad definition of money (M2).

[53] Beck and Webb (2003) suggest that banking sector development facilitates the development of life insurance and its contractual savings function.

[54] This variable is a better measure of the level of financial intermediation as shown in FitzGerald (2006).

[55] Only Outreville (1990 and 1996) tested the impact of a monopolistic market finding a negative and significant effect.

produced mixed results. [56] A low level of foreign participation may also reflect the high degree of competitiveness of the domestic market, as well as its possible saturation.[57]

An alternative approach is to calculate the degree of openness of the economy by looking at the ratio of exports (and imports) to GDP. Papers exploring this relationship all find a positive and significant relation (table 3).

Recent years have seen a rapid growth in global trade, foreign direct investment (FDI), and portfolio investment in the services sector. The insurance industry that, until recently, was largely national is becoming transnational. In response to foreign market opportunities made available by deregulation and globalization, many insurance firms have increased their FDI and acquired other insurers in foreign countries. Foreign participation in insurance markets can be explained from different perspectives including factors explaining FDI in services and relevant determinants of the global demand for insurance. Although several recent papers are investigating foreign participation in insurance services, these papers cannot be considered as part of the insurance-growth nexus. It is however important to mention that the socio-economic factors that influence the level of foreign participation are cited in the demand for insurance literature.[58]

Social security

Social security programs may affect the demand for insurance (life and health insurance) in several different ways. Social security schemes provide protection against health and mortality risks and therefore should affect life and health insurance demand negatively. Lewis (1989) has shown that social security programs proxy national wealth and are a substitute for life insurance, which suggests a negative relationship between life insurance consumption and national expenditures on social security.

[56] Outreville (1996) and Browne et al. (2000) find a non-significant relation. Li et al. (2007) are getting mixed results.

[57] Using a proxy measure for concentration, Feyen et al. (2011) find a negative impact of highly concentrated markets.

[58] Ma and Pope (2003) examine the importance of foreign market characteristics for international insurers. Outreville (2008) examines the location choices of insurers. Ye et al. (2009) investigate the factors explaining the foreign participation in life insurance markets.

However, the relationship between national expenditures on social security and life insurance consumption is also ambiguous a priori. Browne and Kim (1993) argue that social security also provides protection against disability and old age, and the provision of these benefits could produce a positive income effect on life insurance. As the social security benefits represent a household asset, they tend to increase the demand for life insurance activities. Therefore, it is not surprising to find very mixed results across different studies (table 3).

Wealthy countries, with richer tax bases, are therefore expected to have more generous programs. However the pattern of social security programs is very different across countries and when social security expenditure is measured by aggregate public social expenditure, this creates a bias in cross-section studies. Ideally, the effect of social security should be tested by disaggregating social security expenditures, but this information is not easily available in many countries.

Legal and regulatory environment

The quality of the legal and regulatory environment also has a significant effect on market development. A society's attitude to authority, government and the rule of law is important when examining the possible success of insurance services. In developing countries where authority is weak and rules are not enforceable, the implication is a negative impact on the level of development of the insurance sector.

Some of the most influential papers on this topic are from La Porta et al. (1997 and 1998) and Levine (1998 and 1999) which show that legal environments which provide good investor protection tend to encourage a higher degree of financial intermediation, as well as economic growth. It is also argued that the legal system (common law vs. civil law) influence the ability of financial institutions to mobilize and allocate efficiently resources. Legal systems that protect creditor rights should facilitate insurance demand as well as impact insurance company insolvency.[59] It is surprising that few studies have tested this type of factor, but this may have been due to the lack of good indicators when the studies were conducted (table 3).

[59] See Hussels et al. (2005) for a discussion on these issues.

Political risk and governance

There has been a surge of interest in the consequences of governance for development and how a country risk could have an impact on global investment strategies by transnational corporations.[60] A country risk may include several factors such as a pure political risk, access to finance and capital markets, credit rating or sovereign risk. Corruption is commonly defined as the abuse of public office for private gain. Governance is a much broader notion, which is defined as the traditions, and institutions that determine how authority is exercised in a particular country. This includes (i) the process by which governments are selected, held accountable, monitored and replaced; (ii) the capacity of governments to manage resources efficiently and formulate, implement and enforce sound policies and regulations; (iii) the respect of citizens and the state for the institutions that govern economic and social interactions among them (Kaufmann 2003).[61]

This is particularly relevant to the insurance industry but most recent studies accounting for these factors and using available worldwide indices have looked at the internationalization process of insurance business rather than the demand for insurance. An exception is a recent paper by Park and Lemaire (2011) who find a positive and significant impact on insurance penetration and density.

5. What is the role of insurance in economic development?

Considerable attention has been devoted to evaluating the relationship economic growth and financial market deepening. The pioneering work of Greenwood and Jovanovic (1990), King and Levine (1993) and subsequent work by Levine and Zervos (1998), Rousseau and Wachtel (1998), Levine et al. (2000) and others have provided evidence on the relationship between financial development and economic growth.[62] There are three basic characteristics of financial systems that impact on economic growth: i) the level of financial intermediation; ii) the efficiency of financial intermediation; and iii) the products of financial intermediation.

[60] Knack and Keefer (1995 and 1997) found that the institutional environment for economies activity generally determines the ability of emerging economies to catch up to industrial country standards.
[61] See also Outreville (2008).
[62] See FitzGerald (2006) for a survey and critical view.

