Featured Article (Research Paper)

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Economic and Environmental Conditions for the Diffusion of Insurance in Three Non-Euro-American Regions During the Nineteenth and Twentieth centuries

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Abstract: This paper discusses the macroeconomic and environmental conditions for the spread of insurance in three non-Western world regions (China, Middle East and sub-Sahara Africa). Focusing on the nineteenth and twentieth centuries, it examines the patterns of economic development relevant for the growth of insurance in these regions, and compares these against standard economic models of insurance diffusion. The paper argues that the growth of insurance must be explained by more than a simple linear relationship with the growth of per capita incomes. As well as income levels, other factors affecting insurance development include urbanization, taxation, savings rates, legal compulsion to insure, state provision of social security, state-owned insurance bodies and the presence of large infrastructural projects. The second part of the paper focuses on environmental conditions in these regions that drove insurance growth, including climate and geography, demography, drought and disease, building materials and risk-reduction technologies.

Keywords: Africa, China, insurance development, Ottoman Empire

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1 Insurance, Economic Growth and Economic Development

Economic theory has commonly regarded the growth of insurance as a function of economic development and rising incomes. Mature economies have a larger financial service sector, including insurance, than less developed economies. The two standard indices of insurance development, namely insurance penetration (insurance premiums as a percentage of GDP, hereafter IP) and insurance density (insurance premiums per capita), both assume that rising per capita incomes lead to a greater purchase of insurance, both to protect personal asset values (general insurance) and to save for the future (life insurance), so that wealthy countries enjoy higher insurance penetration than poorer countries. The trend line for IP ratios represents an S-shaped curve, with IP ratios rising fastest among middle-income economies in the middle part of the curve. Across all countries, the average income elasticity of insurance demand is about 1.4. In middle-income or emerging economies, however, this elasticity can be as high as five or six, so that, as they develop, their insurance industries grow much faster than average incomes. The model also suggests that in both low and high incomes countries at either end of the S-curve, the income elasticity of demand for insurance is closer to one. In poorer countries the levels of wealth and awareness of insurance are too low to cause demand for insurance to grow faster than incomes. In high income economies, demand reaches a saturation ceiling at the top of the curve, beyond which insurance consumption ceases to grow faster than incomes. In these countries people are on average wealthy enough to retain some risks rather than pay to insure them.[1]

This finding of a statistical relation between incomes and the diffusion of insurance is based on the classical economic premise of a perfect market and well-informed buyers maximizing their expected utility of wealth. The purchase of insurance is a rational exchange of a sum of money in return for protection of an asset value against an uncertain loss from an uncertain event (non-life insurance), or a certain loss from a certain event at an uncertain point of time (life insurance) (Smith 1971).[2] The game theoretical approach to insurance, pioneered by Wasow (1974), is based on the same premise that consumers rationally find their optimal levels of insurance in order to maximise different utility of wealth functions.

1 The S-curve was developed by economists at Swiss Re, and they have subsequently updated their regression model with data from more than 140 countries (e.g., Baker 1987; Enz 2000; Millo 2020; Swiss Re 1999, 2015; Wasow 1986).

2 By comparison, Falciglia (1980) suggests an alternative model with income or consumption uncertainty, and emphasising the role of the interest rate in determining demand.

This approach, in turn, mirrors the view held by many historians that modern insurance was a product of the providential forethought and rational calculation, and the accompanying desire to "domesticate risk" and protect people and goods, promoted by a confluence of the Enlightenment and the commercial expansion of early modern Europe (Daston 1987; Verhoef 2021).

Those who developed the S-curve model have acknowledged its limitations. They have recognized that the income elasticity of demand for insurance differs greatly across individual countries and that the decision to buy insurance may be affected by factors other than income levels, such as movements in the price of insurance, the introduction of compulsory insurance lines and other legal and fiscal changes, state provision of social security, as well as political, social, cultural and religious variables, including culturally-determined attitudes to risk that may or not may not be viewed as rational (Chan 2012). It is also important to account for the often very different development paths of individual lines of insurance. Economic and technological change determined, for example, the timing of the emergence of motor and aviation insurance. The expansion of life insurance in Muslim countries was partly dependent on religious attitudes, while in developed markets life insurance penetration was influenced by welfare provision, savings behaviour, tax deductability of premiums and a range of other factors. In recent times premium growth rates in non-life lines such as accident, private medical, liability, motor, property, marine and credit insurance have all diverged greatly since the financial crisis of 2007–8 (Swiss Re 2015).

Environmental conditions were also significant influences on insurance growth, including climate and geography, demography, drought and disease, building materials and risk-reduction technologies. For reasons of space, not all of the above social, religious, cultural and political factors can be fully considered here, but we do devote the second part of this paper to a discussion of the environmental threats driving the search for risk-spreading and risk-management solutions, including insurance, in our regions, namely China, Turkey and East and West Africa. The selection of regions has been determined partly by the scope of the project and the specific linguistic and other expertise of the project team, and the timeframes are necessarily asynchronous given the different chronologies of development in the different regions – East and West Africa seeing the diffusion of insurance penetration commence much later than was the case Ottoman Turkey or Qing China. Nevertheless, the regions do encompass a range of colonial, non-colonial and post-colonial insurance markets across three continents during the nineteenth and twentieth centuries, and, we argue, offer the basis for informative contrasts and comparisons, as discussed below.

Historical data also demonstrate that the diffusion of insurance in the past cannot simply be read off an S-curve of insurance penetration. Comparing estimates of the volume of British non-life (fire and marine) insurance premiums as a percentage of British GDP in 1801 and 1841 with those for a range of advanced and developing economies in 1970/1 suggests that insurance in early nineteenth century Britain, after a century of growth, still lagged behind the growth of insurance in large developing economies of the late twentieth century. With a real per capita income in 1801 one third higher than that of India in 1970, the IP ratio in Britain was lower. By 1841 real per capita income in Britain had already overtaken the levels reached both in Pakistan and the Philippines by 1970, yet the 1841 IP figure in Britain was about the same as in 1970 Pakistan, and it was just one-third of the level in the Philippines (Pearson 2004).

