CHAPTER 1

The Economics of Life Insurance

"He is the happiest man who can see the connection between the end and the beginning of his life."

Goethe

Humans have always sought to reduce uncertainty.[1] This innate drive to reduce risk motivated the earliest formations of clans, tribes, and other groups. Group mechanisms ensured a less volatile source of life's necessities than that which atomized individuals and families could provide. The group provided greater physical security and helped their less fortunate members in times of crises.

People today continue their quest to achieve security and reduce uncertainty. We still engage in activities and rely on groups to help reduce the variability of income required to obtain life's necessities and to protect acquired wealth. The group may be our employer, the government, or an insurance firm, but the concept is the same. Wealth itself has communal origins: many historians consider the first cultural manifestation of wealth to be the production of grains by incipient agrarian societies in amounts exceeding requirements of current consumption and the emergence of the stockpile.

In some ways, however, we are more vulnerable than our ancestors. The physical and economic security formerly provided by the tribe or extended family diminishes with industrialization. Our income-dependent, wealth-acquiring lifestyles render us and our families more vulnerable to societal and environmental changes over which we have little control. Contemporary individuals are in need of more formalized means to mitigate the adverse consequences of unemployment, loss of health, old age, death, lawsuits, and loss of wealth. As extensions of human activity, businesses are similarly vulnerable.

A BRIEF HISTORY OF LIFE INSURANCE

Humans have long been concerned about the adverse effects on their families of their deaths. Indeed, the risk transfer aspect of life insurance dates back more than 2,500 years to Greek societies. An elaborate funeral ceremony was an important social and religious ritual of ancient times (and this view persists today to varying degrees in many cultures). The belief was that the soul of the departed could gain entrance into the special paradise of his or her faith only if the funeral was conducted with all required rituals, sacrifices, and feasts. The Greek societies assumed this risk for its members by assuring them of a proper burial.

The Roman collegia, patterned after the Greek societies, were numerous during the period of the Roman Republic. These collegia evolved into mutual benefit associations with stated benefits and regular membership contributions. The dissolution of the Roman Empire brought an end to these societies, although similar organizations continued to exist in the Byzantine Empire.

The need for mutual protection and security not only continued but increased after Rome fell. Guilds evolved to meet this need. These guilds, particularly in England, provided mutual assistance to their members as witnessed by the mentioning in most guild statutes of a host of perils for which members might qualify for relief, including death, illness, capture by pirates, shipwreck, the burning of one's home, and the loss of one's tools of trade. Craftsmen guilds evolved in Japan during the period 1699-1868. Guilds, however, were not organized primarily for benevolent or relief purposes. Their primary purposes were religious, social, and economic.

English friendly societies were true mutual benefit groups. Not concerned with trade, craft, or religion, they were operated by officers and a committee elected by members and governed by a set of rules adopted and amended by the membership. Hardly a hamlet in England did not have at least one friendly society. All societies had some form of death or burial fund benefit. Many societies provided benefits for a variety of other perils. Unlike the guilds, benefit payments did not depend on the member's need, although payments often were restricted by the funds available.

The beginnings of friendly societies predate, by some time, the first mortality tables, the laws of probability, and the mathematics of insurance. Society members were assessed as needed to provide the promised benefit payments. **Assessment basis** insurance contracts permit insureds (members) to be assessed retrospectively as claims occur, to provide promised benefit payments.

Contributions were not scaled according to the age or insurability of members, so a large share of the burden was placed on young, healthy members. As a result, many discontinued their memberships. Average mortality rates increased as the average age of the members increased, placing a still heavier burden upon those of advancing years who often were the ones least able to afford it. High failure rates were an inevitable result.

The earliest insurers were individual underwriters who either alone or in concert with others assumed various life insurance risks. Contracts were of short duration; seldom a year. Clearly, long term life insurance contracts could not be satisfactorily underwritten by individuals, for the insured could outlive the insurer! During this early time, the practice of individuals writing their names under the amount of insurance that they were willing to back arose. This practice

gave rise to the term "underwriting," with the person making the contract being known as an "underwriter."

Some early underwriters apparently were not eager to meet their obligations. A 1584 dispute, the earliest on record, illustrates how the meaning of words can be critically important. A life insurance contract was issued on June 15, 1583 by the office of insurance within the Royal Exchange for £383 6s 9d on the life of William Gybbons for a term of 12 months. Thirteen individuals underwrote the contract. The premium was £75. The insured died shortly before the expiration of one year. The insurers refused to pay on the grounds that *their* intended 12 months were the shorter *lunar* months, not the more common *calendar* months. On this basis, the policy had expired. Mr. Gybbons' heirs prevailed on their suit against the underwriters.

Individual underwriting gave way over time to corporate underwriting. The first true mutual insurance company was *The Life Assurance and Annuity Association* established by the *Mystery of the Mercers of London* on October 4, 1699. It failed 46 years later. By 1720, two English insurers, *The Royal Exchange* and *The London* (both stock companies), had managed to receive a monopoly on British insurance. When the *Equitable* applied for a corporate charter to form a stock insurer in 1761, it was refused. Its founders, therefore, decided to form a mutual company, which did not require a charter. Thus, in 1762, *The Society for Equitable Assurances on Lives and Survivorships* was born. The *Equitable* is said to have been the first life insurer to operate on modern insurance principles, including relying on age-based premiums. While the *Equitable* legally remains in existence as the world's oldest life insurer, it is not selling new policies, with its existing business having been transferred to other insurers or placed in run off because of financial difficulties incurred during the 2000s.

The history of life insurance is intertwined with government in numerous ways. One of the most interesting was the effort to raise funds to support government expenditures through the sale of a type of life annuity. Box 1-1 highlights the best known of these schemes.

Box 1-1
France and Tontines

The right to receive rent from land and to transfer this right to others was well established before Roman times. A landowner, for a consideration, could transfer the rent or income from a designated farm or landholding to a beneficiary who might receive this rent in money or in kind for life or for a specified time. It was but a short step from life rents based upon land to annuities based upon the grantor's solvency. Governments as well as monasteries and other religious organizations used the sale of annuities as fundraising devices. The religious prohibition against usury made the annuity a favored device for borrowing large sums.

In fact, in 1689, Louis XIV of France used an annuity scheme devised by Lorenzo Tonti to raise needed funds for the state. Under what was to be known as **tontines,** amounts were paid into a fund by participants who received payments from the fund only for as long as they lived, with a portion of the forfeited funds of deceased participants being used to augment payments to survivors. When participants died, their annuity payments ceased. Portions of these former payments were then allocated among the survivors in what today are called *benefits of survivorship*. As more annuitants died, payments to survivors grew. Other governments and private promoters continued this scheme almost into the twentieth century, when it was outlawed.

The emergence of corporations in England in the late 17th and early 18th centuries, coupled with the availability of adequate mortality statistics and the development of sound actuarial principles, marked the birth of modern life insurance. The introduction of the agency system of marketing using commissioned salespersons gave further impetus to life insurance growth. Today, life insurance companies are found in almost every country and the products provided by these companies are important sources of family and national economic security and economic development.

THE LANGUAGE OF INSURANCE

Insurance is a vitally important risk management tool. From an economic perspective, **insurance** can be defined as a financial intermediation function under which insureds each contribute to a pool from which payments are made to them or on their behalf if specified contingencies occur. Insurance is a contingent claim on the insurance pool's assets.

From a legal perspective, **insurance** is an agreement (insurance policy or contract) by which one party (policyowner) pays a stipulated consideration (premium) to the other party (insurance company or insurer) in return for which the insurance company agrees to pay a defined amount or provide a specific service if specified contingencies occur during the policy term. The person whose life or health is the object of the insurance policy is the **insured**. In most instances, the insured is also the **policyowner** (also called **policyholder**) who is the person that can exercise all policy rights and with whom the insurer deals. The **beneficiary** is the person or entity entitled to insurance death or health benefits in the event of a policy claim.

Insurance can be examined from several perspectives. We offer three here:

- social versus private,
- life versus nonlife, and
- commercial versus personal.

SOCIAL VERSUS PRIVATE INSURANCE

Governments have determined that they, not the private sector, should or must provide some types of insurance. Thus, most countries have extensive social insurance schemes that provide survivor, retirement, disability, health, and unemployment benefits to qualified residents.

Social insurance possesses several characteristics. First, participation is compulsory and financing relies on government-mandated premiums (i.e., taxes). Second, income security is provided for well-defined risks (e.g., unemployment, retirement), and the recipient is not subject to an economic needs test. Finally, it emphasizes social equity (i.e., income redistribution), a characteristic that distinguishes it from private insurance which emphasizes individual actuarial equity (i.e., premiums reflect the expected payout for each insured).

Private insurance is offered by insurance firms in the private sector. Its purchase may be compulsory, as with auto liability insurance, but need not be. Premiums reflect insureds' expected losses. This book's main focus is on private insurance.

Life versus Nonlife Insurance

The private insurance sector divides itself between companies that sell insurance on the person, known as *life insurance, life assurance, personal insurance*, and *long term insurance,* depending on the country, and those that sell insurance to protect property, referred to as *nonlife insurance, property/casualty insurance*, or *general insurance,* depending on the country. The nonlife branch includes insurance to cover:

- property losses – damage to or destruction of property, including homes, automobiles, businesses, aircraft, etc.,
- liability losses – payments owed third parties resulting from the insured's negligence from automobile operation, professional care or advice, product defects, etc., and
- workers' compensation and health insurance payments in some countries.