Considering the size of insurance activities and the economic functions of insurance it should also play a major role in economic growth. Compared to the vast literature focusing on bank, stock and bond markets and their respective environment, it is surprising that no empirical work was published before Ward and Zurbruegg (2000).[63]

There are several ways in which insurance services contribute to economic development:[64] by (i) promoting financial stability for both households and firms; (ii) mobilizing and channeling savings; (iii) supporting trade, commerce, entrepreneurial activity and social programs; and (iv) encouraging the accumulation of new capital and fostering a more efficient allocation. In addition, there are likely to be different effects on economic growth from life and non-life insurance given that these two type of insurance protect the households and corporations from different kind of risks that affect the economic activity in different ways.[65]

To capture the potential effects of financial development on growth, several models incorporate the role of financial development in economic growth. This includes the original Solow-Swan neoclassical growth model, assuming a Cobb-Douglas type of production model, which states that production growth is due to labor, capital, and technology.[66]

The neoclassical production function in its general form Y=f (L, K, T) represents the relationship that output (Y) is produced from labor (L) and capital (K) under certain technology (T). This model also assumes diminishing returns to capital and labor such that $dY/dK > 0$, $dY/dL > 0$, $d^2Y/K < 0$, $d^2Y/K < 0$. In this revised model, the aggregate of the weighted financial activities of three financial institutions: banks, property/liability insurers, and life insurers is taken into account as a multiplicative exponent that impact the production function. The revised Solow-Swan model predicts

[63] Despite the apparent lack of literature on the role of insurance, the work by Outreville (1990, 1996) identifies links between an economy's financial development and insurance market development. The work of Soo (1996) is also mentioned in the literature. This dissertation provides evidence that the growth in the life insurance industry in the US has contributed to productivity and economic growth.

[64] See for example Das, Davies and Podpiera (2003), UNCTAD (2005a), USAID (2006), Haiss and Sumegi (2008). See also Brainard at www.zurich.com/main/insight/downloadlibrary/introduction.htm.

[65] Liedtke (2007) provides interesting insights into the role of insurance in a modern economy.

[66] Webb et al. (2002) or Eller et al. (2006) adopt an endogenous growth model with a modified Cobb-Douglas production function assuming constant returns to scale and perfect competition. Haiss and Sümegi (2008) depart from this model by not including banking and stock market variables directly in the analysis and using real interest rates as an indirect indicator instead. See also an earlier paper by Pagano (1993) which examines the role of financial development within a similar type of model.

that insurance activities and banking increase capital stock productivity, in turn driving the level of investment and output.

Improvements in technology have been considered as a major explanation for the productivity differences between economies. Unfortunately, measures of technology are not readily available for cross-country studies. For this reason, it is appropriate for an empirical study to incorporate a slope coefficient that represents any factor that affects all countries simultaneously and picks up improvements in productivity.

The relationship between the financial sector and the real sector could be classified in terms of causality with respect to five possible hypotheses: (1) no causal relation; (2) demand-following, that is, economic growth leads to a rise in demand for insurance; (3) supply-leading, that is, growth in insurance induces economic growth; (4) negative causal link from finance to growth; (5) interdependence.[67]

The survey shows that only 14 studies (out of the 80 surveyed) are looking at the causality link between insurance development and economic development (table 4).[68] Two policy research working paper at the World Bank (Catalan, Impavido and Musalem 2000 and Impavido, Musalem and Tressel 2003) are included in the list of papers although they are not directly concerned with insurance premiums and GDP growth. However these two papers are the first papers investigating the causality links between assets generated by contractual savings institutions (insurance) and market capitalization and growth. Most of the studies in this list are looking at a panel data of countries (9 studies), the remaining papers are time series studies on Singapore, United Kingdom, Sweden and Malaysia.

Insert here table 4

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[67] See Blum et al. (2002). A similar classification for insurance is proposed in Haiss and Sümegi (2008) and Ching et al. (2010).

[68] The reader interested in a similar survey regarding banking and securities is referred to Blum et al. (2002).

Most studies have found evidence that insurance market development is a supply-leading phenomenon. Ward and Zurbruegg (2000) were the first to show some evidence of the supply-leading pattern. Real premium income causes real GDP in only some countries while the reverse was true in others. The findings in following studies offer more support to the supply-leading hypothesis (table 4). However, it is important to note the significant difference in the results between the life and non-life insurance sectors and also the influence of the level of economic development on the causality links. Several studies tend to demonstrate that life insurance is more important for high-income countries and that on the opposite, non-life insurance is more important for emerging and developing countries.[69] The life insurance sector is often of relatively less importance in developing countries. Of course, for several countries, life insurance may be considered irrelevant or inappropriate for ideological, cultural or religious reasons or because economic security is still provided through the family.

Life Insurance market activity also contributes to economic growth through complementarities with the banking sector and the stock market. The development of the banking sector may facilitate the development of the insurance activity through a much more effective payment system allowing an improved financial intermediation of services.[70] Regarding the conjoint effect with the stock market, the development of the insurance activity, in particular life insurance companies, could promote stock market development by investing funds (savings) raised through contractual saving products in stocks and equities (Impavido et al. 2003; USAID 2006). Property/liability insurance may facilitate bank intermediation activity by for example partially collateralizing credit, which would reduce bank's credit risk exposures promoting higher levels of lending (Zou and Adams 2006; Adams et al. 2009).

Non-life insurance is also known to play a major role in supporting trade (both domestic and international), commerce and entrepreneurial activity. The international character of insurance services relating to goods in international trade is not a recent phenomenon.

[69] Haiss and Sumegi (2008), Arena (2008) and Han et al. (2010) observed a significant relationship between non-life insurance and economic growth in developing countries.

[70] Webb, Skipper and Grace (2002) found that both banking and life insurance penetration were robustly indicative of increased productivity (as measured by increase in growth rate of real GDP per capita) in 55 countries over the period from 1980 to 1996. Support for this idea can also be found in the works of Catalan, Impavido and Musalem (2000).

Transit-transport insurance as well as export credit insurance is often historically connected with the pattern of international trade. The protectionism which developed in almost all countries in the middle of the last century should be viewed as a decision to produce internal insurance services as opposed to importing these services. In developing countries, insurance was considered a macroeconomic tool and as such used by many governments to produce not only insurance services but also social and macroeconomic objectives.

