Financial History Review 14.1 (2007), pp. 7–28. © European Association for Banking and Financial History e.V. 2007
Printed in the United Kingdom doi:10.107/S0968565007000340

Hurricane Betsy and the malfunctioning of the London reinsurance market: an analysis of transatlantic reinsurance trade, 1949–1989

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I

The empirical analysis of international trade in services has long been overshadowed by the study of international trade in goods. One of the reasons is that international trade in services has been less accurately recorded in the international balance of payments statistics. Problems with services data arise, for example, due to inadequate recording methods, a very low degree of differentiation, and a wide range in the quality of the balance of payments statistics of various countries. Another problem with trade in services is presented by the lack of consensus in the literature on how to interpret the existing data. Although in recent years trade in services has received a lot of attention, much work remains to be done before the level of knowledge about trade in services can be considered comparable to that about trade in goods.[1]

As recorded in balance of payments statistics, international insurance transactions are composed of two flows: premium payments, which the insurance company receives in return for the services it delivers, and loss payments, which are payments by the insurance company to the insured in the event that an insured loss occurs. Although these two flows have markedly different meanings, they are recorded in balance of payments statistics as a net figure. For exports, this net figure is premiums received minus losses paid. For imports, it is premiums paid minus losses recovered. As a result, neither the trade volume, as represented by premium flows, nor the extent of losses incurred, as represented by loss payments, can be derived from the statistics.

A remarkable exception to standard recording procedures for international insurance trade is the recording of international reinsurance transactions in the US

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[1] United Nations, Department of Economic and Social Affairs, Statistics Division, 'Manual of statistics of international trade in services', *Statistical Papers*, M/86 (ST/ESA/STAT/SER.M/86) (New York, 2002).

balance of payments.[2] As early as 1949, the US Department of Commerce began publishing statistics on international reinsurance trade, in which it identifies premium and loss payments separately.[3] The separate recording of premium payments allows analysis of international reinsurance trade using methods similar to those employed in the analysis of international trade in goods. It enables the discussion of trade volume, the geographical distribution of trade, trade deficits and surpluses (Section III).

Sections IV to VI of this article go beyond the discussion of international trade patterns. Loss ratios for international trade business[4] are calculated using a quotient of the two international flows: premium and loss payments. The significance of these loss ratios is then analysed by comparing them with combined ratios used by American business journals such as the *National Underwriter* to review market trends in the US domestic market (Section IV). Finally, loss ratios of international trade business are employed to draw conclusions about market trends in US imports and exports (Sections V and VI). The focus here is on trade relations between the US and western Europe, which dominated US international reinsurance trade during the time period under consideration, 1949–89. By analysing the loss ratios of the period before and after the major American catastrophe loss of the 1960s, Hurricane Betsy, it is demonstrated that London did not perform the key function expected of it as an international reinsurance centre, which is to spread national risks beyond national borders in order to provide insurers with a geographically balanced risk portfolio (Section VI).

[2] W. Werner, 'Der Entwicklungsrückstand der US-Rückversicherungswirtschaft. Eine Diskussion der Aussagefähigkeit amerikanischer Leistungsbilanzstatistiken', *Zeitschrift für die gesamte Versicherungs-wissenschaft* (1995), pp. 183–204.

[3] According to the US Department of Commerce, Bureau of Economic Analysis, the complete balance of payments statistics for international reinsurance trade for the period 1949 to the present are not available. The statistics used in this article have been collected from various sources. These are the United States Department of Commerce, Bureaus of Foreign and Domestic Commerce, International Commerce, and Economic Analysis. The publications in which the statistics appeared are *Business Information Service: World Trade Series* and *United States Department of Commerce News*. Some of the statistics have also been gathered from the business journal *National Underwriter*, and from letters from the US Department of Commerce to the Employers' Reinsurance Company. Currently, the statistics are published in the United States Department of Commerce, Bureau of Economic Analysis, *Annual Survey of Reinsurance and Other Insurance Transactions by US Insurance Companies with Foreign Persons (BE-48)* (Washington, DC). The author is prepared to make all statistics used for this article available on request. For early international reinsurance statistics see C. H. von Hollitscher, *Internationale Rückversicherung* (Berlin, 1931).

[4] The term *trade business* refers to all cross-border transactions in which reinsurance services move across national boundaries or are purchased or produced by temporary visitors who cross borders. In contrast, *establishment business* involves the delivery of services through foreign affiliates located in the consuming country.

https://doi.org/10.1017/S0968565007000340 Published online by Cambridge University Press

II

The analysis sheds light on the international relations of a segment of the insurance industry which has hardly received any attention in the academic discussion of financial market globalisation, although it has been international in scope since it became a noticeable segment of the insurance industry in the latter half of the nineteenth century. Since the early days of reinsurance, insurance companies have ceded risks to other insurance companies for two reasons: either they cannot keep certain risks in their risk portfolios, because they have accepted risks in excess of their own financial capacities (retention limits) or because they do not want to keep these risks as they expect them to produce high losses in the future. As a business service whose target is the insurance industry itself, reinsurance is one of the most sophisticated forms of insurance. Hence insurance companies specialising in the reinsurance of other insurance companies – known as professional reinsurance companies – were established in the nineteenth century chiefly in countries where primary insurance services were already highly developed, that is in western Europe and North America. While 37 professional reinsurance companies had been founded in the US and western Europe in the second half of the nineteenth century, their number increased further to 156 in 1925, a level sustained with some fluctuations until another great increase in the number of professional reinsurance companies took place in the late 1970s and early 1980s.[5] The development of business volume proceeded more smoothly. In the period under consideration, insurance and reinsurance markets grew faster than GDP. While average annual growth of real GDP was 4.5 per cent in the 20 countries with the largest insurance markets for the years 1950 to 1980, their insurance markets grew by 5.4 per cent with especially high growth rates in the 1950s. In this decade the growth rates for insurance and GDP were 5.7 per cent and 4.0 per cent respectively. After 1965, reinsurance markets started to grow even faster than other segments of the insurance market. In the OECD, reinsurance premiums as a share of total insurance premiums increased from 14.5 per cent in 1965 to 17 per cent in 1981.[6]

Western European and North American insurance and reinsurance markets not only had quite impressive growth rates in the post-war period but also dominated international markets in terms of absolute premium volume. Together these markets accounted for about 91 per cent of world premiums in 1965. Nevertheless, there was a noteworthy difference in the development of the reinsurance markets in the two regions. In the US, reinsurance premiums made up only 5.2 per cent of all insurance premiums and were thus significantly below the OECD average of 14.5 per cent. In western Europe, on the other hand, this ratio stood at a

[5] C. E. Golding, *A History of Reinsurance* (London, 1927), p. 91 and Schweizerische Rückversicherungs-Gesellschaft (SRG), *Sigma*, 10 (1985).