This book is concerned with the life branch of the private insurance business. Life insurance, broadly defined, focuses on the following types of risks and the corresponding types of insurance:

- **Mortality risk** – possibility that one's death creates undesirable financial consequences for others; covered by life insurance (or life assurance),
- **Longevity risk** – possibility of outliving one's financial resources; covered by endowments, annuities, and pensions, and
- **Morbidity risk** – possibility that injury, illness, or incapacity creates unacceptable financial consequences; covered by health insurance, disability income insurance, and long term care insurance.

Definitions within the life branch can be inconsistent between countries and even within a single market. When referring to life insurance as a branch of private insurance, it often includes all three classes of insurance coverages listed above. The title of this book, *Life Insurance*, adopts this view. Similarly, a **life insurance company** is a corporation authorized under the law of its sovereign state to sell products that involve life and/or health contingencies. When referring to insurance coverage, the term **life insurance** usually means policies that pay benefits to named beneficiaries on the death of the insured. Even here, we encounter inconsistencies. In most markets, annuities and pension-related coverages are classified separately from life insurance policies.

Health insurance indemnifies an insured for costs incurred and/or wages lost because of illness, injury, or incapacity. Thus, **disability income insurance** is health insurance that pays a stated, usually monthly, benefit if illness or injury prevents the insured from working. **Long term care insurance** is health insurance that pays a stated, usually monthly, benefit if incapacity of the insured prohibits him or her from engaging in specified activities of daily living. Policies often provide for three levels of nursing home care: (1) skilled nursing care, (2) intermediate nursing care, and (3) custodial care. **Medical expense insurance** is health insurance that indemnifies the insured for costs incurred because of illness or injury.

Some markets, notably in Europe, classify health insurance as nonlife insurance. In the U.S., private health insurance commonly falls within the life branch.

This book's emphasis is on private insurance for the mortality and longevity risks, while offering limited treatment of morbidity risks.

PERSONAL VERSUS COMMERCIAL INSURANCE

Life insurance companies sell products and services both to individuals and to organizations; i.e., they sell personal and commercial insurance. In the U.S. insurance lexicon, **personal insurance** is any insurance purchased by individuals for non-commercial purposes. This can include individual life and health insurance, home insurance, and family automobile insurance.

The U.S. life insurance industry often classifies its personal insurance as being either industrial life and health insurance or ordinary insurance. **Industrial life and health insurance** is a type of personal insurance in which policies of modest benefit amounts are sold to individuals of low to modest incomes and whose premiums are collected weekly or monthly at the insured's residence or place of employment. **Ordinary insurance** is individually issued life, health, and retirement coverages, other than industrial insurance.

Commercial insurance is any insurance designed for purchase by organizations, such as businesses. Commercial life, health, and retirement coverages are more commonly referred to as group insurance in the U.S. **Group insurance** is a type of commercial insurance in which a group of persons who usually have a business or professional relationship to the contract owner are provided coverage under a single master contract.

Finally, **credit life insurance** and **credit health insurance** provide life and health insurance through financial institutions to cover debtors' obligations if they die or become disabled.

Government oversight is more stringent in personal insurance than in commercial insurance because commercial buyers are generally better able to look after their interests than are individuals. This book emphasizes personal life insurance.

Life insurance is of enormous importance throughout the world. The more economically developed a country, the greater the role of insurance as an economic security device. A United Nations' committee formally recognized that life insurance "can play an important role in providing individual economic security and in national development efforts, including the mobilization of personal savings."[2]

LIFE INSURANCE INTERNATIONALLY

The commonly accepted measure of insurance market size is gross direct written premiums. Globally, such premiums grew at an inflation-adjusted rate of a modest 0.7 percent, to US$2,608 billion, in 2013, after growing by 2.3 percent the previous year. Advanced market life premium growth has stagnated at an average annual rate of -0.2 percent, post-2008 financial crisis. Post-crisis growth has been particularly weak in North America (-2.9 percent), Oceania (-3.7 percent), and Western Europe (-0.6 percent). Advanced economies in Asia, led by Japan, realized average annual growth premium growth of 3.0 percent.

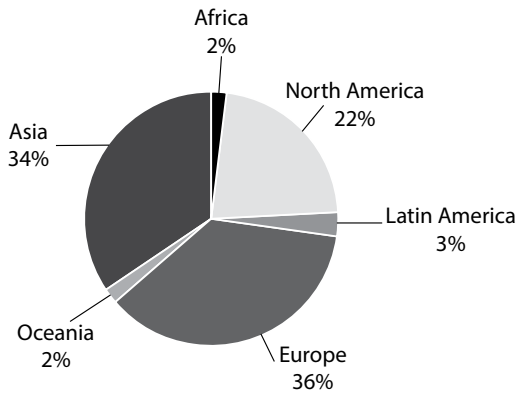
Overall, life premiums in emerging markets have grown more slowly post-crisis than before, but with significant regional variations. Thus, average annual premium growth fell from 16 percent during the 2003-2007 period, to 3.8 percent

in 2009-2013. Swiss Re notes that this relative decline is due mostly to regulatory changes that dented growth in China and India, the two largest such life markets. In Latin America, the Middle East, and Africa, however, average growth post-crisis has been higher than that observed pre-crisis.

In general, the international life insurance industry's profitability improved marginally in 2013, according to Swiss Re, driven mainly by rising equity markets. It remained below pre-crisis levels. The industry is said to be well funded, its capital position having recovered alongside market strengthening and regulatory support in many countries. Swiss Re expects profitability to remain under pressure going forward because of some older, less profitable business and sluggish economic growth.

Long-term world growth in life insurance premiums has been driven by comparatively high growth rates in emerging markets, increasing life expectancy, and governments having to reduce the generosity of social insurance programs in the face of fiscal imbalances. The effects are to substitute private insurance for government insurance, increasing demand for the products sold by life insurers. The demand for products to protect against longevity risk, such as annuities, has driven premium growth. Figure 1-1 shows the regional distribution of life insurance premiums worldwide.

Regional Distribution of Life Insurance Premiums (2013) **Figure 1-1**

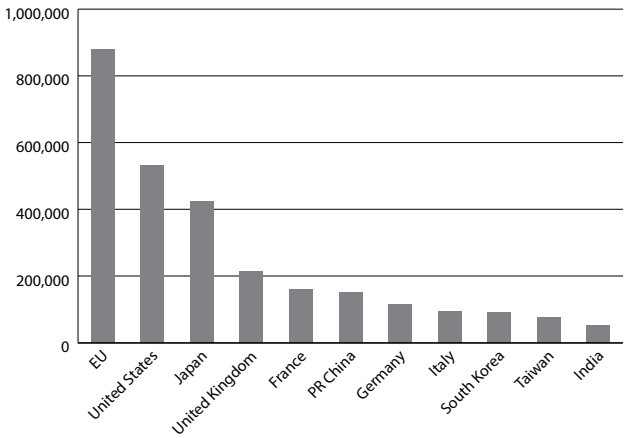


Europe was the world's largest life insurance market in 2013, accounting for 36.3 percent of total direct premiums written, up from the 33.4 in 2012. Asia slipped to second place worldwide, at 34.4 percent, roughly the same as 2012. North America's share fell to 22.4 percent from 23.7 percent in 2012.

The world's ten largest national life insurance markets and that of the European Union (E.U.) are shown in Figure 1-2.

Two measures are used traditionally to show the relative importance of insurance within national economies. **Insurance density** is the average annual per capita premium within a market. Values are usually converted from national currency to U.S. dollars. As such, currency fluctuations affect comparisons, and this fact can lead to distortions, especially over time. Even so, this measure is a useful indicator of the importance of insurance purchases within national economies.

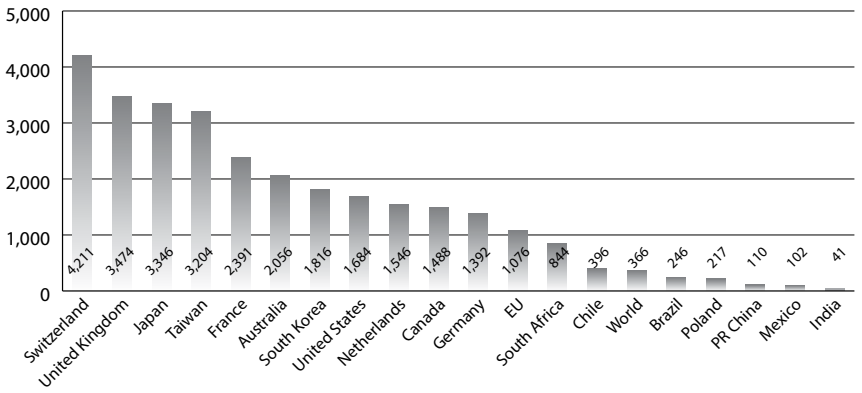
Figure 1-2 **Life Insurance Premium Income for 10 Largest National Markets and the European Union (Millions of US Dollars, 2013)**



The U.S. remained the largest national life insurance market in the world, followed by Japan, with the United Kingdom (U.K.), France, China, and Germany thereafter. Collectively, the member states of the E.U. accounted for considerably more in premium income than any national market.

The other measure, **insurance penetration**, is the ratio of yearly direct premiums written to gross domestic product (GDP). It is an indication of the relative importance of insurance within markets and is unaffected by currency fluctuations. Even so, it does not give a complete picture as it ignores differences in insurance price levels, national product mixes, and other market variations. Figures 1-3 and 1-4 show life insurance density and penetration for selected countries.