Moreover, in industrializing Britain insurance did not march strictly to the tune of economic growth or structural change. Applying the modern average income elasticity of demand for insurance, noted above as 1.4, to British real GNP in the period 1760–1831, fire insurance premiums in Britain should have increased in real terms by 0.90 per cent per annum between 1760 and 1780, 1.93 per cent between 1780 and 1801, and by 2.66 per cent between 1801 and 1831. In fact, real premiums grew by 2.35 per cent in the first period, slowed down to 0.09 per cent in the second period, and accelerated to 2.87 per cent between 1801 and 1831. Booms in urban housing construction, especially in London, in the 1760s and early 1770s, followed by a hugely punitive stamp tax imposed in 1782 that more than doubled the cost of an ordinary residential insurance policy, were the main determinants of this pattern of growth. In other words, the S-curve of the modern world appears to provide a poor guide to understanding the development of fire insurance in Britain during the first industrial revolution (Pearson 2004).

For all the regions examined in this paper for most of our period, a lack of consistent insurance data and national income accounts makes it difficult even to estimate IP ratios with any confidence.[3] There are sufficient indications, however, that the diffusion of insurance followed a non-linear path that is not well explained by the S-curve. In the Ottoman Empire during the decades before the First World War, insurance grew rapidly due to several factors that not only included personal income. Between 1873 and 1913 life insurance, measured by new sums assured, grew more than 67-fold.[4] This explosive growth, however, unfolded unevenly, passing

3 There are no such data at all for East and West Africa before the mid-twentieth century, only limited and fragmented data for Ottoman Turkey, and no consolidated insurance data for China, other than lists of companies and agencies in commercial directories, before the 1930s. We are grateful to an anonymous reviewer for drawing our attention to the data in *Zhongguo baoxian nianjin* (Chinese Insurance Yearbook) for 1936.

4 A stamp tax on fire and life insurance premiums was introduced for the first time in 1894, but Ottoman government sources are too fragmentary to be useful in a reconstruction of the life through no less than six stages. Stagnating between 1873 and 1893, growth accelerated in the following years, only to enter another phase of relative stagnation in 1903. From 1907, sales picked up again and remained, in the two subsequent years, relatively high in spite of a continuous decline from the record level of 1907. From 1910 insurance entered another upswing, with its output growing exponentially until 1913. Overall, life insurance in real terms far outpaced the rate of the Ottoman population within the borders of the present-day Turkish republic.[5] From just 0.02 French francs (FF) real insured per capita in 1893, the figure rose to 0.35 FF in 1912. Life insurance per capita, however, did not rise at a consistent pace. Having reached 0.14 FF in 1900, the amount of life coverage sold was subject to both periodic lulls and sharp declines. Between 1903 and 1906, and 1908 to 1909, life insurance barely kept pace with population. It was not until 1910 that sales picked up again in a market that continued to expand at a rate of some 0.69 per cent annually, with insurance sold per capita remaining in excess of 0.25 FF until 1914 (Pamuk 2018). As it consisted principally of city dwellers, the actual market for life insurance was considerably smaller than indicated by the Ottoman population as a whole. Relative to the population of all major cities within confines of contemporary Turkey, the increase in insurance coverage was spectacular, growing from 0.03 FF per urban inhabitant in 1892 to 1.86 FF two decades later (real values).

Regressing different variables onto Ottoman demand for life insurance before World War One indicates that it was positively correlated with personal disposable income, premium rates and the relative cost of insurance, as well as levels of literacy and thus awareness of insurance. The price of life insurance was extremely volatile over the period. Norwich Union Life's premium rate in Turkey averaged 4.85 per cent but that price oscillated between 1899 and 1914 within a range of more than 2.5 percentage points. From as low as 3.67 per cent in 1899, it rose to 6.19 percent in 1907. After 1908, it remained relatively stable at an average of 4.73 per cent. This pattern might be best explained by changing levels of competition and the emergence of informal collusion between key market players, the evolution of the customer base, and by changing consumer preferences, particular the rise of endowment policies at the expense of more traditional whole-life policies. Although lower prices may have encouraged sales in general, the premium rate alone seems a rather poor predictor for insurance growth. In the case of the Norwich Union Life, for instance,

insurance market. This estimate is based on the aggregate new sums assured of 11 life insurance companies (five British, four French, one German, one American) operating in Constantinople and other places in Turkey, which rose from 71,000 French Francs (real values) to 4.7m FF during this period.

5 Population grew by 24 per cent between 1880 and 1914, while real sums assured grew more than 45-fold (Issawi 1980).

cheaper policies fueled growth in 1906, but they failed to do so in 1912. Indexing premium rates against Ottoman consumer prices, shows that, while the nominal price of life insurance remained fairly stable, its relative cost decreased constantly, dropping sharply in 1912 before rising again in subsequent years. Even at the all-time peak of nominal rates in 1907, insurance was actually cheaper than it had been at the turn of the century.

Moreover, there is reason to believe that the purchasing power of certain segments of society may have increased disproportionately in relation to cost of insurance, making it even more affordable. These included those who profited most from a globalising economy, the "comprador bourgeoisie" – the wealthy inhabitants of the western and northern Turkish seaboards – first targeted by insurance companies and also the first to demand life coverage. However, some from the lower middle classes, including tailors, butchers, and lower-ranked civil servants residing in the great cities and in more rural and remote locations in central and eastern Anatolia, also took out life insurance.

Finally, Turkish insurance between the World Wars also appears to have developed in a way that was not synchronous with rising income levels. Figure 1 shows that while Turkish average incomes rose between 1927 and the outbreak of World War Two, the volume of life insurance premiums was 12 per cent lower in 1939 than it had been in 1927. This may have been connected with changes in the relative cost of insurance, as discussed above for the period before the First World War, or, perhaps more likely, with the withdrawal of most foreign insurance companies from the market during this period.[6]

In several ways the diffusion of insurance in late Qing and Republican China bore a resemblance to that in Ottoman Turkey. The supply of insurance was entirely in private hands, its pattern of development was irregular over time, it usually outpaced economic growth but touched only a small minority of the population. Government played at most a minor role in the sector and regulated and taxed it lightly if at all, one result of which is a lack of consistent statistics on the industry available to the historian.

Just as we have few solid data on the size or growth of insurance in China, the same can be said of China's economy in general. Most scholars agree that during the long period of violence marked by the Taiping Rebellion (1850–69) China's economy suffered and its population declined. Both recovered after the rebellion, although the rate of that recovery is in dispute. Chinese GDP was estimated by Angus

6 More research is required on this issue, but decision to withdrawal may have been due to the genocidal policies pursued against the Ottoman Empire's Christian populations, or a general decline in wealth, or the difficulties involved in building or rebuilding efficient sales networks after the war. The trend was for domestic companies to replace foreign firms in this period.