[6] SRG, *Sigma*, 10 (1985) and 3 (1986).

https://doi.org/10.1017/S0968565007000340 Published online by Cambridge University Press

remarkable 25.5 per cent. Quite a few reasons might have contributed to this significant difference. The Swiss Reinsurance Company, which first pointed out the different relative development of reinsurance markets in the US and western Europe in 1985, gives two reasons in a later report: (1) the heavy fragmentation of the western European insurance industry with 18 separate national markets and more than 5,000 non-life direct insurance companies and (2) the high prevalence of proportional reinsurance compared to non-proportional reinsurance in western European markets (with the exception of the London market). Because non-proportional (or excess) reinsurance is a contract form of reinsurance where the reinsurer makes loss payments to the cedent only when the cedent's loss exceeds a pre-determined limit, premium turnover is lower.[7] Others pointed out that the United States insurance market was fragmented as well but that professional reinsurance companies had to bear a larger burden as a result of this fragmentation than other insurance companies, many of which engaged in active reinsurance business without specialising in it.[8] And indeed dominance of European over US reinsurance providers also shows quite clearly in the different numbers of professional reinsurance companies in the two regions.

Since the early days of reinsurance, most professional reinsurance companies have been situated in western Europe.[9] In 1925 only about 10 per cent of the 156 companies in existence in the US and western Europe were based in the US.[10] Moreover, American expectations that the formation of professional reinsurance companies would be boosted in the US during and after World War II due to disruptions in international reinsurance transactions with western Europe were not fulfilled. Out of 160 professional reinsurance companies that existed in 1968 in the two regions, still only 20 per cent were located in the US. Most international reinsurance activities still originated in western Europe and particularly in London, home of the famous Lloyd's of London, whose business was not exclusively, but to a large degree, reinsurance. With a concentration on the more sophisticated non-proportional business, London was known in the 1960s to be the world's foremost international reinsurance centre. But large reinsurance companies had also emerged in Germany, France, Switzerland and, to a lesser degree, in

7 SRG, *Sigma*, 10 (1985), pp. 7–13 and 9 (1998), p. 5. For a discussion of the different reinsurance contract types see, for example, R. L. Carter, *Principles of Reinsurance* (London, 1991) and C. Pfeiffer, *Einführung in die Rückversicherung* (Wiesbaden, 1986), pp. 45–76.

8 W. Werner, *Die späte Entwicklung der amerikanischen Rückversicherungswirtschaft. Eine Branchenstudie zur internationalen Wettbewerbsfähigkeit* (Berlin, 1993).

9 The origin of the American reinsurance industry is described by E. Kopf, 'Notes on the origin and development of reinsurance', *Casualty Actuarial Society Proceedings*, 16 (1929), p. 57. The 1930s are portrayed by E. H. Boles, 'Trends in professional reinsurance over the past ten years', *The Weekly Underwriter*, 27 May 1939, p. 51. For a discussion of the development of the transatlantic reinsurance relations around the turn of the century see R. Pearson, 'British and European insurance enterprise in American markets, 1850–1914', *Business and Economic History*, 26 (1997), pp. 438–51.

10 Golding, *History of Reinsurance*, p. 91.

Scandinavian countries and the Netherlands.[11] Although many of these firms were also quite active in international markets, they were not as closely linked to each other as the reinsurance companies in London. Another important difference between the London-based and the continental reinsurance companies was the different paths that they used to sell their services to the US market. While reinsurers from Great Britain served the American market almost exclusively through trade business, their continental European counterparts provided services through both trade business and establishment business.

Reasons for the various international activities of reinsurance companies lie in the basic functions of reinsurance business. At least according to representatives from the industry, who have dominated public views on the international activities of this branch of insurance, the most important reason for their international orientation is the key function of their business, the spreading of risk.[12] Large risks are said to exceed not only the retention limits of the ceding companies but also those of entire national reinsurance markets. But a complex global network of international reinsurance transactions has not only developed between reinsurers and primary insurers in the twentieth century but also among professional reinsurers in what is called retrocession trade. In this trade, professional reinsurers further split risk among each other, the motive being once again the same: the spreading of risk. Examples often cited to describe the types of risks covered by such worldwide nets of reinsurance and retrocession contracts are natural hazards like floods, and catastrophic risks that come from industrial operations like nuclear power plants or airlines. The US has had a significant share of such large-scale disasters in the past. The first well-documented example from the annals of the reinsurance industry is the San Francisco earthquake and the resulting fire in 1906. Quite regularly catastrophe losses were caused in the twentieth century by hurricanes in the south-west of the country. Among the latest catastrophe losses that have challenged US reinsurance capacities were the terrorist attacks on the World Trade Center in 2001.[13]

The argument for spreading risk beyond national boundaries was repeated again and again by business representatives in times in which international trade in

[11] For a discussion of the early development of European reinsurance markets see R. Pearson, 'The development of reinsurance markets in Europe during the nineteenth century', *The Journal of European Economic History*, 24 (1995), pp. 557–71.

[12] The reinsurers' point of view is described in detail in K. Gerathewohl, *Rückversicherung. Grundlagen und Praxis* (Karlsruhe, 1976), pp. 566–71. For further statements from representatives of the reinsurance industry see Bayerische Rück, *International Bibliography of Reinsurance: 1996/97 Edition* (Munich, 1996), pp. 254–5.

[13] Like other large-scale disasters before, the terrorist attacks on the World Trade Center brought passing attention to reinsurance markets in the literature. See for example the papers covered by the 'Insurance Project' of the National Bureau of Economic Research (NBER): *NBER Reporter* (Spring 2002), pp. 31–2. See also Organisation for Economic Cooperation and Development (OECD), 'Catastrophic risks and insurance', *OECD Policy Issues*, 8 (Paris, 2005).

financial services still needed a specific justification besides the now-familiar arguments of increasing competition and efficiency. In the post-war era this argument was also used in international trade negotiations. Reinsurance transactions were exempted from the many trade barriers that were introduced in industrialised countries with the rapid expansion of national safety regulation in the 1950s and 1960s. Examples of such achievements include the OEEC, OECD, EEC, EU, GATT and WTO. Together with a few other financial services like transport insurance and short-term trade credit, reinsurance shows that financial market protectionism was not a universal phenomenon in the Bretton Woods period. Meaningful trade accords on the liberalisation of international reinsurance transactions were already agreed upon in the 1950s under the auspices of the OEEC.[14]

While the argument that the main function of international reinsurance markets is to balance the risk portfolios of national insurance companies has not been the subject of further discussion, the evidence presented in this article shows that in the case of Hurricane Betsy international reinsurance markets did not perform this function adequately. The fact that international business with London did not help American insurers to lower their exposure to this major catastrophe loss of the 1960s but actually increased it is especially noteworthy not only because the malfunctioning of the international reinsurance market occurred in the world's leading industrialised nation, but also because of the trade volume affected. Because American and European insurance and reinsurance markets represented more than 90 per cent of world markets, and bilateral trade between the US and the UK was by far the largest segment within transatlantic reinsurance trade, the transactions under consideration were significant compared to the entire international reinsurance market. Although no accurate statistics for international reinsurance trade for the rest of the world exist for the second half of the twentieth century, it is quite safe to assume that reinsurance transactions outside the Atlantic world or between the Atlantic business community and other regions were minuscule compared to transatlantic transactions.[15]

[14] W. Werner, 'Öffnung der Versicherungsmärkte bei OECD, EU und WTO: Mühsamer Abschied vom Finanzmarktprotektionismus der Bretton Woods Periode', *Zeitschrift für die gesamte Versicherungswissenschaft*, 94.4 (2005), pp. 841–64.