Figure 1-3 **Life Premiums per Capita for Selected Countries, European Union, and World (US Dollars, 2013)**

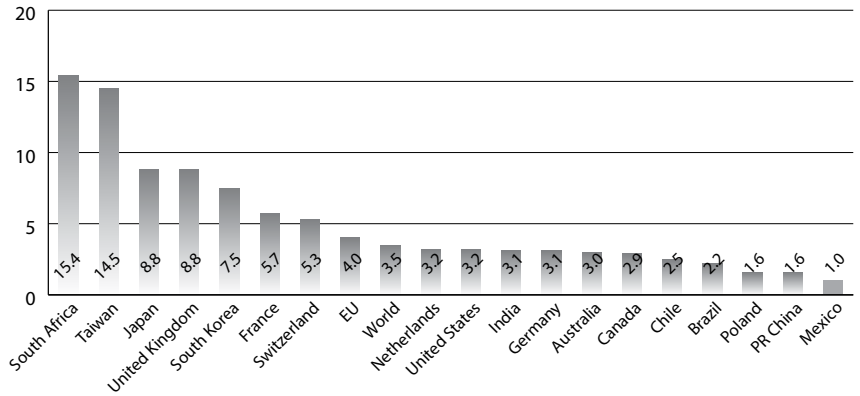


Life insurance density for selected countries, the E.U., and the world for 2013 are presented. The Swiss per capita expenditure of $4,211 was second only to Hong Kong, at $4,445 (not shown in

the figure). The U.K. figure of $3,374 was the world's fifth highest (following Finland at $4,109 and Denmark at $4,093, neither shown), with Japan at sixth highest at $3,346. At $1,684, the U.S. per capita figure ranked 18th in the world. The average for the E.U. member states was $1,620, up in both nominal and real terms from 2012. Density figures for several other country groupings (not shown) were relatively low owing to low per capita incomes. Thus, Latin America and the Caribbean averaged $131, the ASEAN countries averaged $93, and Africa overall averaged $46.

Figure 1-4

Life Premiums as Percentage of Gross Domestic Product for Selected Countries, European Union, and World (2013)



Life insurance penetration ratios for 2013 are presented for selected countries, the E.U., and the world. Taiwan had the world's highest ratio at 14.5 percent. South Africa ranked second at 12.7 percent. At 8.8 percent, Japan tied for fourth with the U.K. The U.S. tied with the Netherlands and Malaysia (not shown) for 19th worldwide, at 3.2 percent. The E.U. averaged 4.73 percent. The ASEAN countries averaged 2.37 percent, while Africa and Latin American and the Caribbean countries averaged 2.43 and 1.39 percent, respectively (not shown).

The Role of Life Insurance in Economic Development

Financial services are essential to economic development. As financial intermediaries, insurance companies perform similar functions and provide similar generic benefits to a national economy as other financial intermediaries such as banks. At the same time, the risks that insurers present to national economies differ in important ways from those of other financial intermediaries, including especially those of banks, as explained more fully in Chapter 9. Further, the benefits of insurance in individual and corporate risk management mean that their overall contributions to economic development differ from those of other financial intermediaries. The more developed and efficient a country's financial markets, the greater will be its contribution to economic prosperity. It is for this reason that governments strive to foster greater competition among financial service providers and ensure that markets are regulated appropriately and are financially sound.

It is wrong to view insurance as a simple pass-through mechanism for diversifying risk under which the unfortunate few who suffer losses are indemnified from the funds the insurer collects from the many insureds. Laudable though it

is, this function masks other fundamental contributions that insurance makes to prosperity. Insurance:

- promotes financial stability,
- substitutes for and complements government security programs,
- facilitates and motivates savings, and
- fosters more efficient capital allocation.

Countries that are best at harnessing these contributions give their citizens and businesses greater economic opportunities. We examine each of the contributions below.

PROMOTES FINANCIAL STABILITY All types of insurance help stabilize the financial situation of individuals, families, and organizations. Without insurance, individuals and families could become financially destitute and forced to seek assistance from relatives, friends, or the government. The stability provided by insurance encourages individuals and firms to invest and create wealth. Indeed, banks and other lenders often insist that key executives of firms carry substantial life insurance made payable to the firm.

SUBSTITUTES FOR AND COMPLEMENTS GOVERNMENT SECURITY PROGRAMS Life insurance can substitute for government security programs. Private insurance also complements public security programs. It can thus relieve pressure on social insurance systems, preserving government resources for essential social security and other worthwhile purposes and allowing individuals to tailor their security programs to their own preferences. Studies have confirmed that greater private expenditures on life insurance are associated with a reduction in government expenditures on social insurance programs. This substitution role is especially important because of the current fiscal challenges faced by national social insurance systems.

FACILITATES AND MOTIVATES SAVINGS The general financial services literature emphasizes the important role of savings in economic growth. Savings can be either financial or non-financial. Non-financial savings take the form of real assets such as land, jewelry and buildings for example. Financial savings are held in financial assets such as savings accounts, bonds, shares, annuities, and life insurance policies. Generally, the more economically developed a country, the greater the proportion of its total wealth is held as financial savings.

Life insurers offer the same advantages as other financial intermediaries in channeling savings into domestic investment. Insurers enhance financial system efficiency in three ways.

- First, insurers reduce transaction costs associated with bringing together savers and borrowers. Thousands of individuals each pay relatively small life insurance premiums, part of which typically represents savings. Insurers then invest these amassed funds in businesses and with government. In performing this intermediation function, direct lending and investing by individual policyholders, which would be time consuming and costly, is avoided.

- Second, insurers create liquidity. Insurance premiums are "borrowed" funds entrusted to insurers by policyowners, not only to pay claims but to make loans and investments. Both life and nonlife insurers stand ready to provide policyholders (and third parties) with instant liquidity if a covered event occurs. The creation of liquidity allows policyholders to have immediate access to loss payments and savings while borrowers need not repay their loans immediately. If all individuals instead undertook direct lending, they likely would find unacceptable the proportion of their personal wealth held in long-term, illiquid assets. Insurers and other financial intermediaries thereby reduce illiquidity inherent in direct lending.
- Third, insurers facilitate economies of scale in investment. Some investment projects are quite large, requiring correspondingly large financing. Such large projects often enjoy economies of scale, promote specialization, and stimulate technological innovations and therefore can be particularly important to economic growth. By amassing large sums from thousands of smaller premium payers, insurers can meet the financing needs of large projects and thereby encourage economic efficiency.

Well-developed financial systems have a myriad of financial institutions and instruments. Contractual savings institutions, such as life insurers and private pension funds, can be especially important financial intermediaries. In contrast with commercial banks, which specialize in collecting short-term deposits, contractual saving institutions usually take a longer-term view. Their longer-term liabilities and stable cash flows are ideal sources of long-term finance for government and business and, as the recent economic crisis confirmed, act as economic shock absorbers during recessions.

Fosters a More Efficient Allocation of Capital Insurers gather substantial information to conduct their evaluations of firms, projects, and managers both in deciding whether (and at what price) to issue insurance, and in their roles as lenders and investors. While individual savers and investors may not have the time, resources, or ability to undertake this information gathering and processing, insurers have an advantage in this regard and are better at allocating financial capital and insurance risk-bearing capacity. Insurers will choose to insure and to provide funds to the most appropriate companies, projects, and managers.

Because insurers have a continuing interest in the companies, projects, and managers to whom they provide financial capital or risk-bearing capacity, they have an incentive to monitor managers and entrepreneurs to reduce the chances that they engage in unacceptable risk-increasing behavior. Insurers thus encourage them to act in the best interests of their various stakeholders (customers, stockholders, and creditors, etc.). By doing so, insurers tangibly signal the market's approval of promising, well-managed firms and foster a more efficient allocation of scarce financial capital and risk-bearing capacity.

The Costs of Insurance to Society

Insurance offers societies great economic and welfare benefits but not without costs. First, insurers incur sales, servicing, administration, and investment management expenses. These costs are an indispensable part of doing business but

increase the price of insurance. Such expenses may average 10 percent or more of policy premiums, with the loss payment and reserving accounting for the balance. The higher are such expenses, the less efficient are insurers, other things being the same.

Second, the existence of insurance encourages moral hazard – the tendency of insureds to alter their behavior because they are insured (see below). Some insureds inflate otherwise legitimate health insurance claims. Each year, some insureds are murdered for life insurance proceeds. All such behaviors cause premiums to be higher than they would be otherwise, represent a deadweight loss to society, and are societal costs of insurance.

LIFE INSURANCE MARKETS

Insurance operations, practices, and regulation can be better understood if they are placed in a logical framework. Economics provides that framework. An understanding of the economic principles that underpin insurance and insurance markets will prove enduring.

ECONOMIC EFFICIENCY AS A SOCIAL GOAL

We begin with a review of the conditions under which markets operate at optimum efficiency. The objective that a market-oriented economy has for its insurance industry is the same as that which it has for other industries – an efficient allocation of society's scarce resources while maximizing consumer choice and value. At the same time, society desires a system that leads to continuous innovation and improvement. These objectives are most likely to be achieved through competitive markets. A **market** is a system of exchange where goods or services are bought and sold.

Competition not only leads to economic efficiency, it provides an automatic mechanism for fulfilling consumer needs and wants and for creating a greater variety of choices. Additionally, in an effort always to secure an advantage over rivals in the market, suppliers engage in efforts to improve their products and services, thus further benefiting buyers.

