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ORIGINAL PAPER

Competitive devaluations in the 1930s: myth or reality?

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Abstract
This article is the first examination of competitive devaluation in the 1930s using data on exchange rates. It analyses the impact of currency changes on foreign trade flows of fourteen industrialized countries 1929–1939. It reviews the development of nominal and real effective exchange rates together with trade and economic growth and conducts a disaggregated analysis of trade and bilateral exchange rates with trade partners. Tests show that the beggar-thy-neighbour effects of exchange rate adjustments were few and temporary. Moreover, it is argued that currency depreciations were expansionary not only for countries that devalued but for the international economy as a whole. This argument draws on Ragnar Nurkse (Nurkse, International currency experience, Lessons of the Inter-War Period. League of Nations, 1944) who undeservingly has been associated with the notion of "competitive devaluation". Nurkse showed that currency depreciations increased global monetary reserves, an observation that has gone remarkably overlooked in the literature.

Keywords Interwar · Europe · Exchange rates · Trade · Depression

JEL Classification E4 · F4 · N1 · N12 · N14

1 Introduction

Now and then, the notion of "competitive devaluations" resurfaces in public debate. They are seen as an evil that contributed to the Depression of the 1930s and which must be shunned in order not to repeat that dark historical experience. Even though the abandonment of the gold standard is seen today as a key for the recovery from the Great Depression, an ambiguity still remains with regard to competitive devaluations. This is highlighted by Crafts and Fearon (2013) who restate what is now the consensus view, that those countries who in 1931 first left gold recovered more swiftly from the Depression, but nevertheless list "competitive devaluations"

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among the evils of the Depression (p.2). The same ambiguity is demonstrated in a recent article on currency devaluations in the 1930s: "While their effect on the initiating countries was unquestionably positive, their deflationary effect on those who stayed on the gold standard prevented them from being beneficial in a strictly Paretian sense" (Albers 2020). This is in essence the notion of competitive devaluation: it promotes recovery but at the cost of others as condensed in the metaphor of "beggar-thy-neighbour".

A classic textbook on the European economic history emphasizes the unfair futility of currency depreciation:

> Thus for any individual country, departure from the gold standard and depreciation of the currency released that country from deflationary constraints and gave a boost to exports. On the other hand, once the same line of action was adopted by many countries, then the benefits formerly reaped by the leaders soon disappeared. (Aldcroft and Morewood 2013, p. 87)

Hence, the argument is that with no need to use monetary policy to target the exchange rate, interest rates can be eased and at the same time the weaker currency makes exports cheaper abroad. It is the latter aspect, as a tool for unfair competition, that gives the pejorative meaning to "competitive devaluation". Moreover, the more countries that let the exchange rate depreciate, allegedly the less efficient becomes this tool.

The aim of this article is to test whether and to what extent any "beggar-thy-neighbour"[1] effect was caused by currency depreciation in the 1930s, and to discuss its broader impact on the international economy. While this issue has been much discussed and already a contemporary literature questioned the unfair effects of the currency depreciations (Harris 1936; The Royal Institute of International Affairs 1936), an adequate assessment still remains. There are good reasons for this, given the difficulty in disentangling the role of exchange rates from the plethora of protectionist trade barriers that were raised during the 1930s. Arguably it was the latter that brought about the collapse of international trade.[2] Eichengreen and Irwin (2010) even argue that there was a trade-off between exchange rate policy and protectionism and "countries that stayed on the gold standard tended to restrict trade more than those that allowed their currencies to depreciate" (p. 894). However, one might twist the issue and argue that the one was intertwined with the other, and protectionism was a retaliatory response to those countries who left the gold standard in 1931 (Albers 2020). While Albers admits that currency depreciation was partly beneficial for recovery, he sees it as responsible for a large part of the deterioration of world trade by inviting to protectionist measures among countries that stayed on gold. His argument illustrates the complex nature of the issue, but nevertheless fails to make an adequate assessment by only distinguishing between on-gold and off-gold, rather than examining the role of exchange rates.

[1] As will be seen below, the original expression was "beggar-my-neighbour", emanating from a once popular game of cards (see, e.g. *The Economist,* 6 Aug. 1927, p. 241).

[2] A common view is, however, that the fall in output was more important than trade barriers for the decline of international trade in the Great Depression. By contrast, de Bromhead et al. (2019) forcefully argue that trade barriers were effective and in the case of Britain convincingly show that trade policy had a major role.

Strangely, a neglect of the actual behaviour of exchange rates characterizes other efforts to address currency depreciation in the 1930s. Thus, Eichengreen and Sachs (1985, 1986) just take account of the gold parity in 1935 over 1929 and Ting and Ho (2018) similarly account for the change in the exchange rate to the dollar in 1935 over 1929. Thus, neither the movements in gold parity during the period, nor the variations in exchange rates between different trade partners are considered. Consequently, they do not analyse the role of exchange rates per se, but their broader relation with the recovery from the Depression. This is also underscored by Ting and Ho, who apply the approach of Eichengreen and Sachs on the Asian context: "Even though a link between currency depreciation and extent of recovery is established herein, we have not explored the mechanisms through which currency depreciation helped the Asian economies to recover from the impact of the Great Depression" (2018:150).

Therefore, in contrast to the previous literature the present article examines the behaviour of exchange rates, including effective (both nominal and real) as well as bilateral against major trade partners. The sample of countries for which these exchange rates have been constructed are industrialized countries in Europe and the USA whose relations with their respective main trade partners are analysed. In addition to twelve Western European countries and the USA, Czechoslovakia is included. In 1929, this former workshop of the Austro-Hungarian Empire was the largest in Eastern Europe with regard to foreign trade, and well integrated with the west.[3] In theory, the effects of exchange rate changes on exports and imports should be persistent but the present article shows they were few and temporary. A conjectural explanation draws on Paul Krugman (1989), who has suggested a "wait and see" mechanism as a response to exchange rate changes in times of uncertainty that might apply on the 1930s. Furthermore, the article is a rehabilitation of Ragnar Nurkse (1944), who exposed the expansionary role of currency depreciations for the global economy in the 1930s, and thus anticipated more recent views, but who undeservingly has been associated with the notion of "competitive devaluation".

The next section shortly reviews contemporary opinions on currency depreciation, mainly as reflected through *The Economist* and *Financial Times*, and connects to Nurkse (1944) and the more recent literature. Nurkse's argument, that currency depreciations in the 1930s were expansionary for the international economy and not only for depreciating countries, is reiterated. Section 3 explores the movement of effective exchange rates, trade, and economic growth among the fourteen countries. The data are introduced in that and the following section, and discussed in greater detail in the appendices. Section 4 reviews a related literature on the effects of currency changes and elaborates a succinct model for the detection of competitive devaluation. In Sect. 4.1 the model is econometrically applied on each of the fourteen countries in the sample, and in Sect. 4.2 applied year by year for all the countries. Section 5 concludes and proposes a conjectural explanation for the lack of beggar-thy-neighbour effects in the 1930s.

[3] The list of trade partners is presented in Appendix A.

2 Contemporary and recent views

By looking at the discourse on competitive devaluation this section traces the development of the argument about beggar-thy-neighbour effects. Leading economists of the time participated in public debate on the topic and in this section such scholarly contributions are reviewed along with articles in *The Economist* and *Financial Times*. With its focus on British voices, the account is admittedly biased, but it suffices to show that insights that allegedly were uncovered only much later (Eichengreen and Sachs 1985, 1986; Eichengreen 2019) emerged contemporaneously, already in the 1930s.

The week before Britain abandoned gold, *The Economist* criticized proposals for a devaluation of the pound and warned for "an international competition in depreciation of currencies".[4] A week later, summing up the immediate reactions, the position was less decisive, and the newspaper conjectured: "indeed, our abandonment of the gold standard may yet be turned to good advantage not only for our-selves but for the world".[5] This line of argument was further elaborated in a review of J.M. Keynes' Halley Stewart Trust lecture, where the newspaper embraced the view that abandonment of gold opened the way to a relief, not only British but an international, from the deflationary pressure coming from governments' "'beggar-my-neighbour' struggle".[6]

However, a fierce critic of currency depreciation was Lionel Robbins. His book *The Great Depression* (1934) traces the collapse of the international economy and the rise of protectionism back to Britain's abandonment of the gold standard, which he characterized "as a catastrophe of the first order of magnitude" (p. 117). Failure to stabilize the pound gave way to competitive depreciation by the USA and Robbins, writing in the first half of 1934, expected the European continent to follow suit.[7] Robbins saw the overall effect of the depreciations as deflationary, worse than any "domestic contraction" (p. 119), mainly due to the uncertainty created by currency instability but also by reducing the value of assets in the depreciated currency. Additionally, even if the Smoot-Hawley tariff came before, exchange rate changes provoked a diversity of trade restrictions and thus caused international chaos.

Joan Robinson devoted one of the papers in *Essays in the Theory of Employment* (1937), to "beggar-my-neighbour remedies" though she had a broader approach and included both external and internal devaluation as well as protectionist measures:

> In times of general unemployment a game of beggar-my-neighbour is played between the nations, each one endeavouring to throw a larger share of the burden upon the others. As soon as one succeeds in increasing its trade balance at the expense of the rest, others retaliate, and the total volume of international

[4] 1931, 19 Sept., p.504.

[5] *The Economist,* 1931, 26 Sept., p.548.

[6] *The Economist,* 1932, 13 Feb., p.341; see also Keynes (1971).

[7] "While this very paragraph was being written, there came news of the depreciation of yet another currency. Before it is printed, there may be many more" (Robbins 1934, p. 161). Probably the news was about Czechoslovakia, devaluing in February 1934; the next was Belgium in March 1935, before the big wave in 1936.

> trade sinks continuously, relatively to the total volume of world activity. Political, strategic and sentimental considerations add fuel to the fire, and the flames of economic nationalism blaze ever higher and higher. (p. 156–7)

A result of the beggar-my-neighbour game, according to Robinson, was "a rise in the rate of interest for the world as a whole and consequently by a decline in world activity" (p. 157). This is a crucial point and, as will be shown below, the opposite argument was made by Nurkse (1944) for a positive interpretation of the currency depreciations.

Even if there was no lack of those alarmist overtures that are echoed in the literature on the 1930s, more balanced views were also voiced in the contemporary debate. *The Economist* as well as *Financial Times* were thus restrictive with complaints about competitive depreciation. This might partly be explained by loyalty to the national government and domestic business, but neither were protectionist measures by France or other gold bloc countries blamed for being "beggar-thy-neighbour". "Competitive depreciation" was seen as a threat rather than an actual occurrence.[8] In connection with the Imperial Economic Conference in Ottawa 1932, fears were raised by *The Economist's* correspondent about a race of competitive depreciation among the "sterling countries", and these were repeated a year later, after New Zealand had devalued, now including the prospects for the gold bloc to follow.[9] However, in March 1934 *The Economist* in an editorial commenting on a proposal for a rapid return to gold, endorsed by the International Chamber of Commerce, was cautiously positive about a gold bloc devaluation. A general return to gold might not even be desirable since rigidly fixed exchange rates were seen as something of the past: "A limited power to vary parities may, indeed, be a permanent feature of the new regime".[10]

The Economist cared more about the relation between the pound and the dollar than with the French franc or the Dutch guilder. From 1933, a French devaluation was foreseen but a bigger problem than the currency depreciation was seen in the risk that it "would lead to the Government's overthrow, a swing to the Right and a new Tardieu Ministry—a change which would accelerate throughout Europe the trend towards economic nationalism in a general *sauve qui peut*".[11] It took another three years before the French franc was devalued, and a few months before it actually happened *The Economist* exclaimed, "…it is to be hoped that the new French

[8] Searching for "competitive devaluation/depreciation" gave 25 hits in *The Economist* and 15 in *Financial Times* during 1931-39. For "beggar-my/thy-neighbour" there were 3 hits in *The Economist* and 11 in *Financial Times.* Most hits were in 1933 and 1936 with a total of 11 in each year. Even if there were no concrete pointers, at two instances *The Economist* recognized that competitive depreciation had occurred, with phrases like "it is desirable to guard against a new outbreak of competitive depreciation" (31 Mar 1934, p. 685) and "Sterling below dollar parity means the possibility of a new race for competitive devaluation which is obviously neither in the interest of Britain nor of the United States" (9 Mar 1935, p. 532).