[15] The first major attempt systematically to collect historical data on international insurance transactions is being undertaken by Peter Borscheid, Universität Marburg, in collaboration with the VolkswagenStiftung. For Germany see for example P. Borscheid, 'Die langwierige Rückkehr auf den Weltmarkt. Zur Internationalisierung der deutschen Versicherungswirtschaft 1950–2000', *Jahrbuch für Wirtschaftsgeschichte*, 2 (2003), pp. 121–49. International trade data that go back to the 1980s for some countries are published regularly by the OECD. See for example OECD, *Insurance Statistics Yearbook, 2005* (Paris, 2005).

III

The discussion of international US reinsurance in this section is based upon two definitions. *The import of reinsurance* is the reinsurance of US insurers by foreign reinsurers. It is represented in the US balance of payments statistics by premiums paid to non-residents. *The export of reinsurance* is the reinsurance of foreign insurers by US reinsurers and is represented by premiums received from abroad.

US trade performance after 1949 indicates that American reinsurers had trouble getting a foothold in international reinsurance markets. Balance of payments statistics for the years 1949 to 1989 show that the United States continuously ran a reinsurance trade deficit. The American trade position improved steadily from 1949 to 1972. In the first year of the analysis, imports amounted to $189 million in comparison to exports of $21 million. In 1973 the United States had only a slight import surplus, reflected by $603 billion in exports versus $769 billion in imports. After 1973, imports grew more rapidly than exports. The deterioration of the trade balance was partially caused by rapidly increasing imports in bilateral trade with Bermuda, which are not comparable with other reinsurance imports. In the tax haven of Bermuda, large American industrial and commercial companies have formed what are known as captive insurance companies, which primarily write the insurance of their parent and fellow subsidiaries. Other factors that complicate analysis of the period beginning in the early 1970s are innovations in reinsurance contracts, such as financial reinsurance, and strong fluctuations in the dollar exchange rate.

The regional distribution of US international reinsurance trade shows that most trade was conducted with western Europe. Well into the 1950s, reinsurance trade with this region accounted for over 90 per cent of total US reinsurance trade. In the early 1950s, trade business with western Europe was conducted almost exclusively with Great Britain. By the end of the period, continental European countries had achieved an equally important position in US international trade. Another significant development was the increase in exports to countries and regions outside western Europe, such as Canada, Japan and Latin America, starting in the early 1970s.

Western Europe's unique position in US international reinsurance trade is also reflected in the geographical distribution of trade deficits. The United States maintained trade surpluses only with non-European partners, i.e. Canada and Latin America. Trade deficits existed with Japan and, to a greater extent, with western Europe. In the trade with western Europe, deficits with Great Britain were more pronounced than those with continental European countries.

IV

For the reinsurance industry, as for most other financial service industries, information on market trends exists only for individual firms and for country

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markets but not for international markets. A commonly used indicator of market trends is the combined ratio or what the early insurance industry called 'underwriting ratio'. Regularly published by several business journals in the US and the UK, this ratio takes into account not only the strongly varying losses but also the comparatively stable operating expenses. The combined ratio is defined as:

$$\frac{\text{losses incurred} + \text{operating expenses incurred}}{\text{earned premiums}}$$

This ratio is used in business journals to compare the latest performance of individual reinsurers in their core activities: risk selection and the setting of profitable premiums. Moreover, on a medium- and long-term basis, the combined ratio is used to describe and analyse market trends of the entire American reinsurance industry. Changes in yearly averages of combined ratios for the whole industry reveal not only the cyclical price fluctuations of a financial industry due to changes in demand and supply but also the single most important factor determining market trends in the reinsurance industry: catastrophe losses. Events such as earthquakes, hurricanes, industrial fire and aircraft crashes leave clear marks on combined ratios throughout the industry. Due to the complex business network of reinsurance and retrocession contracts, virtually all reinsurers are affected by such losses, although of course not to the same degree.

Figure 1 shows the combined ratio for professional reinsurance companies according to the yearly reports of the American business journal *National Underwriter*. The extraordinarily high combined ratio for the year 1965 reflects the impact of Hurricane Betsy, which in a matter of hours destroyed a tremendous amount of property in the US and was known in the industry long after 1965 as the most spectacular catastrophe loss of modern times.[16] The only other catastrophe loss that is nearly as prominent in the annals of the industry is the San Francisco earthquake of 1906.[17] The rise in the combined ratio in the 1970s and early 1980s was regarded by the business community as a sign of intensified competition in the American reinsurance market, although it also reflects higher earnings on invested premiums in a time of high interest rates.[18]

Since combined ratios have proved to be useful in analysing domestic reinsurance markets, it seems obvious that such ratios could be useful for analysing

[16] In 1966, the *National Underwriter* opened its yearly report on the US reinsurance market with the words: 'The reinsurance business will never be the same – after the event of Betsy. The market both here and overseas still reels from the shock of it...' *National Underwriter: Annual Analysis of the American Reinsurance Market* (1966), p. 46.

[17] The significance of the San Francisco earthquake of 1906 is described by I. Findlay, 'Lloyd's stake in America', *International Insurance Monitor*, March 1979.

[18] Underwriting practices geared only towards investment income became known in the reinsurance industry as 'cash flow underwriting'.