A **perfectly competitive market** is one with no imperfections and, therefore, societal welfare, as defined by economists, is maximized. The conditions under which a market exhibits perfect competition are shown in Box 1-2. Such a market requires no government direction or oversight to accomplish these desirable social goals.

Neither insurance nor any other market fully meets these conditions. Fortunately, a market can meet them partially and still function efficiently. The more removed actual market functioning is from these ideal constructs, the more imperfect the resulting competition and, therefore, the less efficient is the allocation of societal resources. Consequently, the poorer will be the industry performance and attendant consumer value and choice. Such market-based (as opposed to governmental) deviations from the conditions for perfect competition that cause an inefficient allocation of resources are referred to as market imperfections (or market failures).

Box 1-2
Conditions for a Perfectly Competitive Insurance Market

The following conditions are necessary for a perfectly competitive insurance market:

- *A sufficiently large number of buyers and sellers such that no buyer or seller can influence the market.* This condition means that all buyers and sellers are **price takers** – none can influence the price of the product as determined by its supply and demand. Underlying this assumption is that neither sellers nor buyers engage in collusive behavior.
- *Sellers have freedom of entry into and exit from the market*. This condition means that new competitors can enter the market if they see that existing firms are making higher than **normal profits,** which are the minimal profits that firms must acquire to remain in operation. Firms must not only respond to rivals after they enter the business, but they also must anticipate new competitors. If competitors know that entry barriers are low, they will automatically hold the line on price increases even if no new competitors actually enter the market. The mere threat of new entry can be sufficient to ensure that firms will make only normal profits. Conversely, competitors will exit a market if they cannot make normal profits or if they can make greater profits elsewhere.
- *Sellers produce identical products.* This condition means that no seller can differentiate its products from those of its rivals. Hence, buyers have no incentive to pay more than the market price for any firm's products.
- *Buyers and sellers are well informed about the products.* This condition means that all firms and consumers possess full knowledge about the product or service under consideration and that none has knowledge unknown to others.

Imperfections in Insurance Markets

Insurers exist to control the effects of market imperfections. If insurance markets were perfectly competitive – which they are not – there would be no need for insurers, and government oversight of insurance would be superfluous, as all customers would have complete information.* Each of the functional operations of insurers exists because of imperfections in insurance markets, as does insurance regulation. An understanding of these imperfections is necessary to a sound foundation. They fall into four classifications:

- market power,
- externalities,
- free rider problems, and
- information problems.

* No financial intermediaries would exist if financial markets were perfectly competitive or "complete." **Complete financial markets** are those in which users and providers of funds have complete information about each other, borrowing/lending functions are frictionless, and monitoring is costless. In such an idealized world, all risks can be exchanged at no transactions costs in financial markets in which both buyers and sellers possess all the information they need about possible future "states of the world."

MARKET POWER The competitive model assumes that a sufficiently large number of buyers and sellers compete such that none is large enough to influence price. In fact, most sellers and some buyers can influence price, to some degree. **Market power** is the ability of one or a few sellers or buyers to influence the price of a product or service. Conditions giving rise to market power include: (1) barriers to entry or exit, (2) economies of scale or scope, and (3) product differentiation/price discrimination.

Barriers to Entry or Exit A market with entry or exit barriers and few sellers likely is one in which existing firms have market power. Firms already in a market prefer barriers to entry. Indeed, society can benefit from firms attempting to create *legitimate* barriers such as when products and services undergo continuous improvement, and firms become more attuned to that which satisfies customers. For example, if an insurer devotes great human, technical, and financial resources to developing highly skilled risk selection expertise, it may have created a barrier to entry for competitors because, to compete in their sophisticated lines of business, competitors must acquire this expertise – a difficult and expensive process. Indeed, any investment, marketing, product innovation, or other operation that requires substantial "learning by doing" can create barriers to competitor entry. This gives incumbent firms a (likely temporary) competitive edge but also provides greater consumer choice or value.

Not all market-created entry barriers are legitimate. For example, society does not condone life insurance companies agreeing to set prices or apportion geographic areas among themselves. Nor do we condone a firm making misleading statements about itself or its products to gain market share. In general, market power that arises from concerted actions of suppliers is suspect, whereas market power that arises from individual firm action is not, provided its effects are not to mislead or harm customers. Indeed, society benefits when businesses use their skill, foresight, and acumen to gain market power in this way.

Neither entry nor exit barriers appear to be great in the insurance markets of the U.S., Canada, the E.U., and an increasing number of other countries. Governmentally created entry barriers exist in all countries in the form of licensing requirements and minimum capital requirements, but they usually are not onerous. They are justified on consumer protection grounds. Barriers to exit are comparatively rare worldwide, although some U.S. states are known to discourage domestic insurers from attempting to re-domesticate to other states.

Reasonable freedom of entry does not exist in many of the world's life and health insurance markets. Several countries limit or have onerous requirements for the creation of new domestic insurers, and many restrict entry of foreign insurers in some way, although the trend is toward more liberal markets.

Economies of Scale or Scope Economies of scale (size) or scope can afford a firm market power. **Economies of scale** are marginal costs savings that exist when a firm's output increases at a rate faster than attendant increases in production costs, holding product mix constant, so that average cost decreases. **Increasing returns to scale** are associated with the size of a firm that has economies of scale.

At a certain size – called the **minimum efficient scale** (MES) – firms' long-run average costs are at a minimum, with further growth yielding no additional

efficiencies. If further growth neither adds to nor detracts from efficiency (i.e., average costs are constant), the firm is operating at **constant returns to scale.** If further growth diminishes efficiency (i.e., average costs increase), the firm is operating at **decreasing returns to scale** where further growth diminishes firm efficiency; i.e., average costs increase.

If, however, efficiency increases (i.e., average costs decrease) over an *industry's* entire relevant output range and fixed costs are high and cannot be recouped on exit, conditions exist for a **natural monopoly**. With a natural monopoly, the MES is so large relative to market size that only one firm can operate efficiently.

Studies on insurance scale economies generally find increasing returns to scale for small to moderate size firms and either constant, modestly increasing, or decreasing returns for larger firms. Thus, market power because of scale economies might be minimal in insurance, with no evidence of a natural monopoly. Even small insurers compete successfully with larger firms, usually as careful niche players.

Whether a firm possesses market power from scale economies depends on its size relative to its market rather than its absolute size. A small firm in a tiny market may wield market power. A large multinational corporation in an international market may have little such power. Also, even a monopolist may be unable to exercise market power if the market is *contestable*, meaning that entry barriers are low and exit is easy. In such instances, the mere threat of competition from possible new entrants may be sufficient to cause existing firms to behave as if the market were competitive.

Economies of scope exist when average production costs decline as a firm produces a greater number of different products or services. This too can give rise to market power. Research suggests that scope economies exist for the joint production of some insurance lines and that some economies also exist in the joint marketing of insurance and banking services.

Product Differentiation and Price Discrimination The pure competitive model assumes **product homogeneity –** meaning that competing products are perfect substitutes in the minds of buyers. The model also assumes that all suppliers charge the same price for these products. **Product differentiation** occurs when, because of product quality, service, location, reputation, or other attributes, one firm's products are preferred by some buyers over rivals' products. **Monopolistic competition** exists when a large number of firms produce similar but not identical products, giving the firms an element of market power in the short run. In the long run, the market tends toward a perfectly competitive market.

As with other firms, insurers routinely try to differentiate their products from those of their competitors. They may do so, for example, by building a reputation for financial soundness. Some products – such as term life insurance – are more difficult to differentiate than others, such as cash value insurance. The more complex is a product or the more complex the product is perceived to be by customers, the greater the likelihood of a successful product differentiation strategy. Regulators are concerned about product differentiation only if the effect is to mislead purchasers. Otherwise, product differentiation can lead to enhanced consumer choice and value and to continuous product improvement.

Insurers often attempt price discrimination, although regulatory requirements may thwart this strategy. **Price discrimination** is the offering of identical products at different prices to different groups of customers. For example, an insurer may offer almost identical long term care insurance policies through its agents, brokers, and the Internet but with each carrying a different price. With increasing competition, insurers seek ways to segment their target markets to charge different prices in each. Insurance regulators may become concerned about price discrimination when the insurer's underlying loss experience and expenses do not justify price differences on otherwise identical policies.

Extreme price discrimination can, in theory, lead to **predatory pricing** – lowering prices to unprofitable levels to weaken or eliminate competition with the idea of raising prices after competitors are driven from the market. Although theoretically possible, no evidence exists of widespread predatory pricing in insurance. Predation is a viable strategy only if reentry barriers are high, which generally is not the case in competitive insurance markets.

EXTERNALITIES The conditions for a perfectly competitive market presume that all production costs are fully included in each firm's costs. This is not always true. The manufacturing facility that pollutes the surrounding air with no penalty for doing so imposes costs on the neighboring population in terms of a less pleasant environment and poorer health. Conversely, providing jobs by opening a new business in an economically depressed area may decrease the incentive for criminal activities thereby providing a beneficial spillover effect to the local community.

The Nature of Externalities The above are examples of **externalities**, which occur when a firm's production or an individual's consumption has direct and uncompensated effects on others. **Positive externalities** exist if others benefit without having to pay. **Negative externalities** exist if costs are imposed on others without their being compensated.