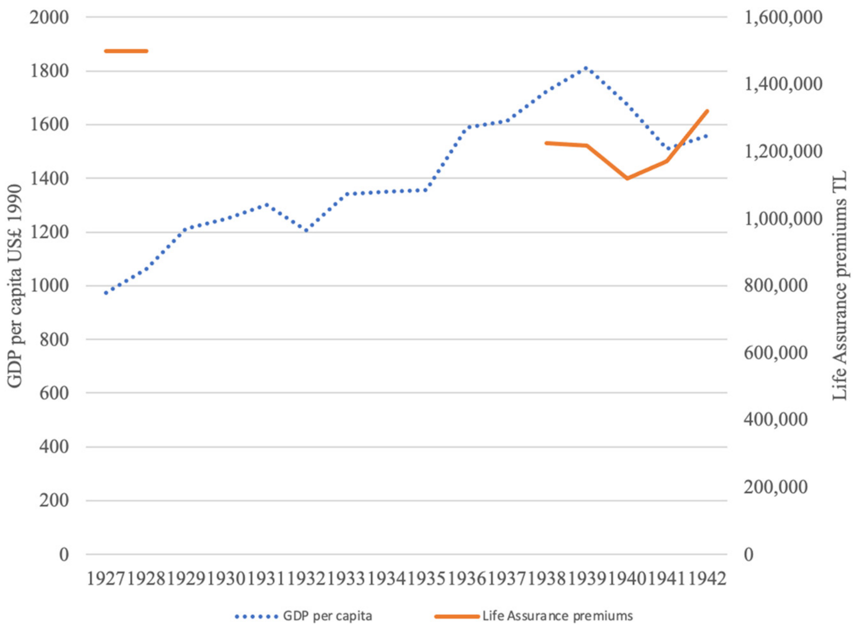

Figure 1: Turkish GDP per capita and life assurance premiums, 1927–42. Note: Turkish GDP per capita in 1990 US$ – PPP adjusted; Life Assurance premiums in Turkish lira (current values). Sources: Ottoman Bank (1942), Pamuk (2018).

Maddison to be $247bn in 1850, falling to $190bn in 1870, then recovering slowly to $241bn by 1913. Only during the interwar years did the economy exceed the size it had reached by the middle of the nineteenth century (Maddison 2006). This sluggish growth was accompanied by only modest structural changes in the economy. Agriculture accounted for 67 per cent of GDP in the 1880s, and still 65 per cent by 1933 (Richardson 1999). Throughout the period the craft sector accounted for most industrial output. As late as 1933 this share was estimated to be 68 per cent (Fairbank and Liu 1980). Estimates of average consumption suggest that the rural population was poorly fed. A standard subsistence daily intake of 2000 calories indicates a generally hungry population throughout the period though rural immiseration was not a universal experience (Richardson 1999).

Other aspects of the Chinese economy that have been identified as brakes on development include low or falling wages, low labour productivity, primitive techniques in agriculture, income inequality, a large population beset by Malthusian constraints of poverty and famine, and the prevalence of extended households and kin networks that act as substitutes for (allegedly) more efficient market transactions (Benjamin and Brandt 1997; Elvin 1973; Zhang 2014). Other factors said to have obstructed economic development were the lack of a legal infrastructure to sustain formal contracts (Rosenthal and Bin Wong 2011), the poor transport infrastructure in the vast interior of the country, a large internal trade that was operated by Chinese merchants through traditional channels, and a foreign trade that was tiny when measured in per capita terms.

In one sense, general trends in the Chinese economy were largely irrelevant for the insurance industry – both Western and Chinese-owned. As a sophisticated financial service, it barely touched the great majority of the population or most of the economy in the interior of China. Probably a more important indicator of the market for insurance was the growth of trade, property and population in the treaty ports alone. From one treaty port (Canton) before 1842, there were 69 such ports by 1912. These provided the main markets for Western companies in all lines of insurance.

Using the foreign population of the treaty ports as a proxy for the size of markets for property and life insurance, the data show rapid growth from a low base between 1851 and 1900, followed by both a great acceleration in the total number, and a greater diversity of nationalities. In 1871 there were probably fewer than 2000 British civilians resident in China, including Hong Kong. By 1900 this figure was nearly 9000. By 1931, there were around 20,000 British residents in China, which probably marked the peak.[7]

Taking only the British civilian resident population of the treaty ports, the potential market for Western life insurance companies was over ten times larger in 1931 than it had been in 1871.[8] The absolute size of this market, however, remained small – no larger than that of a modest English provincial town, if we exclude most of the émigré White Russians in the treaty ports, many of whom lived in dire poverty, and the Japanese who mostly bought their insurance from the local agencies of Japanese companies. While Chinese elites increasingly insured their lives with the growing numbers of Chinese-owned companies, low incomes excluded the majority of Chinese from the market (Lowenstein 2020). As an observer remarked in 1925: "…the majority of the population of China are below the poverty line if that line is placed at a per capita annual income of $15 per year or a family (of five) income of $75 or even $50 per year, and probably four-fifths of those above the poverty line consume each year all they produce" (Dung 1928). If the annual

7 The estimates are calculated from data in Bickers (2010), and China Maritime Customs Service (1913). They exclude British military personnel stationed in Hong Kong.

8 The British figures alone understate the growth of the market. Although we do not have reliable data for all foreign populations during the entire period, British residents accounted for about half of the foreigners in China in 1900 (excluding Japanese and Russians), but only about one-third by 1917. Calculated from China Maritime Customs Service (1913, 1918).

premium required for a small (£100) life insurance policy could absorb the annual income of the majority of Chinese, or one third of the income of intermediate groups living above the poverty line, it is clear that affordability alone severely restricted the expansion of life insurance in China in this period. Presumably average incomes were even lower in the late nineteenth century, making financial constraints on insurance growth at that time even greater.[9]

An analysis of the Shanghai policy registers for 1900–3 of the largest Western life insurer in China, Standard Life of Edinburgh, reveals a striking absence of native Chinese and women. This probably reflects the highly-skewed gender composition of the ex-patriate community in China during this period, dominated by young bachelors and single men working for private commercial and financial firms or in government or military service. Nevertheless, the expansion of the life insurance in China depended on the ability of foreign as well as local offices to reach successfully beyond the ex-pat community. As early as 1903 some offices, such as China Mutual were writing almost all their new business on native lives. Gradually the Chinese native market appears to have grown. Dung (1928) estimated that the total volume assured in 1926 was G$ 15m, of which G$ 9m was on Chinese lives and the remainder on the lives of foreign residents.