[9] *The Economist,* 6 Aug 1932, p. 261; 23 Sept 1933, p. 569.

[10] *The Economist,* 31 Mar 1934, p. 685.

[11] *The Economist,* 1 July 1933, p. 4.

Government will recognize the need for the devaluation of the franc, and will carry it out as quickly and smoothly as possible".[12]

It seems clear, however, that there were mutual suspicions between opinions in Britain and the USA about unfair manipulations of the currencies. The British were suspected of deliberately using the Exchange Equalisation Account in that purpose. In Britain, this was deemed as unwarranted but admittedly self-inflicted due to the Account's lack of transparency.[13] *The Economist* was concerned about the instability of the floating, and depreciating, dollar, and during the World Economic Conference an editorial vehemently pleaded for the stability of the pound and cooperation with the gold bloc countries.[14] The harshest criticism by *The Economist* was, however, directed towards President Roosevelt whose policy, and in particular the buying up of gold, puzzled *The Economist*:" The main outlines of the policy, however, are still as obscure and the future as unpredictable as ever…. If the President is committed beyond recall to securing a rise of prices by monetary mean, almost any method would be preferable to this".[15] Later *The Economist* acknowledged the US monetary policy as a lever for the recovery but kept resentments about the dollar depreciation.[16] Judging by the account of Kenneth Mouré (1991), in France the Depression was seen as an outcome of irresponsible economic policy that should not be repeated and only when other means were exhausted was the franc devalued. The French were also aware that the stabilization of the franc in 1928 meant a devaluation of 80 per cent compared with the prewar parity, which contributed to the self-restraint (Mouré 1991, p. 208, 211–2). Nevertheless, France responded to the British abandonment of gold with a surtax on imports from Britain, and other depreciating countries (Mouré 1991, p. 17—see Appendix D for details). The parity to gold was kept until September 1936 when the Tripartite Agreement with the USA and Britain had been negotiated, in an effort to achieve currency stability (Nurkse 1944, p. 131). One could conclude that currency adjustments in the 1930s were not undertaken in an atmosphere of tit-for-tat and when the gold bloc finally came to an end in 1935 and 1936, there was a broad understanding of the need for realignments of exchange rates.

The League of Nations published towards the end of the Second World War a study, *International Currency Experience*, largely written by Ragnar Nurkse (here referred to as Nurkse 1944). This study has later been alleged as an exponent of the notion of competitive devaluation (Eichengreen and Sachs 1985, 1986; Eichengreen

[12] *The Economist,* 16 May 1936, p. 369.

[13] By Arthur Salter, writing in *The Economist* 6 and 13 July 1935. Salter suggested that the Bank for International Settlements (BIS) should manage an equalization fund, an arrangement that in the post-war period came with IMF. Salter also suggested a greater exchange rate flexibility and stated: "Where the alternative is an increase of Bank rate or depreciation, the latter must be chosen" (p. 57).

[14] *The Economist,* 1 July 1933, p. 3.

[15] *The Economist,* 4 Nov 1933, p. 849.

[16] "The definition of currency honesty is no longer so rigidly drawn as to exclude all readjustments of currencies. But when a rich country, with a strong currency, voluntarily devalues by a very large percentage solely in order to facilitate its internal economic policy, it might be considered a very dangerous precedent and an incitement to the insanity of competitive depreciation" *The Economist,* 3 Oct 1936, p. 18.

1992). This is surprising given that Nurkse actually anticipated the criticism by Eichengreen and Sachs in an elaborate manner. Even if Nurkse's account is non-formal, its approach is superior to that of Eichengreen and Sachs's two-country model in having a multilateral perspective. A key argument of Nurkse is that the devaluations increased the price of gold by as much as 70 per cent, and that as a consequence monetary reserves increased which opened the way for a monetary expansion that did not exclude countries which had not depreciated: "Thus the all-round increase in the price of gold in the various countries, unaccompanied by a corresponding rise in commodity prices, enlarged the supply of international currency irrespective of the expansion in new gold output" (p. 19). Contrary to Joan Robinson's prognosis about globally rising interest rates, Nurkse with hindsight could notice the international decline in interest rates and saw them as an outcome of the depreciations.

One possible cause of confusion is that Nurkse coined the notion about the "devaluation cycle of the 'thirties'" and was a proponent of stable exchange rates of the style of Bretton Woods—that is, pegged but adjustable "in case of chronic and long-term disequilibria in balances of payments" (1944, p.138).[17] Given the undeserved connection with "competitive devaluation" assigned to Nurkse, it is suitable to quote him at some length:

> At the end of 1936, however, in contrast to 1934 or 1932, exchange relationships between the principal free currencies were not widely different from what they had been in 1930, before the cycle of devaluations had begun. What then, was the significance of this whole cycle? Was any good purpose served by the successive shocks to international currency relations, was there any need for going through such violent disturbances if the outcome in terms of exchange rates differed so little from the starting point?
>
> In contemporary discussion much stress was laid on the competitive aspects of currency devaluation. In many quarters devaluation was regarded primarily as a means of improving a country's foreign trade balance and hence its volume of domestic employment—an effective means but one that operated necessarily at the expense of other countries and invited retaliation.
>
> More recently, empirical studies have suggested a shift in emphasis. It has been shown that countries with depreciated currencies increased their exports mainly to other countries with depreciated currencies. This was a natural result of the expansion of production and money income which accompanied or followed devaluation. In other words, monetary expansion tended to stimulate not only home market activity but also foreign trade of the countries with depreciated currencies *inter se*. (Nurkse 1944, p. 129)

In the quoted paragraph Nurkse emphasizes, as had Harris (1936) before him, the expanding trade between the countries that had left gold, but he laid no less weight on the universal character of devaluation and its effect on monetary reserves.

[17] See Eichengreen (1992, p. 22): "Thus the account here differs fundamentally from that of Nurkse (1944) in emphasizing the beneficial effects of the entire round of devaluations that took place in the 1930s, an episode that Nurkse dismisses as a fruitless 'devaluation cycle'".

Instead of a devaluation cycle, however, Nurkse would have favoured an early and coordinated expansionary action by the leading industrial nations: "What made the long succession of devaluation inevitable was the fact that monetary expansion was completely uncoordinated in time as well as degree…In default of simultaneous anti-depression measures, successive devaluations leading to monetary expansion were the only practical alternative" (p. 130). Ragnar Nurkse was thus far from the disapproving view of "competitive devaluation", that has been commonly ascribed to him. On the contrary, he anticipated arguments that have today been broadly accepted regarding the gold standard and the Great Depression, arguments that were pioneered in the more recent literature by Eichengreen and Sachs (1985, 1986), Temin (1989) and Eichengreen (1992).

Critically examining the notion of competitive devaluation in the 1930s, Eichengreen and Sachs (1985) stress the distinction between protectionism in the field of trade and exchange rate management. They argue that recovery was promoted in the depreciating countries, primarily due to the easing of restrictions on the domestic credit market, but there was a beggar-thy-neighbour effect unless there was also a gold outflow making credit easier abroad. Since they find that "depreciating countries gained rather than lost gold reserves…*Currency depreciation, beneficial from the individual country's point of view, was in fact beggar-thy-neighbor*" (1985, p. 943, italics added). However, this is the result of a model where the world gold stock is *assumed* to be fixed and the gain of one country must be the loss of another. That assumption disregards a key argument of Nurkse, namely that the value of the gold stock increased both due to the increasing gold price and the rise in gold output "fully comparable to any of nineteenth-century discoveries" (Nurkse 1944, p. 18). Data show that from December 1930 to December 1935, that is, before the dissolution of the gold bloc, gold reserves of gold bloc countries increased on par with sterling countries, while control countries lagged behind (see Appendix C).

The truly ambiguous conclusion by Eichengreen and Sachs is supplemented with a demand for further empirical research. Thus far, this plea has received no response although Douglas Irwin, in his Ohlin Lectures, stated:

> For all practical purposes, the notion that countries engaged in competitive devaluation during the 1930s is *simply erroneous*. In fact, there was only one real example of a competitive devaluation. After New Zealand devalued its currency by 15 percent against the British pound in 1933, Denmark followed with a 17 percent devaluation of the krona." (Irwin 2012 p. 153, italics added)

It is not clear however, what qualifies these as competitive. Irwin refers to Straumann (2010, p. 121 ff), who classifies both New Zealand and Denmark as involved in competitive devaluation, although not making clear why some currency depreciations were competitive and other not; Irwin also refers to Kindleberger (1934), but rather than finding any loser Kindleberger pointed out that Britain was the winner by having to pay less for its butter import.

Ever since the Australian pound in early 1931 had settled at 1.30 to the British pound, compared to almost one to one a year before, devaluation had been debated in New Zealand. Both the Australian and the New Zealand pound followed the

British pound after its abandonment of the gold parity, but this maintained New Zealand at a disadvantage vis à vis Australia. A new peg to the British pound was declared on 19 January 1933, and on that day the Danish krone had resumed the slide that gently had begun in the summer before. Denmark faced capital flight and a political crisis related to the labour market when the decision about a new peg of the krone was declared on 31 January (Hoffmeyer 1968, p. 177). It is difficult to find the significant circumstances that according to Straumann would motivate a beggar-thy-neighbour stamp to the Danish devaluation in 1933 in contrast to other European devaluations.[18]

A conclusion from this review of the discourse on "competitive devaluation" is that critical or balanced views appeared already in the 1930s. By contrast, more recent critics have retained an ambiguity by arguing that devaluations were expansionary only for those who devalued and caused beggar-thy-neighbour effects on others. That devaluations could be expansionary for the global economy was, however, indicated early on and eloquently argued by Nurkse (1944).

3 Effective exchange rates and economic performance

The history of European currency politics following the exit of the British pound from the gold standard in September 1931 is well known and the details are left out here (e.g. Straumann 2010). Less known, however, is the behaviour of the exchange rates, notably the effective exchange rates experienced vis à vis the main trade partners. The history of the effective exchange rates contributes to our perception of the notion of competitive devaluation and should therefore be told before the occurrence of beggar-thy-neighbour effects are examined. Broadly three groups of countries materialized and can be defined according to the open-economy trilemma about the impossibility for a country to combine more than two of the following three conditions: fixed exchange rates, open capital markets, and independent monetary policy. Hence countries leaving gold early on (the sterling bloc) combined open capital markets and independent monetary policy; at a similar point, other countries retained the fixed exchange rate but regulated both capital and current accounts (control countries) and thereby achieved some policy independence; finally, those who stayed on gold (the gold bloc) retained open capital markets and continued to give up an independent monetary policy. However, the differences were not clear cut, for example, Denmark practically was a member of the informal sterling bloc, but introduced exchange controls in 1931 as did Czechoslovakia, which sometimes is seen as a gold bloc country.[19] Italy was among those who formed the gold bloc but became a control country in 1934. The USA left gold in 1933, earlier than those in the gold bloc. Yet, by 1936 all countries in the gold bloc had left the gold parity, and thereby the "devaluation cycle", so labelled by Nurkse, was completed.

[18] Besides references in the text, this paragraph builds on *The Economist* 14, 21, 28 January and 4 February 1933.

[19] Eichengreen 2019, p. 81. Exchange controls cover a broad area and their use varied between countries. Czechoslovakia and Denmark did for example not limit foreign debt service (League of Nations 1938).