The competitive model does not accommodate externalities easily under circumstances for which property rights are weak or nonexistent. The price of goods and services that carry externalities fails to reflect their true benefits and costs. With the polluter, its direct *accounting* costs of production as measured by its expenses for labor, machinery, etc., fail to capture all *economic* costs of production, because the business imposes uncompensated costs on the surrounding community. Its production costs are thus understated, so its prices are lower than they should be, resulting in more sales and higher production and still greater pollution. If the facility were forced to compensate the community for its lessened enjoyment and poorer health, its direct production costs would align more closely to its true economic costs.

Herein lies the problem with allowing competitive markets to deal freely with goods and services that carry externalities when property rights are ill-defined. In general, with negative externalities, the price will be too low, too much will be produced and consumed, and too many resources will be devoted to the industry. Conversely, with positive externalities, the price will be too high, too little will be produced, and too few resources will be devoted to the industry.

Externalities and Insurance Both negative and positive externalities exist in life insurance. Perhaps the most significant insurance-related negative externality is health insurance fraud. From 5 to 15 percent of all health insurance claims in some markets, such as in Europe and North America, are believed to involve fraud. An extreme example of a negative externality associated with life insurance occurs when an insured is murdered for the death proceeds. Fraudulent claims make premiums higher for everyone and can impose costs on concerned families and employers.

Another negative externality flows from the sensitive economic role played by financial intermediaries, as was demonstrated in the 2008-09 recession. **Systemic risks** exist if the difficulties of financial institutions cause disruptions elsewhere within an economy. Box 1-3 discusses systemic risks in insurance.

Box 1-3
Systemic Risks in Insurance Markets

Two types of systemic risks are cascading failures and runs. **Cascading failures** exist when the failure of one financial institution is the cause of the failure of others, with the result that harm occurs elsewhere within the economy. Cascading failures are precipitated by **contagion risk** that exists when financial intermediaries are highly connected. Banks are highly connected via the interbank market. No equivalent mechanism exists with life insurance companies. Unlike banks, insurers do not lend short-term funds to each other. While life insurers can be connected via reinsurance – insurance purchased from other insurers (called reinsurers) on portions of the insurer's portfolio of policies – the practice does not rise to a level sufficient to pose a threat to the insurance industry or financial system or economy as a whole.

Also, **runs** – depositors or policyowners demanding their money at once – can lead to systemic risk if customers lose confidence in financial institutions. Runs result from liquidity risk which can exist when financial intermediaries have illiquid assets and/or mismatches in the durations of their assets and liabilities. Banks have both problems. Insurers do not. While runs have occurred in insurance – policyowners of the two largest U.S. life insurer failures, Executive Life and Mutual Benefit Life, initiated runs – they have been limited to insurers already in financial difficulty and have not caused the failure of sound insurers and have not posed a threat to the soundness of the insurance industry or to the financial system as a whole or the economy.

Positive externalities also exist in insurance. For example, insurers only rarely seek protection under copyright law for their product, processing, and service innovations, thereby allowing others to copy the innovations. Consequently, a tendency may exist for firms to engage in less development than they would otherwise.

Finally, a society may determine that its interests are served best by ensuring that unemployed, sick, injured, and retired persons are provided a base level of economic security through social insurance programs. In providing this insurance, government reduces the likelihood that relatives may have to relinquish their jobs to provide care and that such individuals might impose other costs on society, such as resorting to criminal activities.

Free Rider Problems Goods or services supplied to one person but available to others at no extra cost can cause **free rider problems**. Goods and services with free rider problems and that carry extensive positive externalities are called **public**

goods. Examples include public education, police and fire protection services, and national defense.

A competitive market will not provide public goods. Everyone has an incentive to encourage others to incur the cost to produce the service, which others can then enjoy for free, but each waits for the others to do so, anticipating a "free ride." Consequently, if they are to be provided, government must do so, and they are appropriately financed by societal revenues (taxes). Indeed, the existence of public goods is the primary justification for the existence of governments and for having a tax system.

Free rider problems exist in insurance as when individuals know or believe that others will make good any losses that they suffer. Individuals who believe that they will receive free emergency medical care have less incentive to purchase health insurance.

Insurance regulation is a public good. Persons and firms benefit from regulation, even if they pay little or nothing for it. The private market seems unlikely to provide the level of regulation that most countries' citizens seem to want.

INFORMATION PROBLEMS The perfectly competitive model assumes that both buyers and sellers are well informed. As a practical matter, we know otherwise. Information problems abound in insurance and are the industry's most important category of market imperfections.

Asymmetric information problems arise when one party to a transaction has relevant information that the other does not have and can take advantage of that fact to the first party's benefit and the other party's detriment. Most life insurance company operations and practices exist to address asymmetric information problems. They also constitute the most challenging problems of life and health insurance customers and drive most regulation in insurance. Four classes of such problems are:

- buyer ignorance,
- adverse selection,
- moral hazard, and
- agency problems.

Buyer Ignorance **Buyer ignorance**, commonly referred to as the **lemons problem** by economists, stems from information relevant to a transaction being known by the seller but not by the buyer and the seller uses the information to the detriment of the buyer. "Lemon" is U.S. slang connoting an automobile that appears sound to the buyer but is defective in some way. Individuals purchase policies in good faith, relying on the integrity of the insurance company, its contract, and its representatives. Few consumers are sufficiently knowledgeable to be able to assess fully the quality and value of an insurance contract or to assess adequately an insurer's financial solidity or the integrity of its representatives.

The lemons problem in insurance provides the rationale for the great majority of insurance regulation. Insurers and their representatives have little incentive to disclose adverse information to potential customers. For example, an insurer in poor financial condition is not keen to advertise that fact to potential customers. Doing so would hurt sales. Governments seek to rectify the unequal positions between insurance buyers and sellers by mandating certain disclosures by insurers,

by monitoring insurer financial condition, by regulating insurer marketing practices, and through other means. Private market solutions exist as well, as with rating agencies that rate the financial condition of insurers.

Adverse Selection **Adverse selection,** also called **antiselection,** is the tendency of self selected insurance applicants to exhibit average claim experience greater than that of a randomly selected group of insureds, representing an asymmetric information problem resulting from the fact that the customer knows more than the seller about the customer's situation and uses that fact to the seller's detriment.

It plagues insurers worldwide and is the principal reason that insurers seek extensive evaluative information about proposed insureds. They want to know as much as practical about the loss potential of those to whom they might issue insurance. In this way, they can charge premiums that more equitably reflect the expected value of the losses that a proposed insured adds to the insurance pool.

The insurance company cannot be certain that buyers disclose all relevant information. Proposed insureds have incentives to secure the most favorable possible terms, conditions, and prices. To do so, they may not disclose all that they know about their insurability. If some insureds withhold or misrepresent key risk-related information in the evaluative process, they may pay premiums that are lower than the expected value of their losses. Doing so imposes costs on other insureds in the insurance pool. The challenge for insurers is to obtain sufficient information to assess insurability properly but without incurring excessive expense or imposing undue burdens on proposed insureds.

Insurers try to minimize adverse selection in several ways. First, a central purpose of insurance underwriting is to deter and detect adverse selection. Also, insurance contract wording helps minimizes adverse selection. For example, some individuals contemplating suicide purchase life insurance policies in hopes of providing money to heirs. Most life contracts, however, provide that the insurer need not pay death benefits if the insured commits suicide within the first two policy years. Further, the law provides that the insurer may be able to rescind a policy if the insured misrepresented information to procure insurance. Adverse selection can be so severe that private insurers refuse to offer insurance.

Moral Hazard **Moral hazard** results when the presence of insurance changes the loss prevention behavior – called ex ante **moral hazard** – or loss minimization behavior – called ex post **moral hazard** – of the insured or beneficiary. The effect of moral hazard is that the insured becomes less risk averse. Nonlife insurers are concerned with both types of moral hazard. Life insurers are concerned primarily with *ex ante* moral hazard, but the concern differs as between life insurance and health insurance. Insurers are not overly concerned that insureds for life insurance will engage in behavior that will shorten their lives just because they are insured. Also, they are not particularly concerned that those who purchase life annuities will engage in behavior to lengthen their lives just because they own annuities. For most of us, the desire to continue living is uninfluenced by whether we are insured!

On the other hand, insurers try to avoid selling life insurance whose beneficiary would gain more from the insured dying than from the insured living. They also try to avoid selling disability income insurance whose benefit payment would

exceed the insured's wages. Failure to avoid such situations means that the insurance itself increases the likelihood of the insured event occurring; i.e., it creates moral hazard.

Insurers try to minimize the creation of moral hazard in several ways. In underwriting life insurance, insurers want to be satisfied that the proposed beneficiary designation is logical (what is the relationship between the beneficiary and the proposed insured?) and that the insurance amount bears a reasonable relationship to the financial loss that the beneficiary would suffer on the insured's death. Contract wording also addresses moral hazard. To collect disability income benefits, the contract requires the insured to demonstrate the extent of disability. The main rationale for insurer claims settlement departments is to discourage and identify incidents of moral hazard.

Agency Problems **Agency problems** arise because the interests of one party (the agent) differ from those of the party that it represents (the principal). A person who acts for another is an **agent**. The person whom the agent represents is the **principal**. The agent's incentive is to maximize its personal gain, which is not always compatible with simultaneously maximizing the principal's gain.