We have little idea of the overall size of the market for fire insurance in the treaty ports before the 1930s, but it must have grown during the period, given the expansion of stone-built residential, commercial and public buildings in the international settlements. The expansion of modern industries also provided new high value properties to be insured against fire, such as textile mills, warehouses and machinery, complex risks which were already familiar to European insurers. We can assume that little of the residential property of ordinary Chinese in their crowded living quarters in major cities was deemed insurable by Western underwriters, taking into account their subjective views of the physical and moral hazards involved in insuring non-European property located outside the international settlement districts (Zwierlein 2017). One estimate of insurance penetration for 1937 shows fire insurance premiums as 0.19 per cent of Chinese GDP, which is just half of the level reached in the UK by 1841 and well below the levels seen in several Asian countries by 1971 (Pearson 2004). However, the estimate also suggests, very plausibly, that in treaty ports such as Shanghai insurance density and penetration was many times higher than the average for the whole of China.[10]

9 The average annual premium for a £100 with-profit life insurance policy issued by Standard Life in China at the turn of the century was around £5, or about $25.

10 We are very grateful to an anonymous reviewer for these Chinese estimates, which we have not yet been able to verify ourselves from the original source. See footnote three above.

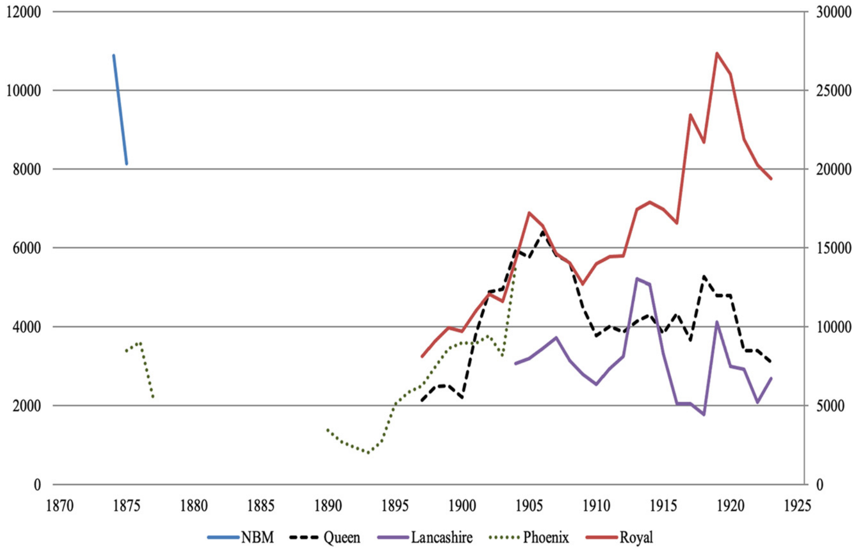

Figure 2: Net premium earnings from fire insurance of five UK insurance companies from their China agencies, 1874–1923. Note: Royal Insurance graphed on right *y*-axis, other companies on left *y*-axis. Sources: Ryan (1983), Trebilcock (1998); Aviva plc archive, North British & Mercantile, (General Court Minutes 1870–1914) and Royal Insurance (Results of Foreign Business, vol. 1 1887–1906).

The records of five British fire insurance companies operating in China between 1874 and 1923 reveal the rapid growth of their premium income from the mid 1890s, a growth sustained into the later 1900s. This was followed, in the case of the Royal Insurance Company, by a downturn, recovery and rapid upswing through to the 1920s (see Figure 2). This pattern of growing fire insurance income during the 1890s and early 1900s, resembles the trend in other lines of Chinese insurance. Rapid premium growth in marine insurance was highly correlated with the growth of Chinese foreign trade from the 1890s after two decades of sluggish trade growth (see Figure 3). It suggests a wider acceptance of, and demand for, all types of insurance in this period of political and economic change. It also curiously mirrors the rapid expansion of insurance in the Ottoman empire at the same time, also during a period of reform, pointing to the importance in these regions of the impact of changing political environments on the diffusion of insurance.

Insurers from Britain, Western Europe and the US entered the Chinese and Ottoman Empires as outsiders having to cope with the bureaucracy, the regulations

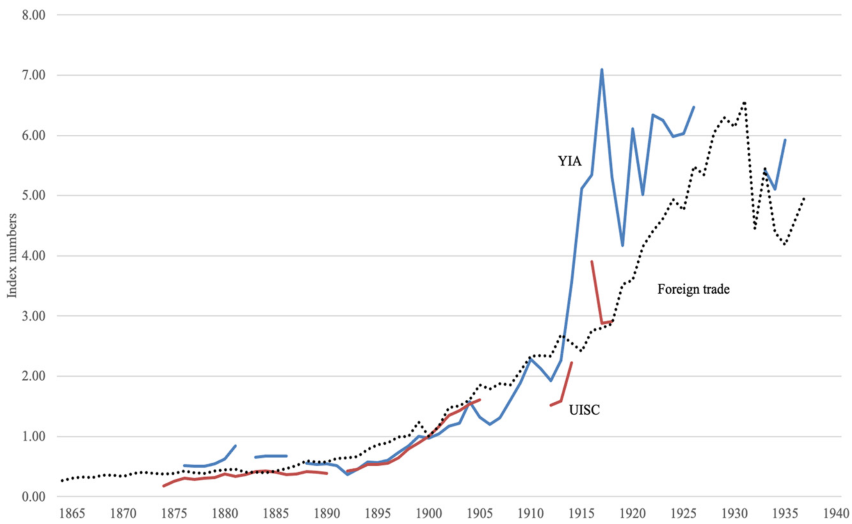

Figure 3: Chinese foreign trade and marine insurance 1864–1937. Key: YIA = Yangtze Insurance Association of Shanghai; UISC = Union Insurance Society of Canton.
Note: Trade values indexed on 1900 = 100. Sources: Company annual reports and Hsiao (1974).

and the police powers of foreign governments and jurisdictions.[11] The situation in colonial East and West Africa was somewhat different, as British and French insurance companies enjoyed the advantages of formal imperialism, including government and jurisdiction by their own settler communities. The result of colonial rule was slow economic development and a very limited market for insurance. By the late 1950s agriculture still employed over 80 per cent of the workforce in East Africa and only four per cent of the population lived in towns and cities.[12] Import substitution industries accounted for less than five per cent of the GDP of Tanganyika. Europeans occupied the most senior jobs in colonial government, while Asians occupied largely middle positions in the civil service or engaged in retail business in urban areas (Kenya National Archives and Documentation Service 1952).