However, what is usually overlooked is that a fixed parity with gold or a particular currency is not the same as an effectively fixed exchange rate. The effective exchange rate is defined as an index of a basket of exchange rates, composed by a country's trade partners and weighted according to the size of the trade. Thus, even with a "fixed exchange rate" the effective exchange rate of a currency might change depending on the trade partners. Further, there are the nominal and the real effective exchange rates, below labelled NEER and REER, respectively:

$$\mathrm{NEER_i} = \Sigma[(e_{ij}m_{ij}) + (e_{ij}x_{ij})] \tag{1}$$

$$\mathrm{REER_i} = \Sigma[(e_{ij}m_{ij\,*}p_j/p_i) + (e_{ij}x_{ij\,*}p_j/p_i)] \tag{2}$$

where subscripts denote country *i* and *j*, respectively; e_{ij} is the annual change in the exchange rate taken as the amount of country *i's* currency for one unit of country *j's*; *m* is the share of country *i's* imports coming from country *j*; *x* similarly denotes the exports*; p* is the annual changes in the consumer price index. Since the exchange rate is expressed as the number of units of the home currency for one unit of the foreign currency, a depreciation is shown as a rise of the exchange rate, and an appreciation as a fall. The adjustment for relative prices in the calculation of REER is taken as the foreign prices over the domestic prices, and consequently a depreciation of NEER would be counteracted by a relative rise of domestic prices or reinforced by a relative decline of domestic prices, and the reverse in case of nominal appreciation.

Effective exchange rates of the sterling bloc depreciated in the early 1930s while those retaining the gold parity appreciated, as illustrated by the graphs in Fig. 1.[20] In the second half of the 1930s, the former were stable or appreciated while the bulk of the rest, which had now left gold, depreciated. Thus, Nurkse might have been right considering exchange rates against major currencies when he described the situation in 1936 as back to where it had been in 1930, but he missed what had happened to effective exchange rates. In fact, for this sample of countries as a whole, the average of effective exchange rates, while stable 1929–1931, from 1932 onwards displayed a steady trend of depreciation. In 1936, the average of NEER had depreciated by 8 per cent and REER by 10 per cent and continued to depreciate throughout the 30 s. It is noticeable that the real effective exchange rates are moving as much as the nominal rates, indicating that the purchasing power parity hypothesis was not matched for these countries in this period (see also Taylor 2002; and Ljungberg 2019).

The different time patterns of exchange rate movements demonstrated in the graphs illustrate the division into different currency blocs. The sterling bloc depreciated in the early 1930s and did, with few exceptions, not return to the previous level although appreciating slightly when the gold bloc had dissolved. This also applies to

[20] The indices shown in Fig. 1 are Paasche fixed base indices. Usually, chain indices are of Laspeyres type, which means that the weights are for the preceding year or a preceding period of years. Arguably Paasche weights, that is, weights for the current year, make more sense because the measured change in exchange rates pertains to the basket of the actual year in comparison with the base year. Here the comparison of interest is with 1929. For a discussion, see Ljungberg (2019).

REER, implying that the gained competitive advantage could be broadly retained. An exception to this was Norway, for which REER in 1939 had appreciated and was a few percentage points below its 1929 level. The USA, which left gold later than the sterling bloc, yet before any in the gold bloc, retained its gain in competitiveness as shown by the stable REER at a high level, even though NEER in 1939 was back to the level of 1929. Among the gold bloc, the trajectories of effective exchange rates were dispersed after they abandoned the gold parity. Belgium depreciated about a third in 1935 and 1936 but was in 1939 almost back to its levels of 1934 in both NEER and REER. The Netherlands and Switzerland improved competitiveness after leaving gold in 1936, though not only due to depreciating currencies but also to lower inflation rates than among their respective trade partners. France on the other hand, left gold in the autumn of 1936 and improved competitiveness despite the increasing inflation as shown by the sharper rise of NEER than in REER. Among the control countries, Germany stands out with a continuous appreciation of both NEER and REER, although the harsh deflation in the early 1930s delayed the start of REER appreciation until after 1933. Austria was different from Germany, with a stronger REER appreciation until 1934 whereafter the currency depreciation improved competitiveness even though the level of 1929 was not regained. Italy in 1934 left the gold bloc, became a control country and turned appreciation to depreciation, although after 1937 more in nominal than real terms.

Over the 1930s, nine out of the fourteen countries improved their competitiveness with the help of currency depreciation, as indicated by REER data. It is not unreasonable to assume that all this depreciation of both NEER and REER took place at the cost of trade partners. Table 1 indeed suggests that both trade and economic growth followed the devaluation cycle, and the table highlights that the currency blocs demonstrate distinctly different patterns over the 1930s. The sterling countries experienced positive GDP growth 1929–34 and trade declined at single digit rates, whereas the other countries had negative GDP figures and trade declined at double digit rates. However, in 1934–38gold and control countries performed somewhat better, in particular in trade, than the sterling countries, even if the latter retained the lead seen over both periods from 1929 to 1938. What is noticeable for the period 1929–34 is that most control and gold countries reduced imports more than exports. This is in line with the argument of Eichengreen and Irwin (2010), that protectionism was stronger among countries that were more resistant to currency depreciation. Also noticeable is that some of the prime suspects of competitive devaluation, that is, the UK, the USA, and Denmark, reduced imports significantly less than exports, which questions that these countries profited from any beggar-thy-neighbour effect.

Nurkse (1944) saw no signs of competitive devaluation in the pattern of trade: "The revival of aggregate demand in certain important markets, rather than any 'exchange dumping', appears to have been one of the central factors governing the movement of trade during the devaluation period. The evidence seems to suggest that any export gains obtained by devaluation at the expense of countries that had not yet devalued were short-lived and relatively unimportant" (p. 129–30). Yet, a more systematic econometric testing might answer the question whether beggar-thy-neighbour in the 1930s is a fact or an artefact.

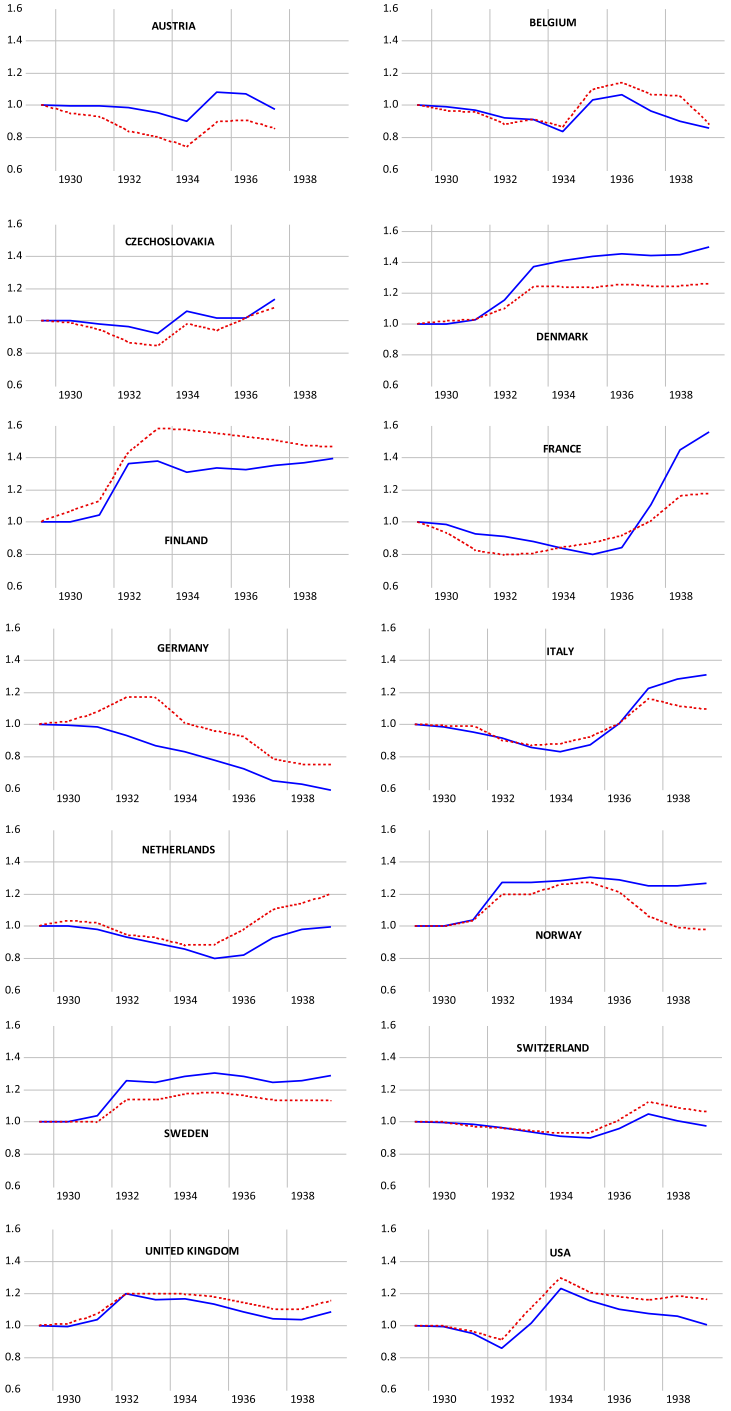

Fig. 1 Nominal (continuous lines) and real (dotted lines) effective exchange rates for 14 countries, 1929–1939 (1929 = 1). *Source*: Author's calculations, see text and Appendix B

Table 1 Average annual rates of change (per cent) in export, import and GDP. *Sources*: GDP growth as calculated on Maddison (2001), but for Norway (Grytten 2004) and for Sweden, Schön and Krantz (2012). Imports and exports are current values in Mitchell (2013) deflated with implicit price indices derived from United Nations (1962), but for Finland, Norway, Sweden, and the UK with national accounts implicit trade deflators (Hjerppe 1988; Grytten 2004; Schön 2015; Sefton and Weale 1995, respectively) and for the US export and import price indices in Lipsey (1963). Czechoslovakia and Belgium do not have data for unit values in United Nations (1962) why their exports are deflated with their respective CPI, and their imports with (weighted) CPI of main trade partners (Appendix A), adjusted for change in nominal exchange rates. Since the CPI-based trade deflators for all countries similarly deviate from the unit value deflators, the average differences for the other 12 countries (between CPI-based deflators and the UN implicit price indices) have been used to adjust the estimated deflators for Czechoslovakia and Belgium

		1929–34			1934–38			1929–38		
		Export	Import	GDP	Export	Import	GDP	Export	Import	GDP
Austria	Control	−7.43	−8.39	−5.60	0.26*	4.43*	3.37*	−5.00*	−4.72*	−2.21*
Germany	Control	−10.07	−16.00	−1.38	3.93	3.03	7.49	−6.31	−5.12	3.53
Czechoslovakia	Control	−14.73	−16.52	−3.79	10.23*	16.00*	6.24*	−5.47*	−7.68*	−1.12*
Italy	Gold–Ctrl	−15.01	−15.34	−0.13	11.75	20.06	4.10	−4.29	−1.20	2.10
Belgium	Gold	−9.76	−14.22	−1.36	8.28	10.08	1.37	−1.08	−3.17	0.34
France	Gold	−11.25	−13.32	−2.10	15.60	20.82	2.23	−1.73	−1.35	−0.14
Netherlands	Gold	−13.94	−16.21	−2.11	7.31	10.78	3.82	−5.57	−5.72	3.24
Switzerland	Gold	−8.69	−16.34	−0.81	6.96	12.7	2.19	−3.11	−5.30	0.49
UK	Sterling	−7.30	−2.68	0.46	0.93	3.00	3.42	−1.65	0.38	2.48
Denmark	Sterling	−6.47	−3.16	1.55	5.90	4.82	2.40	1.40	2.85	2.01
Finland	Sterling	3.72	−6.14	2.19	3.43	13.86	5.62	5.55	5.49	4.56
Norway	Sterling	1.64	−5.52	1.53	2.85	10.48	4.72	2.79	2.44	3.25
Sweden	Sterling	−3.76	−4.83	0.32	5.82	8.42	3.65	2.28	1.70	2.39
USA	Gold–float	−17.58	−12.08	−6.03	14.63	16.48	6.08	−6.01	−1.79	0.68
Average		−8.62	−10.77	−1.24	6.99	11.07	4.06	−2.01	−1.66	1.54

Annual rates of change estimated as fitted trends. *For Austria and Czechoslovakia end year is 1937