Agency problems lurk behind innumerable insurance relationships, operations, and practices. How do the insurer's stockholders (principal) ensure that the board of directors (their agent) takes their interests fully into consideration? How does the board (principal) ensure that managers (agents) take the board's (and stockholder's) interest fully into consideration? How does the insurer ensure that its salespeople (agents) do not misrepresent or withhold required information about the company and its products from customers and misrepresent or withhold key information about the customer from the company? The insurance company cannot always depend on its agents being completely forthcoming to underwriters about applicants' insurability. After all, salespeople are interested in making the sale to secure a commission.

The issue of how to ensure that the insurance regulator (the public's agent) adequately protects the public (principal) is an agency problem. In these and a host of other situations, inefficiencies can arise when the interests of the agent and the interests of the principal diverge.

The key to minimizing the problem lies in arranging incentives (and disincentives) such that the interests of the agent align more closely with those of the principal. This can be done, for example, by tying compensation more closely to the principal's desired outcome or by requiring disclosure by the agent of potential conflicts between the agent's and principal's interests.

Asymmetric Information Problems and Tradeoffs By definition, solutions to information asymmetry problems rest in securing additional information. In each of the above instances, the affected party could obtain more information to reduce the asymmetry. An ill-informed buyer can engage in deeper research about her insurance needs and the quality and prices of insurance policies. The insurer considering the issuance of a policy can always secure additional information about the proposed insured. Insurers can undertake deeper claims investigations to root out fraudulent or exaggerated claims. An insurer's board of directors can establish

a stricter system of monitoring managers, and managers can tighten supervision of salespeople.

However, contrary to the costless information assumption of the competitive model, securing more thorough information imposes additional costs on transactions, either on the consumer in increased search costs or on the insurer in securing more or better monitoring or information. Tradeoffs are inevitable between (1) additional costs incurred to become better informed and (2) additional claim payments and other inefficiencies in making decisions with less information.

Because insurance is a financial future-delivery product tied closely to the public interest, governments judge this information imbalance to warrant substantial oversight of the financial condition of insurers. The widely accepted view is that the public, especially poorly informed consumers, should be protected. The market has some solutions to these problems. Rating agencies monitor insurers' financial condition, rendering opinions as to their solidity. Also, insurance agents and brokers often provide evaluations of insurers and shop the market on consumers' behalf.

Government often believes that it should provide or require that information be provided for the public good. Also, significant economies of scale and scope exist with respect to the consumption and production of regulatory services, further supporting a governmental role.

Why Private Markets Fail to Insure Some Exposures

Private insurers will not provide insurance for every risky exposure. Thus, virtually no private insurance exists against the financial consequences of unemployment. Individuals with no income and no assets generally cannot secure insurance or most other private sector financial services. Insurers voluntarily sell comparatively little individual health insurance, disability income insurance, and life insurance to those in poor health. No financial intermediary will guarantee a family's entire fortune against losses, home against a decline in market value, or computer against obsolescence.

In each of the above and many other instances, the failure of the private market to provide the service stems from one or more of four reasons:

- insurers cannot adequately address the information problems that they encounter, especially severe moral hazard or adverse selection,
- demand is insufficient because buyers have low incomes and/or wealth,
- risk aversion is insufficient to motivate individuals to pay high premium loadings, and/or
- positive externalities accompany the purchase, such as with certain social insurance benefits for some population segments.

An immediate question is: does the failure of a private insurance market to provide some demanded insurance service warrant government stepping in to provide the service? To economists, none of the first three reasons above provides a rationale for government doing so. Only the existence of positive externalities provides such a rationale.

DETERMINANTS OF INSURANCE CONSUMPTION

Insurance consumption has evolved to suit each country's particular environment. Price and innumerable economic, demographic, and cultural factors influence the demand for insurance. Insurance supply is molded by price and by a market's risk-bearing capacity and government regulation.

PRICE Price is determined by the interaction of the forces of demand and supply. From the insurer's perspective, its prices are influenced by its cost structures, by the competitiveness of the particular line of insurance, and by government tax and other policy. Unfortunately, what constitutes the price of insurance is not easy to define. The policy premium is not the price as insureds receive value from the promises of claim payments and often cash values. We also have no satisfactory measure for quantity. Researchers who model insurance have used proxies for price and quantity that, while not completely satisfactory, nonetheless allow us to gain insight into their effect on quantity demanded.

To explore the effect of price on insurance consumption, we need to understand **price elasticity** of demand, which is the percentage change in demand for a good or service resulting from a given percentage change in price; in formula format:

$$\text{Price Elasticity} = \frac{\Delta Q}{Q} \div \frac{\Delta P}{P}$$

In theory, price elasticity can range from zero (perfectly inelastic) to minus infinity. In practice, price elasticities typically range from zero to about minus two. They ordinarily carry a negative sign as the quantity demanded decreases (increases) as price increases (decreases). A price elasticity of –1.0 means that a given change in price can be expected to evoke a precisely proportionate and opposite change in quantity demanded: a 1.0 percent price increase should lead to a 1.0 percent decrease in quantity demanded.

In life insurance, one researcher calculated a price elasticity of whole life insurance policies issued in the U.S., using various price measures.[4] New sales were negatively related to prices, as expected, with elasticities ranging from –0.32 to –0.92, depending on policy type and the price measure used. Another study, using a different approach, estimated an elasticity of –0.24.[5] A study that examined the price elasticity of group life insurance in the U.S. found it to be –0.7; meaning that a 10 percent increase (decrease) in price could be expected to cause a 7 percent decrease (increase) in quantity ($1,000 face amount units) demanded.[6]

ECONOMIC FACTORS Numerous economic factors influence insurance consumption. The level of a country's economic development, as measured by income, has been the most consistently important factor but others also have been found to be significant.

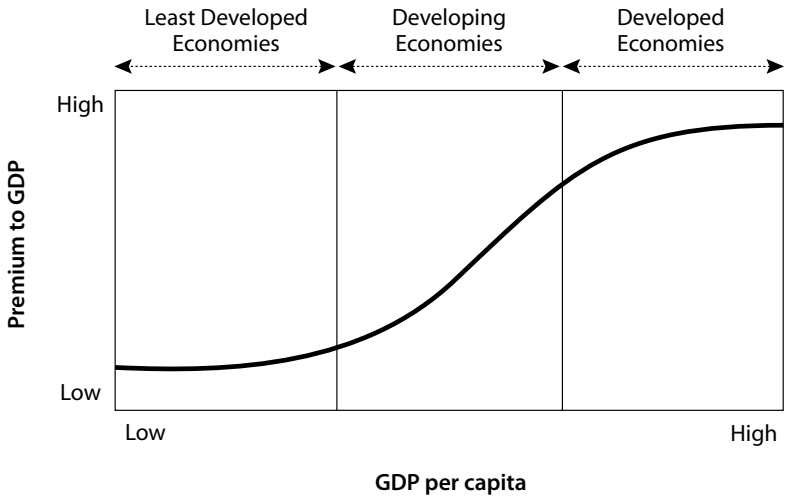
Income and Wealth The higher an economy's income, other things being equal, the more it spends on all types of insurance. Also, at the microeconomic level, the higher a household's income, the greater its insurance consumption.

If we assume that countries follow a similar developmental path, a reasonable conclusion from the studies is that the income elasticity of insurance premiums is

greater than 1.0. The **income elasticity of insurance premiums** tells us the relative change in insurance premiums written for a given change in national income. One researcher found that life insurance consumption in Asia is three times more sensitive to changes in income than in the member countries of the *Organization for Economic Cooperation and Development* (OECD) – the economically advanced, private-sector oriented economies.[7]

Studies suggest that the elasticity itself varies with level of income. Figure 1-5 provides a conceptual way of visualizing this relationship.

Stylized Relationship between Insurance and Economic Development **Figure 1-5**



For the least developed countries, the ratio of premiums written to GDP is fairly low. For mid-income countries, the ratio begins to rise rapidly; that is, the income elasticity is higher. For economically advanced economies, the ratio of premiums to GDP seems to flatten out (and, therefore, the elasticity declines relative to mid-income countries) as consumers presumably have need for only so much insurance and, at higher incomes, have more alternatives to insurance. Also, several studies have shown that life insurance demand increases with increasing levels of insureds' wealth. These results are consistent with a belief that wealthier people have more to protect than the less wealthy, and they have greater financial resources with which to purchase insurance.

Inflation Inflation rates influence insurance consumption. Inflation has long been considered as detrimental to life insurance supply and demand, and studies confirm this intuition. In times of high inflation and significant economic volatility, consumers seek shorter term, more liquid investments and avoid longer-term, fixed commitments. Traditional cash value insurance products are perceived as long-term, fixed commitments, and, therefore, demand for them shrinks during inflationary or volatile times. On the supply side, inflation causes uncertainty for insurers, negatively affecting long-term planning and investing.

Another interesting research finding is that inflation's affect seems to vary by region.[8] One study found that inflation's affect is about 2½ times more important to life insurance demand in Asian economies than in OECD economies.

DEMOGRAPHIC FACTORS Demographics influence insurance consumption. We know that the age of first marriage for both men and women is increasing in many countries, while the years of higher education has lengthened. Dual income families are more common, as are single parent families. These and other demographic trends should be expected to affect insurance demand. Other factors include the following.

That much of the world's population is aging is well recognized. As a consequence, increasing proportions of individuals in many societies are elderly, with prospects for even greater population aging in the future. Increasing life expectancy is predicted to translate into a greater demand for savings-based life insurance products as well as for long term care insurance. Moreover, longer life is hypothesized to result in more affordable life insurance, which should stimulate sales in the segment of populations needing such coverage. Research results are mostly consistent with this hypothesis for developed economies but less so for developing countries.