11 Although after the first Opium War of 1840–2, the British, followed by other foreign residents, within their settlements in the Chinese treaty ports benefitted from their own jurisdiction and administration under their assertion of extra-territorial rights, this imperialist assertion was always vulnerable to being contested by the Chinese authorities. Towards the end of the nineteenth century and beyond the revolution of 1911 it became a major source of grievance for Chinese nationalists.

12 In this paper East Africa refers to the states of Kenya, Uganda and Tanzania.

Most Africans formed a peasant class at the bottom of the social order. In 1957 in Tanganyika fewer than 15,000 African males earned wages of more than £10 a month, representing a tiny African middle class (Kimambo and Maddox 2017).

Insurance companies in East Africa targeted the European and Asian communities, which never exceeded three per cent of the population. During colonial rule the great majority of Africans lacked sufficient disposable income to purchase insurance. Nevertheless, there were some financial service developments in the years after the Second World War. The rural networks of British banks in Kenya, for instance, expanded rapidly to 177 branches by the 1960s from just 16 branches in 1926 (Central Bank of Kenya 1970). The number of insurance companies (general and life) operating in East Africa rose from 93 in 1950 to 130 ten years later. The increase was particularly marked in companies specialising in general insurance, which rose from 56 to 99 (East African Statistical Department 1964). This growth was due to several factors. First, the expansion of the settler economy in Kenya justified the transformation of insurance agencies into branch networks with greater autonomy from head office. Second, the modernisation policies of the late colonial regime reflected an attempt to create "an ideal British society in East Africa" (Tanzania National Archive 1944b). These policies emphasised the importance of social security programmes. Third, the "Grow-more-crops" campaign in East Africa during the 1950s expanded the export of raw materials. This campaign aimed to increase colonial revenue and enlarge the proportion of African cash crops in the colonial economy (Kimambo and Maddox 2017). This contributed to a rise in demand for marine insurance. Fourth, pressures from the International Labour Office in Geneva forced the British colonial government to transform the largest section of African cheap labour into a wage labour force, which had implications for accident insurance (Tanzania National Archive 1944a).

In 1961 Tanganyika gained independence from Britain. In 1963 it joined the newly independent Zanzibar to form the United Republic of Tanzania, in the same year as Kenya achieved its independence. The political winds of change had economic implications and the number of insurance companies declined in the early 1960s. The massive exodus of settlers during this period badly affected the insurance business, which had been largely financed by the settlers' investments. Insurance branches closed and some insurance companies in Kenya collapsed during the period of 1961–1963. The newly independent government in Kenya under Jomo Kenyatta, however, convinced some settlers to remain, and this helped the recovery in the number of insurance companies in late 1963 and 1964 and an increase in premium volume and investment income (see Table 1).

The decades after independence witnessed the increased role of government in African economies. Government expenditure in East Africa rose as a proportion

Table 1: Insurance in East Africa 1959–64.

Year	Total no. companies	Gross premiums	Gross claims	Loss ratios (gross) %	Income from assets	Surplus
1959	130	10,903,182	4,024,136	36.9	963,863	4,562,941
1960	130	11,814,120	4,964,608	42.0	1,244,594	4,250,469
1961	128	11,772,550	5,901,689	50.1	1,426,852	3,443,995
1962	120	13,111,880	5,965,285	45.4	1,516,984	3,827,389
1963	121	12,451,114	5,775,179	46.4	1,644,032	4,061,815
1964	125	13,195,417	6,794,465	51.5	1,899,047	3,812,198

Sources: Loxley (1966) and East African Statistical Department (1964).

of GDP, though savings rates fell.[13] Rural-urban migration increased massively. The urban population rose from 11 per cent in 1960 to 21 per cent in 1980 (South Centre 1998). The motive behind government policies was to expand African participation in economic development. British financial institutions, however, continued to dominate the East African markets. For example, in 1973, three commercial banks managed by British multinational banks continued to account for approximately 80 per cent of total commercial bank deposits in Kenya (Central Bank of Kenya 1974). Before 1965 the new independent governments omitted to pass legislation that required insurance companies to invest their assets in local markets, so there was an outflow of insurance capital from Tanzania and Uganda to Kenya and an outflow of surpluses back to British head offices. This outflow triggered the indigenisation of insurance business in the region from the late 1960s. This took the form of localisation in Kenya, state support for Kenyan-owned private businesses, while in Tanzania in 1967 the socialist government nationalized both insurance and banking. The state-owned National Insurance Corporation was authorised to transact all insurance business. While contemporaries argued that the main reason for this policy was to expand insurance benefits to Africans who had been ignored by foreign insurance companies, another important reason for nationalisation was "to channel people's savings for the purposes of financing the developments plans of the country and the economic uplift of the entire population" (National Insurance Corporation 1971). Under monopolistic conditions, the National Insurance Corporation of Tanzania (NIC) invested funds into building projects,

13 Between 1960 and 1979 government expenditure increased from nine to 16 per cent of GDP in Tanzania, and from 11 to 20 per cent in Kenya. World Bank (1980).

short-term deposits, loans on mortgages and government stocks.[14] The corporation‘s investments expanded from Tsh 2.9m in 1966 to Tsh. 122.7m in 1977. By mid-1977 about 57.8 per cent of NIC investment went direct to government stocks while 32.9 per cent was placed as deposits with the national bank. Between 1970 and 1977 the NIC's premium income increased sixty-fold from TSh. 5.4 million in 1970 to TSh. 324.6m in 1977 (National Insurance Corporation 1970 and 1977).