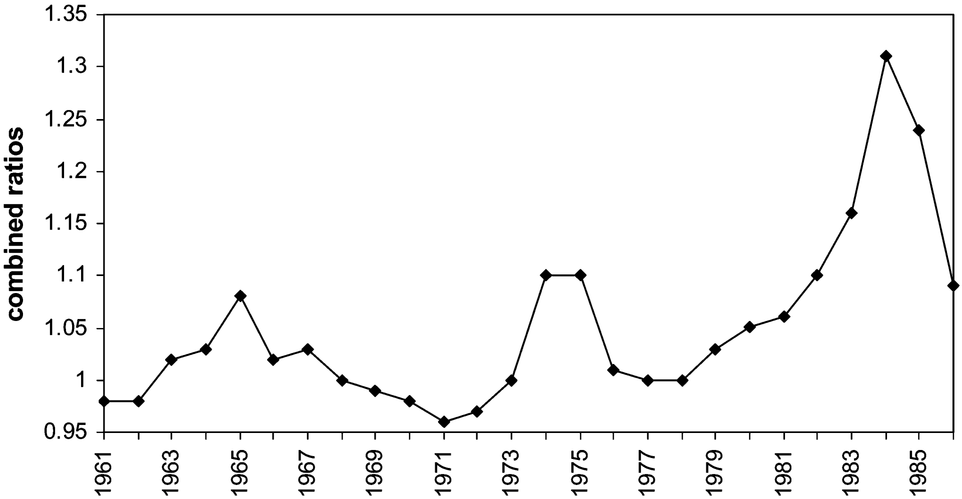

Figure 1. *Combined ratios of the US domestic market, 1961–86*
Source: *National Underwriter: Annual Analysis of the American Reinsurance Market,* various issues (1961–87).

international trade business as well. Provided that, as in the statistics of the US Department of Commerce, premium and loss payments are separately identified, a similar ratio can be calculated for international trade business as the quotient of these two flows:

$$\frac{\text{Loss payments}}{\text{Premium payments}}$$

This loss ratio can be calculated for both imports and exports. The loss ratio of US exports is the quotient of losses paid by American reinsurers to foreign insurers and the premiums the American companies receive from abroad. The loss ratio of US imports is the quotient of loss payments received by American companies from abroad and the premiums paid to foreign companies. While the export loss ratio represents underwriting results in the US reinsurers' international trade business, the import loss ratio reflects the foreign reinsurers' underwriting experience with the US market.

Although it is reasonable to assume that the calculation of loss ratios for imports and exports could benefit the analysis of international trade business, it is unclear whether balance of payments statistics are a suitable basis for such calculations. The possibility of producing reliable loss ratios from these statistics has been regarded with reservation by business journals and the US Department of Commerce. In their yearly reports on the American reinsurance market, neither the American *National Underwriter* nor the well-known English business journal *The Review* used the balance of payments statistics for calculating loss ratios for the international trade business of the US. The Department of Commerce listed loss ratios only temporarily in its 1960s publications. Later reports stated that loss ratios could not be derived from the statistics.

It would certainly be incorrect to assume that loss ratios obtained from the balance of payments statistics correspond exactly to the figures commonly used in domestic markets. For once, no information on operating expenses is available for international trade business. Moreover, the balance of payments statistics, from which the loss ratios are derived, are too different from corporate balance sheets, which are the basis for the calculation of combined ratios for the domestic market. Above all, the following special features of balance of payments statistics must be taken into account regarding the calculation of loss ratios for international trade business:

1. It is not possible to identify individual companies or specific company groups from balance of payments statistics, although loss ratios are of course influenced by the type of companies participating in international trade.[19] For example, international trade business is conducted by established companies as well as by new market entrants. In most cases, the business of the new entrants will reflect a much higher loss ratio than that of the established firms.
2. As with combined ratios derived from corporate balance sheets, it is not possible to identify individual reinsurance contracts from the balance of payments statistics. Loss ratios of international trade business can be influenced by class of business and type of contract.
3. If international reinsurance trade is intra-firm trade, the conditions of this trade are not necessarily comparable with usual market conditions.
4. Because balance of payments statistics for services are obtained from questionnaires, they are subject to sampling and non-sampling errors.[20]
5. The US balance of payments statistics show only net premiums (premiums less commissions) paid and received internationally. They do not provide a breakdown by earned premiums, losses incurred (including those incurred but not reported) and expenses incurred, which are used in normal insurance accounting practice to show underwriting results.

The smaller the trade volume under review, the greater the likelihood that some of the above-mentioned special features of balance of payments statistics will distort the results. Thus a particular bilateral trade relationship may be dominated by a non-representative group of companies (1) or reinsurance contracts (2), be largely

[19] The US Department of Commerce withholds numbers that could reveal any information about the international activities of individual companies.

[20] For a discussion of sampling and non-sampling errors in US surveys on services transactions see A. Y. Kester (ed.), *Behind the Numbers: US Trade in the World Economy* (Washington, DC, 1992), p. 118. The US balance of payments statistics on international reinsurance trade are said to be accurate by the United States Department of Commerce, International Trade Administration, *Sources of Data on US Insurance Abroad. An Inventory and Evaluation* (Washington, DC, 1981), p. 4.

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comprised of intra-firm trade (3), or be subject to errors in compiling the data (4). Problems with regard to the definition of premium and loss payments (5) occur independently of the trade volume under review.

In order to analyse the significance of loss ratios derived from balance of payments statistics, it will be assumed that major trends of a particular reinsurance market are experienced by the majority of reinsurers participating in this market, whether they are providing their services cross-border as foreign companies or from within the country as domestic companies. Thus US reinsurance imports should reflect market trends similar to those of the US domestic market. In other words, extraordinary catastrophe losses such as Hurricane Betsy, which in 1965 resulted in a dramatically increased combined ratio for American reinsurers, should also show up in the loss ratios of the American business of reinsurers situated abroad.

In order to examine the significance of loss ratios derived from the US balance of payments statistics, a time series regression helps to show similarities between the fluctuations in, and the levels of the combined ratios of, the US domestic market and the loss ratios of US imports. The US balance of payments statistics are used to calculate the import loss ratio, excluding bilateral trade with Bermuda, as it is not normal commerce. For the domestic market, the combined ratio as published regularly by the *National Underwriter* is used as described above. Because the combined ratio contains not only losses incurred but also the relatively stable operating expenses, the numbers for the domestic market are higher than the numbers calculated for foreign trade. The combined ratio is especially suitable for this analysis since it includes the majority (about 70 per cent) of reinsurance services provided by US companies between 1960 and 1986 and because professional reinsurance companies are not only the main participants in the US reinsurance market but also in international markets.[21] The combined ratio also unavoidably reflects underwriting results from the international business of American reinsurers, that is US exports. These exports accounted for 21 per cent of reinsurance services provided by American reinsurers during the period under consideration.[22] If international reinsurance markets function properly and spread national risk beyond national boundaries, these exports will reflect market trends of other countries and not those of the US domestic market.

As Figure 2 shows, the trends of the combined ratio and the import loss ratio are similar. Unique catastrophe losses such as Hurricane Betsy are indeed represented by increased loss ratios in the US business of foreign companies. Without exception, the loss ratios of US imports reflect significant turning points in the US domestic market in 1965, 1970, 1974 and 1984. Taking into account the difference

[21] Werner, *Entwicklung der Rückversicherungswirtschaft*, pp. 59–61.
[22] Ibid., pp. 60 and 76.