The educational level of a population or of a household is believed to affect insurance consumption. The expectation is that the more educated or literate a population or household the greater the likelihood of understanding the need for insurance. Research findings are mostly consistent with this hypothesis.

The structure of households continues to evolve worldwide. The nuclear family accounts for a declining proportion of households in most developed countries. Research generally has found that life insurance demand is inversely related to the number of young children in the household and the dependency ratio.

By revolutionizing agricultural production, the plow altered societies worldwide. The production of goods and services thus grew in importance and with it arose ever-larger mining, manufacturing, and commercial enterprises. Business and employment specialization became more important, thus rendering individuals more reliant on trade to obtain that which they and their families no longer produced themselves. Specialization implies vulnerability.

Industrialization brings urbanization which in turn brings about a new social order where the predominant economic and social security formerly provided by family, friends, and acquaintances is replaced to varying degrees by formal public and private arrangements and a necessity for greater financial self-reliance. Research has revealed a positive relationship between industrialization and urbanization and insurance consumption.

SOCIAL FACTORS Cultural perceptions of the role of insurance products can vary substantially. In many countries, especially in Asia, life products are sought primarily as savings instruments, and this is consistent with a high cultural propensity to save. In some countries, especially those that are predominantly Muslim, insurance is sometimes viewed as inappropriate because of religious beliefs (although products and insurer operations can be made to comport fully with these beliefs). See Box 1-4. Research has documented less insurance of all types is consumed in countries that are predominantly Muslim.

In some cultures and with certain relationships (as between close friends, for example), it might be socially unacceptable to refuse the offer to purchase insurance, because saying no is considered impolite. Too often, in such circumstances, a policy is purchased but is terminated shortly thereafter. This has been an issue in South Korea, for example.

Box 1-4
Islam and Insurance

For devout Muslims, the Koran is the source and guide for all social and economic decisions and institutions. The Koran was God's final revelation of His law to humankind. After the Prophet Mohammed's death, Islamic scholars built a body of law – the Shari'a – around the Koran. Among other things, the Shari'a sets out rules for the allocation of resources, property rights, production and consumption, the working of markets, and the distribution of income and wealth. The Shari'a is central to Islamic economic theory and lies at the base of all Islamic financial and commercial activity. For example, an ethic in Islam is that wealthy Muslims contribute (*zakat*) to the less fortunate.

The Koran proscribes the payment of interest (*riba*) and gambling. Like Western banking, Western-style insurance may be dismissed by devout Muslims as a form of usury or gambling. Additionally, some Islamic scholars have argued that insurance is an attempt to defy fate as predetermined by God. Other Islamic scholars respond that, even if life's harmful events are a certainty, preparing for the inevitable is no defiance, especially for one's dependents. Indeed, this is both ethical and economically sound.

To be compatible with Islamic principles, Islamic insurance must incorporate *Mudarabah* and *Takaful*. **Mudarabah** is a form of partnership for which one party provides the funds while another provides the expertise and management. The parties share any profits on a prearranged basis. Islamic insurers invest funds according to the Shari'a (no fixed-income securities; no investment in certain companies such as distilleries). By building a profit-sharing (rather than interest-paying) pooling arrangement, they fully respect the *riba* prohibition.

Islamic insurers establish a **Takaful** – a type of solidarity or mutual fund separate from the management operation, which relies on a pact among participants to guarantee each other. In this way, they respect the prohibition on gambling. The fund, as a collective rather than a one-on-one insuring arrangement, simply protects the investors and their heirs against events that would alter their economic status. The pooling arrangement is consistent with the *zakat* principle of helping those in need.

In a *Mudarabah* insurance contract, participants invest a fixed sum for a fixed term to be distributed between the investment fund and the *Takaful*. The insurer makes a clear distinction between shareholders and policyholders. They invest shareholder capital separately from policyholder funds. Underwriting is permitted to ensure fairness among participants, not to discriminate against or reject anyone. It would be unethical for *Mudarabah* participants to bear the risks of another without a contribution (*tabarru'*) that reflects equitably those risks.

Source: Harold D. Skipper and Tara Skipper, Chapter 16, in Harold D. Skipper, ed., *International Risk and Insurance.* Boston: Irwin/McGraw-Hill, 1998.

Political and Legal Factors Research has established that improvements in a country's political environment enhance insurance demand. Conversely, an unstable political environment depresses insurance demand. Such an environment means that private property rights, human rights, or both are less secure. The non-insurance related decisions made by public policymakers – regulatory agencies, the courts, the legislature, and others – have a profound impact on all financial services, including insurance.

Governments make decisions that directly affect insurance demand and supply. Some research has found an inverse relationship between private insurance consumption and the generosity of public economic security services; that is, the more important are public economic security sources, the less important are private-sector sources, other things being the same. Governments also determine what insurance products can be sold, who can sell them, and how they can be sold. Government often spurs insurance demand by making the purchase of some

types compulsory or affording tax concessions for the purchase of some types of insurance.

Tax laws and the premium approval process greatly influence product design and value. For example, most countries' laws permit a tax deferred accumulation of interest on life insurance cash values and/or offer other tax preferences. Countries that have repealed such tax benefits have realized a decrease in sales of cash value insurance policies.

GLOBALIZATION The continuing globalization of financial services adds a new dimension to insurance consumption, especially for markets that have been highly restrictive. Increasing internationalization can attract increased capital from abroad, product and marketing innovations, and different ways of managing companies. Increased capital strengthens the financial capacity of insurance companies and can result in more competition and therefore consumption. Product and marketing innovations and different management styles can lead to greater consumer choice and value. The trend toward greater market internationalization has affected insurance consumption – as we have witnessed in many Eastern European countries and in China and India – although broad-based research on this issue is sparse.

ECONOMIC CONCEPTS OF LIFE INSURANCE CONSUMPTION

In this section, we explore economic concepts underpinning life insurance consumption. We first introduce the human capital concept. We then show how the human life value concept derives from human capital. We close this section with a discussion of how life insurance fits into the economic theory of lifetime consumption.

THE CONCEPT OF HUMAN CAPITAL

Sir William Petty, considered the "father of political statistics," is credited as the first economist to use the human capital concept, in 1699. Daniel Bernoulli, a famous Swiss mathematician, popularized the concept some 40 years later. **Human capital** is the productive capacity within each person and is considered to be the driving force in economic growth. The essence of human capital is that investments are made in oneself with an expectation of future benefits. Economic research in human capital gained substantial recognition when the 1991 *Nobel Memorial Prize for Economics* was awarded to Gary Becker for his pioneering research on the topic.

Investment in human capital – education, for example – has become one of the most cogent explanations for the differences in countries' rates of economic growth, as well as differences in wage rates between and within countries. Further, as Peter Bernstein wrote in his award-winning book on risk, despite the world's enormous wealth, human capital remains by far the largest income-producing asset for the great majority of people. Bernstein drew the logical connection between life insurance and human capital: "Why else would so many breadwinners spend their hard-earned money on life-insurance premiums?"[9]

THE HUMAN LIFE VALUE CONCEPT

The human life value (HLV) concept is a part of the general theory of human capital. Some semblance of HLV is expressed in the Code of Hammurabi, the Bible,

the Koran, and early Anglo-Saxon law in which it was used to determine the compensation allowed to the relatives of an individual killed by a third party. In recent years, the valuation of a human life in connection with legal actions seeking recovery for wrongful death has gained prominence.

The HLV concept was first applied to life insurance in the 1880s through the efforts of Jacob L. Green, then president of the *Connecticut Mutual Life Insurance Company*, which merged into *Massachusetts Mutual Life Insurance Company* in 1996. **Human life value** is a measure of the future earnings or value of services of an individual – that is, the capitalized value of an individual's future earnings less self-maintenance costs such as food, clothing, and shelter. From the standpoint of one's dependents, the breadwinner's HLV is the value of the benefits that the dependents can expect. Similarly, from the viewpoint of an organization, an employee's HLV is the value added to the enterprise through his or her services to the firm. Thus, a person may have more than one HLV.

Not until the l920s did the concept become widely accepted as an economic basis for life insurance. Solomon S. Huebner was one of the early and most effective proponents of the concept, helping to bring it into both the life insurance practitioner and academic communities. The first edition of this book, published in 1915, contained a section titled "Capitalization of the Value of a Human Life and Indemnification of That Value." In 1927, he published a volume titled *The Economics of Life Insurance* which dealt exclusively with the HLV concept. His five precepts or admonitions regarding HLV are as relevant today as they were almost a century ago. See Box 1-5.

Box 1-5
Huebner's Five Human Life Value Admonitions

1. *The human life value should be carefully appraised and capitalized.* The HLV is based on the fact that persons who earn more than is necessary for their self-maintenance have a monetary value to those who are dependent upon them. Thus, it is the present value of that part of the earnings of individuals devoted to family dependents and others who benefit from these individuals' economic earning capacity. Whenever continuance of a life is economically valuable to others, an economic basis for life and health insurance exists.
2. *The human life value should be recognized as the creator of property values.* HLV is key to turning property into a productive force. In other words, the HLV is the cause and property values are the effect.
3. *The family is an economic unit organized around the human life values of its members*. The family should be organized and managed, and its economic values finally liquidated, in the same manner that other enterprises are organized, operated, and liquidated.
4. *The human life value and its protection should be regarded as constituting the principal economic link between the present and succeeding generations*. The realization of the potential net earnings of the breadwinner constitutes the economic foundation for the proper education and development of children in the event of the breadwinner's premature death or incapacity and the protection of children against the burden of parent financial support.
5. *In view of the significance of human life values relative to property values, principles of business management utilized in connection with property values should be applied to life values.* Principles such as appraisal, conservation, indemnity, and depreciation should be applied to the organization, management, and liquidation of human life values. These principles have been applied to property values for decades.