Specific economic and climatic factors, the latter discussed further below, helped drive this growth. The droughts which affected the region between the late 1960s and 1970s necessitated the importation of food grains from different parts of the World. This had a positive impact on the expansion of NIC's marine insurance business. Between 1970 and 1977, marine premiums increased from Tsh. 2.9m to Tsh. 33.4m (National Insurance Corporation 1980). The introduction of micro-insurance schemes in rural areas during the late-1970 and 1980s had a significant impact on the expansion of life insurance, even though the global economic recessions of the 1970s adversely affected peasants in East Africa and their average incomes did not improve. Some scholars have suggested that economic hardship and the greater access of micro-insurance pushed many peasants into taking out policies in the hope of using them as collateral for loans (Loxley 1979). Whatever the reason, net life insurance premiums earned by the NIC rose from Tsh. 13.1m in 1970 to Tsh. 71.4m in 1977.

By the 1980s, despite this growth in insurance sales, difficulties soon emerged with nationalised insurance in Tanzania. Mbilinyi (1996), then minister of finance, reported that in the absence of competition the quality of insurance services had deteriorated. Many policyholders were not paid when their policies matured or in the event of a loss, while at the same time the interest and bonuses received from endowment policies were too small to offset soaring interest rates and inflation. In sum, although the insurance nationalisation experiment in Tanzania, as also in Ghana, helped provide capital for aspects of economic development, as a means of diffusing insurance through the population it demonstrated severe limitations.[15]

14 Insurance institutions, both private and state-owned, performed similar economic development functions in India and South Africa between the 1950s to the 1980s (Jitschin 2010; Verhoef 2018).

15 The Ghana Insurance Corporation invested in a number of Ghanaian and West African development banks, as well as oil mills and the Ghana Tourist Development Company (Ghana Insurance Corporation 1987).

2 Environmental Factors Influencing Insurance Diffusion – Climatic and Health Regimes

While the relation between economic growth and the diffusion of insurance across our regions was variable and uncertain, there is no question of the importance of environmental threats driving the search for risk-spreading and risk-management solutions, including insurance. Droughts, locust invasions and epidemic diseases delivered powerful shocks to colonial agriculture and peasant farmers in East Africa between the 1920s and 1950s (Anderson 1984; Iliffe 1979; Kjekshus 1977). In response to the threats to agriculture, British colonial government appointed a committee in 1930 to explore the viability of crop insurance schemes across Kenya and Tanzania. A report on the locust menace suggested that it was impractical for private for-profit insurance corporations to transact crop insurance against locust risks. East African peasants in any case could not afford any type of insurance regardless of the various perils they faced. The committee recommended the setting up of a crop insurance scheme that would protect mainly white settlers crops against damage by locusts (Kenya National Archives and Documentation Service 1930b). Another recommendation was the amendment of legislation to give the Crown Agents for the colonies a mandate to transact this form of insurance on behalf of the Office of Governor, though they had no experience of insuring against risks in East Africa. Aware of their inexperience, the Crown Agents advised the colonial government in Kenya to draw lessons from Pakistan which had also been struck by a locust invasion in 1928. The colonial government used “The Locust Invasion of Pakistan during 1928” as reference point while they addressed the issue of insurance against locusts in 1930 (Kenya National Archives and Documentation Serivce 1930a).

Notwithstanding these initiatives, no evidence has been uncovered so far by our research that any quotations were ever made for insurance against locust damage, nor any claims paid, despite the fact that the locust invasion pushed some settlers into bankruptcy and drove the Kenyan colony to the edge of famine (Kenya National Archives and Documentation 1929; Official Gazette 1929). Furthermore, we have found no evidence of crop or livestock insurance schemes being put in operation to cover farmers for the risks of drought, the erosion of soils by strong winds, and the infection of cattle with trypanosomiasis through tsetse flies. Instead, non-insurance forms of risk management were pursued by colonial administrators. Seed storage and the cultivation of sweet potatoes and cassava was encouraged in order to make the African farmers less vulnerable to the uncertainty of rainfall (Tanzania National Archive 1939b). The importation of trypanosome-resistant cattle from the West Africa was considered but rejected in favour of the establishment of inoculating camps and clearing bush along cattle routes and the use of anti-trypanosome treatment of the slaughtered stock after infection (Tanzania National Archive 1939a).

This neglect of forms of agricultural insurance by colonial governments continued in both West and East Africa immediately after independence. The national insurance enterprises that sprang up in Ghana, Nigeria and Cameroon, for instance, did not focus their products on rural development and agricultural risks. In Ghana the new state insurance corporation soon came under criticism for centralised organisation and its reliance on financial intermediaries and brokers who saw little profit in selling insurance to native farmers (Republic of Ghana 1963). International efforts for and by the insurance industry to address West Africa's environmental risks, particularly in view of the need for rural development, did not gain weight until the late 1970s and the 1980s, when the African Insurance Conference, supported by UNCTAD, began finally to discuss initiatives such as crop insurance schemes (Crowe 1980). Until then, African rural communities remained largely dependent on their traditional forms of mutual assistance and risk sharing schemes, such as the *Susu* in Ghana or tontines in Cameroon, which were based on the principles of solidarity and reciprocity of the extended family systems, clan unions and sometimes entire villages (Zaman and Merkonnen 1993).

Unlike many environmental risks facing native peasant farmers, the human disease environment in Africa directly threatened colonial administrators and white residents on a personal level. In East Africa tropical diseases such as malaria, dengue, yellow fever and cholera were the major threat to the visitors and locals alike. Authorities in Tanganyika undertook some programmes to reduce these diseases. A good example is the Anti-Malaria Campaign between 1940 and 1950, which focused on using kerosene as effective method of containing malarial-carrying mosquitoes (Issa 2011). Health risks necessitated the establishment of a health insurance scheme in the late 1940s. This was designed, however, only to cover British officials and experts who travelled to Kenya and Tanganyika. At the same time, colonial officials in Kenya and Tanganyika enjoyed the benefits of the "Social and Industrial Injury Insurance Scheme" established under British National Insurance Act 1948 (Tanzania National Archive 1948). Africans who worked in formal colonial sectors were generally excluded (UK High Commission 1949). However, the colonial government did pay compensation to families of workers who died in plantation or mining accidents.