4 Testing for competitive devaluation

As pointed out above, the literature on the effects of exchange rates changes in the 1930s is meagre. However, after the collapse of the Bretton Woods system and the spread of floating, a vast literature on the effects of exchange rate changes in this more recent period has developed. Commonly these effects are analysed within a framework of price elasticities of imports and exports. A related issue within this strand of literature is the extent of pass-through of changes in exchange rates into consumer prices or prices of exports and imports (for surveys of the literature see Goldstein and Khan 1985; Goldberg and Knetter 1997; Leigh et al. 2017). Central in the discussion about exchange rates is the Marshall–Lerner condition, stating that if the sum of the absolute values of both import and export elasticity is at least one, a depreciation of the currency will improve the current account (Bahmani et al. 2013). In the standard model traded quantities are a function of prices and national income though there are alterations including disaggregation down to sectoral level.[21] Arguably, notwithstanding the Marshall–Lerner condition, price elasticities can only provide indirect evidence about the impact of exchange rate changes. Suppose that we know that the effects of a particular depreciation were expansionary for the economy and improved the current account, yet it is not obvious whether the direct cause was through increased price competitiveness, through release of deflationary constraints on economic policy, or something else. A problem in much of the literature is an aggregation bias, that the standard models even out differences in outcomes related to different trade partners and obscure the causal mechanism (Bahmani-Oskooee and Hegerty 2007). To uncover the causal mechanism, total trade is here disaggregated to the bilateral relations between the domestic country and a sample of its trade partners. The rationale is that since the bilateral exchange rates of a country move differently towards different currencies, the elasticity should be measured on the distribution of trade between trade partners. Below, such a disaggregation is pursued both as panel regressions for each country over the 1930s, and as regressions in each year 1930–1939 of panels for the fourteen countries with their respective trade partners.[22]

According to the notion of competitive devaluation, an unfair advantage is created by making exports cheaper in foreign currencies and imports more expensive in the domestic currency, by help of currency depreciation. However, although prices are part of the mechanism, they are not a conclusive indicator of the outcome due to, for one but not the only reason, the extent of pass-through from exchange rate changes to prices. Arguably a conclusive indicator could be derived from the distribution of exports and imports between the trade partners of a country. Then it is a necessary condition of a beggar-thy-neighbour effect if growing shares of a country's exports are sold to countries against which the currency depreciates. The

[21] A recent theoretical approach is suggested by Bergin and Corsetti (2020). How a flexible exchange rate worked counter-cyclically in the Great Recession, apart from any beggar-thy-neighbour effect, is shown by Ljungberg (2021).

[22] Per definition a panel should include a time dimension but in this model the panel is undated with time replaced by up to 20 trade partners. See Appendix A for the trade partners.

same can be concluded if diminishing shares of imports are coming from countries against which the currency depreciates. Given that these are necessary indications implies that neither exports nor imports provide sufficient or strong evidence on their own. For example, rising exports could be due to innovation or change of preferences in the importing country. That such changes take place inversely in both exports and imports is less likely. Therefore, if a country is gaining market shares in countries against which its currency depreciates, and imports relatively less from the same countries, this can be taken as strong evidence of a beggar-thy-neighbour effect. An advantage with looking at trade shares is that relevant price data, which pose well-known measurement problems, are not needed.[23] Furthermore, by taking trade shares we also distinguish from the growth or decline of the total trade, which were determined by more factors than the currency, while trade shares just as bilateral exchange rates specifically relate to trade partners. Nonetheless, one limitation of this approach is that domestic production is a substitute for imports and consequently the import shares may underestimate the impact of exchange rate changes.[24] However, in practice the currency effects would be captured by the distribution of imports on trade partners, at least if the sample of trade partners is not too small.

One could consider including diverse control variables but in line with the trade literature, these are limited and have in this study been restricted to just two, which are more discussed below. The problem of endogeneity or reverse causality from trade to exchange rates is probably of less significance, the reason for this being as follows: First, in periods with large currency fluctuations the causality unlikely runs from trade to changes of the exchange rates (Leigh et al. 2017). This certainly applies to the 1930s, when abandonments of the gold standard were undertaken as discrete measures in acute crises. Second, modelled here are changes in trade shares following exchange rate changes in the year before. Besides reducing the risk of endogeneity this time lag also takes account of the J-curve that is observed in connection with exchange rate movements. That is, immediately after a currency depreciation the current account may deteriorate and improve only with a lag (Bahmani-Oskooee and Hegerty 2010; Bahmani-Oskooee and Zhang 2014).[25] A lag of one year is in line with Leigh et al. (2017) who, in an examination of devaluations since the 1980s, found that most of the improvements in current accounts occurred within a year. Furthermore, with one exception neither lengthening nor omitting the lag was found to improve the results and arguably the one-year lag captures also shorter temporary effects that leave an impact on the annual figures. The exception, when exports were boosted with a longer lag after the dissolution of the gold bloc, is discussed in Sect. 4.2.

[23] A source of error, however, would be if relative prices change so that trade partners' shares in current values change without a concomitant change in volume shares. However, that this should occur for both exports and imports seems improbable.

[24] A solution would be to measure imports as shares of total income but GDP data in current prices for the 1930s are rare and reconstruction would impose greater uncertainty.

[25] The lag is usually connected with contracts but could also be due to expectations. This was noticed by the US Department of Commerce (1934, p. 9, as cited in Nurkse 1944, p. 120) when imports grew in 1933 despite a weaker dollar and an explanation was proposed in "the distinction between a depreciating and a depreciated currency", that is, traders anticipated a further weakening of the dollar.

4.1 Country by country

The country by country estimations over the 1930s are performed as panel regressions with the following equation:

$$\text{exportshare}_{ijt} = \alpha + \beta_1 dner_{ijt-1} + \beta_2 x_{ijt} + \gamma_i + \gamma_t + \beta_3 \text{DUMMY}_{it} + \varepsilon_{it} \quad (3)$$

where lower case letters denote natural logarithms and subscripts denote home country i and trade partners j; *exportshare* is the shares (in current prices of the exporting country) taken by main trade partners in a stacked panel; *dner* is the change of the bilateral nominal exchange rate to the country in question, and x stands for two control variables. One is the shares (in current prices of the domestic country) of imports, and the other is the tariff levels, both considering the trade partners of the domestic country. The change of the bilateral exchange rates is for the year before, in line with the argument about the J-curve. Import shares control for the economic dynamics of the trade partners, which in standard trade models are caught by an income variable, as well as for path dependency in the pattern of trade. Furthermore, to support a beggar-thy-neighbour effect, the import share as a control variable should have a negative sign indicating opposite movements of import and export shares. Trade barriers of different sorts were raised during the 1930s and it would require meticulous work to accurately control for their influence. However, aggregate tariff levels are used in order to provide an approximation of trade barriers. As reported in Table 2 control variables are added after regressing only the exchange rate changes. Occasionally extreme values among trade partners create noise in the results. Since these are identified as outliers in the residuals, they can be adjusted for through the inclusion of dummy variables. Hence, *DUMMY* is added in a third regression, but only when outliers have resulted in residuals larger than half a standard error. At most two dummies are inserted for outliers, each taking the value 1 for that observation and 0 for the rest. To account for different levels of countries' trade shares, country fixed effects are applied, denoted with γ_i; while idiosyncrasies of different years are captured by period fixed effects γ_t, and ε_{it} is the residual.

Similar equations are run with the *importshare* at the left-hand side, with the lagged *dner* plus *exportshare,* and trade barriers as independent variables. Trade barriers are proxied by tariff levels, but to make sense in the equation, all trade partners cannot face the same tariff. Therefore, import tariffs are included as control variable only for seven countries whose differentiation of import tariffs could be mapped with reasonable accuracy and effort.

Trade partners for each country are listed in Appendix A. Bilateral exchange rates are taken as cross rates with the British pound calculated from monthly close rates in *Global Financial Data* (GFD) and trade data are from Mitchell (2013), all of which are discussed in greater detail in Ljungberg (2019). For France and Italy, additional trade data have been drawn from INSEE (1966) and ISTAT (1958, 1968), respectively. Average tariff levels have been mainly taken from Clemens and Williamson (2004), although adjusted for French surcharges on countries with depreciated currencies, British imperial preferences, and American Reciprocal Trade Agreements. One may object that tariff levels varied between commodities, and that these might

not be captured by averages. However, to accurately disaggregate down to commodity level would require a larger research project. Notwithstanding the weaknesses of the present tariff variables, for the 1930s they significantly elaborate Clemens and Williamson (2004) which hitherto present the most comprehensive comparative historical dataset on tariff levels.[26]

Table 2 shows the results with export shares as the dependent variable. On the surface, there are indeed indications of beggar-thy-neighbour effects. Thus, for eight of the fourteen countries there are statistically significant coefficients for exchange rate changes in the preceding year, suggesting that depreciation increased market shares and the opposite for appreciation. For three of the eight countries (Germany, Italy, and the USA), though, the statistical significance disappears when controls are added. Suspects for pursuing beggar-thy-neighbour policies are then Czechoslovakia, Finland, Sweden, Switzerland, and the UK, that is, three sterling countries and one control country as well as one country in the gold bloc. However, before drawing any conclusions one has to examine the table in full. Thus, along with a statistically significant coefficient for changes in the exchange rate these countries, except Switzerland and Finland, display a statistically significant positive sign for the import shares, indicating that imports and exports moved together. This is moreover the case for most of the countries, irrespective of the coefficient for exchange rate changes. That import and export shares move in the same direction, questions the occurrence of any beggar-thy-neighbour effect from exchange rate changes. It rather supports the argument of Nurkse, namely that depreciation released economies from the deflationary fetters in the Great Depression.[27] Tariffs in export markets had a role in constraining exports but clearly so only for Belgium, France, the Netherlands, and Austria, countries which until late in the 1930s were bounded by the deflationary shackles.

A check on the robustness of the indications for a beggar-thy-neighbour effect is the corresponding tests of the import shares, where the beggar-thy-neighbour effect would show up in negative coefficients for exchange rate changes. Table 3 reports, however, such a coefficient with statistical significance only for Germany, and when controls are added the significance disappears. Among the other countries Denmark, Switzerland, and the USA show statistical significance for changes of the exchange rates, but the sign indicates growth of imports with currency depreciation or decline with appreciation which except for Denmark disappears when controls are added. The claim of Denmark conducting "the only" competitive devaluation (see above) finds no support here, and the suspicions raised about Switzerland, related

[26] De Bromhead et al. (2019) specify tariff levels for 258 product categories in British imports 1924–1938 in their assessment of trade policy. To do something similar for both exports and imports of a sample of countries would be a huge project.

[27] An alternative explanation is the influence of bilateral agreements, which became common from 1934. However, even though Germany and Italy heavily relied on such agreements it is easy to pick exceptions from a correlation between bilateral clearing agreements and a significant positive coefficient for import shares. Thus, France and the UK had almost no agreements of that kind but a strong correlation between import and export shares. On the other hand, Denmark, Switzerland and Finland had a significant share of their trade along bilateral clearing agreements (Gordon 1941, esp. p. 133) but a negative or insignificant correlation between imports and exports.