The development of multinational operations has resulted in increasing demand for international insurance coverage. The ever increasing number, size and complexity of risks insured have enhanced the trend for international expertise and diversification. Thus, the contribution of insurance services to development, both through trade in insurance services and supporting the growth of viable and financially sound domestic insurance capacity can help overcome supply-side constraints.

6. The role of foreign direct investment

The positive view of the finance-led growth hypothesis normally focuses on more open and liberalized financial systems. Foreign participation in domestic insurance markets has greatly increased due to deregulation, liberalization and globalization of international insurance activities. What is the impact of foreign direct investment (FDI) on development? Although some research has been conducted on international insurance services, the appropriate role of foreign insurers in national insurance markets continues to be a topic of great interest and concern to policymakers.

Empirical evidence in the banking literature provides contradictory findings concerning the ownership question (foreign versus domestic) and the relationship between ownership and bank efficiency (Eller, Haiss and Steiner 2006). Although increased foreign competition seems to enhance customers' welfare with innovative and differentiated products which are more attractive or better priced, negative effects, such as the crowding out of domestic institutions and increased systemic risk need to be considered as well.

Foreign participation in the insurance sectors can be explained from multiple streams of literature including the analysis of the factors explaining FDI in a country. Papers by Moshirian (1997 and 1999) and Li and Moshirian (2004) examine the causality links between the demand for insurance services and the level of FDI in insurance services. Outreville (2008) examines the factors giving location-specific advantages to foreign participation. Ye et al. (2009) show that socio-economic and market structure factors can influence foreign participation in life insurance markets. In addition, governance/legal indicators (common law, political stability, government effectiveness, regulatory quality, the rule of law and control of corruption) all show a positive impact on foreign participation in life insurance.[71]

7. Concluding remarks and research implications

Previous surveys on the demand for insurance have examined the determinants and the impact of financial development and economic growth. The literature has mostly analyzed the demand side of financial institutions neglecting the supply side. Within the insurance-growth nexus, this survey identifies 80 papers, most of them investigating the demand for life insurance. Only 15 papers are concerned with Property-Liability (non-life) insurance and empirical papers (only 12 papers) investigating the corporate demand for insurance (property-liability insurance by firms or reinsurance by insurers) are not part of the analysis.

Since considerable debate has taken place regarding the role of financial institutions as a factor of economic growth, more recent empirical research has focused on the causality links between insurance growth and economic growth, confirming the claim of UNCTAD that a sound national insurance market is an essential characteristic of economic growth.

Although there is considerable information available on the determinants of the demand for insurance and more limited evidence that suggest a supply-leading role of insurance institutions, there are several issues that still require further attention. A well-developed insurance sector is necessary for the economic development, as it provides long-term

[71] These results extend the findings by Ma and Pope (2003).

investments for economic growth, while simultaneously strengthening risk-taking abilities. However, only a few papers have investigated the impact of the cultural, legal and political context on the demand for insurance, and there has been no investigation on the causality links between these factors, the insurance behavior of people and the role of insurance.

Considering the substantial potential for growth and development in the insurance sector of the vast majority of developing countries, it is important to raise the visibility of this sector and to clarify what set of provisions might be needed to enable insurance market development alongside other facets of financial deepening. At the same time, developing countries' markets depend extensively on international services mainly because the small size of the domestic market and domestic insurance companies and because there is often insufficient experience and know-how. This result in a dependence on foreign insurance and reinsurance services and this issue has not been extensively analyzed in the current empirical literature.

There are also policy implications. What are the measures, which governments/regulators can put in place to address supply problems and maximize benefits arising from insurance services? Do impacts differ across countries? What are the trends and similarities?

Table 1: Insurance penetration, 1970-2009

50 countries accounting for 93.4% of total world premiums in 2009

Countries		1970	1980	1990		2000	2009
OECD Countries							
	Australia	5.2	4.5	6.82		8.97	6.16
	Austria	3.0	4.6	4.80		5.63	6.01
	Belgium	3.4	4.0	4.37		7.73	7.95
	Canada	4.7	4.8	6.00		6.47	7.44
	Chile	..	0.7	2.62		3.79	3.81
	Czech Rep.	..	..	2.29	a	3.22	3.97
	Denmark	3.4	4.1	4.28		6.36	9.26
	Finland	3.0	4.8	6.48		8.90	9.57
	France	3.3	3.6	5.74		9.03	10.37
	Germany	4.1	4.5	4.95		6.44	7.11
	Hungary	..	..	2.49	b	2.84	3.09
	Italy	2.0	1.9	2.52		5.68	7.75
	Japan	3.9	6.6	10.81		11.29	10.18
	Korea (Rep. of)	1.1	2.4	9.80		11.09	10.92
	Mexico	0.9	0.7	0.98		1.48	1.99
	Netherlands	4.9	5.8	7.59		9.50	13.57
	New Zealand	4.5	3.6	3.95		5.17	5.78
	Poland	..	..	1.83	b	2.76	3.77
	Portugal	2.4	2.8	2.91		5.54	8.24
	Spain	1.5	1.7	3.32		6.53	5.64
	Sweden	3.1	4.0	4.61		6.77	8.09
	Switzerland	4.6	5.9	7.69		11.99	10.03
	Turkey	..	0.3	0.40		1.07	1.27
	United Kingdom	5.4	5.3	9.21		16.89	12.92
	United States	6.8	7.0	8.82		8.72	8.07
BRIC Countries							
	Brazil	0.7	0.9	1.34		2.38	2.59
	Russia	..	..	0.58	a	2.34	2.50
	India	1.0	1.0	1.53		2.16	5.39
	China	..	..	0.80		1.61	3.27
Other Emerging and Developing Economies							
Central and South America							
	Argentina	1.7	1.8	1.84		2.38	2.59
	Colombia	..	1.2	1.26		1.83	2.27
	Ecuador	..	..	0.93		1.31	1.67
	Guatemala	..	0.9	0.74		0.98	1.20
	Panama	..	2.9	2.52		3.17	3.51
	Uruguay	..	1.6	1.69		1.71	1.73
	Venezuela	1.5	1.6	1.90		1.90	4.30
Asia							
	Indonesia	0.2	0.5	0.84		1.03	1.33
	Malaysia	1.6	2.1	3.03		4.16	4.84
	Pakistan	0.8	0.8	0.74		0.53	0.66
	Philippines	1.8	1.7	1.12		1.35	1.12
	Singapore	2.0	2.5	2.85		6.17	6.27
	Taiwan	1.1	1.6	4.30		7.01	17.29
	Thailand	0.7	0.9	1.70		2.53	4.07
Africa							
	Algeria	..	1.1	1.02		0.47	0.76
	Egypt	0.8	0.7	0.76		0.59	0.83
	Kenya	..	2.5	2.63		2.17	2.74
	Morocco	1.6	1.9	1.92		2.61	2.83
	Nigeria	..	0.9	0.55		0.57	0.48
	South Africa	..	5.3	9.89		17.54	12.89
	Tunisia	1.1	1.3	1.56		1.67	1.91
Source: Sigma, several issues							
Note:	a= 1992, b=1991						