As the winds of nationalism began to blow across Africa, colonial governments in East and West Africa endeavoured to extend modern social and economic infrastructures to Africans. The British Colonial Office repeatedly promised to develop its territories and ensure that a colony like Tanganyika "must be primarily a black man's country" (Kimambo and Maddox 2017). Despite the presence of the Mau Mau revolt in Kenya (1952–1960) and a strong nationalistic movement in colonial Tanzania, insurance business grew steadily in East Africa. Between 1950 and 1960, life insurance business expanded more than any other class of insurance, per capita premiums rising three-fold (see Table 2). Two developments contributed to this growth: the increasing number of residents of European and Asian origin, and an increase in the awareness of the benefits of life insurance among the African population. Indians from Goa and Gujarat migrated to East Africa in large numbers. While Goans were employed in the British colonial administration, Gujaratis engaged in business (Frenz 2008). The prosperity of Kenya in 1950s, which was the largest insurance market in the region, attracted more Europeans. The colony prospered due to a rise in agricultural prices after the Second World War (Throup 1988). This accounts for the increased number of Europeans in Kenya, from 23,384 in 1945 to 62,000 in 1958 (Harrison 1959; Tignor 2016). The non-African population grew by 51 per cent between 1950 and 1958 (East African Statistical Department 1961). The migration of Europeans and Asians to East Africa had direct implications on life insurance business there, as Table 2 reveals.

From the 1930s British colonial administrations in East Africa expanded education and health facilities (Wallbank 1938). While some have argued that colonial education was subject to powerful racial and social divisions, efforts made in the 1950s did allow more Africans to access formal education (Rodney 1972). The development of social services coincided with rapid rural-urban migration. Throup has suggested that the African population in urban centres like Nairobi grew by 17 per cent between 1952 and 1959 (Throup 1988). At the same time, the rural population was becoming integrated into capitalist economic system and the cash economy replaced subsistence economy. These developments increased awareness of the

Table 2: The growth of life assurance in East Africa 1950–58.

Year	A. Life assurance premiums £	B. Total population	C. Non-African population	Per capita premiums £	Per capita premiums non-African £
1950	1,270,496	18,414,000	312,000	0.07	4.07
1951	1,445,321	18,723,000	330,400	0.08	4.37
1952	1,769,937	19,037,000	348,300	0.09	5.08
1953	2,071,127	19,352,000	364,100	0.11	5.69
1954	2,566,874	19,677,000	384,500	0.13	6.68
1955	3,396,041	20,010,000	406,900	0.17	8.35
1956	3,702,159	20,348,000	430,100	0.18	8.61
1957	4,507,231	20,692,000	455,300	0.22	9.90
1958	4,653,114	21,033,000	470,300	0.22	9.89

Source: East African Statistical Department (1961).

benefits of life insurance among Africans. Consequently, more Africans entered into insurance markets as consumers and contributed even more than European and Asians to the growth of life insurance.[16]

Practical problems remained, however, in underwriting African lives. As early as the 1940s British insurance companies in West Africa had explored the possibility of selling insurance to native elites (UK National Archives 1947/8). Africans employed in the colonial administration were particularly identified as potential clients. British insurers and brokers became interested in African mortality tables from 1947. Willington Eldred and Son Ltd, a London firm of brokers, asked for so called "experience cards" that reported the number of Africans in colonial government service and their life expectancy as applied to the widows and orphans pension scheme, as a basis for computing life insurance premiums. However, the lack of statistical and demographic information killed this initiative, together with the received view among British underwriters that only European ways of life were acceptable risks. Even the Eldred representative wrote

> I wish I could find some company who would do Endowment Assurance for Africans. It has got to be done sometime as every day I have to turn down cases and with the national feeling growing up over here I find it very difficult.

He added, however, that

> I would not dream of asking you to take on the average African in commercial [employment?] There are hundreds here who live and behave just like Europeans, have stacks of money and are Knights, O.B.E.s and What-nots. (UK National Archives 1947/8)

In short, because insurers continued to work without significant health data about the local African population, a distortion in the price of insurance remained. Eurocentric, racist and elitist biases resulted in significantly higher pricing of life insurance schemes for African clients and a continuing lack of insurance products for the broad population in West Africa by the dawn of independence in the mid twentieth century. When a group of Afro-American entrepreneurs launched a local insurance project for the Ghanaian public in the late 1950s, they had to rely on the mortality tables of Afro-Americans to calculate premium rates, which were consequently greatly under-priced.[17] Life insurance remained not only an exclusive product for the urban elite in West Africa throughout the 1960s and 1970s, but it also persisted in being a difficult and largely unprofitable business (CAEF Archives 1970).

16 Table 2 shows that per capita premiums between 1950 and 1958 rose by a factor of 3.14 among the general population compared to 2.43 among non-Africans.

17 The company sold contracts for 10-, 15- and 20-year endowment policies, endowments at ages 55 and 60, and a children's educational endowment at age 18 (Ghana Insurance Corporation 1956).

Western insurance companies trying to sell life insurance in the Ottoman Empire and China in the nineteenth and early twentieth centuries also struggled with the disease environment and low life expectancy among native populations. However, it did not prevent them eventually attempting to extend their markets beyond the ex-pat community. In China western life insurance companies at first largely confined their operations to the European populations of the treaty port cities. From the 1850s Standard Life intermittently gathered data on the climate in Shanghai and Hong Kong and on the health of foreign residents there (Standard Life Archive 1855). In 1870 it resolved to permit its agencies in India to insure the lives of "first-class" Indians, typically those educated native men with a higher than average income, employed by the Indian Civil Service. Thomas Lang, however, the Bombay-based official who later helped transform the Shanghai agency into a branch office in 1900, actively discouraged the insurance of native lives. In India this resulted in the slow growth of this business until the Boer War, when growing competition from other British and American life offices, the opening of government and private commercial posts to Indians that had previously been reserved for Europeans, and the removal of several regiments from India to South Africa, together eroded Standard Life's traditional ex-patriate customer base. The result was a concerted shift into the Indian market. By 1902 40 per cent of risks accepted by the Bombay office in 1903, and 16 per cent of those in Calcutta, were on native lives (Moss 2000).