One's HLV is subject to loss through (1) premature death; (2) illness, injury, or incapacity; (3) retirement; and (4) unemployment. Any event affecting an individual's earning capacity has a corresponding impact on her HLV. The probabilities of loss from death and incapacity are significantly greater than from the other commonly insured perils. Less than one building in every 100 ever experiences a significant fire or other loss throughout its history, whereas one of every seven workers dies before age 65. Moreover, the average property loss in well protected cities does not exceed 10 to 15 percent of the property value involved. Perhaps only one of every 30 fires results in a total loss. By contrast, the death peril always results in a total loss to the potential estate. The same is true of some health events.

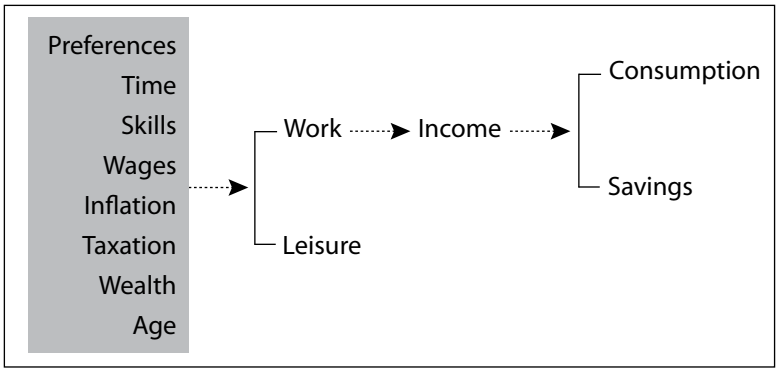
Life insurance and health insurance make possible the preservation of an individual's HLV in the face of an uncertain lifetime. The HLV concept provides the philosophical basis for systematizing the insurance purchase decision.

Economic Theories of Consumption and Insurance

Individuals occupy their time either in activities that produce income (or its equivalent) or in those that do not. For the sake of simplicity, economists label these two states of nature as work and leisure. One's investment in self – in human capital – plus one's preferences, time, wealth, income, and a host of other factors, influence how time is divided between work and leisure. As Figure 1-6 illustrates, work gives rise to income, which in turn is spent on consumption or is saved.

Figure 1-6

Work or Leisure



Economic theories of consumption seek to explain consumer consumption and saving behavior over one's lifetime. It will prove insightful to examine these theories.

Economic Theories of Consumption Economic theories of consumption begin with the assumption that rational consumers seek to maximize their lifetime utilities. **Utility** is a measure of consumer satisfaction derived from economic goods. The theory holds that individuals seek to maximize their utility and minimize their disutility over their lifetimes – that is, to arrange their affairs to derive maximum enjoyment (and minimum discomfort) throughout their lives.

The maximization of lifetime utility, therefore, involves attempts by consumers to allocate their lifetime incomes in such a way as to achieve an optimum lifetime pattern of consumption. This means planning for the future and not living only for today. This concept is rational, but on what basis would we expect individuals to make allocations between now and the future or, stated differently, between consumption now and consumption (saving) for the future?

Some earlier theories suggested that current consumption was some function of a household's current income. More recent theories take a longer-term view, suggesting that individuals consider likely future income as well. The most widely accepted theory is called the **life cycle hypothesis**, which hypothesizes that individuals can be expected to maintain a more or less constant or increasing level of consumption over their lifetimes. Income will be low in the beginning and end stages of life and high during the middle stage of life.

In early life, families "subsidize" children. As the children enter the work force, they begin to contribute economically to their own maintenance, ideally no longer relying on parents for financial support. Incomes increase throughout most of one's working lifetime, with income exceeding expenditures to allow for saving. At retirement, incomes typically cease or diminish, with the retiree entering a period of dissavings as savings are drawn down to support maintenance.

Consumption Theories and Insurance In their earliest forms, no consumption theory allowed for bequests to heirs or for an uncertain time of death. In his seminal paper, Yaari extended the life cycle model by including the risk of dying. He showed conceptually that an individual increases expected lifetime utility by purchasing fair life insurance and fair annuities.[10] "Fair" means paying a premium equal to the expected value of payments to or on behalf of the individual, without charges for expenses or profits.

Pissarides extended Yaari's work by examining the joint motivation of saving for retirement and for bequests via life insurance.[11] He established that life insurance was theoretically capable of absorbing all fluctuations in lifetime income and, thereby, could enable consumption and bequests to be independent of the timing of income. As a result, the same effective consumption pattern could be achieved through the appropriate use of life insurance as could be achieved were the time of death known with certainty. Without life insurance, the lifetime consumption pattern would be different and involve less enjoyment (utility).

Lewis included the preferences of those dependent on the breadwinner's income.[12] His empirical estimates based on U.S. households were encouraging. He found that life insurance ownership was positively related to household income and to the number of dependent children. An important conclusion of his research was that social security substituted for privately purchased life insurance.

Past empirical research has not always found life insurance ownership to be consistent with the life cycle hypothesis. In recent research, Lin and Grace were able to disaggregate whole life and term life ownership and examine their relationship with financial vulnerability over the life cycle. They found the expected consistency. Interestingly, they also found that the more volatile is the financial situation of a household, the more life insurance it purchases and that life insurance is used to manage major financial obligations that were foreseeable in the near term, such as educational expenses and health care costs.[13]

Another dimension of the life cycle hypothesis relates to outliving one's assets. Life annuities offer insurance against this risk. Researchers have established theoretically that the purchase of actuarially fair annuities is welfare enhancing for risk averse individuals. For individuals with high mortality risk aversion, even high priced annuities may be attractive.

The market for individually purchased life annuities seems thin, however. One hypothesis for this result is the presence of substantial adverse selection. Individuals whose life expectancies are high seek annuities, using their superior knowledge about their expected longevity to secure good deals for themselves. As most insurers' annuity pricing schemes are not as refined as life insurance pricing, adverse selection problems would be more prominent with annuities than with life insurance.

For example, lower priced life annuities are not yet widely available for individuals with life-shortening health issues. Such persons, therefore, would be expected to shun life annuities in favor of holding greater proportions of their wealth in other assets – contrary to the expected utility-optimizing behavior implicit in the life cycle model. Such individuals are unable to maximize lifetime utility, because fairly priced annuities are unavailable to them.

Conclusion

Many of yesterday's insurance products, operations, and practices differ from those of today and will differ still more from tomorrow's products, operations, and practices. The fundamentals of risk and insurance, however, do not change, although our understanding of them deepens with time.

We should not study insurance as if we were examining sets of facts, figures, and operational details independent of their larger context. The economic fundamentals of risk and insurance provide this larger context as well as the foundation on which we construct our house of knowledge. The stronger that foundation, the more lasting will be our knowledge and the more easily we can add to it.

Endnotes

1 This chapter draws in part from Harold D. Skipper, Chapters 1, 3, and 4 in Harold D. Skipper, ed., *International Risk and Insurance*. Boston: Irwin/McGraw-Hill; 1998 and Harold D. Skipper and W. Jean Kwon, *Risk Management and Insurance: Perspective in a Global Economy.* Malvern, PA: Blackwell Publishing; 2007, Chapters 1, 2, 4, and 19.

2 *Resolution 21 (X), Life Insurance in Developing Countries*, Adopted at the tenth session of the Committee on Invisibles and Financing Related to Trade, United Nations Conference on Trade and Development, Dec. 1982.

3 All premium data are taken from "World Insurance in 2013," Sigma (2014), Zurich: Swiss Re.

4 D. F. Babbel, "The Price Elasticity of Demand for Whole Life Insurance," *Journal of Finance 4*, Issue 1 (1985), pp. 225-239.

5 M. J. Brown and Kihong Kim, "An International Analysis of Life Insurance Demand," *Journal of Risk and Insurance*, 60: (1993), pp. 616-634.

6 "The Effects of Price Adjustment on Insurance Demand," *Sigma* (1993), Zurich: Swiss Re.

7 D. Ward and R. Zurbruegg, "Does Insurance Promote Economic Growth? Evidence from OECD Countries," *Journal of Risk and Insurance*, 67: (2000), pp. 489-507.

8 *Id.*

9 Peter L. Bernstein, *Against the Gods: The Remarkable Story of Risk* (New York: John Wiley & Sons, 1996), p. 110.
10 Menahem Yaari, "Uncertain Lifetime, Life Insurance, and the Theory of the Consumer," *Review of Economic Studies* (Apr. 1965), pp.137-150. This finding was confirmed by Stanley Fischer, "A Life Cycle Model of Life Insurance Purchases," *International Economic Review* (Feb. 1973), pp. 132-152.
11 C.A. Pissarides, "The Wealth-Age Relation with Life Insurance," *Economica* (Nov. 1980), pp. 451-457.
12 F. D. Lewis, "Dependents and the Demand for Life Insurance," *The American Economic Review* (June 1989), pp. 452-467.
13 Y. Lin and M. Grace, "Household Life Cycle Protection: Life Insurance Holdings, Financial Vulnerability, and Portfolio Implications," *Journal of Risk and Insurance* (March 2007), pp. 141-173.