Figure 1a: Relationship between Insurance Premiums (in Log) and GDP
Average values 2007-2009, 80 countries

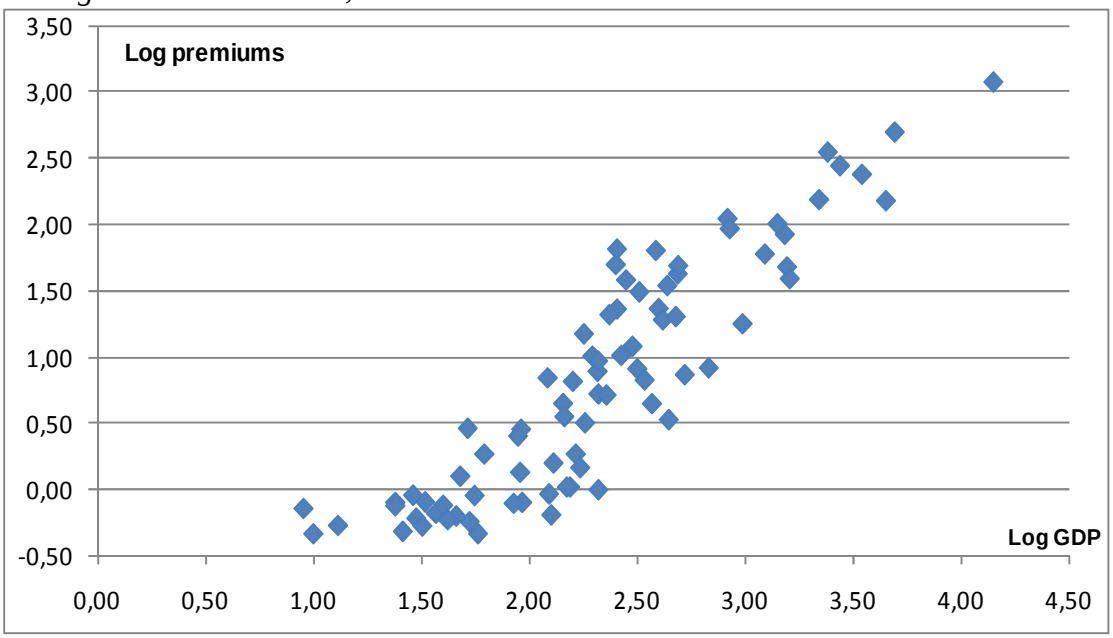

Figure 1b: Relationship between Density and GDP per Capita (in Logs),
Average values 2007-2009, 80 countries