By stark contrast, only one of these factors – competition – was at work in China, and the absence of Chinese lives among the first policies issued by the new Shanghai agency was in part a legacy of Lang's strictures. The volume of Standard Life's business in Shanghai soared during the 1900s, but there was little success in penetrating the native Chinese market. This seems to have been related largely to the unattractive methods of remuneration used to reward the Chinese salesmen, rather than to any reluctance of the Scottish insurer to underwrite Chinese lives on grounds of environmental or health risks. The diffusion of life insurance into the Chinese population outside the international settlements was left largely to the new Chinese-owned life insurance firms that began to emerge before and after the First World War, such as the China Mutual Life Assurance of 1898 and the China United Assurance Society of 1912 (Lowenstein 2020). As early as 1903 the China Mutual was writing almost all of its new business on native lives. Gradually life insurance on Chinese citizens grew to reach an estimated 60 per cent of the total market by 1926 (Dung 1928). Yet this business hardly touched the vast majority of the rural population, which into the 1940s continued to suffer from high mortality and low life expectancy, and outbreaks of acute communicable diseases such as plague, cholera, small-pox, meningitis, diphtheria, relapsing fever and typhus, as well as endemic tuberculosis. The very poor state of Chinese peasant health was often exacerbated by other problems such as famine, flood, drought, and other natural catastrophes.

French and British life insurers in late Ottoman Turkey were more successful than their contemporaries in China in penetrating the native Turkish market, aided by public health measures introduced by the Ottoman government that helped combat bubonic plague and other pandemics, and by improvements in nutrition. While these improvements were geographically uneven, more striking in the western seaboard than in the rural east, life insurers appeared to have been able to cope fairly well with the disease environment and poor health. While average life expectancy at birth in Turkey remained well below 40 years until the 1940s (Pamuk 2018), the average age at death of the Turkish policyholders of the British company Norwich Union Life owning policies issued between 1899 and 1914, and the French Company Soleil-Vie on claims made between 1907 and 1927, was over 46 years. Policyholders of Gresham Life who took out policies between 1873 and 1899 died on average at the age of 57, but this relative longevity might be explained by the company's more conservative underwriting policy, which was much less ambitious at penetrating the native Turkish population. It was not until the 1890s that the Gresham began to underwrite lives other than those of European or Levantine descent.[18] Even the most successful insurers however, were not immune to the dangers of the environment. Typhus was the number one killer of policyholders of the Soleil-Vie between 1907 and 1927, ahead of more 'modern' causes of death such as cancer and heart disease.

3 Conclusions

This paper commenced with an examination of the modern S-curve model of insurance diffusion. This model does contain an essential truth about the development of insurance, namely that in all societies and at all times sufficient disposable money incomes were required to afford the exchange of cash in the present for insurance protection from uncertain losses in the future. It is clear that the majority of the peasant populations in all our regions for most of the nineteenth and twentieth centuries were too poor to participate in the formal insurance economy, even if they had been granted access to it by either foreign or indigenous firms.

18 As well as deriving from a combination of prudence and conservatism, Gresham's policy may also have been linked to sociability. Its agents and doctors initially were, without exception, British-born, and, in the case of the doctors, Paris-educated. If they were appointed initially out of prudence and with a view to cementing the standing/prestige of the office, it could also be assumed that they were more favourably disposed to clients of similar backgrounds.

However, historical evidence indicates that it is a highly stylized model, the variations from which are enormous and must be considered in order to understand all the drivers of this financial service. The intervention, or lack of intervention, of colonial and post-colonial governments was clearly important in determining the structure, quantity and trajectory of insurance provision in mid-twentieth century Africa. One of the most significant findings of our research is that colonial legacies continued to hinder insurance diffusion well after a state's political independence, even where the need for protection was most urgent, for example the relative paucity of crop or livestock insurance in East Africa before the 1970s.

Some obstacles were due to technical problems, such as the absence of accurate data on mortality and health for populations outside the social or foreign elites, or the uncertainties deriving from limited information about climate and other environmental risks. From the early nineteenth century, British insurance companies in China made efforts to inform themselves of local environmental conditions, and to take advantage of public and private initiatives to reduce such risks. The latter include the hydrological maps produced of Chinese coastal waters, the investment in buoys, lighthouses and tugboats to keep shipping moving safely, the new water supply and improved drainage systems in Hong Kong, and the mass vaccination programme carried out on Shanghai during the 1870s (*North China Herald*, 22 April 1876). It is difficult, however, to ascertain the extent to which such environmental risk mitigation measures allowed insurance to expand more rapidly than it otherwise would have in China or elsewhere.

Where insurance underwriters did not dare to venture, alternative or traditional forms of risk pooling or risk management sometimes addressed specific needs for protection. Examples include the Qing government's granary storage system that aimed to mitigate the effects of crop failures and famine in the Chinese provinces long before commercial forms of crop insurance were ever thought of; or the “Consoo fund” at Canton, which provided some guarantee to foreign traders against the bankruptcy of its Hong merchant subscribers, long before credit insurance became available in the West (Greenberg 1951; Morse 1926; Shiue 2000, 2004; Yi 2008).

Some of the obstacles to insurance diffusion were due to Orientalist attitudes and racist stereotypes often upheld and conveyed by foreign underwriters and insurance managers. Our research suggests that during the nineteenth and twentieth centuries Euro-Americans proved more adept at finding solutions to environmental obstacles than in overcoming obstacles to risk management thrown up by human attitudinal or behavioral traits. Those Euro-Americans, including businessmen, driving the formal and informal imperialism of the period were imbued with the philosophy that the resources of natural world were placed on earth for human exploitation, and that human ingenuity could find technological solutions to any challenges posed by science. In contrast, the same generations of Euro-Americans were less capable of recognizing and managing the barriers to the spread of insurance that their own prejudices and ideologies threw up. In short, it appears that there was some lag in the insurance industry between technological advances in risk management and advances in the psychological, cultural and intellectual attitudes of those managing risk.

Orientalist attitudes, however, were not consistent across companies, or across individuals in a position to promote native insurance. In both China and Ottoman Turkey before the First World War some companies endeavored more persistently and effectively than others to extend the market for insurance beyond wealthy social elites. This variation may be explained by a number of factors, including corporate culture, competitive pressures on business strategy, and serendipity – the chance presence of a liberal-minded or entrepreneurial agent determined (overseas insurance agents for European companies were all males at this time) to expand his insurance business among the majority native population. There was certainly a wide range of political, social and cultural drivers of insurance diffusion outside the Euro-American world, but these remain beyond the remit of this paper.

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