Table 2 Export shares regressed on exchange rates, import shares, and tariffs, 1930–39

	Austria	Austria	Belgium	Belgium	Czechosl	Czechosl	Czechosl Dummy Romania 31
$dner_{t-1}$	0.385 (0.132)	0.330 (0.169)	0.107 (0.826)	0.384 (0.118)	−0.025 (0.574)	0.334 (0.421)	0.629** (0.046)
$Mshare_t$		0.342** (0.018)		−0.306** (0.046)		0.460*** (0.000)	0.527*** (0.000)
$Tariffs_t$		−0.193* (0.069)		−0.521*** (0.000)		−0.082 (0.547)	−0.018 (0.877)
Outlier dummy1							−0.771*** (0.002)
Outlier dummy2							
Adj.R^2 P(F-stat)	0.90 (0.000)	0.91 (0.000)	0.90 (0.000)	0.98 (0.000)	0.86 (0.000)	0.91 (0.000)	0.93 (0.000)
Obs	72 (1930–37)	72 (1930–37)	80	73	64 (1930–37)	59 (1930–37)	59 (1930–37)

	Denmark	Denmark	Denmark Dummies France, USA 37	Finland	Finland	France	France
$dner_{t-1}$	0.137 (0.749)	0.195 (0.683)	0.139 (0.722)	1.170* (0.081)	1.603*** (0.003)	0.008 (0.939)	0.026 (0.742)
$Mshare_t$		−0.152 (0.282)	−0.219* (0.075)		0.164 (0.422)		0.415*** (0.000)
$Tariffs_t$		0.165 (0.464)	0.086 (0.643)		−0.246 (0.334)		−0.302*** (0.003)
Outlier dummy1			−0.829*** (0.005)				
Outlier dummy2			0.805*** (0.004)				
Adj.R^2 P(F-stat)	0.97 (0.000)	0.97 (0.000)	0.98 (0.000)	0.87 (0.000)	0.90 (0.000)	0.94 (0.000)	0.96 (0.000)
Obs	60	60	60	60	53	200	184

	France Dummy Italy 39, Indonesia 39	Germany	Germany	Germany Dummy Bulgaria 31	Italy	Italy	Italy Dummy NL 36
$dner_{t-1}$	0.030 (0.687)	1.183*** (0.003)	0.211 (0.322)	0.195 (0.332)	0.384* (0.083)	0.265 (0.138)	0.251 (0.105)
$Mshare_t$	0.366*** (0.000)		0.849*** (0.000)	0.829*** (0.000)		0.509*** (0.000)	0.477*** (0.000)
$Tariffs_t$	−0.353*** (0.000)		0.109 (0.222)	0.108 (0.200)		0.049 (0.726)	0.150 (0.224)
Outlier dummy1	−1.072*** (0.000)			−0.753*** (0.000)			−1.086*** (0.000)

Table 2 (continued)

	France Dummy Italy 39, Indonesia 39	Germany	Germany	Germany Dummy Bulgaria 31	Italy	Italy	Italy Dummy NL 36
Outlier dummy2	0.679** (0.013)						
Adj.R^2	0.97	0.77	0.93	0.93	0.90	0.95	0.96
P(F-stat)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	184	150	142	142	108	108	108

	Netherl	Netherl	Netherl Dummies Soviet 30, 31	Norway	Norway	Sweden	Sweden
$dner_{t-1}$	0.321 (0.526)	0.397 (0.425)	0.387 (0.231)	−0.005 (0.984)	0.080 (0.744)	0.683** (0.013)	0.617** (0.024)
$Mshare_t$		0.778*** (0.004)	0.321* (0.070)		0.033 (0.696)		0.340** (0.033)
$Tariffs_t$		−0.322 (0.131)	−0.512*** (0.001)		−0.115 (0.300)		0.020 (0.853)
Outlier dummy1			−1.114*** (0.003)				
Outlier dummy2			2.210*** (0.000)				
Adj.R^2	0.85	0.87	0.94	0.98	0.98	0.92	0.92
P(F-stat)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	90	83	83	80	80	80	80

	Switzerl	Switzerl	U.K	U.K	U.K Dummies NZ 35, IT 36
$dner_{t-1}$	0.771** (0.003)	0.853*** (0.003)	0.849** (0.011)	0.809** (0.018)	0.685*** (0.001)
$Mshare_t$		−0.130 (0.547)		0.067 (0.510)	0.382*** (0.000)
$Tariffs_t$		−0.090 (0.352)		−0.055 (0.304)	0.037 (0.556)
Outlier dummy1					2.772*** (0.000)
Outlier dummy2					−2.139*** (0.000)
Adj.R^2	0.92	0.91	0.78	0.76	0.92
P(F-stat)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	59	58	160	153	153

	USA	USA	USA Dummies DK 31, 37
$dner_{t-1}$	0.565*** (0.000)	0.169* (0.090)	0.146 (0.118)

Table 2 (continued)

	USA	USA	USA Dummies DK 31, 37
$Mshare_t$		0.725*** (0.000)	0.765*** (0.000)
$Tariffs_t$		−0.085 (0.352)	−0.071 (0.409)
Outlier dummy1			1.040*** (0.002)
Outlier dummy2			−1.038*** (0.002)
Adj.R^2	0.89	0.95	0.96
P(F-stat)	(0.000)	(0.000)	(0.000)
Obs	178	178	178

Probability in parentheses; *for stat. significance at 10% level, **for 5% level, and ***for 1% level.

to exports, are rejected on the import side. Similarly, suspicions raised on the export side about Czechoslovakia, Finland, Sweden, and the UK are not supported on the import side. Overall, there is a strong correlation between import and export shares, emphasizing the persistence of trade patterns as well as the dependence of trade on the development of incomes. As regards tariffs, the French surtaxes and British Imperial Preference clearly had an impact on the imports of these countries as indicated by the statistically significant negative coefficients for tariffs. Other countries with a coefficient for tariffs are the USA and those with which the USA, from 1935 onwards, established a Reciprocal Trade Agreement (RTA).[28] Any effect of RTA is however not discernible, except for Sweden whose imports from the USA substantially expanded after the RTA in 1935. US imports from the RTA partners also expanded in total, but exceptions among the minor trade partners with an RTA apparently reduce the correlation in the model. The complex pattern of trade barriers, with quotas and bilateral agreements on top of tariffs and surtaxes (Gordon 1941; Chalmers 1953), arguably destroyed the multilateral trade and made it less sensitive for price signals, whether transmitted from exchange rates or tariffs.

The fact, observed above, that most countries in the sample improved their competitiveness with the help of currency depreciation, has so far not been found to unambiguously entail beggar-thy-neighbour effects. Arguably, instead of unfair conduct currency depreciations contributed to reconstruction of macroeconomic fundamentals, as contended by *The Economist* before the gold bloc devaluations (see above).

[28] For details, see Appendix D.

Table 3 Import shares regressed on exchange rates, export shares, and tariffs, 1930–39

	Austria	Austria	Belgium	Belgium	Belgium Dummy Soviet 39	Czechoslovakia	Czechoslovakia
dner $_{t-1}$	0.144 (0.531)	0.037 (0.867)	0.016 (0.951)	−0.050 (0.838)	0.026 (0.906)	−0.215 (0.609)	−0.109 (0.775)
Xshare $_t$		0.278** (0.022)		0.182*** (0.006)	0.182*** (0.003)		0.425*** (0.001)
Tariffs $_t$				−0.239 (0.173)	−0.192 (0.229)		
dummy1					−0.676*** (0.000)		
dummy2							
Adj.R^2 P(F-stat)	0.91 (0.000)	0.92 (0.000)	0.93 (0.000)	0.94 (0.000)	0.95 (0.000)	0.88 (0.000)	0.90 (0.000)
Obs	72 (1930–37)	72 (1930–37)	80	80	80	64 (1930–37)	64 (1930–37

	Czechoslovakia Dummies Hungary 30, 31	Denmark	Denmark	Denmark Dummies UK 30, Fr 36	Finland	Finland	Finland Dummy USA 30
$dner_{t-1}$	−0.144 (0.677)	1.136** (0.019)	1.159** (0.017)	1.245*** (0.003)	0.020 (0.969)	−0.513 (0.239)	−0.551 (0.186)
$Xshare_t$	0.294** (0.018)		−0.165 (0.321)	−0.122 (0.380)		0.455*** (0.000)	0.486*** (0.000)
$Tariffs_t$							
dummy1	0.775** (0.015)			−0.847*** (0.005)			0.701** (0.028)
dummy2	−0.607** (0.043)			−1.012*** (0.001)			
Adj.R^2 P(F-stat)	0.92 (0.000)	0.93 (0.000)	0.92 (0.000)	0.95 (0.000)	0.88 (0.239)	0.92 (0.000)	0.93 (0.000)
Obs	64 (1930–37)	60	60	60	60	60	60

	France	France	France Dummies Spain 31,39	Germany	Germany	Germany Dummies Soviet 35, 37	Italy
$dner_{t-1}$	0.043 (0.647)	0.015 (0.849)	0.028 (0.701)	0.357 (0.309)	−0.443* (0.070)	−0.124 (0.561)	0.175 (0.565)
$Xshare_t$		0.414*** (0.000)	0.294*** (0.000)		0.677*** (0.000)	0.723*** (0.000)	
$Tariffs_t$		−0.423*** (0.002)	−0.422*** (0.001)				
Dummy1			0.644** (0.016)			1.380*** (0.000)	
Dummy2			−1.521*** (0.000)			−0.621*** (0.005)	

Table 3 (continued)

	France	France	France Dummies Spain 31,39	Germany	Germany	Germany Dummies Soviet 35, 37	Italy
Adj.R^2	0.89	0.92	0.93	0.73	0.88	0.91	0.79
P(F-stat)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	200	200	200	150	150	150	108

	Italy	Italy Dummies Switzerl. 33, UK 36	Nether-lands	Nether-lands	Nether-Lands Dummy Soviet 39	Norway	Norway
$dner_{t-1}$	−0.202	−0.091	−0.043	−0.121	−0.056	0.006	0.007
	(0.359)	(0.618)	(0.861)	(0.626)	(0.805)	(0.987)	(0.985)
$Xshare_t$	0.982***	0.844***		0.086	0.116**		0.147
	(0.000)	(0.000)		(0.140)	(0.032)		(0.467)
$Tariffs_t$				−0.207	−0.156		
				(0.227)	(0.314)		
dummy1		0.922***			−0.790***		
		(0.001)			(0.000)		
dummy2		−1.486***					
		(0.000)					
Adj.R^2	0.90	0.89	0.97	0.97	0.97	0.90	0.90
P(F-stat)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	108	108	90	90	90	80	80

	Norway Dummies Canada 30, 31	Sweden	Sweden	Switzer-Land	Switzer-Land	UK	UK
$dner_{t-1}$	0.018	0.171	−0.042	0.418*	0.427	0.162	0.119
	(0.953)	(0.459)	(0.857)	(0.023)	(0.040)	(0.579)	(0.687)
$Xshare_t$	0.293*		0.265**		−0.104		0.049
	(0.086)		(0.014)		(0.381)		(0.527)
$Tariffs_t$			−0.250*		−0.132		−0.721**
			(0.094)		(0.266)		(0.019)
dummy1	−0.949***						
	(0.000)						
dummy2	−1.047***						
	(0.000)						
Adj.R^2	0.93	0.97	0.97	0.98	0.98	0.88	0.88
P(F-stat)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	80	80	80	59	59	160	160

	UK Dummies NZ 35; Italy 36	USA	USA	USA Dummies DK 31, 37
$dner_{t-1}$	−0.022	0.565***	0.117	0.105
	(0.909)	(0.000)	(0.258)	(0.274)
$Xshare_t$	0.230***		0.776***	0.806***
	(0.003)		(0.000)	(0.000)

Table 3 (continued)

	UK Dummies NZ 35; Italy 36	USA	USA	USA Dummies DK 31, 37
$Tariffs_t$	−0.759*** (0.000)		0.094 (0.594)	0.015 (0.928)
dummy1	−2.837*** (0.000)			−1.080*** (0.002)
dummy2	−0.734*** (0.007)			1.178*** (0.001)
Adj.R^2	0.95	0.88	0.95	0.95
P(F-stat)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	160	178	178	178

"Tariffs" are the differentiated import tariff levels of France, the UK, USA, and countries which achieved an RTA with the USA (general import tariffs adjusted for surcharges, imperial preferences, and RTA, respectively). Probability in parentheses; *for stat. significance at 10% level, **for 5% level, and ***for 1% level

4.2 Year by year

One might, however, object that a decade is a long period and when countries depreciated, the beggar-thy-neighbour effect was only temporary and would therefore not show up in these tests. A second version of the test is therefore performed, as a "cross section panel", that is, one equation is run for each year with all the sample countries and their respective trade partners involved. In the stacked panel of the fourteen countries, observations for their respective trade partners replace the annual series of observations. The trade partners correspond to period or dates in a time series panel, and since trade partners differ between countries, "period fixed effects" would make no sense though cross section random effects are applied. However, when highlighted by the Hausman test, cross section fixed effects are applied. All variables are logged and taken as annual changes. On the right-hand side, changes in exchange rates pertain to the preceding year, while both changes in trade shares and tariff changes are from the current year. Equation (3) is thus slightly modified to Eq. (4), which is also run in two versions letting *dexportshare* and *dimportshare* change places:

$$\text{dexportshare}_{ij} = \alpha + \beta_1 dner_{ij} + \beta_2 dx_{ij} + \gamma_i + DUMMY_i + \varepsilon_{ij} \tag{4}$$