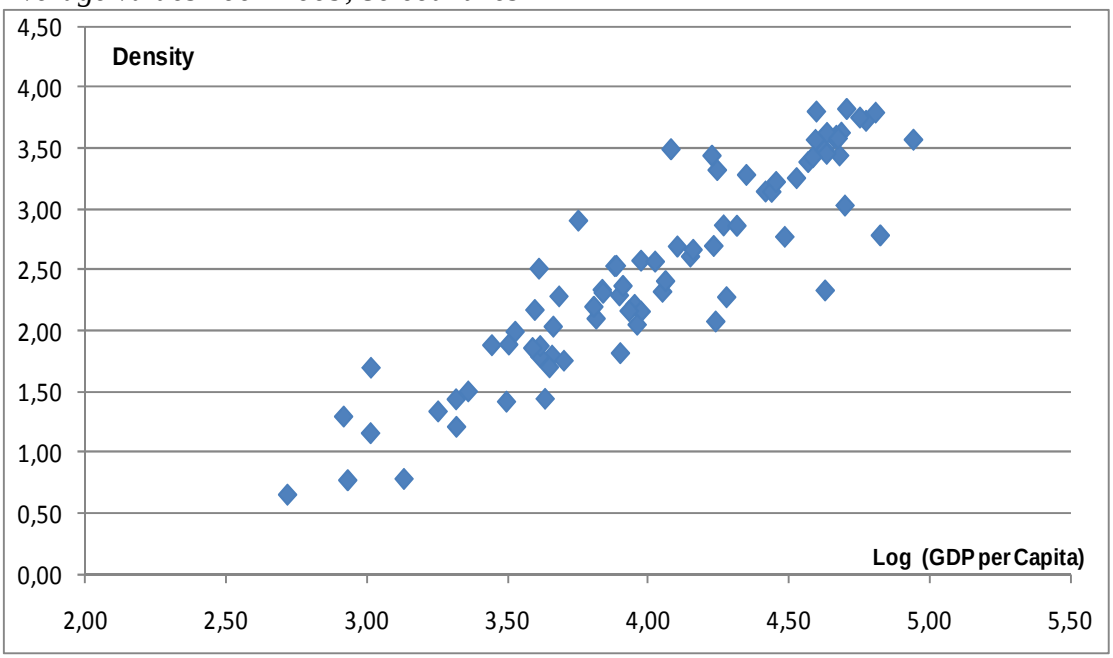

Table 2: Estimates of the Insurance-growth relationship

Log total premiums	-4.62	+1.221	Log GDP	R2=0.81	Beenstock et. Al (1988) and Outreville (1990) both report 1.34				
	(-12.78)	(18.76)		F=352.3	Li et al. (2007) report values between 1.09 and 1.28				
Log density	-7.23	+1.409	Log GDP per Capita	R2=0.83	Beck and Webb (2003) report 1.471				
	(-10.89)	(19.81)		F=392.3					
Note: OLS estimates, 80 countries, average values 2007-2009									

Figure 2: Relationship between Penetration and GDP per Capita (in US$)
Average values 2007-2009, 80 countries