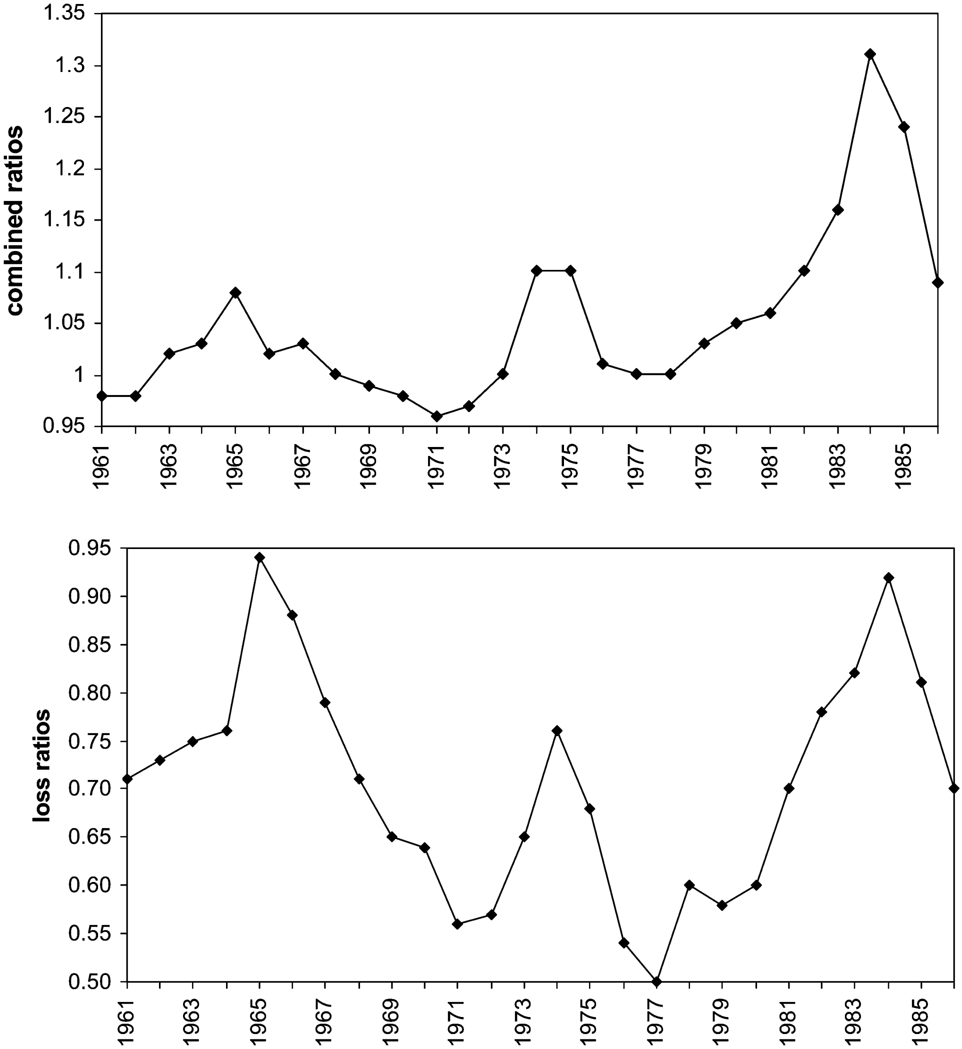

Figure 2. *Combined ratios of the US domestic market and loss ratios of US imports, 1961–86*
Sources: Loss ratios of the US domestic market: see Figure 1. Loss ratios of US imports: United States Department of Commerce, Bureaus of Foreign and Domestic Commerce, of International Commerce, and of Economic Analysis, 'United States Reinsurance Transactions'.

in the levels, the time series regression clearly shows that the trend of import loss ratios (MLR) is similar to the trend of domestic combined ratios (DCR). For the levels we obtain:

$$MLR_t = -0.42 + 1.05DCR_t + e_t$$

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and for growth

$$MLR_t - MLR_{t-1} = 1.05\,(DCR_t - DCR_{t-1}) + v_t$$

where the error terms e_t and v_t show different structures.[23]

This result confirms that the underwriting results in the US business of both foreign and domestic reinsurers show similar trends. Moreover, the result allows the conclusion that the significance of loss ratios derived from the US Department of Commerce statistics is comparable to that of the combined ratios of the domestic market and that the loss ratios can be used for further analysis from a historical perspective.

V

Since only the trends, not the levels, of combined ratios and loss ratios are comparable, no direct comparisons can be made between the underwriting results of domestic and international markets. On the other hand, comparisons between various segments of the international trade business are possible as they are based on the same statistics.

Table 1 compares the underwriting results of US imports and exports. The first column of figures ('Total') gives information about total imports and exports. The other columns give loss ratios for US trade with western European and non-western European countries ('WE' and '1-WE').

During the period under consideration, 1949–89, the average annual loss ratio of all imports was 0.71 (line MLR), the loss ratio of all exports 0.76 (line XLR). The negative loss ratio difference of −0.05 (line MLR – XLR) indicates that in international trade business, US reinsurers were not as successful as their foreign trade partners. This result supports the assumption that long-standing trade imbalances are caused by differing levels of commercial success of the trade partners. For the US, whose reinsurance industry was little developed compared to that of western Europe, international reinsurance trade meant both trade deficits and comparatively high loss ratios.

Looking at loss ratio differences of individual decades, particularly high negative loss ratio differences stand out in the 1960s and 1970s. Loss ratio differences for these decades were −0.07 and −0.09. During the growth phase of the US reinsurance market, which brought with it many capacity shortages, foreign reinsurers evidently enjoyed especially good business opportunities in the US. High loss ratio differences were especially marked in bilateral trade with Great Britain, which dominated US foreign trade in the first half of the period.

[23] The error e_t in the regression of levels was captured by a first-order autoregressive model, $e_t = 0.81e_t + v_t$, where v_t is a random error term. Going from levels to differences the dependence of the error term e_t disappears and v_t becomes a random error term with no significant autocorrelation.