Table 4 reports the result with *dexportshare* as the dependent variable. It is noteworthy that a strong and statistically significant exchange rate elasticity is displayed for 1931, and nearly so in 1930, reacting on exchange rate changes in 1930 and 1929 before the devaluation cycle had begun among the industrialized countries. The elasticity of about 2 means that changes in the exchange rate had double the impact on the distribution of exports among trade partners, or differently expressed, that a one per cent depreciation of the bilateral exchange rate towards a trade partner would incite a two per cent increase in

the exports market share of that trade partner. However, in 1929 and 1930 the movements of exchange rates were very limited. Figure 2 illustrates the volatility of bilateral exchange rates and shows that on average appreciations were less than one per cent in 1929 and less than two per cent in 1930, while depreciations are not even discernible in the graph (0.11 and 0.10 per cent respectively). Had these elasticities been retained in the following years, when currency changes multiplied, the influence on trade would have been substantial. However, no effect from exchange rates on exports is discernible for 1932 and although statistically significant in 1933 and 1934, the elasticities are smaller and the contribution of currency movements to the redistribution of exports was limited as also can be inferred from the low adjusted r-squared values. For 1935 the influence of exchange rate changes was inverse of expectations as indicated by the minus sign. These were the years when the contemporary debate was most heated and the minus sign in 1935 suggests that traders anticipated devaluations of the gold bloc in line with the arguments about the J-curve.

There also came an upturn but it lasted until 1938 as a reaction on the dissolution of the gold bloc in 1936 and the concomitant depreciations. In table 4 this can be seen in the last column which is an added exceptional case with a two-year lag for the exchange rate

changes. Interestingly, this result is contrary to the perceived notion of competitive devaluation, that "once the same line of action was adopted by many countries, then the benefits formerly reaped by the leaders soon disappeared" (Aldcroft and Morewood 2013, p. 87).

Apart from 1931, 1933, 1934, and the delayed reaction in 1938, the coefficients for exchange rate changes do not achieve statistical significance whereas tariff changes did so in 1935-1937. In these years tariff changes, together with changes in import shares, explain a non-negligible part of changes in exports. It is noteworthy that in all years (except 1935) import shares with statistical significance move in the same direction as export shares. As already pointed out in the country by country analysis, these findings call into question any beggar-thy-neighbour effect and suggests a dominance of the income effect together with protectionist measures. That is, growing economies increased their shares of both exports and imports, while the reverse takes place in declining economies. However, the indications for 1933 and 1934, as well as the delayed response in 1938, suggest the occurrence of beggar-thy-neighbour effects in these years and that exchange rate changes did influence the export markets.

Table 5 reports results for the import side. Compared with the export side, we do not see the same sensitivity for exchange rate changes in 1930 and 1931. The coefficient is quite large in 1930 but even when dummies correct for outliers it is not statistically significant. One possible explanation for this is that the pass-through to consumers from currency depreciation to prices of imports in domestic markets were stickier than for exports in foreign markets. Indeed, the general deflationary pressure

Table 4 Change in exports to main trade partners regressed on change in bilateral exchange rates and imports, 14 countries with main trade partners

	1930	1930	1930 Dummies DK: US US: Brazil	1931	1931	1931 Dummies FI: USSR NL: USSR	1932
dner	1.348 (0.249)	1.797 (0.113)	1.727 (0.107)	2.066*** (0.007)	2.118*** (0.003)	2.037*** (0.000)	0.049 (0.891)
Imports		0.367*** (0.000)	0.329*** (0.000)		0.540*** (0.000)	0.368*** (0.000)	
Tariffs		−0.056 (0.696)	−0.088 (0.517)		0.209 (0.235)	0.107 (0.333)	
Outlier dummy1			−0.529*** (0.004)			−0.754*** (0.000)	
Outlier dummy2			0.565*** (0.002)			3.201*** (0.000)	
Adj.R^2 P(F-stat)	0.00 (0.245)	0.20 (0.000)	0.28 (0.000)	0.04 (0.007)	0.17 (0.000)	0.70 (0.000)	−0.02 (0.648)
Obs	148	148	148	148	148	148	148

	1932#	1932 Dummies NL: USSR US: Czsk	1933#	1933#	1933# Dummies US: DK, Czsk	1934	1934
dner	0.318 (0.380)	−0.114 (0.638)	0.261* (0.086)	0.317** (0.027)	0.308** (0.019)	−0.046 (0.801)	0.235 (0.109)
Imports	0.451*** (0.000)	0.270*** (0.002)		0.162** (0.039)	0.143** (0.046)		0.393*** (0.000)
Tariffs	−0.125 (0.404)	0.006 (0.959)		−0.004 (0.956)	−0.011 (0.876)		0.351 (0.121)
Outlier dummy1		−2.355*** (0.000)			−0.746*** (0.000)		
Outlier dummy2		1.492*** (0.000)			0.750*** (0.000)		
Adj.R^2 P(F-stat)	0.08 (0.032)	0.47 (0.000)	0.07 (0.056)	0.12 (0.010)	0.27 (0.000)	−0.01 (0.803)	0.15 (0.000)
Obs	148	148	148	141	141	148	141

	1934 Dummies UK: US US: Czsk	1935	1935	1935 Dummies DE: BG UK: NZ	1936	1936	1936 Dummies UK: NZ, It
dner	0.365** (0.010)	−0.379* (0.029)	−0.429** (0.015)	−0.431*** (0.001)	0.137 (0.694)	0.178 (0.433)	0.154 (0.433)
Imports	0.388*** (0.000)		−0.315*** (0.000)	0.344*** (0.000)		0.306*** (0.000)	0.580*** (0.000)
Tariffs	0.351 (0.100)		−0.485*** (0.005)	−0.254 (0.041)		−0.603* (0.094)	−0.463** (0.035)
Outlier dummy1	0.593*** (0.002)			−0.391** (0.021)			−3.096*** (0.000)
Outlier dummy2	−0.577*** (0.003)			2.817*** (0.000)			−1.817*** (0.000)

Table 4 (continued)

	1934 Dummies UK: US US: Czsk	1935	1935	1935 Dummies DE: BG UK: NZ	1936	1936	1936 Dummies UK: NZ, It
Adj.R^2 P(F-stat)	0.24 (0.000)	0.03 (0.029)	0.21 (0.000)	0.59 (0.000)	−0.01 (0.693)	0.09 (0.002)	0.67 (0.000)
Obs	141	148	141	141	147	139	139
	1937	1937		1937 Dummies DK: Fr It: NL	1938#	1938#	1938# Dummies Be: Arg DK: Fr
dner	−0.233 (0.535)	−0.166 (0.501)		−0.350 (0.114)	−0.031 (0.575)	−0.061 (0.201)	−0.048 (0.254)
Imports		0.780*** (0.000)		0.777*** (0.000)		−0.092 (0.289)	−0.037 (0.631)
Tariffs		−0.291*** (0.005)		−0.285*** (0.002)		0.091 (0.657)	0.155 (0.384)
Outlier Dummy1				−0.993*** (0.000)			0.728*** (0.001)
Outlier Dummy2				0.983*** (0.000)			1.006*** (0.000)
Adj.R^2 P(F-stat)	−0.00 (0.526)	0.61 (0.000)		0.69 (0.000)	0.09 (0.023)	0.16 (0.004)	0.36 (0.000)
Obs	147	139		139	126	115	115
		1938 Dummies DK: Fr It: NL		1939#	1939#		1939 Dummies Fi: Fr Fr: DE
dner				0.390 (0.137)	0.400* (0.080)		0.171 (0.249)
dner(1936)		0.620*** (0.005)					
Imports		0.088 (0.157)			0.399*** (0.000)		0.321*** (0.000)
Tariffs		0.383** (0.034)			−0.092 (0.600)		−0.129 (0.402)
Outlier dummy1		0.945*** (0.000)					−0.559*** (0.009)
Outlier dummy2		−0.904*** (0.000)					−0.563*** (0.008)
Adj.R^2 P(F-stat)		0.25 (0.000)		0.07 (0.057)	0.17 (0.002)		0.26 (0.000)
Obs		115		123	113		113

#denotes that cross section fixed effects are applied while elsewhere are cross section random effects are applied (according to Hausman tests). In column heads, country acronyms denote dummy for home country: trade partner. Probability in parentheses; *for stat. significance at 10% level, **for 5% level, and ***for 1% level. The last column for 1938 has *dNER* with a two-year lag, see text

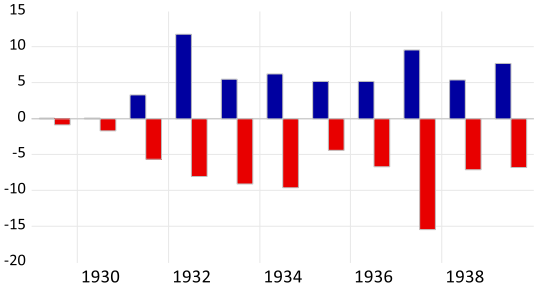

Fig. 2 Averages of depreciations and appreciations in per cent, 1929–1939. *Note:* The bars show the averages of depreciations (blue) and appreciations (red) between the 14 countries in the sample and their respective trade partners. Sources, see text

on prices in these years lends some support to this conjecture. However, in 1932—the year after the break-up of the gold standard—the exchange rate is weakly statistically significant when adjustment is made for outliers. The coefficients for 1933 show a similar result and 1934, when the US dollar had also depreciated, displays a strong statistical significance for the exchange rate. On the export side, one could also note an influence in 1933 and 1934 from exchange rate changes in the preceding years and the beggar-thy-neighbour effect was present. The depreciation of the British pound took place in both 1931 and 1932, when counted as annual average over the preceding year, while the US dollar slid in 1933 and 1934 (see Figs. 13 and 14) and both these countries had weighty shares in the trade of all countries in the present sample. In 1935 and the following years no impact can be traced on the import side from the exchange rates and the beggar-thy-neighbour effects were apparently temporary. The traces of a J-curve, with adverse behaviour in 1935 in waiting for the devaluation by the remaining gold bloc countries and a delayed impact after the 1936 devaluations, that is uncovered on the export side, cannot be found on the import side (not reported in Table 5). These contrasts between exports and imports highlight the persistent phenomenon of the high mutual correlation between imports and exports, broken only by a negative correlation in 1935 when exports showed an adverse behaviour, and in 1938. This correlation suggests that in addition to the aforementioned income effect patterns of trade were of major importance, whether determined by protectionist trade barriers or path dependency of different sorts. The increase in bilateral trade in the 1930s probably also contributed to this correlation between imports and exports. Another probable impact of the rise of bilateral trade is exposed by the uneven influence from tariff changes in this cross-sectional version of the model. These were found to be significant only in export markets during the latter half of the 1930s, even though, as was shown above, Imperial preferences and surtaxes influenced the sources of British and French imports. Though the present tariff indicators are crude, the results support the argument by de Bromhead et al. (2019) about the importance of trade policy. An outcome of these trade policies and erosion of multilateral trade was a weakening of the influence of exchange rate changes on trade flows, which is demonstrated by the present analysis.