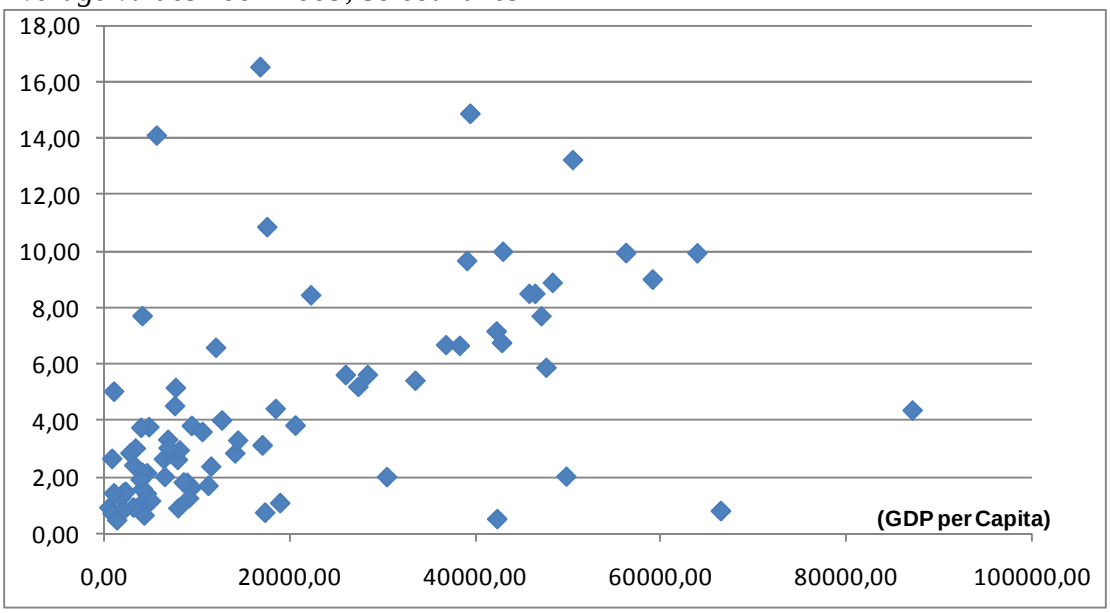

Table 3: List of macroeconomic factors affecting the demand for insurance

	Variable	Expected effect	Validation
Economic factors			
	Disposable income	Positive	All studies.
	Permanent income	Positive	Fortune (1972); Outreville (1980, 1985); Beck and Webb (2003).
	Income distribution/inequality	Ambiguous	Beenstock et al. (1986); Beck and Webb (2003); Nakata and Sawada (2007); Feyen et al. (2100);
	Price of insurance	Negative	Mantis and Farmer (1968); Fortune (1973); Babbel (1985); Outreville (1985); Outreville (1990); Browne et al. (2000); Esho et al. (2004).
	Anticipated Inflation rate	Negative	Browne and Kim (1993); Outreville (1996); Beck and Webb (2003); Li et al. (2007).
	Annual inflation rate	Negative	Other studies under the hypothesis that it reflects expected inflation
	Real interest rate	Ambiguous	Outreville (1996); Beck and Webb (2003); Lim and Haberman (2003); Li et al. (2007); Sen (2008); Chen, Lee and Lee (2011);
	Interest rate volatility	Ambiguous	Beck and Webb (2003)
	Stock market impact	Ambiguous	Headen and Lee (1974); Lim and Haberman (2003); Chui and Kwok (2009); Avram et al. (2010); Chen, Lee and Lee (2011);
	Unemployment rate	Negative	Mantis and Farmer (1968); Outreville (1980); Beenstock et al. (1986); Lenten and Rulli (2006).
Demographic factors			
	Population size/density	Positive	Mantis and Farmer (1968); Nakata and Sawada (2007); Feyen et al. (2011);
	Urbanisation	Positive (some exceptions)	Outreville (1996); Browne et al. (2000); Szablicki (2002); Beck and Webb (2003); Hwang and Gao (2003); Esho et al. (2004); Hwang and Greenford (2005); Sen (2008); Chen, Lee and Lee (2011); Park and Lemaire (2011);
	Age structure	Ambiguous	Truett and Truett (1990); Browne et al. (2000); Chen et al. (2001);
	Dependency ratio	Ambiguous	Beenstock et al. (1986); Truett and Truett (1990); Browne and Kim (1993); Beck and Webb (2003); Li et al. U(2007); Sen (2008); Chui and Kwok (2008 and 2009); Feyen et al. (2011);
	Life expectancy	Ambiguous	Beenstock et al. (1986); Browne and Kim (1993); Outreville (1996); Ward and Zurbruegg (2000); Beck and Webb (2003); Lim and Haberman (2003); Li et al. (2007); Sen (2008); Chui and Kwok (2009); Chen, Lee and Lee (2011); Feyen et al (2011);
Social and cultural factors			
	Risk aversion	Ambiguous	Browne and Kim (1993); Browne et al. (2000); Park et al. (2002); Esho et al. (2004);
	Education/Human capital	Positive	Truett and Truett (1990); Browne and Kim (1993); Ward and Zurbruegg (2002); Webb et al. (2002); Hwang and Gao (2003); Hwang and Greenford (2005); Li et al. (2007); Arena (2008); Han et al. (2010); Curak et al. (2009); Chen, Lee and Lee (2011); Feyen et al. (2011);
	Religion (Muslim)	Negative	Browne and Kim (1993); Outreville (1996); Webb et al. (2002); Ward and Zurbruegg (2002); Beck and Webb (2003); Chui and Kwok (2008 and 2009); Feyen et al. (2011); Park and Lemaire (2011);
	Hofstede's cultural variables		Park et al. (2002); Esho et al. (2004); Chui and Kwok (2008, 2009); Park and Lemaire (2011);
Structural factors			
	Financial development or banking sector development	Positive	Outreville (1990 and 1996); Ward and Zurbruegg (2002); Beck and Webb (2003); Li et al. (2007); Arena (2008); Sen (2008); Chui and Kwock (2008 and 2009); Avram et al. (2010); Chen, Lee and Lee (2011); Feyen et al. (2011);
	Monopolistic market	Negative	Outreville (1990 and 1996);
	Presence of foreign companies	Ambiguous	Outreville (1990 and 1996); Browne et al. (2000); Li et al. (2007);
	Market concentration	Negative	Outreville (1996); Feyen et al. (2011); Park and Lemaire (2011);
	Degree of openness	Positive	Arena (2008); Curak et al. (2009); Avram et al. (2010); Chen, Lee and Lee (2011);
	Social security	Ambiguous	Beenstock et al (1986); Browne and Kim (1993); Outreville (1996); Ward and Zurbruegg (2002); Hwang and Greenford (2005); Li et al. (2007); Chen, Lee and Lee (2011); Feyen et al. (2011);
	Legal origin	Ambiguous	Browne et al. (2000); Webb et al. (2002); Beck and Webb (2003); Esho et al. (2004); Park and Lemaire (2011);
	Enforcement of property rights/law	Positive	Ward and Zurbruegg (2002); Esho et al. (2004); Nataka and Sawada (2007); Chui and Kwok (2008 and 2009); Avram et al. (2010); Feyen et al. (2011);
	Political risk	Negative	Ward and Zurbruegg (2002); Webb et al. (2002); Beck and Webb (2003); Park and Lemaire (2011);

Table 4: Empirical papers testing the causality links

Author (s)	Year	Sector	Sample-Countries	Methodology	Causality link
Catalan, Impavido and Musalem	2000	Life, P/L and pensions	14 OECD, 5 emerging	Granger equations-causality tests	Heterogeneity in the results: No causality in many OECD countries, mixed results in emerging countries and when causality does exist, it runs from contractual savings to market capitalization.
Ward and Zurbruegg	2000	Total insurance premium	9 OECD countries	Granger equations-causality tests	Weak evidence: Supply-leading in a few countries and no significant causality links in the others.
Webb, Grace and Skipper	2002	Life and P/L insurance	55 countries	Simultaneous equations	Supply-leading: Increased productivity over the period. Also find a synergy between banks and insurers.
Impavido, Musalem and Tressel	2003	Global insurance sector	25 OECD, 7 emerging	GMM dynamic panel estimations	Heterogeneity in the results: Contractual savings have a stronger impact in market based financial systems.
Boon	2005	Total insurance funds	Singapore	Cointegration tests and Granger equations	Supply-leading: Long-term effect from insuramnce to GDP
Kugler and Ofoghi	2005	Life and P/L insurance	United Kingdom	Cointegration tests and Granger equations	Causality runs in both directions
Arena	2008	Life and P/L insurance	56 countries	GMM dynamic panel estimations	Supply-leading: Both life and non-life sectors. Life insurance more important for high-income countries.
Haiss and Sümegi	2008	Life and P/L insurance	29 European countries	OLS on unbalanced panel	Supply-leading: Life insurance more important for high-income countries and non-life more important for emerging EU countries.
Adams, Anderson, Anderson and Lindmark	2009	Global insurance sector	Sweden. Long time-series (1830-1998)	Granger equations-causality tests	Supply-leading for insurance but bank lending does not Granger-cause growth in insurance or economic growth
Curak, Loncar and Poposki	2009	Life and P/L insurance	10 EU countries	OLS and 2SLS estimations	Supply-leading for both life and non-life insurance
Han, Li, Moshirian and Tian	2010	Global insurance sector	77 countries	GMM dynamic panel estimations	Supply-leading: This relationship is more significant for non-life insurance than for life insurance. Non-life insurance is of great importance for economic growth in developing countries.
Ching, Kogid and Furuoka	2010	Life insurance	Malaysia	Cointegration tests	Demand following: one-way relationship from real GDP to life insurance sector.
Avram, Nguyen and Skully	2010	Global insurance sector	93 countries	OLS and GMM panel estimations	Supply-leading: verified for insurance density but not for insurance penetration
Chen, Lee and Lee	2011	Life insurance	60 countries	GMM dynamic panel estimations	Supply-leading: Strong impact of the development of the life insurance market on economic growth. Stock market and the life insurance market are substitutes rather than complements.