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Table 1. *Average annual loss ratios of US imports and exports, 1949–89*

		WE			
	Total	*Total*	*GB*	*CE*	*1-WE*
1949–89					
MLR	0.71	0.72	0.70	0.79	0.75
XLR	0.76	0.82	0.86	0.78	0.67
MLR-XLR	−0.05	−0.10	−0.16	0.01	0.08
1949–59					
MLR	0.70	0.70	0.69	0.77	0.78
XLR	0.68	0.76	0.78	0.72	0.58
MLR-XLR	0.02	−0.06	−0.09	0.05	0.20
1960–9					
MLR	0.76	0.76	0.76	0.80	0.82
XLR	0.83	0.90	0.95	0.83	0.72
MLR-XLR	−0.07	−0.14	−0.19	−0.03	0.10
1970–9					
MLR	0.61	0.60	0.58	0.68	0.64
XLR	0.70	0.75	0.77	0.73	0.61
MLR-XLR	−0.09	−0.15	−0.19	−0.05	0.03
1980–9					
MLR	0.75	0.81	0.76	0.89	0.77
XLR	0.81	0.86	0.92	0.82	0.76
MLR-XLR	−0.06	−0.05	−0.16	0.07	0.01

Source: United States Department of Commerce, 'United States Reinsurance Transactions'.
MLR = loss ratio, imports
XLR = loss ratio, exports
MLR – XLR = loss ratio difference
CE = continental Europe
WE = western Europe
1-WE = non-European trade partners
GB = Great Britain

At first glance, it is difficult to understand why American reinsurers had slightly better results in overseas markets in the 1950s than their foreign competitors did in the US market, as indicated by the positive loss ratio difference of 0.02. However, it should be recognised that export loss ratios for this period are calculated on the basis of extraordinarily low export volumes, so that outliers for bilateral trade with non-European countries have greatly affected the loss ratio difference for this decade. The loss ratio difference of −0.06 in trade with western Europe is more in keeping with the general pattern.

As might have been expected from London's strong position in international reinsurance markets, the least favourable loss ratio difference (−0.16) manifested itself in trade with Great Britain. Trade with continental European and non-European countries (columns CE and 1-WE) produced more positive results for the US (0.01 and 0.08, respectively). Except for the 1980s, this order was maintained throughout the entire period under consideration. Thus the regional distribution of loss ratio differences also corresponds to the analysis of trade imbalances from Section III. The analysis of import and export volumes showed that the US had its highest trade deficits in bilateral trade with Great Britain, followed by continental Europe and the non-European trade partners, in that order. There were positive loss ratio differences in trade with non-European countries in which the United States achieved trade surpluses. In trade with western Europe, which was characterised by trade deficits for the United States, the data show negative loss ratio differences.

For trade with continental Europe, loss ratio differences were not in keeping with the overall trend for two of the decades under consideration. The data show positive loss ratio differences for the 1950s and 1980s, which deviate from the general picture. The positive loss ratio differences for the two decades add considerably to the fact that the US achieved a slightly positive loss ratio difference in its bilateral trade with western Europe for the entire period. The reasons for the positive loss ratio differences of the 1950s and 1980s are not clear, but an important clue is provided by the large number of continental European reinsurers which served the US market through subsidiaries. The great number of continental European subsidiaries, which provided up to a third of all reinsurance services by reinsurers situated in the US in the 1960s, suggests that intra-firm trade may have played an important role in bilateral trade between the US and continental Europe.[24] At the least, the relations of the continental European reinsurers with the US differed clearly from those of the British competitors, who served the American market almost exclusively through trade business. In 1963 there were 21 European professional reinsurers situated in the US, only two of which were from Great Britain.[25]

Both decades, the 1950s and the 1980s, are distinguished by exceptional efforts on the part of continental European reinsurers to increase their presence in the US by establishing numerous subsidiaries. In the 1950s, business relations, which had been interrupted by World War II, were re-established. With the establishment of subsidiaries in the late 1970s and early 1980s, continental European reinsurers contributed substantially to the largest expansion of reinsurance capacity that has taken place in the United States since the early nineteenth century.

VI

Particularly surprising results can be found in the statistics on international US reinsurance trade for trade with the world's foremost international reinsurance centre, London. The United States and Great Britain engaged in a significant

[24] See list of special features of balance of payments statistics, no. 3, in Section IV.

[25] The different modes of supply used by British and continental reinsurers servicing the US insurance market are described in Werner, *Entwicklung der Rückversicherungswirtschaft*, pp. 86–90.

https://doi.org/10.1017/S0968565007000340 Published online by Cambridge University Press

amount of bilateral trade until the late 1960s. Until then, America's trade with western Europe represented almost 90 per cent of total US reinsurance trade. For a long time, this trade was almost exclusively with Great Britain and, more particularly, with the well-known insurer Lloyd's of London.[26] Great Britain remained America's most important trade partner until the end of the 1960s, with its reinsurance services totalling 70 per cent of US reinsurance imports. During this decade, which was marked by Hurricane Betsy, loss ratios of bilateral trade between the US and Great Britain display a noteworthy peculiarity.

As Figure 3 shows, trends of import and export loss ratios are similar to those of the combined ratios of the American domestic market, assuming a one-year time lag in the export loss ratio. The high combined ratio caused by Hurricane Betsy in the domestic market in 1965 appears in both curves as clearly as the subsequent consolidation of the American reinsurance market and the comparatively favourable underwriting results that existed before this spectacular catastrophe loss occurred. No such similarity existed either before or after the period under consideration.[27]

The similarity between the combined ratios of the domestic market and the loss ratios of imports is as expected. Both trends represent underwriting experience in the US market. The only difference between the two ratios is that one represents the underwriting results of American reinsurers and the other those of foreign companies, in this case of British reinsurers.

Fully unexpected is the high correlation between the combined ratios of the US domestic market and the loss ratios of US exports. These exports represent reinsurance contracts in which American companies reinsure risks from Great Britain. According to the general understanding of international reinsurance markets, these contracts should represent trends of the British market, or, more precisely, a mixture of trends of various countries, due to London's function as an international reinsurance centre.

Based upon statements by the reinsurance industry regarding the key function of its international activities, it would certainly be reasonable to expect that international trade business with London would have counteracted the financial malaise of American companies in times in which the US market performed poorly. However, the loss ratios of US reinsurance exports to Great Britain clearly reveal that London did not meet these expectations. When many American reinsurers were pushed to the edge of their financial capacity after Hurricane Betsy, they experienced high losses not only in domestic business but, after a one-year delay, also in the business with London.

[26] For the dominant role which Lloyd's of London played in the US reinsurance market see *National Underwriter* (1966), p. 47 and Carter, *Principles of Reinsurance*, p. 3.