Table 5 Change in imports to main trade partners regressed on change in bilateral exchange rates and exports, 14 countries with main trade partners

	1930	1930	1930# Dummies Be: USSR US: DK	1931	1931#	1931 Dummies Czsk: HU Fr: RO	1932
dner	−0.664 (0.606)	−1.150 (0.344)	−1.303 (0.217)	−0.148 (0.765)	−0.446 (0.355)	−0.412 (0.281)	−0.297 (0.195)
Exports		0.442*** (0.000)	0.416*** (0.000)		0.254*** (0.000)	0.165*** (0.000)	
Tariffs		0.510 (0.125)	−0.133 (0.885)		−0.573 (0.143)	−0.096 (0.476)	
Outlier dummy1			1.247*** (0.000)			−1.494*** (0.000)	
Outlier dummy2			−0.450*** (0.016)			0.645*** (0.000)	
Adj.R^2 P(F-stat)	−0.00 (0.601)	0.15 (0.000)	0.51 (0.000)	−0.01 (0.765)	0.15 (0.001)	0.43 (0.000)	0.01 (0.182)
Obs	148	148	148	148	148	148	148

	1932	1932 Dummies Czsk: US US: Chile	1933	1933#	1933# Dummies It: CH US: Arg	1934	1934
dner	−0.325 (0.146)	−0.334* (0.087)	−0.257* (0.061)	−0.249 (0.107)	−0.264* (0.053)	−0.323** (0.014)	−0.294** (0.025)
Exports	0.216*** (0.000)	0.103* (0.063)		0.204** (0.018)	0.175** (0.023)		0.204*** (0.001)
Tariffs	−0.149 (0.165)	−0.125 (0.187)		−0.143 (0.377)	−0.142 (0.320)		0.103 (0.705)
Outlier dummy1		0.994*** (0.000)			0.993*** (0.000)		
Outlier dummy2		−1.239*** (0.000)			0.877*** (0.000)		
Adj.R^2 P(F-stat)	0.09 (0.001)	0.31 (0.000)	0.02 (0.057)	0.30 (0.000)	0.45 (0.000)	0.03 (0.013)	0.10 (0.000)
Obs	148	148	148	148	148	148	148

	1934 Dummies DE: HU It: CH	1935	1935	1935 Dummies Fi: USSR UK: NZ	1936	1936	1936# Dummies UK: NZ It: UK
dner	−0.314*** (0.006)	−0.024 (0.880)	−0.134 (0.402)	−0.231 (0.134)	−0.068 (0.824)	−0.095 (0.751)	−0.079 (0.659)
Exports	0.190*** (0.000)		−0.308*** (0.000)	0.335*** (0.000)		0.225*** (0.005)	0.382*** (0.000)
Tariffs	−0.008 (0.974)		0.139 (0.496)	0.079 (0.684)		−0.084 (0.763)	0.057 (0.735)
Outlier dummy1	0.668*** (0.000)			−0.795*** (0.002)			3.107*** (0.000)

Table 5 (continued)

	1934 Dummies DE: HU It: CH	1935	1935	1935 Dummies Fi: USSR UK: NZ	1936	1936	1936[#] Dummies UK: NZ It: UK
Outlier dummy2	−0.932*** (0.000)			0.684*** (0.007)			−1.685*** (0.000)
Adj.R^2 P(F-stat)	0.32 (0.000)	−0.01 (0.879)	0.08 (0.001)	0.17 (0.000)	−0.01 (0.821)	0.04 (0.033)	0.66 (0.000)
Obs	148	148	148	148	147	147	147

	1937	1937	1937 Dummies It: UK US: Brazil	1938	1938[#]	1938[#] Dummies It: Arg US: Arg
dner	0.245 (0.503)	0.376 (0.146)	0.218 (0.279)	−0.076 (0.145)	−0.084 (0.114)	−0.072 (0.122)
Exports		0.696*** (0.000)	0.333*** (0.000		0.024 (0.793)	0.019 (0.808)
Tariffs		−0.052 (0.592)	0.065 (0.399)		0.132 (0.811)	0.128 (0.792)
Outlier dummy1			1.292*** (0.000)			−1.201*** (0.000)
Outlier dummy2			−2.491*** (0.000)			−0.734*** (0.002)
Adj.R^2 P(F-stat)	−0.00 (0.487)	0.52 (0.000)	0.71 (0.000)	0.01 (0.142)	0.22 (0.000)	0.40 (0.000)
Obs	147	147	147	126	126	126

	1939	1939	1939[#] Dummies US: Arg, Chile
dner	−0.063 (0.764)	−0.217 (0.224)	−0.247 (0.180)
Exports		0.467*** (0.000)	0.477*** (0.000)
Tariffs		0.091 (0.684)	0.076 (0.753)
Outlier dummy1			0.391* (0.061)
Outlier dummy2			0.559*** (0.008)
Adj.R^2 P(F-stat)	−0.01 (0.760)	0.27 (0.000)	0.59 (0.000)
Obs	123	123	123

[#]Denotes that cross section fixed effects are applied while elsewhere are cross section random effects (according to Hausman tests). In column heads, country acronyms denote dummy for home country: trade partner. Probability in parentheses; *for stat. significance at 10% level, **for 5% level, and ***for 1% level.

5 Concluding discussion

Despite monetary arrangements take a central place in explanations of the Great Depression, the actual development of exchange rates has been remarkably neglected. This might explain why the notion of "competitive devaluations in the 1930s" has lingered not only in public debate but also in the literature. However, the present analysis of bilateral exchange rates between fourteen advanced countries and their main trade partners 1929–39 uncovers only temporary evidence of any beggar-thy-neighbour effect. Such effects would arise from competitive devaluation, understood as a boost of exports and a limitation of imports by help of currency depreciation. While the effect on the distribution of exports suggested some countries as suspects, for no country currency depreciation worked as a constraint on the distribution of imports. On the contrary, for Denmark and Switzerland the effect was the reverse. Even more important is the result that imports and exports towards the same trade partners in general were highly correlated. If there were beggar-thy-neighbour effects imports and exports would typically move in opposite directions. The findings are in line with the mechanism suggested by Nurkse (1944), that the major effect of depreciation was expansionary and thereby stimulated both exports and imports. In variance to the grave misrepresentation of his argument in the recent literature, Nurkse pointed to the fact that devaluation of currencies increased the value of gold and as a consequence created a monetary expansion that was not limited to the countries that devalued.

Nevertheless, temporarily beggar-thy-neighbour effects did arise. An examination of the effects of exchange rate changes across the whole sample of countries year by year showed that currency depreciations caused such effects in 1933 and 1934. Notable is that the highest sensitivity was shown for exports in 1931, before the devaluation cycle had begun. Theoretically this is reasonable and means that the pass-through of exchange rate changes to commodity prices gave signals to the market. That this kind of normality did not work during the 1930s is demonstrated by the lack of impact from exchange rates in the country analyses, despite currency induced improvements of REER applied to most countries in the sample. Indeed, only temporary impacts in 1933 and 1934 are traced. Therefore, what requires explanation is why this mechanism did not work, or worked so poorly, during the Great Depression.

While this goes beyond the scope of this article, what follows is the outline of a conjectural explanation. Before exchange rates became volatile exporters were more sensitive but when exchange rate volatility increased from 1931, both supply (exports) and demand (imports) sides became less sensitive and only occasionally trade flows could be impacted by currency depreciation. Paul Krugman has suggested a "wait and see" mechanism in times of uncertainty, that would explain the low significance of beggar-thy-neighbour effects:

> When the exchange rate is highly volatile, firms are more likely to regard its movements as temporary, so that regressive expectations reduce their response; and even if they do not have regressive expectations, exchange-rate

> volatility gives them an incentive to adopt a "wait and see" policy that does not respond quickly to exchange-rate changes. (Krugman 1989, p. 54)[29]

The "wait and see" policy is quite rational since, as Krugman shows, the anticipated losses of an unfavourable change in the exchange rate would not be greater, while the profits in case of a favourable change would grow if a firm delays its entry or exit in the market. The high elasticity found for exports in 1930 and 1931 might show the sensitivity during circumstances of relative exchange rate stability. Later, when volatility in exchange rates magnified, the sensitivity declined and even became insignificant.

Paradoxically, it follows that uncertainty about exchange rates would not have contributed to the slump in international trade during the Great Depression. Rising tariffs, import quotas, and bilateral agreements, as well as the general decline in economic activity, were rather the causes. The insignificant or temporary beggar-thy-neighbour effects show that the "evils of competitive devaluation" in the 1930s is largely a myth. Unfortunately, this myth has concealed the expansionary effects currency depreciation had on the international economy. According to Nurkse, this effect was due in particular to the "practically universal" (1944, p. 18) devaluation in terms of gold, which increased the monetary reserves. As mentioned, later authors have highlighted this effect but only for individual countries leaving some ambiguity about the myth. However, the argument of Christina Romer (1992), that the gold inflow to the USA ended the Great Depression, could be well placed in the larger context of currency depreciations.

A corollary to the myth of competitive devaluations in the 1930s is that there was a kind of tit-for-tat warfare in the field of exchange rates. Although far from exhaustive and inviting to further research, my examination of the contemporary discourse, mainly as reflected in *The Economist* and *Financial Times*, indicates rather a desire for exchange rate stability than a wish to hit back.

Finally, it should be kept in mind that the present analysis pertains to the 1930s and not to the possible occurrence of beggar-thy-neighbour effects in other episodes. Neither does it question the bolstering effect of currency depreciation in economic crises by *ceteris paribus* increasing the value in domestic currency of a country's exports (Ljungberg 2021). In the 1930s currency depreciation released the deflationary pressure of the gold standard mentality not only for individual countries but for the global economy by immensely increasing the monetary reserves.

[29] Theoretically, this explanation is valid even if Krugman somewhat later changed his mind about the working of the adjustment mechanism in the 1980s: "With hindsight, however, we can see that the reports of the demise of the exchange rate mechanism in the 1980s were premature" (Krugman 1991, p. 17).

Appendix

A: trade partners

Below are listed trade partners on which the effective exchange rates 1929–1939 are based, and which are included with bilateral exchange rates and trade in the calculation of export and import elasticities. The figures in parentheses show the percentage share these countries had in the total foreign trade of the country in question in 1929:

Austria Czechoslovakia, Germany, Hungary, Italy, Poland, Switzerland, UK, USA, and Yugoslavia (78).

Belgium Argentina, France, Germany, India, Netherlands, Soviet, UK, and USA (62).

Czechoslovakia Austria, Germany, Hungary, Poland, Romania, Soviet, UK, and USA (69).

Denmark France, Germany, Norway, Sweden, UK, and USA (85).

Finland France, Germany, Soviet, Sweden, UK, and USA (73).

France Algeria, Argentina*, Australia*, Belgium, Brazil*, Czechoslovakia*, Finland*, Germany, India*, Indonesia*, Italy, the Netherlands*, Poland*, Romania*, Spain, Soviet*, UK, USA, Sweden, and Switzerland (76). (Countries with * based on INSEE 1966).

Germany Austria, Belgium, Bulgaria, France, Italy, Netherlands, Soviet, Sweden, UK, USA, Spain, Denmark, Switzerland, Poland, Czechoslovakia, and Hungary (72).

Italy Argentina*, Austria, Belgium*, Brazil*, France, Germany, India*, Netherlands*, Switzerland, UK, USA (70) (Countries with * based on ISTAT 1958, 1968).

Netherlands Belgium, France*, Indonesia, Germany, Soviet, UK, USA, Norway, Sweden (75) (Countries with * based on INSEE 1966).

Norway Denmark, France, Germany, Netherlands, Sweden, UK, USA, and Canada (74).

Sweden Denmark, France, Germany, Netherlands, Norway, UK, USA, Soviet, and Finland (78).

Switzerland: Austria, France, Germany, Italy, UK, and USA (64).

UK Argentina, Australia, Canada, France, Germany, India, Netherlands, New Zealand, Soviet, USA, Denmark, Sweden, Norway, Belgium, Switzerland, and Italy (74).

USA Argentina, Brazil, Belgium, Canada, Chile, Czechoslovakia, Denmark, France, Germany, Italy, Japan, Mexico, Netherlands, Norway, Sweden, Switzerland, UK, Venezuela (73).