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Appendix 1: 80 empirical papers in the insurance-growth nexus

Author (s)	Year	Journal	Sector	Dependent variable	Sample-Countries	period
Kreinin, Lansing and Morgan	1957	RES	Life insurance	Premiums	United States	Survey 1953
Hammond, Houston and Melander	1967	JRI	Life insurance	Premiums	United States	Surveys 1952, 1961
Mantis and Farmer	1968	JRI	Life insurance	Total insurance sales	United States	1929-1964
Neumann	1969	JRI	Life insurance	Total annual purchases	United States	1947-1964
Duker	1969	JRI	Life insurance	Premiums	United States	Surveys 1950, 1959
Lee and Whitaker	1971	MSJBE	Life insurance	Premiums	United States	1946-1969
Berekson	1972	JRI	Life insurance	Life insurance in force, premiums	United States	Student survey 1969
Fortune	1972	JRI	Life insurance	Life insurance in force	United States	1953-1967 (quarterly)
Cummins	1973	JRI	Life insurance	Life insurance reserves	United States	1955-1968 (quarterly)
Fortune	1973	JOF	Life insurance	Life insurance in force	United States	1964-1971 (quarterly)
Headen and Lee	1974	JRI	Life insurance	Life insurance purchases	United States	1957-1971 (quarterly)
Anderson and Nevin	1975	JRI	Life insurance	Life insurance purchases	United States	Survey between 1968-1971
Cargill and Troxel	1979	JRI	Life insurance	Life insurance reserves	United States	1954-1974 (quarterly)
Ferber and Lee	1980	JRI	Life insurance	Life insurance purchases	United States	Panel (143 families), 1968-76
Diacon	1980	GPRI	Life insurance	Life insurance per capita	United Kingdom	1946-1968
Outreville	1980	GPRI	Life and P/L insurance	Premiums	France	1953-1976
Babbel	1981	JRI	Life insurance	Life insurance per capita	Brazil	1951-1967
Burnett and Palmer	1984	JRI	Life insurance	Life insurance owned per family	United States	Panel (159 families)
Schwebler	1984	GPRI	Life insurance	Premiums	Germany	1965-1980
Babbel	1985	JOF	Life insurance	Life insurance in force	United States	1953-1979
Miller	1985	MLR	Life insurance	Life insurance in force	United States	Survey 1984
Outreville	1985	Econ Letters	Group Life insurance	Life insurance in force	Canada	1955-1979
Beenstock, Dickinson and Khajuria	1986	IME	Life insurance	Premiums	10 OECD countries	1070-1981
Fitzgerald	1987	JRI	Life insurance	Face value of life insurance	United States	Wisconsin Survey 1947-1978
Rejda, Schmidt and McNamara	1987	JRI	Group life insurance	Premiums	United States	1957-1984
Beenstock, Dickinson and Khajuria	1988	JRI	P/L insurance	Premiums	12 OECD countries	1970-1981
Lewis	1989	AER	Life insurance	Life insurance ownership	LIMRA survey	1976
Fitzgerald	1989	RES	Life insurance and annuities	Face value of life insurance	United States	Wisconsin Survey 1946-1964
Auerbach and Kotlikoff	1989	NBER paper	Life insurance	Life insurance amounts purchased	United States	Surveys 1980, 1982, 1984
Outreville	1990	JRI	P/L insurance	Premiums	55 developing countries	1983-1984
Truett and Truett	1990	JRI	Life insurance	Life insurance amount per family	Mexico, US	Mexico (1964-79), US (1960-82)
Bernheim	1991	JPE	Life insurance, annuities	Life insurance purchases	United States	Survey 1975
Outreville	1992	UNCTAD	P/L insurance	Premium income	50 developing countries	1983 and 1986
Browne and Kim	1993	JRI	Life insurance	Premiums per capita	45 countries	1980, 1987
Showers and Shotick	1994	JRI	Total insurance	Premiums	United States	Survey 1987
Outreville	1996	JRI	Life insurance	Premium income	48 developing countries	1986
Gandolfi and Miners	1996	JRI	Life insurance	Life insurance ownership	United States	1984
Zhi Zhuo	1998	Working Paper	Life insurance	Premiums per capita	China	1986-1995
Browne, Chung and Frees	2000	JRI	P/L insurance	Motor and Liability premiums	22 OECD countries	1986-1993
Hau	2000	JRI	Life insurance	Life insurance holdings	United States	Survey 1989
Enz	2000	GPRI	Life and P/L insurance	Premiums/GDP (Penetration)	90 countries	1970-1998
Catalan, Impavido and Musalem	2000	World Bank	Life, P/L and pensions	Insurance assets	14 OECD, 5 emerging	1975-1997
Ward and Zurbruegg	2000	JRI	Total insurance premiums	Premiums, GDP	9 OECD countries	1961-1996
Rubayah and Zaidi	2000	UMR	Life insurance	Premiums	Malaysia	1971-1997
Park, Borde and Choi	2002	IBR	Global insurance sector	Insurance penetration	38 countries (12 EU)	1997
Ward and Zurbruegg	2002	GPRI	Life insurance	Premiums	25 OECD and 22 Asian	1987-1998
Webb, Grace and Skipper	2002	Working Paper	Life and P/L insurance	GDP per capita, penetration	55 countries	1980-1996
Szablicki	2002	Working Paper	Life insurance	Penetration, density	63 countries	1980-1996 /1960-1996
Impavido, Musalem and Tressel	2003	Working Paper	Global insurance sector	Total assets of insurance institutions	25 OECD, 7 emerging	6 years period on average
Beck and Webb	2003	WBER	Life insurance	Penetration, density	68 countries (14 EU)	1961-2000
Lim and Haberman	2003	Working Paper	Life insurance	Premiums	Malaysia	1968-2001
Jappeli and Postaferri	2003	JPubE	Life insurance	Life insurance purchases	Italy	Survey 1989-1998
Hwang and Gao	2003	MF	Life insurance	Premiums	China	1986-1996
Esho, Kirievsky, Ward and Zurbruegg	2004	JRI	P/L insurance	P/L Consumption	44 countries (12 EU)	1984-1998