[27] The results of the two time series regressions read: $XLR_t = -4.81 + 5.67\ DCR_{t-1}$ and $MLR = -2.56 + 3.26\ DCR_{t-1}$. The number of 12 observations is insufficient for further statistical analysis.

https://doi.org/10.1017/S0968565007000340 Published online by Cambridge University Press

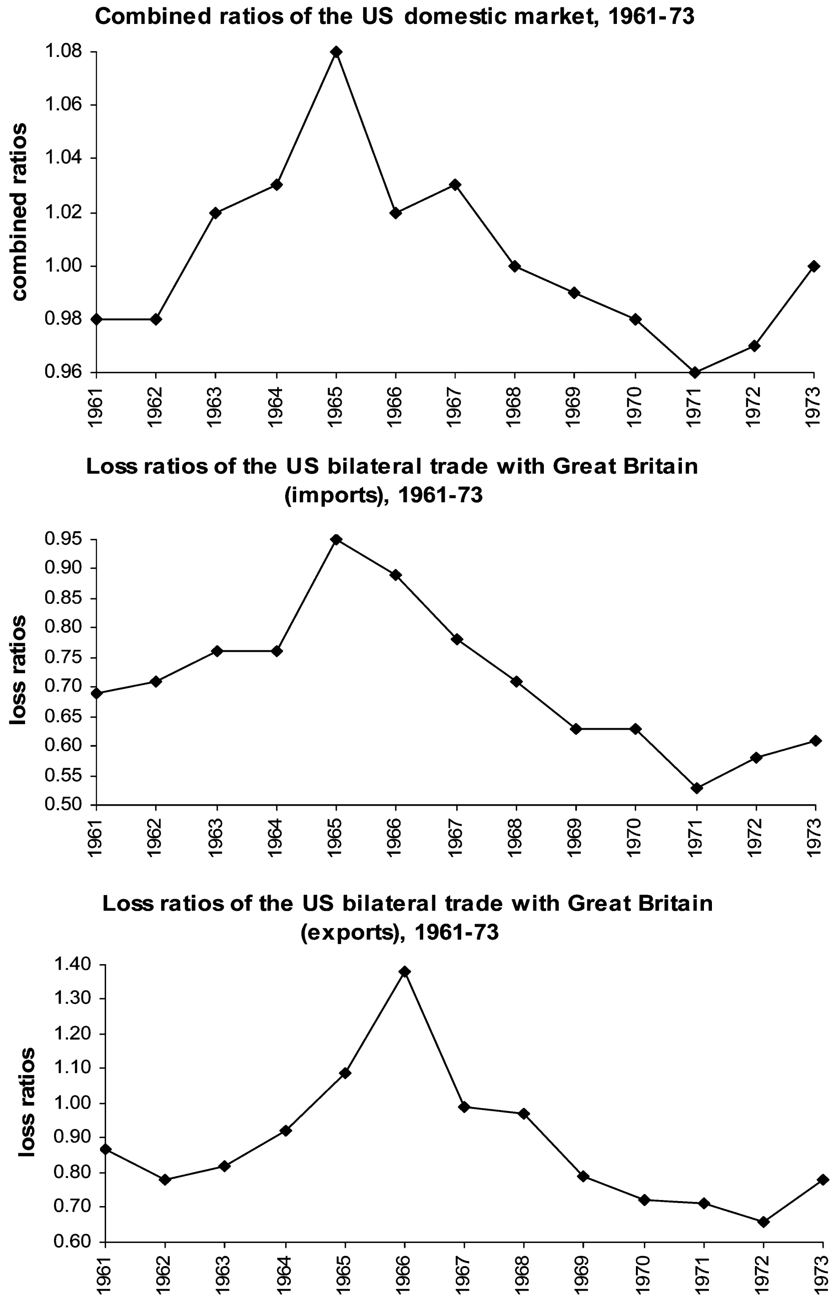

Figure 3. *Combined ratios of the US domestic market and loss ratios of US bilateral trade with Great Britain, 1961–73*

Sources: Loss ratios of the US domestic market: see Figure 1. Loss ratios of US bilateral trade with Great Britain: United States Department of Commerce, Bureaus of Foreign and Domestic Commerce, of International Commerce, and of Economic Analysis, 'United States reinsurance transactions'.

https://doi.org/10.1017/S0968565007000340 Published online by Cambridge University Press

The only explanation for the similarity between the loss ratios of US exports to Great Britain and the combined ratios of the American domestic market is that British companies returned a portion of their American business to the US via retrocession. As an international reinsurance centre, London has a very high portion of such international retrocession business. The one-year time lag in the import loss trend can thus be accounted for by the delay that was caused by reporting American claims to American companies via London.[28]

There are two motives guiding the retrocession business. As described in the introduction to this article, insurance companies reinsure in order to limit their exposure to large risks or to shift less profitable parts of their business to other market participants. Of course, these two motives also govern retrocession business. Clear indications that the latter motive guided the British in retroceding American business to American companies can be found in articles published in business journals at the end of the 1960s. As the most important supplier of reinsurance services for the United States, Great Britain has always been the subject of much attention in these journals. In a retrospective view of the developmental problems of the American market in the 1950s and 1960s, an article published in 1967 describes the increased interest of the American insurance industry in writing international reinsurance business, the willingness of the London market to fulfill this need, and the negative outcome of this business from the perspective of the American companies:

> By 1960 there were a great many American companies interested in accepting reinsurance – some on a businesslike basis and many not.
>
> Under the pressure of this buyer's market, the underwriting syndicates in London were anxious to increase their own ability to serve their customers across the world. One device that was developed in order to provide additional capacity was the parceling out of participations in excess contracts to insurers in the US. This was done by numerous Lloyd's syndicates and also by members of the London company market. Acceptance of such business became quite a status symbol [in the US], especially for unsophisticated insurance company officers. The natural result of this development was that when unfavorable experience developed in the US, many insurers found that they were not only paying substantial losses on their own direct policies but they were also sharing to a much greater

[28] Even in the US domestic market there was some late reporting of losses from Hurricane Betsy. As the *National Underwriter* remarks in its 1966 yearly market report: 'As will be appreciated, it takes some time for each of the many losses in such major catastrophes to find its final resting place …', p. 46. The reason for the one-year delay in reporting claims via London may specifically lie in the longer time period that it takes for claims to be settled between reinsurers and the reinsured in the case of non-proportional reinsurance, the contract form favoured over proportional reinsurance by London. Proportional (or excess) reinsurance is a form of reinsurance in which the reinsurer makes loss payments to the cedent only when the cedent's loss exceeds a pre-determined limit. Whether this limit has been reached can only be determined after all claims have been settled by the cedent, a process that can take a considerable length of time. For a discussion of the longer 'claims tail' of non-proportional business see R. L. Carter, *The Reinsurance Market* (Cambridge, 1981), p. 9.

degree than they had anticipated in such catastrophe losses through the excess contracts written for underwriters in London's market.

> Betsy was the crowning blow, and many of the insurers who had decided to experiment in the reinsurance field withdrew – blowing on their burned fingers as they did so![29]

The market analysis in the business journal corresponds with the observations based upon loss ratios on the following important points: first, British reinsurers retroceded American business to American reinsurers. This trend began in the early 1960s, when combined ratios of the American domestic market and loss ratios of US exports to Great Britain began to follow similar paths. After Hurricane Betsy, the underwriting policies of American insurers became more restrictive with regard to the British market. The similarity between the trends in the American export loss ratios and the combined ratios of the US domestic market decreased.