B: effective exchange rates for the USA, France, and Italy

In order to have effective exchange rates for the USA that are consistent and comparable with those for European countries in Ljungberg (2019–data available at https://www.lusem.lu.se/economic-history/databases/economic-history-data/exchange-rates), nominal (NEER) and real (REER) effective exchange rates are calculated for 1929–1939:

$$\mathrm{NEER}_{\mathrm{us}} = \Sigma[(e_{\mathrm{usj}} m_{\mathrm{usj}}) + (e_{\mathrm{usj}} x_{\mathrm{usj}})] \tag{5}$$

$$\mathrm{REER}_{\mathrm{us}} = \Sigma[(e_{\mathrm{usj}} m_{\mathrm{usj}} {}_{*} p_{\mathrm{j}} / p_{\mathrm{us}}) + (e_{\mathrm{usj}} x_{\mathrm{usj}} {}_{*} p_{\mathrm{j}} / p_{\mathrm{us}})] \tag{6}$$

where subscripts denote the USA and country j, respectively; e_{usj} is the annual change in the exchange rate taken as the amount of US dollars for one unit of country j's currency; m is the share of American imports coming from country j; x denotes the same for the exports; p is the annual changes in the consumer price index. Trade partners are as listed in Appendix A. Data on trade are from Mitchell (2013), and annual exchange rates are calculated on monthly close rates in *Global Financial Data*; except for Chile, Mexico, and Venezuela, which are annual rates as given by the *United Nations Statistical Yearbook* (1948).

For France and Italy, the NEER and REER available in Ljungberg (2019) have been improved by the addition of more trade partners, which can be seen in Appendix A. The share of total trade included in the calculations increased from 48 to 76 per cent for France, and from 53 to 70 per cent for Italy.

C: gold reserves

Table 6 shows development of gold reserves valued in USD, with December 1930 = 100. 1930–1933 values are with the old gold parity of USD 20.67 per ounce, and from 1934 with the new parity of USD 35 per ounce. The gold bloc consists of France, Belgium, Netherlands, Switzerland, and Poland. The four sterling countries

are the UK, Denmark, Norway, and Sweden. The control group includes Germany, Austria, Czechoslovakia, Hungary, Bulgaria, Romania, Greece, Yugoslavia, and Italy which originally was in the gold bloc but introduced exchange controls and depreciated in 1934.

Average columns emphasize the reserves of the gold bloc. When reserves are pooled greater weight is given to "rich" countries why the outflow from France results in a marked drop in 1936. The big discrepancy between the columns for the control group is due to the close to extinction of the German gold reserve.

D: tariffs

Tariffs for Argentina, Austria, Brazil, Chile, Denmark, France, Germany, India, Indonesia, Japan, Mexico, Norway, Spain, Sweden, and Italy are taken the "average tariff levels" from Clemens and Williamson (2004). Since the same, or not very different results can be obtained for several of these countries by the ratio customs revenues to aggregate imports, from Mitchell (2013), the latter source has been used for countries missing in Clemens and Williamson: Belgium, Czechoslovakia, Hungary, Netherlands, Poland, Romania, Soviet (1929–1932), and Venezuela. Yugoslavia is provided by Clemens and Williamson 1929–31 and then extrapolated with an estimate of customs revenues based on Mitchell (2013) and SEE (2014) together with imports from Mitchell (2013).

Algeria and France had "complete tariff assimilation" (Gordon 1941, p. 471), why their mutual tariffs are set to zero.

Imperial preferences, in particular from 1933 when the Ottawa agreement became efficient, mean that average tariff levels underestimate tariffs charged on non-British exports to the Empire, while overestimating tariffs within the Empire. The Ottawa Agreement (Cabinet 1932) provides tariff schedules of Dominions and India for commodity groups and though giving a rough idea of the magnitude of tariffs and preferences, an estimate of the overall impact on tariff levels would require a meticulous work with trade statistics down to commodity level. Such a venture was conducted by MacDougall and Hutt (1954), however only for the years 1929, 1937, and 1948. Their estimates for 1929 have been assumed valid for 1929–32, and 1937 for 1933–39, in a reconstruction of general tariff levels as well as preferential tariffs for imports to Australia, Canada, India, and New Zealand. For the UK, the timing is slightly different since the Import Duties Act introduced preferential tariffs already from 1 March 1932 and these were confirmed by the Ottawa Agreement (NIESR 1943). Thus, the 1929 benchmark is used for 2/12 of 1932, and the benchmark of 1937 for 10/12 of 1932. Since MacDougall and Hutt only provide the "margin of preference" but not general tariff levels, average tariff levels according to Clemens and Williamson (2004) for these countries, except Canada, have been necessary inputs in the estimations.

MacDougall and Hutt in some cases provide ranges, and the midpoint value has been used. Concerning imports from Empire to the UK, they are a bit ambiguous: in tables on p. 237–8 the margin of preference is reported to have been 2–3 per cent in 1929, and 10–12 per cent in 1937; but from the more detailed table on p. 241, one

Table 6 Gold reserves of central banks and governments (Dec 1930 = 100). *Source*: Federal Reserve Bulletin, various issues (1930s)

December	USA	Gold Bloc		4 Sterling		9 Control	
		Average	Pooled	Average	Pooled	Average	Pooled
1930	100	100	100	100	100	100	100
1931	96	191	148	89	83	105	73
1932	96	204	171	86	82	97	69
1933	95	185	158	115	127	126	68
1934	195	302	275	188	215	210	94
1935	240	250	225	212	227	187	69
1936	266	271	182	274	343	172	60

can derive a range of 0.59–0.66 per cent in 1929 and 7.5–9.11 per cent in 1937. I have taken the mean of their higher judgements and set 2.5 per cent for 1929 and 11 for 1937, since not all imperial benefits were captured by the preferential schedules (Gordon 1941, pp. 216 ff, 408 ff; Glickman 1947). MacDougall and Hutt chose 1937, the fifth year after Ottawa, because it took time to implement the agreements all over the Empire. However, for the Dominions and India implementation seems to have been achieved by start of 1933 (Chalmers 1953, p. 117), and by having the average tariff levels as the basis for the estimations the time of implementation is accounted for.

The average tariff level of Canada, provided by Clemens and Williamson (2004), is identical with what can be derived from Mitchell (2013). However, Irwin (1998, p. 339) presents average tariffs for US exports to Canada, 1928 and 1932, which are substantially higher. The discrepancy is probably due to the particular composition of imports and a deliberate Canadian policy (Kottman 1975; McDonald et al. 1997). However, given that USA conveyed more than half, and sometimes two-thirds, of Canadian imports, the levels are simply not consistent, in particular when the Imperial preference is included in the equation. The solution here is to stick to the average tariff level according to Clemens and Williamson, and to calculate the general tariff level by adjustment for MacDougall and Hutt's (1954) estimate of the Imperial preference. However, probably due to the trade agreement with the USA (below), the Canadian tariff level fell so low that from 1936 tariffs on British goods would have been negative, with MacDougall and Hutt's margin of preference. I have therefore assumed that from 1933 and the implementation of the Ottawa agreement, tariffs on British imports to Canada stayed constant.

With the Reciprocal Trade Agreements (RTA), negotiated bilaterally from 1934, countries faced different tariff levels for their exports to USA (Gordon 1941). The New York Times (1938) published a table with the number of reduced tariff schedules and the ranges of reductions, which have been used for an estimation of the tariff level of the USA towards countries with an agreement, assuming that all countries with an RTA achieved the same percentage reduction in the US tariffs. These reductions 1934–37 would amount to almost four-fifths of the 15 per

Table 7 Reciprocal Trade Agreements between USA and other countries, when effective

Belgium	Sweden	Brazil	Canada	Netherl	Switzerl	France	Czechosl	U.K	Venezuela
1/5	5/8	1/1	1/1	1/2	15/2	15/6	23/10	1/1	16/12
1935	1935	1936	1936	1936	1936	1936	1938*	1939	1939

Only countries in the present sample of trade partners are included. Source, Gordon (1941, p. 395) *For Czechoslovakia trade data are missing 1938–39. With Canada, the RTA was extended from 1939

Table 8 French surtaxes on imports from other countries, 1931–36

	Denmark	Finland	Norway	Sweden	U.K	India, Argentina	Australia
Surtax %	15	15	15*	15	15	15*	15
Introduced	Nov 1931	Dec 1931	Nov 1931	Nov 1931	Nov 1931	Nov 1931	Nov 1931
Omitted	Sep 1936	March 1933	Sep 1936	March 1933	Sep 1936	Sep 1936	Sep 1936

*The surtax on imports from Norway was 8 per cent at the introduction but was increased one month later. Similarly with India 7 per cent, and Argentina 10 per cent in the first month. Source, Gordon (1941, p. 225 f.)

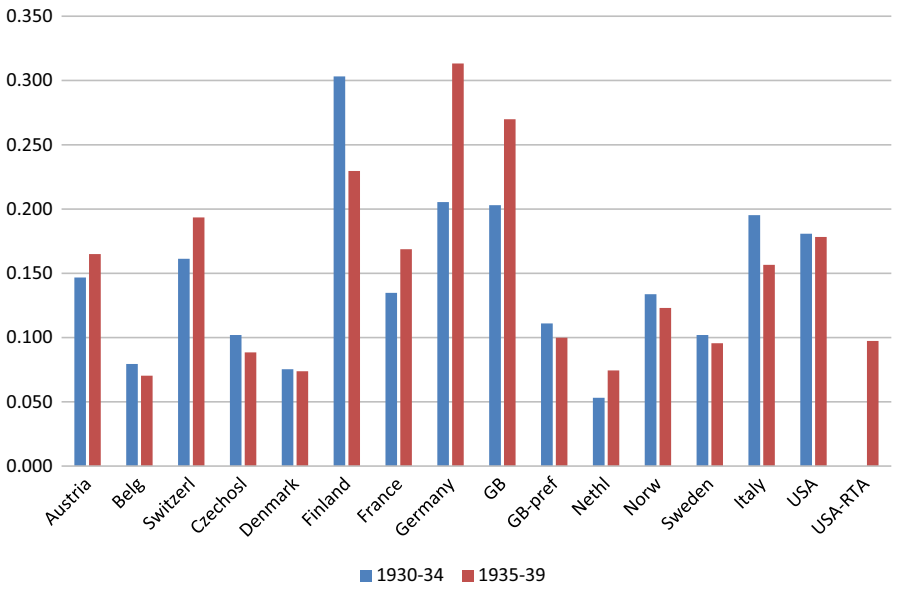

Fig. 3 General tariff levels, averages over 1930–34 and 1935–39. *Note*: For France surtaxes not included; GB-pref considers imports from Empire; USA-RTA considers countries with which USA had a Reciprocal Trade Agreement. Details and sources, see text

cent decrease in the average tariff level that actually took place. This seems reasonable because the most-favoured-nation principle gave spillover effects, even if the major impact should be with the RTA partners. While used for an adjustment of the US average tariff level, a corresponding adjustment for the tariff levels of

most RTA partners is problematic. Not because USA did not achieve the reciprocal benefits but because these were usually provided as reductions of other trade barriers than tariffs (Gordon 1941). The UK, with an RTA in 1939, had few other trade barriers and reduced tariff for American goods. However, with insufficient knowledge of other trade barriers, all partners in RTAs are assumed to have reduced tariffs to the same extent as USA. When implemented during a year, say from 15 June, the reduced tariff is weighted 13/24 in that year and the general tariff level weighted 11/24. Table 7 shows when RTA between USA and other countries became effective.

Another complication to the average tariff levels is the surtaxes introduced as penalty on misbehaving trade partners. In the current sample probably the most important were the surtaxes introduced by France in late 1931 on imports from countries with depreciating currencies. Table 8 shows the time periods and amount of the French ad valorem surtaxes pertaining to the current sample plus trade partners. For other countries, this meant that French tariffs were lower than indicated by the average tariff levels, and the general tariff level has been accordingly constructed.

A picture of the variety of tariff levels, and their change over the 1930s, is provided by Fig. 3. One should remember, that in particular on the European continent were other trade barriers than tariffs important. Neither was there a clear trade-off between tariff levels and currency policy. Thus, gold bloc countries Belgium and the Netherlands had the lowest tariffs while sterling Finland the highest until 1934, then passed by Germany. One may further object that tariff levels varied between commodities, and these might not be captured by averages. However, to accurately disaggregate down to commodity level would require a larger research project.

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