Appendix 1: 80 empirical papers in the insurance-growth nexus, continued

Hwang and Greenford	2005	RMIR	Life insurance	Premiums	China, Hong-Kong, Taiwan	1986-1999
Boon	2005	Working Paper	Total insurance funds	GDP	Singapore	1991-2002
Kugler and Ofoghi	2005	Working Paper	Life and P/L insurance	GDP per capita	United Kingdom	1966-2003
Davis and Hu	2005	Working Paper	Pensions funds	Pensions assets	18 OECD, 20 EME countries	1960-2003
Lenten and Rulli	2006	AJM	Life insurance	Premiums	Australia	1981-2003
Li, Moshirian, Nguyen and Wee	2007	JRI	Life insurance	Premiums	30 OECD countries	1993-2000
Okura and Kasuga	2007	APJRI	Life insurance	Amount purchased, premiums	Japan	Survey 2005
Nakata and Sawada	2007	Working Paper	P/L insurance	Premiums	32 countries (not specified)	1994
Arena	2008	JRI	Life and P/L insurance	GDP per capita	56 countries	1976-2004
Chui and Kwok	2008	JIBS	Life insurance	Premiums per capita (density)	41 countries	1976-2001
Haiss and Sümegi	2008	Empirica	Life and P/L insurance	GDP per capita	29 European countries	1992-2005
Zheng, Liu and Dickinson	2008	GPRI	Life and P/L insurance	Premiums, density, penetration	95 countries and China	1980-2006
Vadlamannati	2008	JAER	Global insurance sector	Premiums	India	1980-2006
Sen	2008	Working Paper	Life insurance	Density, penetration	India + 12 Asian countries	1965-2004/1994-2004
Adams, Anderson, Anderson and Lindmark	2009	ABFH	Global insurance sector	Economic growth	Sweden	1830-1998
Chui and Kwok	2009	JMFM	Life insurance	Density, penetration	38 countries	1966-2004
Curak, Loncar and Poposki	2009	IRJFE	Life and P/L insurance	Economic growth	10 EU countries	1992-2007
Guo, Fung and Huang	2009	JFSR	P/L insurance	Premiums	United States	1990-2007 (Monthly)
Zheng, Liu and Deng	2009	GPRI	Life and P/L insurance	Ratio of insurance penetration	95 countries	1980-2007
Lee, Kwon and Chung	2010	GPRI	Life insurance	Premiums	Korea	Survey 2005
Han, Li, Moshirian and Tian	2010	GPRI	Global insurance sector	GDP growth, Insurance density	77 countries	1994-2005
Ching, Kogid and Furuoka	2010	AEB	Life insurance	Life insurance assets	Malaysia	1997-2008 (Quarterly)
Avram, Nguyen and Skully	2010	Working Paper	Global insurance sector	GDP per capita, penetration, density	93 countries	1980-2006
Chen, Lee and Lee	2011	JID	Life insurance	GDP per capita	60 countries	1976-2005
Feyen, Lester and Rocha	2011	World Bank	Life and P/L insurance	Penetration, density, assets/GDP	90 countries	2000-2008
Park and Lemaire	2011	Working Paper	P/L insurance	Penetration, density	82 countries	1999-2008

Note: Empirical papers on the health insurance sector are excluded from the list.
Specific lines of business like liability insurance or motor insurance are also excluded.

ABFH (Accounting, Business and Financial History)
AEB (ASEAN Economic Bulletin)
AER (American Economic Review)
ALM (Australian Journal of Management)
APJRI (Asia-Pacific Journal of Risk and Insurance)
GPRI (Geneva Papers on Risk and Insurance)
IER (International Economic Revierw)
IME (Insurance Mathematics and Economics)
IRJFE (International Research Journal of Finance and Economics)
JAER (Journal of Applied Economic Research)
JFSR (Journal of Financial Services Research)
JIBS (Journal of International Business Studies)
JID (Journal of International Development)
JMFM (Journal of Multinational Financial Management)
JOF (Journal of Finance)
JPE (Journal of Political Economy)
JPubE (Journal of Public Economics)
JRI (Journal of Risk and Insurance)
MF (Managerial Finance)
MLR (Monthly Labor Review)
MSJBE (Mississipi Valley Journal of Business and Economics)
NBER (National Bureau of Economic Research)
RES (Review of Economics and Statistics)
RMIR (Risk Management and Insurance Review)
UMR (Utara Management Review)
UNCTAD (United Conference on Trade and Development)
WBER (World Bank Economic Review)

Appendix 2: Empirical papers on the corporate demand for Insurance

Author (s)	Year	Journal	Sample-Countries	period
Mayers and Smith	1990	JB	US insurers	1981
Davidson, Cross and Thornton	1992	JFSR	US insurers	1974-1986
Yamori	1999	JRI	Survey of Japanese firms	1986
Hoyt and Khang	2000	JRI	RIMS Firms survey (US)	1990
Zou, Adams and Buckle	2003	JRI	Chinese firms	1997-1999
Zou and Adams	2006	JFI	Chinese firms	1997-1999
Cole and McCullough	2006	JRI	US insurers	1993-2000
Regan and Hur	2007	JRI	Korean firms	1990-2001
Krummaker and Graf vd Schulenburg	2007	Working paper	German firms	2004-2005
Aunon-Nerin and Ehling	2008	JFE	US firms	1991-2002
Hamid, Osman and Nordin	2009	IJEM	Malaysian firms	2002-2006
Michel-Kerjan, Raschky and Kunreuther	2009	Working paper	US firms survey	2007
JB (Journal of Business)				
JFE (Journal of Financial Economics)				
JFSR (Journal of Financial Services Research)				
JRI (Journal of Risk and Insurance)				
IJEM (International Journal of Economics and Management)				