Second, the article points out the lack of experience on the part of the American insurance industry in terms of its ability to shift less profitable business to other market participants. The author assumes that British insurers had sold off a selection of adverse American risks to their US customers. And indeed there are clear indications of this in the extraordinarily large loss difference of −0.19 in the international trade between the US and Great Britain during the 1960s (Table 1). Through the intermediation of the experienced London reinsurers, the underwriting results of the US business had substantially worsened after parts of this business had been returned to American companies.

An important reason why American insurers assumed such an unfortunate risk selection from London could be that US business constituted the majority of the international business of the London market during the 1960s. Lloyd's of London, which always received a large portion of US business, certainly had some limits to its ability to produce a regional spread of risks for its American customers. But it takes two to tango, as the Americans say. When American companies accepted reinsurance business from Great Britain (as a status symbol, this article suggests), the great majority of them apparently did so indiscriminately. They evidently did not search for genuinely international business and ended up using the London market in the same way they would have used the American market, i.e. for the exchange of American risks. This is a clear indication that American companies were not ready to compete actively in international reinsurance markets. It should be remembered, however, that it was only the US exports that did not serve the purpose generally expected of international reinsurance transactions. Through US reinsurance imports, American insurance companies did in fact receive payments from British companies for losses caused by Hurricane Betsy.

[29] A. B. Kelly, 'Insurance capacity in the changing reinsurance market', *Best's Fire and Casualty News* (1967), pp. 16–22.

VII

This article has utilised US balance of payments statistics for an analysis of the international reinsurance trade. By using premium payments, it was demonstrated that the United States was a continuous net importer of reinsurance services in the 1950s and 1960s. By calculating loss ratios for international trade business, it was shown that the underwriting results of foreign reinsurers in their US business were better than those of American reinsurers in their international business. This is in accordance with the general expectation that trade deficits, if they exist over a long period of time, are caused by differing levels of business success of domestic and foreign companies. Loss ratios have also been successfully employed in analysing US trade with individual regions and countries. In trade relations where the US had large trade deficits, the differences in the underwriting results of domestic and foreign reinsurers were more significant than in the countries with more balanced trade relations.

In bilateral trade with Great Britain, which dominated US international reinsurance trade in the 1950s and 1960s, there was clear evidence of the weak competitive position of American reinsurers vis-à-vis the experienced international reinsurers in London. Underwriting results accompanying the largest catastrophe loss of the 1960s, Hurricane Betsy, show that US reinsurance imports from Great Britain did not help American companies to protect their risk portfolios against such catastrophe loss, a task maintained by reinsurers to be the key function of their international activities.

London's failure to balance American risk portfolios leaves us with several questions in a notoriously under-researched field. Did British reinsurers engage in the practices that were revealed as a result of Hurricane Betsy not only in the US but also in other national markets? Did American companies turn to continental reinsurers after 1965 as a result of their dissatisfaction with the London market? Had they not turned to London in great numbers in the 1950s because of high growth rates in the domestic market? Several publications of the United Nations Conference on Trade and Development address an issue not directly related to US international trade, namely, the quality of services developing countries have received from western European reinsurers.[30] One might ask what reinsurance services these countries received if even the American insurance market was not able to use London's offers properly in the 1960s.

Of course, questions also arise with respect to the methods employed in this article. In their complexity, statistics on the United States' international reinsurance

[30] See, for example, United Nations Conference on Trade and Development (UNCTAD), *Invisibles: Insurance. Insurance of Large Risks in Developing Countries* (TD/B/C.3/137) (Geneva, 1977); UNCTAD, *Reinsurance Problems in Developing Countries* (E.74.II.D.2) (New York, 1973). An overview of the numerous publications of UNCTAD on reinsurance and developing countries is provided by the United Nations in *The Activities of UNCTAD's Special Programme on Insurance* (Sales no. E.85.II.D.23) (New York, 1987).

trade are certainly open to various interpretations. The significance of loss ratios of international trade business is – for certain periods and with a few limitations – comparable with that of combined ratios for domestic markets. The loss ratios of international trade business are in accordance with statements from American business journals regarding the problems of US reinsurers in getting a foothold in international markets during the post-war period. However, the US balance of payments statistics cannot provide all information desirable for the empirical analysis of international reinsurance trade.

There are two particular influences on international reinsurance trade that are impossible to discern from the US balance of payments statistics. The first is the influence of different classes of business and types of contracts on the data. The second is the influence that affiliates have on the international trade data through intra-firm trade with their parent companies. In US international reinsurance trade, this influence may have played a role in bilateral trade with continental Europe, the only region with numerous subsidiaries in the US.

Further discussion of the fact that loss ratio differences in bilateral trade with continental Europe were not in keeping with general trends in the period under consideration should take into account that (a) newly established European subsidiaries were not very profitable when starting up in the US, (b) the transactions of these firms with their parent companies did not necessarily follow market conditions, and (c) only the 1950s and 1980s saw major efforts of continental European companies to increase their market presence in the US. Because these two are the only decades in which underwriting results in bilateral trade with continental Europe were favourable for companies situated in the US, the results from Table 1 could mean that European parent companies used retrocession contracts with favourable conditions for their US subsidiaries to subsidise them indirectly. Such cross-subsidisation during the start-up phase would have helped the subsidiaries to show good results in their balance sheets and thus earn good business ratings, which is a key factor in reinsurance markets for attracting new business. In other words, international intra-firm transactions would have helped European reinsurance companies to sustain and improve their competitive advantage vis-à-vis American companies.

Although improvements in the data on intra-firm trade and the different classes of business are desirable, the separate publication of premium and loss payments is crucial. The reason why these two totally different transactions are usually not recorded separately in the balance of payments lies in the principles of the national accounts, in which the contribution of the insurance industry to GDP is only accounted for in the difference between premium and loss payments, the so-called services' content of the transactions.[31] These data are, however, totally inadequate for an empirical analysis of international insurance and reinsurance trade. And it is

[31] H. Hipler, 'Die Versicherungsunternehmen in den Volkswirtschaftlichen Gesamtrechnungen', *Wirtschaft und Statistik* (1970), p. 333.

almost needless to say that the separate publication of the two flows certainly would not be detrimental to the national accounts.[32]

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[32] The International Monetary Fund (IMF) made a step in the right direction in the early 1990s. In 1993 it called for the separate identification of premium and loss payments as a memorandum item. See IMF, *Balance of Payments Manual*, 5th edition (Washington, DC, 1993), p. 43.